



Estimating tobacco and vaping prevalence in Aotearoa, New Zealand via wastewater analysis

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Acknowledgement of Country

The University of Queensland (UQ) acknowledges the Traditional Owners and their custodianship of the lands on which we meet today.

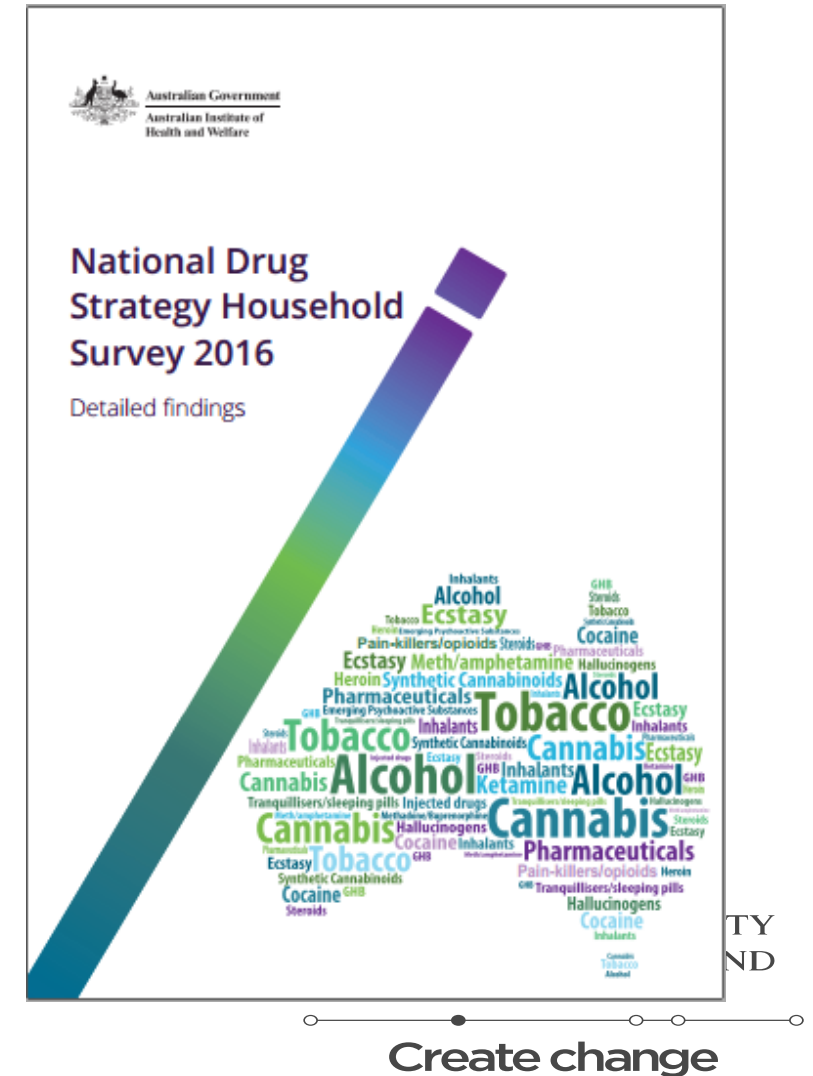
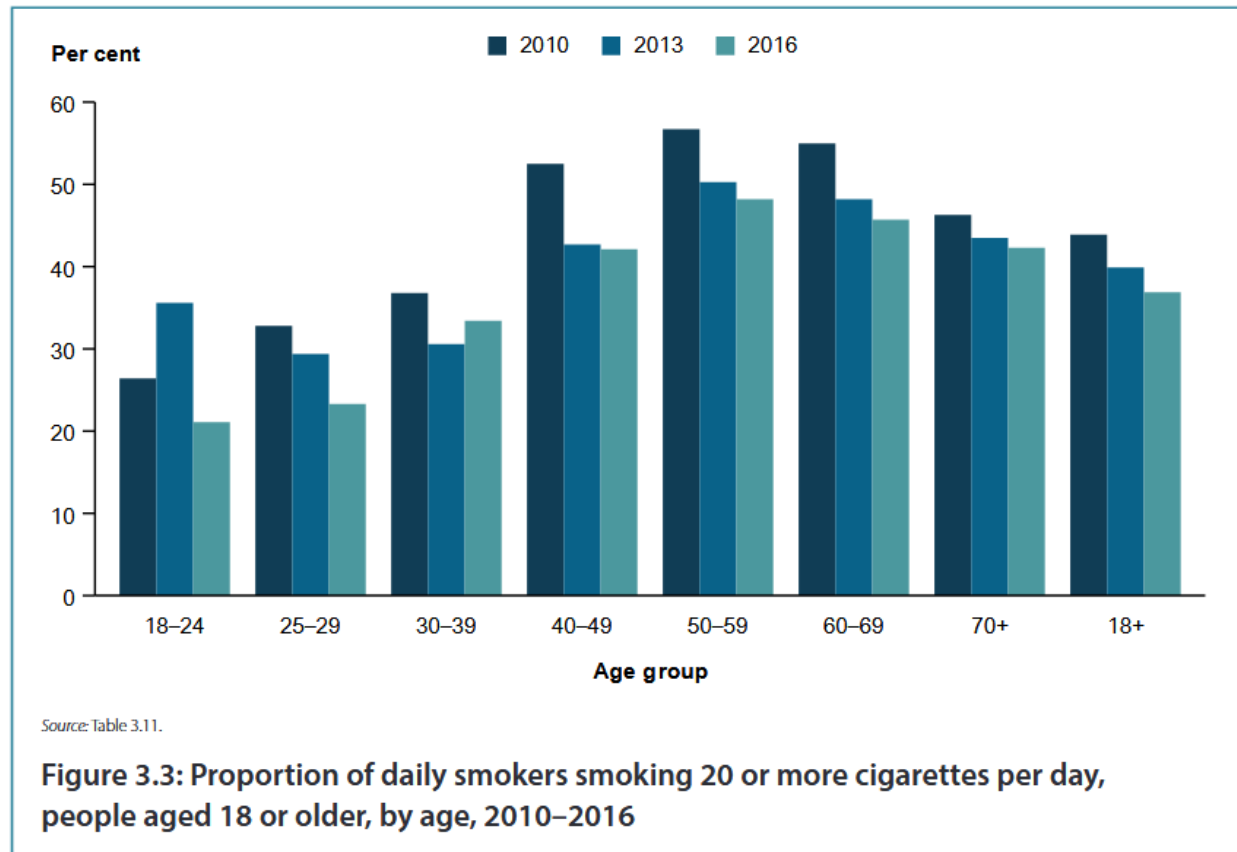
We pay our respects to their Ancestors and their descendants, who continue cultural and spiritual connections to Country.

We recognise their valuable contributions to Australian and global society.



Sources of information about tobacco consumption

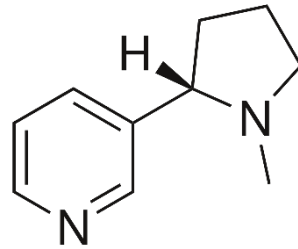
- Questionnaire surveys
- Taxation statistics



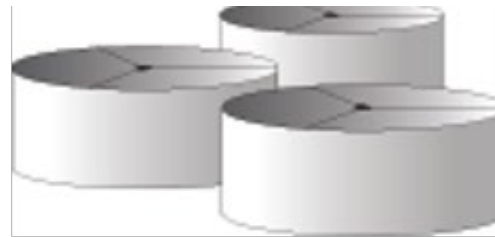
Wastewater analysis:

Estimation of use on community-wide level on daily basis

**Substance use
(e.g smoking)**

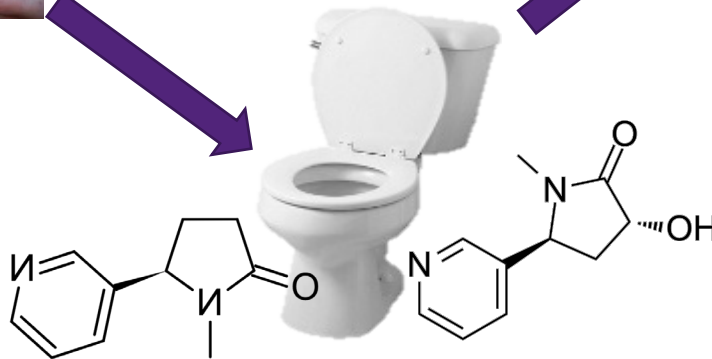


Wastewater sampled



Nicotine biomarker:
Cotinine and hydroxycotinine

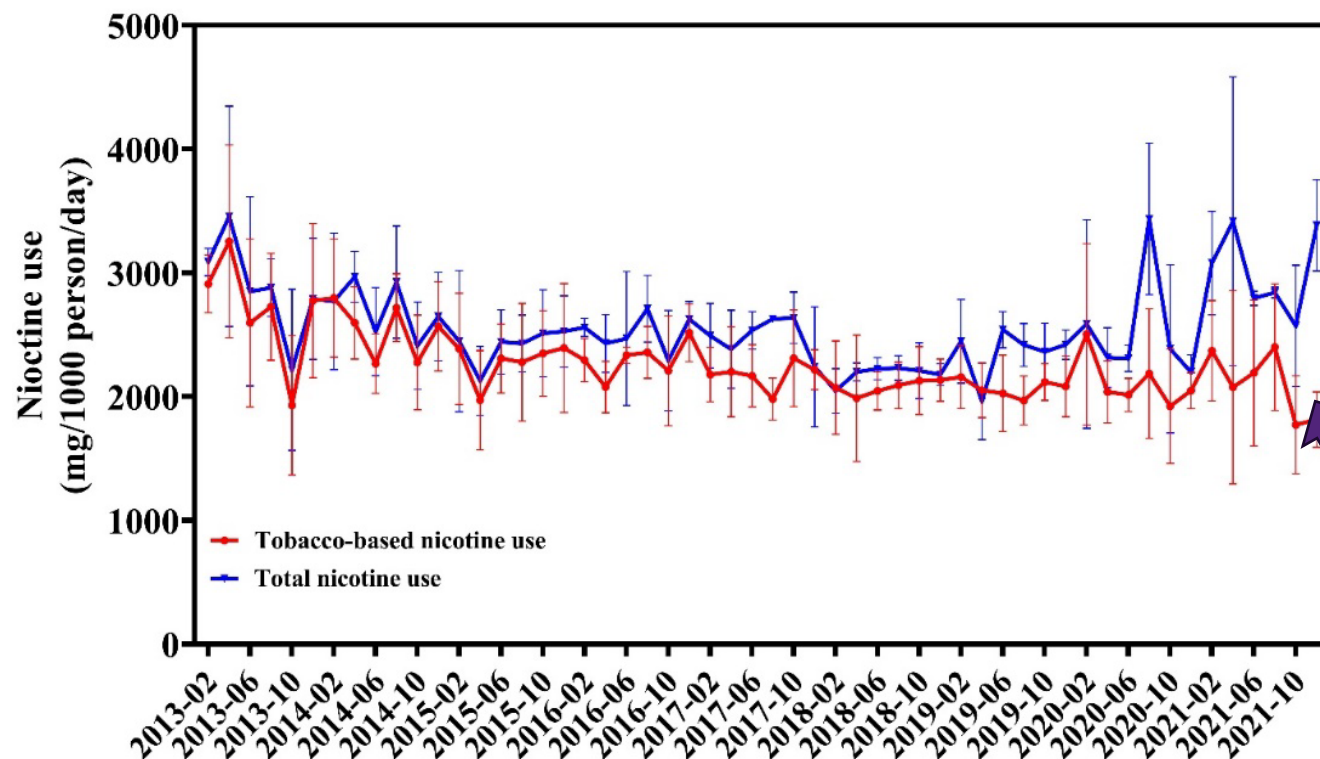
Tobacco biomarker:
anabasine and anatabine



Excreted



Tobacco biomarker Measured



Highlights:

- Tobacco use continuously declines but at a reduced rate over recent years.
- Total nicotine use increased since 2018 possibly attribute to the increase in e-cigarette use

Vaping ban

Wang *et al.*, 2024. Analysis of wastewater from 2013 to 2021 detected a recent increase in nicotine use in Queensland, Australia. Water Research 250, 121040.

Evolution of NZ Drug in Wastewater Testing programme

- 2016 Method development/validation
- December 2016 Trial begins
- Mid-2017 additional site added
- 2018 National programme 37 sites
- 2022 Programme funding increased
- 2023 New resources
- 2024 65 sites

National Drugs in Wastewater Testing Programme - Quarter 2, 2024

Date Published: October 2024

Results are now available for the second quarter (2024) of drugs in wastewater testing, which covers around 75% of New Zealand's population.

The drugs tested for include methamphetamine, MDMA, cocaine, fentanyl, and heroin. These reports focus on methamphetamine, MDMA and cocaine as these drugs are routinely detected by the programme.

Social harm cost estimates have been included in this report. These are derived from the New Zealand Illicit Drug Harm Index 2023 (*National Drug Intelligence Bureau (2023). The New Zealand Illicit Drug Harm Index 2023: Research report. Wellington: Ministry of Health*). The Drug Harm Index 2023 provides a conservative measure of the harms associated with the use of illicit drugs in New Zealand and considers both personal and community harms.

Key findings: April – June (Q2 2024)

Methamphetamine

- Methamphetamine use across sample sites increased in Q2 2024, averaging an estimated 18.1 kilograms per week. This was above the average quantity consumed over the previous four quarters (25% or 3.7 kilograms).
- All districts, except for Wellington, recorded above average methamphetamine use when compared with their respective average consumption rates over the previous four quarters.
- Methamphetamine use across sample sites in Q2 2024 equates to an estimated weekly social harm cost of \$19 million.

Methylenedioxymethamphetamine (MDMA)

- MDMA use across sample sites decreased in Q2 2024, averaging an estimated 5.9 kilograms per week. This was below the average quantity consumed over the previous four quarters (13% or 0.9 kilograms).
- Canterbury was the only district to record above average MDMA use.
- MDMA use across sample sites in Q2 2024 equates to an estimated weekly social harm cost of \$1.2 million.

Cocaine

- Cocaine use across sample sites remained high in Q2 2024, averaging an estimated 3.9 kilograms per week. This remained above the average quantity consumed over the previous four quarters (50% or 1.3 kilograms above).

How programme currently works

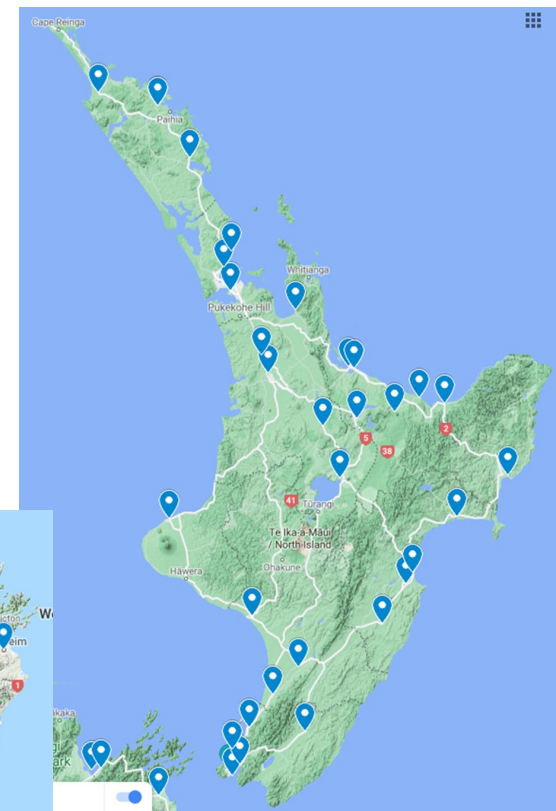
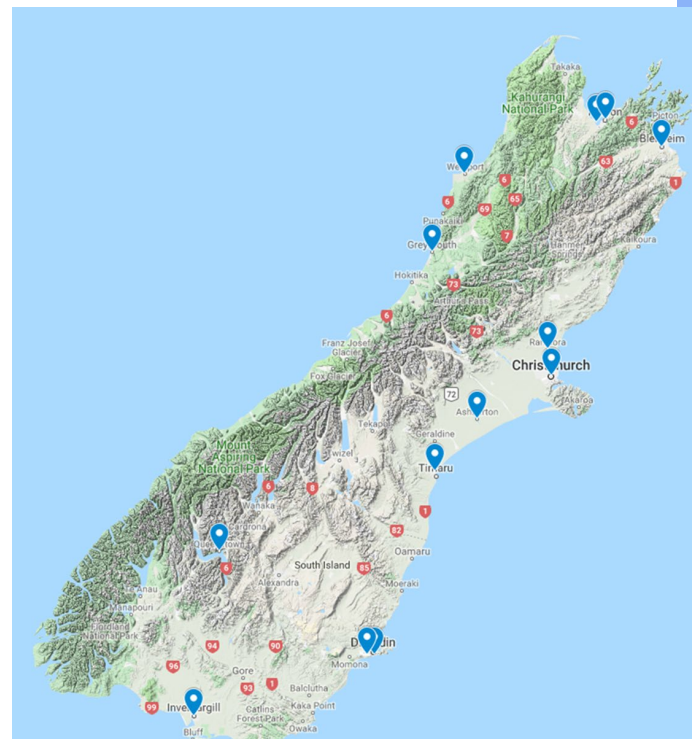
- 65 sites, approx. 75% of NZ's population
- 24-hour composite samples, 7 days
- Most sites monthly, smaller 2 monthly
- Councils not paid, only contractors where required

Target substances:

- Meth, MDMA, cocaine, heroin, fentanyl.
- THC at 5 sites.

Value added to the program

- Measuring actual tobacco use in NZ



Reported trend of tobacco use in NZ

What are our smoking rates and how are they changing?



Smoking rates in Aotearoa New Zealand continue to decrease. Currently, an estimated 6.8% of adults are daily smokers (284,000 people) and 8.3% of adults are current smokers (350,000 people) ²⁷

- Continuous decline of smoking rate in NZ

<https://www.smokefree.org.nz/smoking-its-effects/facts-figures>

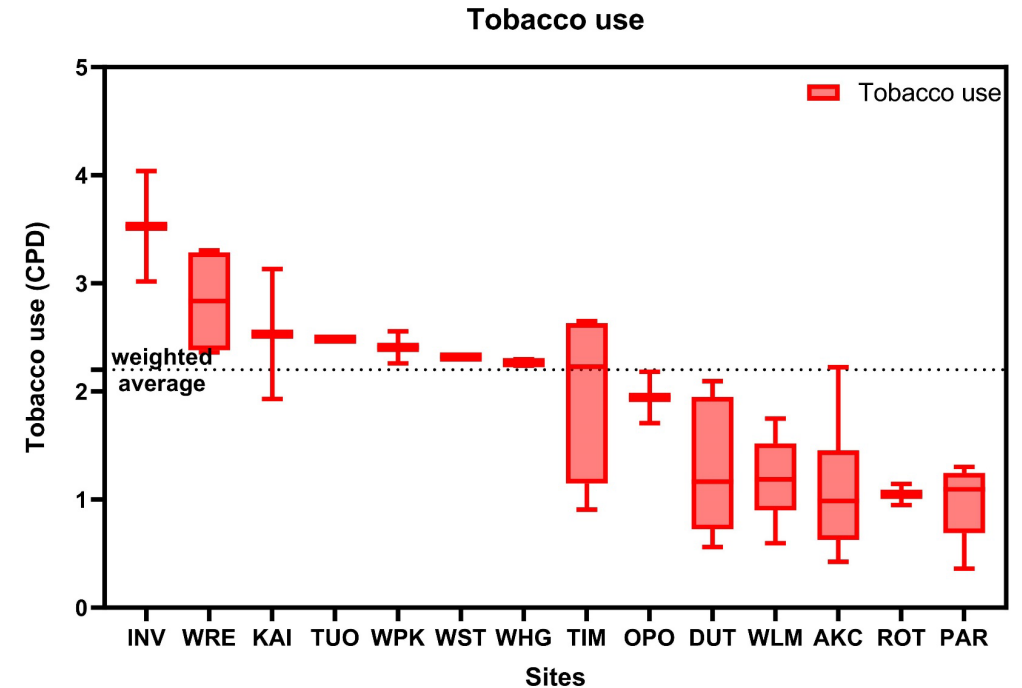
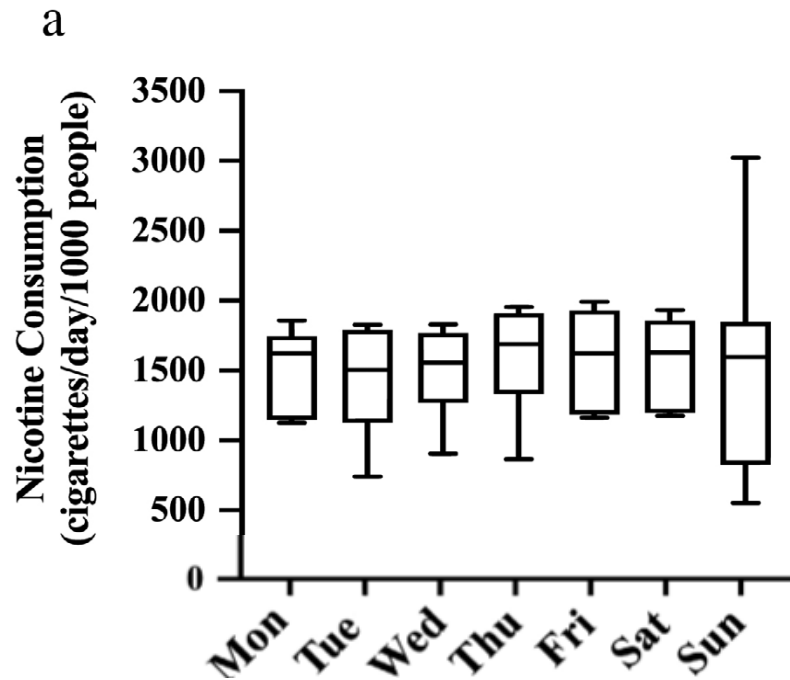
New Zealand bans young people from buying cigarettes for life

World Politics

Tue 13 Dec 2022



Reported trend of tobacco use in NZ wastewater (with nicotine biomarkers)

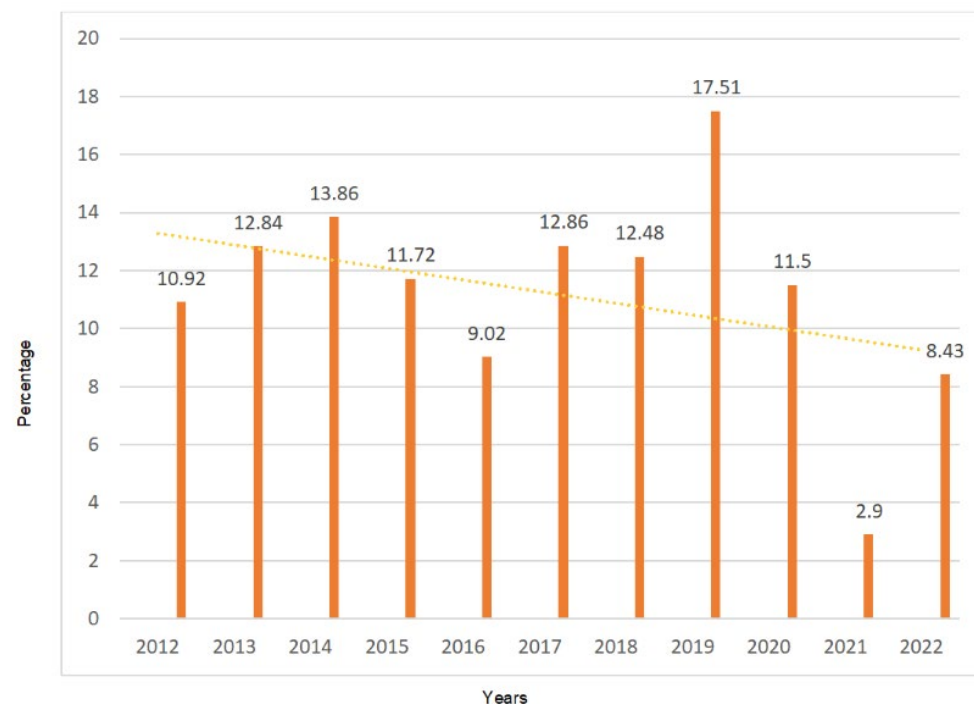


- Measured tobacco use in NZ during 2018 Census

Trowsdale *et al.* (2021) - Drug and Alcohol Review, 40, 1178–1185

- Measured tobacco use in NZ during 2021-2023

Factor that can influence - illicit tobacco use in NZ



- Trend in the estimated upper bound of the proportion of total tobacco consumed by daily smokers that was illicit, New Zealand, 2012-2022



Research, Evaluation and Monitoring of Illicit Tobacco

in New Zealand

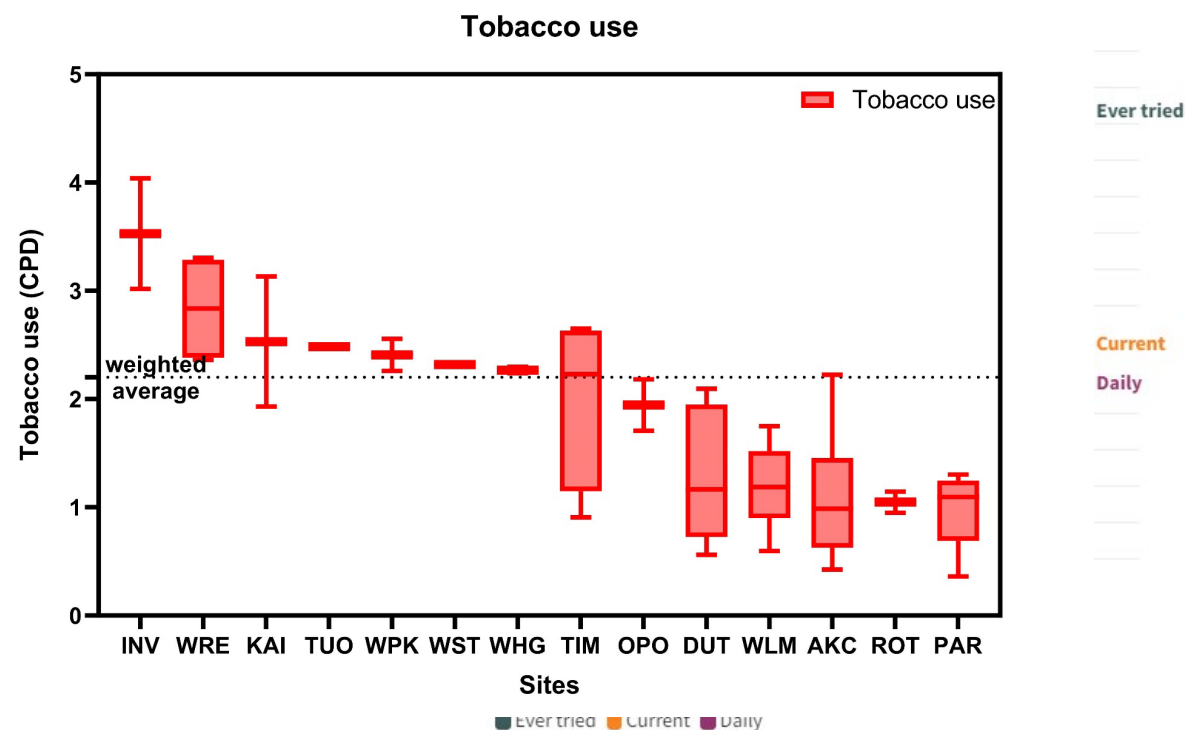
Baseline report 2022

School of Population Health,

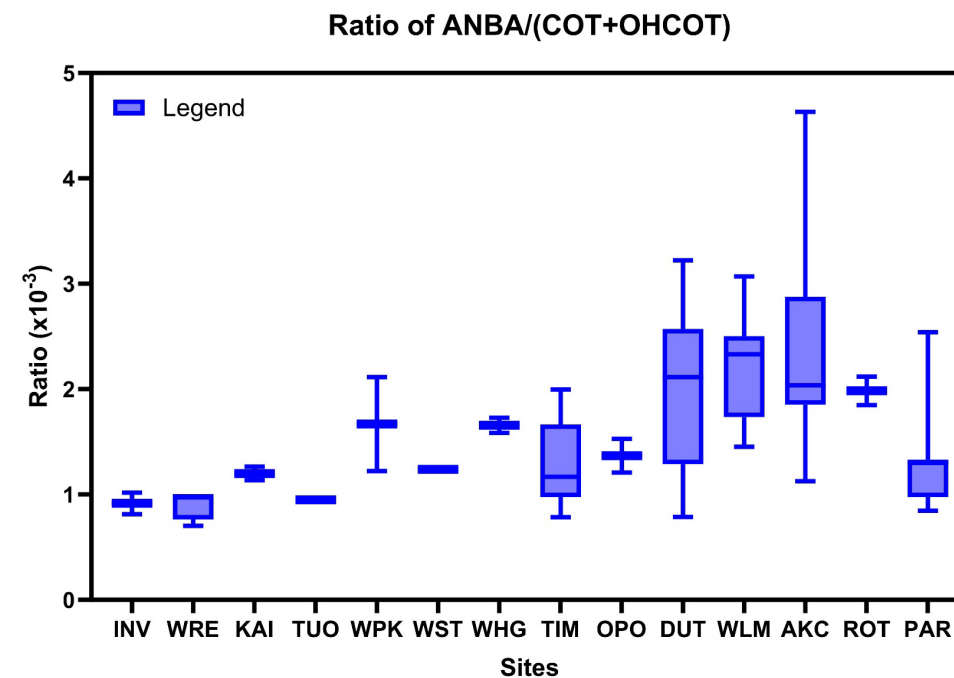
Waipapa Taumata Rau | University of Auckland,

Auckland, New Zealand

Factor that can influence – the emergence of vaping in NZ



Source: [New Zealand Health Survey Data Explorer](#) • Current use defined as vaping 'at least once a month'



phcc

* A Flourish chart

- Ratio of tobacco use to nicotine products in NZ during 2021-2023

- <https://www.phcc.org.nz/briefing/vaping-prevalence-and-trends-key-findings-202223-nz-health-survey>

Preliminary observations

- Strong impact of vaping on the level of nicotine measured in wastewater
- Large variation of vaping prevalence from communities to communities

Things to do

- Gather sales data for triangulation
- Analysis of more wastewater samples to increase the power of the estimates



Acknowledgements

Operators at WWTPs who help collect wastewater samples

The National Drugs in Wastewater Testing Program - NZ

The National Wastewater Drug Monitoring Program - AU

ARC LP190101124 Understanding Australia by analysing wastewater during the Census

NHMRC 2029808 Monitoring nicotine: Triangulating social media, global survey and wastewater data to inform future vaping and smoking policies