Understanding rural–urban variation in diabetes indicators: Key findings from the New Zealand Atlas of Healthcare Variation

Key findings:

- Diabetes is estimated to be most common among people living in the most urban regions.

    o It is not known whether this reflects under-diagnosis or lower prevalence in rural populations.

- Ethnic differences persist irrespective of rurality. Compared to European/Other, Māori:

    o had a higher prevalence of diabetes;

    o were significantly less likely to regularly receive any hypoglycaemic medication;

    o had higher rates of hospital admissions for serious complications related to diabetes, like diabetic ketoacidosis (DKA) and hypoglycaemia.

- Regular dispensing of any hypoglycaemic medication was highest for people living in less rural (R1) regions and lowest in people living in most urban (U1) regions.

- Studies suggest socioeconomic differences between rural and urban populations likely contribute to differences in health outcomes. Further research is needed to explore how rurality, socioeconomic status and ethnicity intersect to affect diabetes indicators.

This report presents data from the Atlas of Healthcare Variation to examine whether there is difference in the prevalence and management of diabetes among people in rural and urban areas in Aotearoa New Zealand. This supports improved analysis and monitoring of rural health as one goal of the New Zealand Rural Health strategy (Minister of Health, 2023).

Geographical classification of health

To determine how urban or rural an area is, the Geographical Classification of Health 2018 (GCH) was used. GCH was developed using the 2018 census. It has three rural categories (R1, R2 and R3) and two urban categories (U1 and U2), with R3 being most rural and U1 being most urban. It takes into account distances, in terms of travel times, from urban centres, where key health services are more likely to be located, in addition to relative size of population in the area.

Using GCH, one in five New Zealanders and one in four Māori live in rural areas. For more information on the GCH please see the classification's website: **https://rhrn.nz/gch/about-gch**

Method

The Diabetes Atlas reports data from existing national collections, including the Virtual Diabetes Register, the Pharmaceutical Collection, and the National Minimum Dataset. It highlights demographic and regional differences in diabetes indicators, including diabetes prevalence, medication use and hospital admissions.

To obtain rurality for each record, we linked the domicile concordance files (determining whether domicile is R1, R2, R3, U1, U2) available on the GCH website with the domicile code information available in our national datasets. For more details on methodology, please see the Atlas of Healthcare Variation Methodology here: https://www.hqsc.govt.nz/assets/Our-data/Publications-resources/Methodology_diabetes_Jun_2024.docx.

In this report, we present results for the diabetes indicators by rurality (U1, U2, R1, R2/R3). R2 and R3 were grouped for analysis due to low numbers. For our ethnic group comparisons, we focused on Māori and European/Other due to the low number of Pacific and Indian people living in rural regions.

Diabetes prevalence

It is estimated around 307,000 people had diabetes in 2022, an increase of around 15,000 people from 2021. Pacific peoples had the highest estimated rate of diabetes at 12.5%, followed by the Indian population (9.5%) and the Māori population (7.0%). The prevalence of diabetes varied across districts. For example, among people aged 65 – 74 years, those living in Counties Manukau district had the highest prevalence of 27.9% compared with 9.4% in Nelson Marlborough. More than half (55.3%) of Pacific peoples and about 37.7% of Māori aged 65 – 75 years living in Counties Manukau district were estimated to have diabetes. For more results, please see the Atlas of Healthcare Variation: https://www.hqsc.govt.nz/our-data/atlas-of-healthcare-variation/diabetes/.

By rurality

In 2022, people living in the most urban regions had the highest prevalence (6.5%), followed by people residing in the less urban (U2) regions (6.2%).

People residing in the less rural (R1) region had the lowest prevalence of 5.8%.

This pattern was similar for most age groups. For example, among people aged 65 – 74 years, those living in the most urban regions had a significantly higher prevalence (18.0%) compared with those in all other regions.

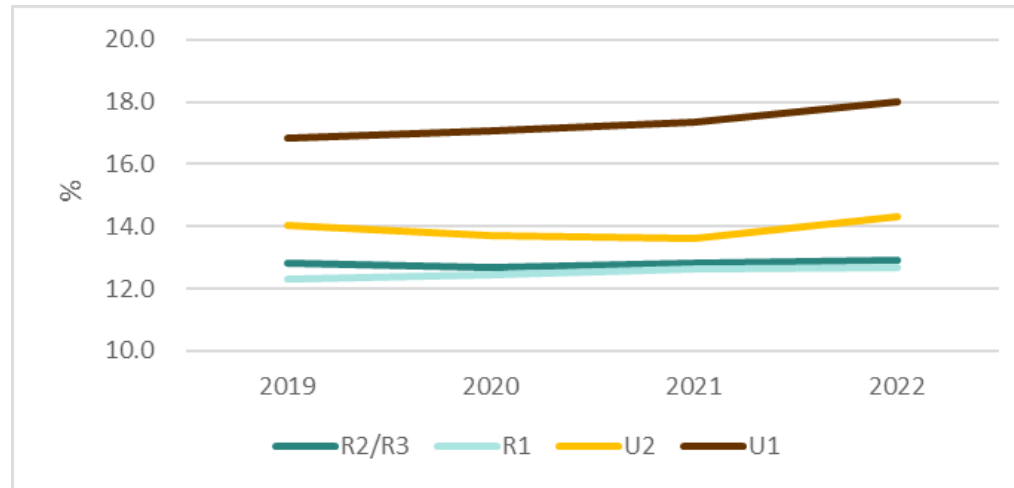See Figure 1 for prevalence by rurality over time (2019 – 2022).

Figure 1: Diabetes prevalence among people aged 65– 74 years by rurality over time (2019 – 2022), as a percentage of Primary Health Organisation (PHO) enrolled population

By ethnic grouping and rurality

Among Māori and European/Other populations, there were minimal differences in diabetes prevalence across the urban/rural categories. However, differences in rates between ethnic groups remained.

For example, Māori aged 65 –74 years living in most urban regions have significantly higher diabetes prevalence (29.7%) when compared to their European counterparts (13.5%; see Figure 2)
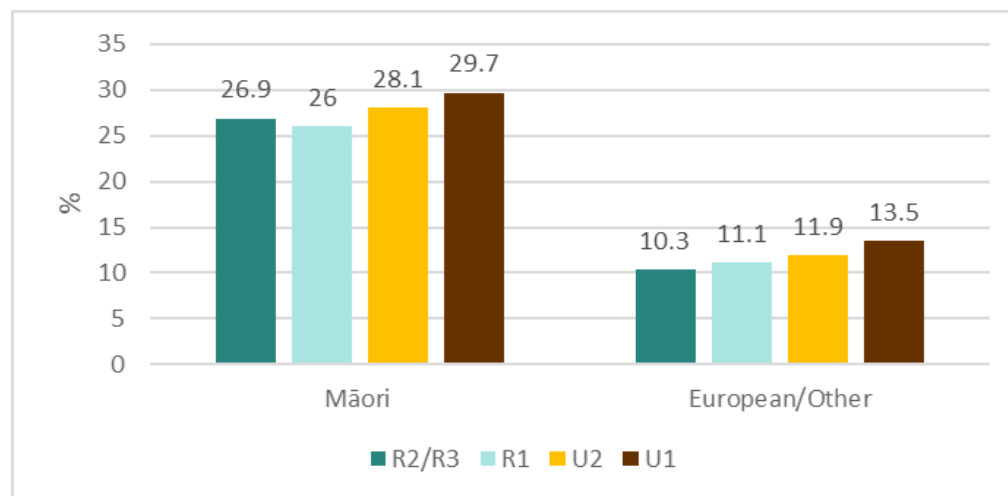
Figure 2: Diabetes prevalence among Māori and European/Other aged 65 –74 years by rurality, as a percent of PHO enrolled population

People with diabetes regularly receiving any hypoglycaemic medication

In 2022 about 68% of people estimated to have diabetes received any hypoglycaemic medication to lower their glucose levels regularly (at least 3 quarters a year).

Māori were significantly less likely to regularly receive any hypoglycaemic medication when compared to other ethnic groups. For example, among those aged 45 – 64 years with diabetes, about 67% Māori regularly received any hypoglycaemic medication, this was significantly lower compared to European/Other (72%), Indian population (72%) and Pacific peoples (69%).

By rurality

In 2022, people living in the most urban regions were less likely to regularly receive any hypoglycaemic medication (67%) while people residing in R1 regions were more likely to regularly receive any hypoglycaemic medication (70.5%). The pattern was similar for most age groups, for example, among people aged 65 – 74 years, people living in R1 region had higher rates of regularly receiving any hypoglycaemic medication (77%) when compared to people living in other region. See Figure 3 for rates by rurality over time (2019 – 2022).
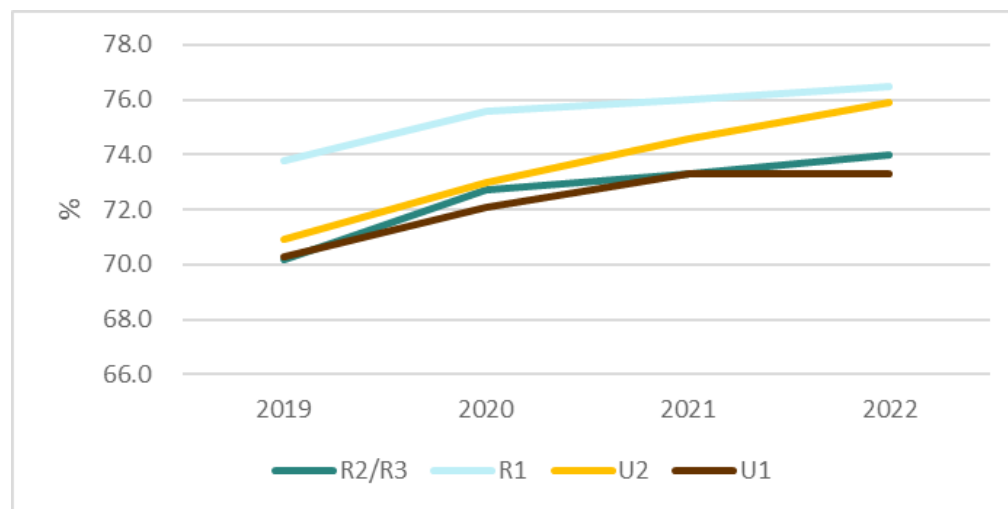
Figure 3: People aged 65– 74 years regularly receiving any hypoglycaemic medication by rurality over time (2019 – 2022)

By rurality and ethnic grouping

In 2022, among people aged 65 – 74 years (see Figure 4):

- Both Māori and European/Other living in the R1 regions had the highest rates of regularly receiving any hypoglycaemic medications and those living in most urban (U1) regions had the lowest rates.

Irrespective of rurality, Māori had lower rates of regularly receiving any hypoglycaemic medications when compared to their European/Other counterparts.
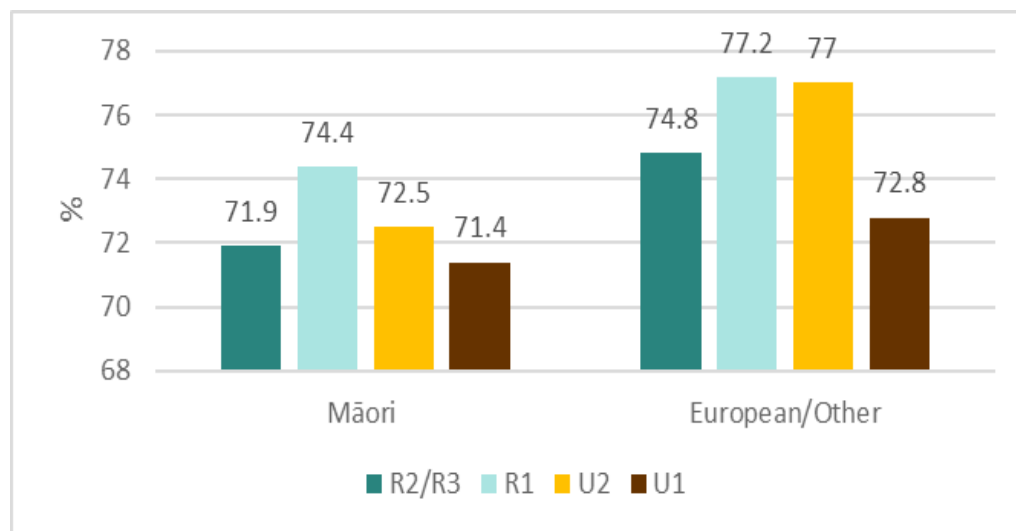
Figure 4: People aged 65 – 74 years regularly receiving any hypoglycaemic medication by ethnic grouping and rurality (2022).

Hospital admissions for diabetic complications (Ketoacidosis (DKA), hypoglycaemia and lower limb amputations)

In 2022, there were:

- 1,176 admissions for Diabetic Ketoacidosis (DKA)
- 766 admissions for hypoglycaemia
- 721 lower limb amputations

In 2019 – 2022, Māori had significantly higher rates of admissions for DKA and hypoglycaemia.

By Rurality

- Except for DKA, there were minimal differences by rurality.
- Among Māori, admissions for DKA seem to be lower in people living in most rural regions.
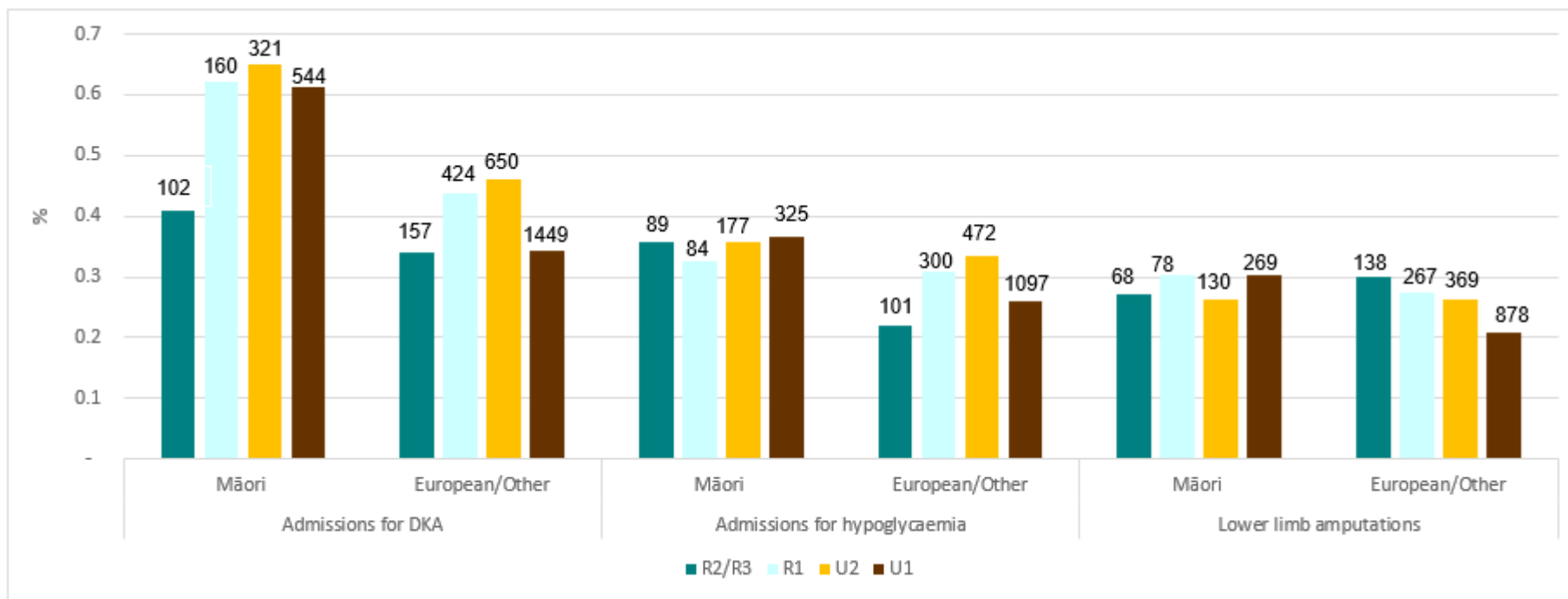
*Please note that numbers above bars indicate counts

Figure 5: Admissions for DKA, hypoglycaemia and lower limb amputations by rurality (pooled 2019 – 22 data)

Discussion

This study found that estimated diabetes prevalence was highest in people living in the most urban regions. It is unknown whether this is due to underdiagnosis of diabetes in rural areas or lower prevalence of diabetes in rural areas.

A key finding was that across all locations, Māori were more likely to have diabetes, less likely to receive hypoglycaemic medication, and more likely to be admitted to the hospital for diabetic ketoacidosis (DKA) and hypoglycaemia compared to European/Other groups. These findings underscore the need for targeted interventions and policies to address both rural-urban and ethnic disparities in diabetes care and outcomes.

Studies suggest that differences in the socioeconomic profiles of rural and urban populations likely contribute to differences in health outcomes (Whitehead et al., 2023). Further research is needed to explore the intersection between rurality, socioeconomic status, and ethnicity in diabetes indicators.

References:

Minister of Health. 2023. Rural Health Strategy. Wellington, NZ: Ministry of Health. Retrieved on 10 July 2024 from https://www.health.govt.nz/system/files/documents/publications/rural-health-strategy-oct23-v2.pdf

Whitehead, J., Davie, G., de Graaf, B., Crengle, S., Lawrenson, R., Miller, R., & Nixon, G. (2023). Unmasking hidden disparities: a comparative observational study examining the impact of different rurality classifications for health research in Aotearoa New Zealand. BMJ open, 13(4), e067927. https://doi.org/10.1136/bmjopen-2022-067927

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