



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

This report examines differences in the dispensing rates of long-term medications and specific types of medicines, such as antipsychotics and benzodiazepines, among people aged 65 and over 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).

Polypharmacy refers to a person using multiple (five or more in general) medicines at once. It can be appropriate, when medicines are necessary for managing complex or multiple conditions and have been carefully reviewed, or it can be harmful (inappropriate polypharmacy) (Duerden et al 2013). Inappropriate polypharmacy is prescribing multiple medicines that are unnecessary, unhelpful or unwanted, or have unacceptable side effects or risks.

Polypharmacy is associated with:

- people not taking medicines as prescribed
- significant costs to patients and health services
- adverse drug events and drug interactions that can result in poor health outcomes, such as falls, cognitive impairment, frailty, depression and lower quality of life.

Older people (65 years and over) are more susceptible to medicine-related side effects, especially older people who are frail or have multiple health conditions.

Key findings

- People living in urban areas were significantly more likely than those living in rural areas to receive five or more medicines in two consecutive quarters in 2023.
 - This urban–rural pattern persisted across age groups and was similar when stratified by aged residential care status, although not always statistically significant due to small numbers.
- People living in rural areas were less likely than those living in urban areas to receive benzodiazepine or zopiclone.
 - Māori consistently had lower dispensing rates for benzodiazepine or zopiclone than European/Other across rurality categories, although differences were not always statistically significant.

Method

The Polypharmacy Atlas reports data from existing national collections, including the Pharmaceutical Collection and the Primary Health Organisation Enrolment Collection. It highlights demographic and regional differences in dispensing long-term medicines. Only those who are enrolled in a PHO are included in the analysis.

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 \(rhrn.nz\)](https://rhrn.nz)

To determine rurality for each individual record, we linked GCH files with the domicile code information in our national datasets. One limitation is that around 60 domicile codes that could not be mapped to GCH 2018 were excluded from the rurality analysis. This affected fewer than one percent of individuals. For more information on methodology:

[Atlas of Healthcare Variation: Methodology Polypharmacy in older people \(hqsc.govt.nz\)](https://hqsc.govt.nz)

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 and Asians living in rural areas.

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

Dispensing of five or more long-term medicines

In 2023, about 46.5 percent of people aged 65 years and over received five or more long-term medicines. Of these, 33.3 percent of people received five to seven long-term medicines, 17.9 percent of people received 8 to 10 long-term medicines and 8.1 percent received 11 or more long-term medications (noting that these groups are not mutually exclusive).

Dispensing rates increased significantly with age, with those aged 85 years and over having the highest rates. Ethnic differences are evident: Māori and Pacific peoples received more medicines at a younger age compared with Asian or European/Other.

For more results: [Atlas of Healthcare Variation: Polypharmacy in people aged 65 years or over \(hqsc.govt.nz\)](https://hqsc.govt.nz)

By rurality

- Overall, people aged 65 years or over living in urban areas (urban 1: 47.4 percent; urban 2: 47.3 percent) were significantly more likely to receive five or more medications in two consecutive quarters in 2023 compared with those living in rural areas (rural 1: 44.3

percent; rural 2 and 3: 42.0 percent). This pattern was consistent across the two ethnic groups and all age groups when observed separately.

- When the data was further broken down by rurality, ethnicity and age, people living in the most rural regions were consistently less likely to receive five or more medications in two consecutive quarters compared with other rurality categories. However, this pattern was not statistically significant for some subgroups due to small numbers.
- A similar pattern was observed when results were stratified by aged residential care status: those living in the most rural regions were less likely to be dispensed five or more medications in two consecutive quarters than those in more urban categories. This pattern, however, was not statistically significant among people living in aged residential care.

Figure 1: PHO-enrolled population aged 75–84 years dispensed five or more long-term medicines in any two consecutive quarters in 2023, by ethnic grouping and rurality, percent

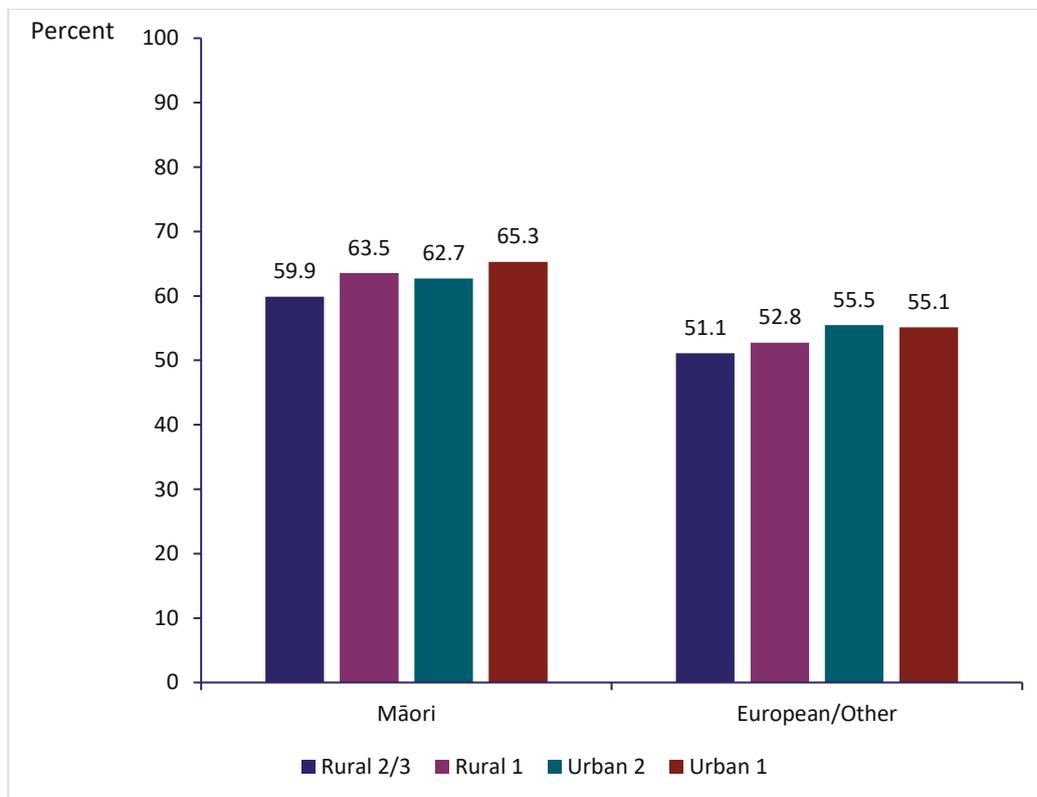
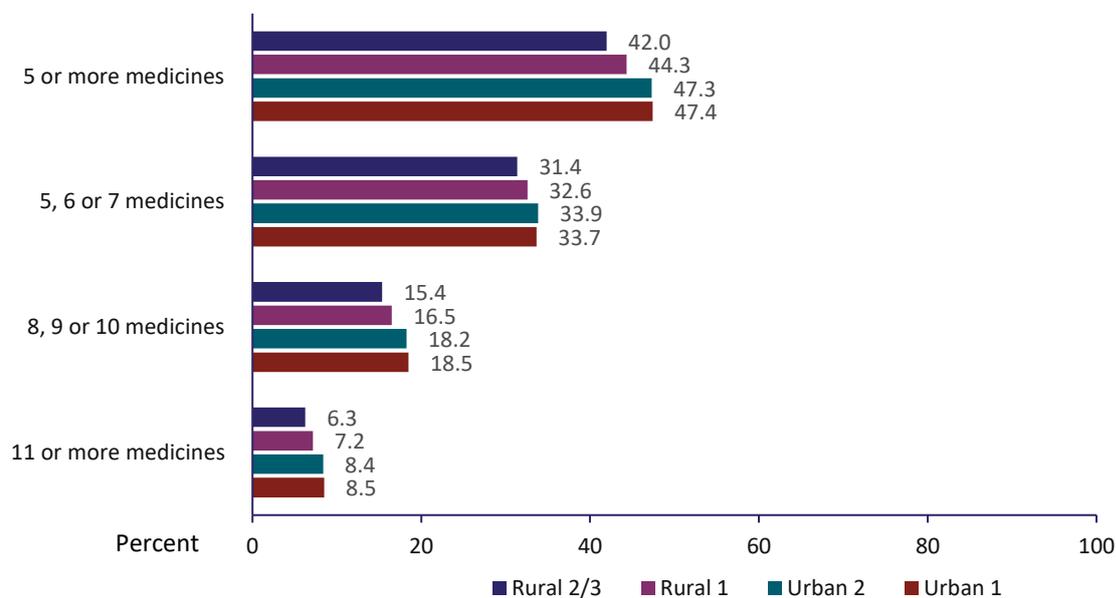


Figure 2: PHO-enrolled population aged 75–84 years dispensed five or more long-term medicines in any two consecutive quarters in 2023, by rurality, percent



Triple whammy dispensing

The triple whammy is the combination of an angiotensin converting enzyme (ACE) inhibitor/angiotensin receptor blocker (ARB), a diuretic and a non-steroidal anti-inflammatory drug (NSAID). Medsafe (2013) notes an increased risk of acute kidney injury with this combination, especially in people with risk factors for renal failure and in older adults.

- In 2023, 2.7 percent (~21,750 people) were dispensed the ‘triple whammy’ within the same 90-day period. Rates varied significantly by age and ethnic group. For example, among those aged 65–74 years, rates were higher for Māori (3.6 percent) and Pacific peoples (3.4 percent) compared with Asian (1.8 percent) and European/Other (2.7 percent).

By rurality

- No significant variation when results were stratified by rurality.

Dispensing anti-psychotics and/or benzodiazepines

- In 2023:
 - about 4.9 percent of people aged 65 years or over received an antipsychotic and 16.2 percent received a benzodiazepine or zopiclone
 - nearly 2.1 percent of the PHO-enrolled population received both an antipsychotic and a benzodiazepine or zopiclone within the same 90-day period

- rates varied significantly by age and ethnic group
- people living in aged residential care were significantly more likely to receive anti-psychotics and/or benzodiazepines, compared with those not living in aged residential care.

By rurality

Dispensing anti-psychotics

- Overall, there was slight variation by rurality (rural 2 and 3: 3.7 percent; rural 1: 4.4 percent; urban 2: 5.5 percent; urban 1: 5.0 percent).
- Rates varied by ethnic grouping irrespective of rurality. Māori were less likely to receive an antipsychotic compared with European/Other, although the differences were not always statistically significant within each rurality group.
- When split by aged residential care, people living in less urban areas (urban 2) had the highest dispensing rates, while those in the most rural regions (rural 2 and 3) had the lowest rates among people not living in aged residential care. A similar pattern was seen among those living in aged residential care, although the differences were not statistically significant.

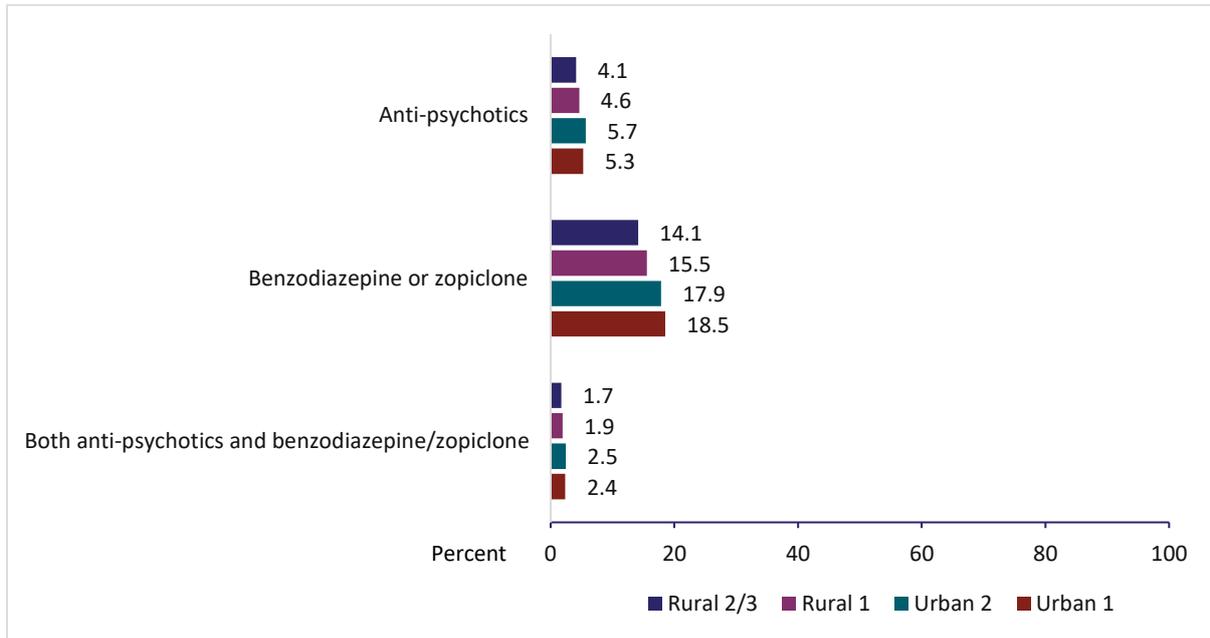
Dispensing benzodiazepine or zopiclone

- The PHO-enrolled population aged 65 years or over living in rural areas (rural 2 and 3: 13.1 percent; rural 1: 14.3 percent) were significantly less likely to receive benzodiazepine or zopiclone during 2023 when compared to people living in urban areas (urban 2: 16.6 percent; urban 1: 17.1 percent). This pattern holds across all age groups and for European/Other but was less consistent for Māori.
- Ethnic differences were evident irrespective of rurality. Māori were less likely to receive a benzodiazepine or zopiclone compared with European/Other, although differences were not always statistically significant within each rurality category.
- A similar rural–urban pattern was observed when results were split by aged residential care status, but the differences were not always statistically significant.

Dispensing both anti-psychotics and benzodiazepine/zopiclone during the same 90-day period

- Overall, people aged 65 years or over living in rural areas (rural 2 and 3: 1.5 percent; rural 1: 1.8 percent) were significantly less likely to receive both medicines within the same 90-day period in 2023 compared with those living in urban areas (urban 2: 2.4 percent; urban 1: 2.2 percent). This pattern was consistent for European/Other and for those aged 65–74 and 75–84 years, but less so for Māori and people aged 85 years or over.
- When split by ARC status, people living in less urban areas (urban 2) had the highest dispensing rates, while those in the most rural regions (rural 2 and 3) had the lowest rates among both ARC and non-ARC users.

Figure 3: PHO-enrolled population aged 75–84 years were dispensed anti-psychotics and/or benzodiazepines in 2023, by rurality, percent



Discussion

Our analysis showed that people living in urban areas were more likely to receive five or more medicines compared with those in rural areas. This may reflect differences in health care access, prevalence and detection of long term conditions. While lower dispensing rates in rural areas may suggest reduced exposure to medication related harm, they may also indicate reduced access to care, which can lead to undertreatment if fewer conditions are diagnosed or reviewed. These results also do not account for people moving to urban areas to access specialist services, which could contribute to rural–urban differences.

Rural residents were also consistently less likely to receive benzodiazepines, or zopiclone, which may reflect differences in the prevalence of mental health conditions, or availability of mental health services.

Across all indicators, aged residential care plays a major role, with people living in aged residential care more likely to receive five or more medicines, antipsychotics and benzodiazepines/zopiclone. However, rural–urban differences were less pronounced within aged residential care populations, likely due to the more standardised care environments in aged residential care.

Overall, these findings highlight the need for targeted rural health strategies, improved access to primary and mental health care, and strengthened medication review processes to ensure safe and equitable prescribing for older adults across New Zealand.

References

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