

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

Qiuda Zheng¹, Zhe Wang¹, Andrew Chappell², Kaitlyn Phung², [Phong K. Thai¹](mailto:p.thai@ug.edu.au)

¹Queensland Alliance for Environmental Health Sciences (QAEHS), The University of Queensland, Brisbane, Australia, ²Institute of Environmental Science and Research (ESR) Ltd., 27 Creyke Road, Ilam, Christchurch, 8041 New Zealand

Presenter's email: p.thai@ug.edu.au

Introduction: *Tobacco control policies in Aotearoa, New Zealand are considered most progressive in the world. However, these policies could have inadvertently lead to the surge of illicit tobacco or other nicotine-containing products, like e-cigarettes in the country. In addition to the legal sales data, one needs to quantify the total tobacco and e-cigarette use in the population to evaluate the actual impact of tobacco control policies. This study aimed to apply a relatively new approach to provide those use estimates in different populations across New Zealand via analysis of tobacco specific biomarkers and nicotine metabolites in wastewater.*

Methods: *Wastewater samples were collected in 18 sites in several months of 2023, covering different communities as part of the National Drugs in Wastewater Testing Programme. Anabasine (tobacco specific biomarker) and cotinine and hydroxycotinine (nicotine metabolites) were analysed using isotope dilution direct injection LC-MS/MS. Daily consumption were estimated from biomarkers concentration, daily flow data, population estimates and excretion factors.*

Results: *All target biomarkers were detected in the samples, indicating considerable level of tobacco and other nicotine-containing products in Aotearoa, New Zealand. The estimated prevalence of tobacco use is relatively lower than its neighbour, Australia. Interestingly, the level of non-tobacco nicotine use is likely not significantly higher than Australia, despite the fact that e-cigarette (or vaping) was banned in Australia in the same period.*

Discussions and Conclusions: *This study provides the first wastewater study in Aotearoa, New Zealand that provides quantitative estimates of total tobacco and non-tobacco nicotine use in populations. This is important background information to assess the progress of tobacco control when recently there was a change tobacco policy due to the political landscape. Our study provides the starting point to explore the implications of this shift and supports the development of further practical policies in the future.*

Disclosure of Interest Statement: *No conflict of interest. ZW is a PhD student and receives a PhD scholarship from the University of Queensland.*