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RESEARCH REPORT

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Do the differing vaping and smoking trends in Australia and New Zealand reflect different regulatory policies?

Colin Paul Mendelsohn[1] | Robert Beaglehole[2] | Ron Borland[3] | Wayne Hall[4] | Alex Wodak[5] | Ben Youdan[6] | Gary Chung Kai Chan[7]

[1]Unaffiliated, Sydney, Australia

[2]Faculty of Medical and Health Sciences, The University of Auckland, Auckland, New Zealand

[3]School of Psychology, Deakin University-Melbourne Burwood Campus, Burwood, Australia

[4]Centre for Youth Substance Abuse Research, Royal Brisbane and Women's Hospital Site, University of Queensland, Herston, Australia

[5]St Vincents' Hospital, Alcohol and Drug Service, Darlinghurst, Sydney, Australia

[6]ASH, Auckland, New Zealand

[7]National Centre for Youth Substance Use Research, The University of Queensland, Brisbane, Australia

Correspondence
Colin Paul Mendelsohn, Unaffiliated, 11 Carlotta Road, Double Bay, Sydney, NSW 2028, Australia.
Email: mendel@bigpond.net.au

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Abstract

Background and Aims: Comparing regulatory models for nicotine vaping products in different countries can provide insights into the most effective regulatory approach but can be confounded by cross-national differences. This study compared two neighbouring countries with very different vaping regulatory models but with similar tobacco control policies and population demographics. Australia has a highly restrictive, prescription-only vaping policy, while New Zealand adopted a regulated consumer model.

Methods: This study compared trends in daily smoking and vaping among adults and youth from 2016 to 2023 in Australia (adults ≥14 years and ≥15 years; youth 12–17 years) and New Zealand (adults ≥15 years, youth 14–15 years), using published statistics from large nationally representative surveys.

Results: Between 2016 and 2023, the decrease in adult daily smoking in New Zealand (from 14.5% to 6.8%) was larger than in Australia (from 12.2% to 8.3%) by a factor of 0.67 [95% confidence interval (CI) = 0.43, 0.93]. However, the increase in adult vaping in New Zealand (from 0.9% to 9.7%) was larger than in Australia (0.5% to 3.5%) by a factor of 0.56 (95% CI = 0.17, 1.02). The largest smoking reductions in both countries were in young adults, who also reported the highest vaping rates. There was a more rapid decline in smoking in the lower socioeconomic groups and Indigenous people in New Zealand than in Australia. Youth smoking rates declined in both countries to very low levels. Youth vaping rates in New Zealand were higher but have started to decline since regulations were introduced.

Conclusions: If the association is causal, New Zealand's less restrictive approach to vaping (compared with Australia's more restrictive approach) may have contributed to a more rapid decline in adult smoking, and reduced social inequalities and Indigenous smoking, but at the possible expense of increased youth vaping.

KEYWORDS
Australia, e-cigarette, New Zealand, nicotine vaping products, policy analysis, public health, regulation, smoking, tobacco harm reduction

INTRODUCTION

Regulatory models for nicotine vaping products (NVPs) vary significantly between countries from highly restrictive approaches, such as those in Australia, to more permissive models that treat NVPs as adult consumer products, as in the United Kingdom [1]. Restrictive policies give priority to preventing youth vaping and minimising the unknown long-term risks of vaping. More liberal approaches aim to facilitate the

use of vaping by adults who smoke who are seeking to quit while minimising youth vaping [2].

To understand the impact of different vaping policies, it is informative to compare trends in smoking and vaping rates between two comparable countries with different regulatory approaches to NVPs. Australia and New Zealand serve as ideal case studies for such a comparison. They are geographically adjacent, English-speaking democracies with similar ethnic compositions, demographics, quality of life and health outcomes. Although Australia has a higher average income, the cost of living in New Zealand is lower. New Zealand has a larger Indigenous population and a significant Pacific Islander community (Supplement 1, Table S1).

Historically, Australia and New Zealand have implemented similar tobacco control measures, including high cigarette taxes, comprehensive advertising bans, plain packaging with graphic health warnings and stringent smoke-free policies (Supplement 1, Table S2). Both countries have banned the sale of snus and nicotine pouches, although these products can be imported for personal use. Differences in the timing of policies regarding plain packaging and heated tobacco products are addressed later in the article.

Australia has taken a highly restrictive precautionary approach to regulating NVPs by classifying nicotine e-liquid as a prescription-only 'unapproved' medicine since 2011 [9]. From 2016 to 2023 nicotine e-liquid was only legally available with a doctor's prescription from pharmacies or via personal importation [10]. However, this prescription model has faced significant challenges, including low rates of prescribing, low compliance by vapers and the emergence of a large illicit market controlled by criminal networks, which supplies over 90% of vaping products [10, 11].

In contrast, New Zealand has adopted a more risk-proportionate approach. It has endorsed vaping as a tool for smoking cessation and encouraged its use among adults unable to quit smoking through other means [12]. The New Zealand Ministry of Health provides online resources such as the Vaping Facts website [13] and the Quit Strong campaign [14].

Nicotine e-liquid has been legally available in New Zealand by retail sale and personal importation as an unregulated adult consumer product since 2010. In 2020, the Smokefree Environments and Regulated Products (Vaping) Amendment Act 2020 legalised and regulated NVPs in New Zealand by allowing them to be sold from licensed retail outlets, including a wide range of specialist vape shops and convenience stores [15]. This law was enacted in 2021. According to Action on Smoking and Health (ASH) New Zealand (NZ), there is minimal evidence of a significant illicit market for vaping products [16].

Both countries began collecting vaping prevalence data in 2016. This study compares trends in adult and youth smoking and vaping rates in Australia and New Zealand from 2016 to 2023 and discusses the possible explanations and policy implications of these findings. It is important to note that this observational study cannot make definitive causal inferences about the impact of vaping policies on smoking rates. This is discussed further in the Limitations section.

METHOD

This study was not pre-registered.

Data sources

We compared the daily smoking and vaping prevalence for adults and youth from nationally representative surveys conducted in both countries from 2016 to 2023 (Table 1).

Australia's National Health Survey (NHS) [4] data points did not align with the 2016 to 2023 period. The 2016 smoking prevalence was estimated by deducting one-third of the difference between the 2015 and 2018 data points (14%–13.3% = 0.7%; one-third = 0.23%, rounded to 0.2%) from the 2015 data point of 14% (i.e. 13.8%). The decline between 2015 and 2018 was assumed to be linear. The last data point of the NHS was 2022.

The National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) was used for Indigenous Australian people. Only the 2019 to 2023 period was included as the previous survey was in 2013 to 2014 [6, 17, 18].

TABLE 1 Surveys used in this study.

Country	Survey	Agency	Frequency	Adults (age)	Youth (age)
Australia	National Drug Strategy Household Survey [3]	Australian Institute of Health and Welfare	Triennial	14+	
	National Health Survey [4]	Australian Bureau of Statistics	Triennial	15+	
	Australian Secondary School Students' Use of Tobacco and E-cigarettes [5]	Centre for Behavioural Research in Cancer, Cancer Council Victoria, for the Australian Government Department of Health and Aged Care	Triennial		12–17
	National Aboriginal and Torres Strait Islander Health Survey [6]	Australian Bureau of Statistics	Every 6–8 y	15+	
New Zealand	New Zealand Health Survey [7]	New Zealand Ministry of Health	Annual	15+	
	ASH Year 10 Snapshot Survey (ASH) [8]	Action for Smokefree 2025 (ASH)	Annual		14–15

Abbreviation: ASH, Action on Smoking and Health.

Only one data point was available for daily vaping from the Australian Secondary School Students' Use of Tobacco and E-cigarettes survey (Figure 1) [5].

For vaping, the studies did not differentiate between the use of nicotine, nicotine-free liquids and other substances.

These estimates and trends should be robust within surveys, but caution should be exercised on overall prevalence levels as survey design and sampling can impact to a small degree, as is seen in the slight differences when multiple surveys are used to indicate trends.

Further information about the surveys, such as sample sizes and methodology are found in Supplement 2, Tables S1 and S2. Data points for all surveys are listed in Supplement 2, Table S9.

CI for the included surveys are listed in Supplement 2, Table S3. The data availability statement is in Supplement 2, Table S4.

Data analysis

The primary outcomes were daily smoking and vaping prevalence. Daily smoking is most often used to assess the effects of tobacco control measures in Australia. Vaping prevalence was not assessed in either country until 2016, but we assume its prevalence was close to zero before then.

For most of the analyses, we did not directly compare absolute rates between surveys because of the differences in survey methodologies, including varying definitions of daily smoking and vaping, survey frequency, age group classifications and data collection methods (e.g. school vs. home settings). The definitions of daily smoking and vaping used in the surveys are summarised in Supplement 2, Table S5. Instead, we focused on differences in trends to make inferences about the effects of differing regulatory policies.

All average annual changes in prevalence are expressed as geometric means to account for the multiplicative nature of cumulative percentage changes over multiple years. These changes are reported as absolute values.

Because the original data from the surveys were not available, we conducted Monte Carlo simulations using the published data from each country to test the differences in relative rates of change in the adult population [19]. The adult smoking and vaping prevalence estimates and the sample sizes from the National Drug Strategy Household Survey (NDSHS) and New Zealand Health Survey (NZHS) were used as the input data. We simulated sampling from two populations in 2016 and 2023, one for Australia and one for New Zealand, assuming the prevalence estimates reported in the two surveys were representative estimates of the corresponding populations and years. The simulated sample size was set to the same survey sample size in each country in the corresponding year, and we simulated the number of

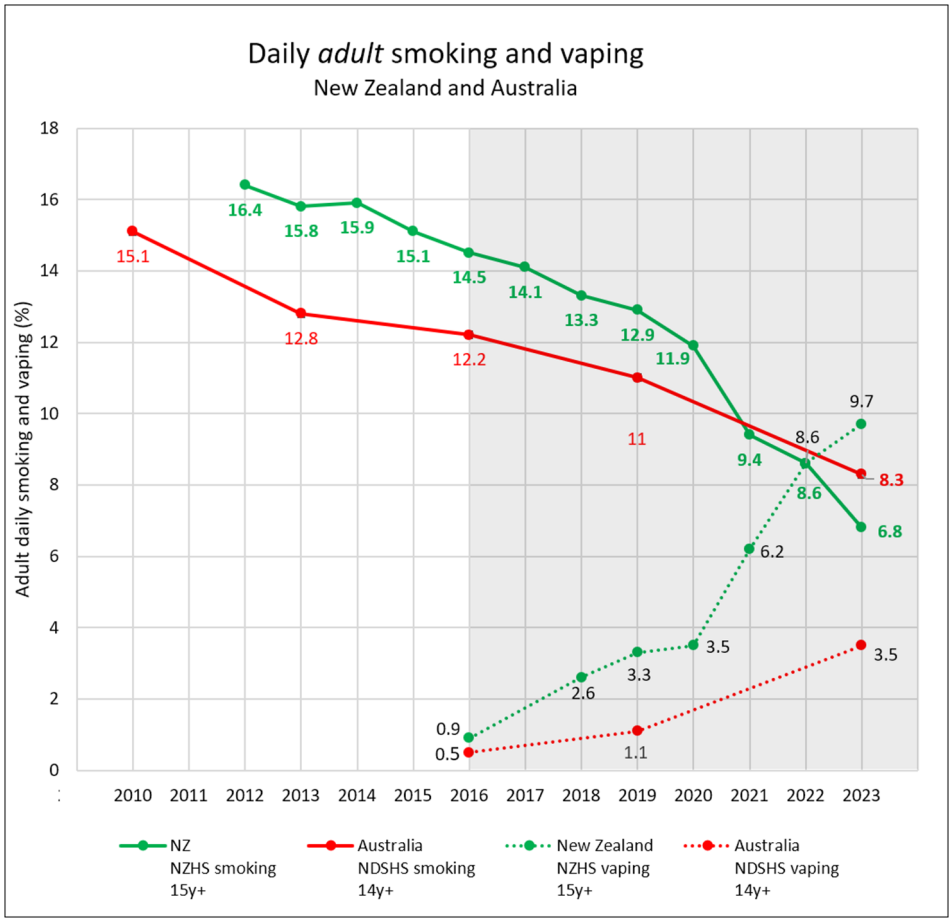

FIGURE 1 Daily adult smoking and vaping in Australia and New Zealand.
Confidence Intervals are available in the Supplement, Table S6.
Note: The NHS 2016 data point is an estimate (see text).

participants who would report vaping from a binomial distribution. Overall, 10 000 simulations were run. We estimated the ratio and the corresponding 95% CI of the relative changes between the countries based on simulated data from binomial distribution. The lower and upper bounds of this interval were the 2.5 and 97.5 percentiles of the 10 000 simulations. This simulation was conducted in R 4.3.3. The analysis script was available at https://github.com/gckc123/vaping_simulation_2025.

Surveys excluded

Three datasets were excluded because of various limitations. Further details can be found in Supplement 2, Table S6.

- The youth data from Australia's NDSHS [3] and the NZHS [20] were excluded because the small sample sizes provided prevalence estimates with large relative standard errors.
- An Australian survey by a market research company commissioned by the Australian Department of Health and Aged Care was excluded because it was not nationally representative and did not report the prevalence of daily smoking or vaping [21].

RESULTS

Adult smoking

In New Zealand, daily adult smoking (ages 15+) reported in the NZHS declined by a factor of 0.53 from 14.5% in 2016 to 6.8% in 2023, an average annual decrease by a factor of 0.1 (Figure 1).

The decline was particularly notable in the lowest socio-economic quintile where smoking rates dropped from 26.2% in 2016 to 10.7% in 2023 (an average annual decrease by a factor of 0.12). The decrease in smoking in this population was most rapid from 2020 to 2023, falling from 24.2% to 10.7%, an average annual decrease by a factor of 0.24. This coincided with a rapid rise in vaping from 5.2% to 15.8% in this group (Supplement 2, Table S7).

Among Māori, the smoking rate declined by a factor of 0.52, from 35.5% to 17.1% over the same period (an average annual decrease by a factor of 0.1). The change was especially notable from 2020 to 2023 when smoking declined from 28.6% to 17.1% (an average annual decrease by a factor of 0.16) mirroring the sharp rise in vaping from 5.3% to 23.5%.

In Australia, daily adult smoking (ages 14+) reported in the NDSHS decreased by a factor of 0.32 from 12.2% in 2016 to 8.3% in 2023, an average annual decrease by a factor of 0.05. The NHS reported a decline from an estimated 13.8% in 2016 (based on 2015 and 2018 data points) to 10.2% in 2022 (also an average annual decrease by a factor of 0.05) (Figure 1).

Smoking prevalence in Australia's most disadvantaged quintile declined by a factor of 0.24 from 17.7% in 2016 to 13.4% in 2023 (an average annual decrease by a factor of 0.04).

Smoking by Indigenous Australian people (adults 15+) reported in the NATSIHS declined by a factor of 0.23 over 4 years from 37.4% in 2019 to 28.8% in 2023, an average annual decrease by a factor of 0.06 [6, 18]. Eight percent of Indigenous adults were currently vaping in 2023, but daily vaping was not recorded. However, the 2023 NDSHS reported that 6.5% of Indigenous adults vaped daily, substantially less than the Māori daily vaping rate of 23.5% [3].

We tested the ratio of the magnitude of the relative changes between the two countries using Monte Carlo simulation. Between 2016 and 2023, the decrease in adult daily smoking prevalence in New Zealand (from 14.5%–6.8%) was higher by a factor of 0.67 (95% CI = 0.43, 0.93) than that in Australia (from 12.2%–8.3%).

Rate of decline in smoking by vaping rate

The decline in smoking prevalence accelerated as vaping increased in both countries. In New Zealand, the average annual reduction in smoking increased from a factor of 0.03 in 2012 to 2016 to 0.17 in 2020 to 2023, corresponding with the rise in vaping prevalence. In Australia, the average annual reduction in smoking increased from a factor of 0.02 in 2013 to 2016 to 0.07 in 2019–2023 (Supplement 2, Table S8).

Decline in smoking by age group

The decline in smoking was greatest in the younger adult age groups, which also had the highest rates of vaping. In New Zealand, the decline was most marked in the 18- to 34-year-olds. In Australia, the greatest decline occurred in the 18- to 49-year-old age group (Figure 2). However, the reduction in smoking was less in Australia, especially in the 18- to 24-year-old age group.

The average annual declines in adult smoking in both countries are summarised in Table 2.

Adult vaping

In New Zealand, daily adult vaping prevalence reported in the NZHS increased from 0.9% in 2016 to 9.7% in 2023. In Australia, daily vaping reported in the NDSHS increased from 0.5% in 2016 to 3.5% in 2023. Monte Carlo simulation analysis shows that the increase in adult vaping in New Zealand was higher by a factor of 0.56 (95% CI = 0.17, 1.02) than in Australia.

Youth smoking and vaping

From 2016 to 2023, daily youth smoking declined to very low levels in both countries: 1.2% among 14- to 15-year-olds in New Zealand and 0.3% among 12- to 17-year-olds in Australia (Figure 3).

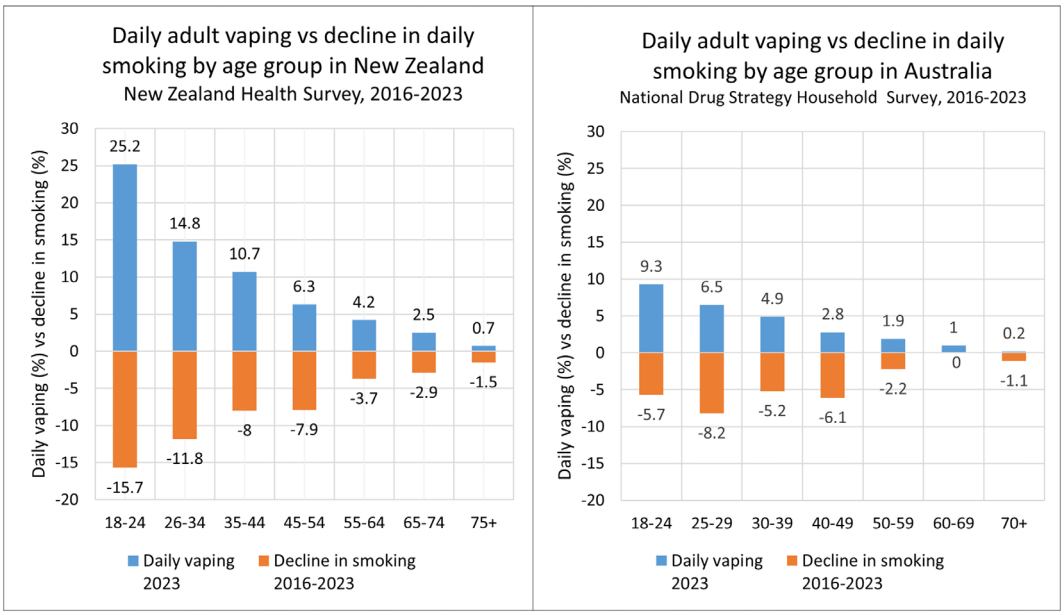

FIGURE 2 Daily vaping prevalence and relative decline in daily smoking (%) by age group from 2016 to 2023.

TABLE 2 Changes in adult smoking prevalence from 2016 to 2023.

Adult smoking							
	Survey	2016	2022	2023	2016–2022 (6 y)	2016–2023 (7 y)	Average annual decrease in smoking (by a factor of)[a]
Australia	NDSHS	12.2%		8.3%		32%	0.05
	NHS	13.8%[b]	10.2%		26%		0.05
New Zealand	NZHS	14.5%		6.8%		53.1%	0.1

Abbreviations: NDSHS, National Drug Strategy Household Survey; NHS, Australia's National Health Survey; NZHS, New Zealand Health Survey.
[a]Geometric means.
[b]Estimated from 2015 and 2018 data points.

In New Zealand, the prevalence of daily youth vaping increased from 1.4% in 2016 to 10% in 2023 (an average annual increase by a factor of 0.32) (Figure 3). In Australia, the only reliable data point was 3.0% in 2023. The differing age ranges in the surveys preclude direct comparisons.

DISCUSSION

Tobacco smoking is still the leading preventable cause of death and disease in Australia and New Zealand, making smoking reduction an urgent public health priority. Our analysis found a more rapid decline in daily adult smoking in New Zealand compared to Australia between 2016 and 2023, with New Zealand seeing an average annual decrease by a factor of 0.1 in adult daily smoking prevalence compared to around 0.05 in Australia's surveys (Table 2).

In each country, the decline in smoking was accompanied by a similar increase in vaping, although the absolute changes were larger in New Zealand (Figure 1). This is consistent with people who smoke cigarettes shifting toward vaping and some people who have not previously smoked initiating the use of NVPs instead of cigarettes.

The prevalence of daily adult smoking in the lowest socio-economic communities declined three times faster in New Zealand (26.2%–10.7%—an average annual decrease by a factor of 0.12) than in Australia (17.7%–13.4%—an average annual decrease by a factor of 0.04).

Daily smoking by Māori adults declined by a factor of 0.1 annually, a rate similar to the general population. This was associated with a high uptake of vaping. In comparison, in the previous 4-year period before vaping became popular, Māori smoking declined by a factor of 0.02 annually (from 37.7% in 2012 to 35.5% in 2016).

Smoking prevalence in the Indigenous Australian population declined by a factor of 0.06 annually from 2019 to 2023. In the previous 5-year period from 2014 to 2019 when vaping was less prevalent, daily smoking declined by a factor of 0.02 annually (42% in 2014 to 37.4% in 2019) [17]. Smoking also declined most rapidly in the younger adult age groups with the highest vaping rates.

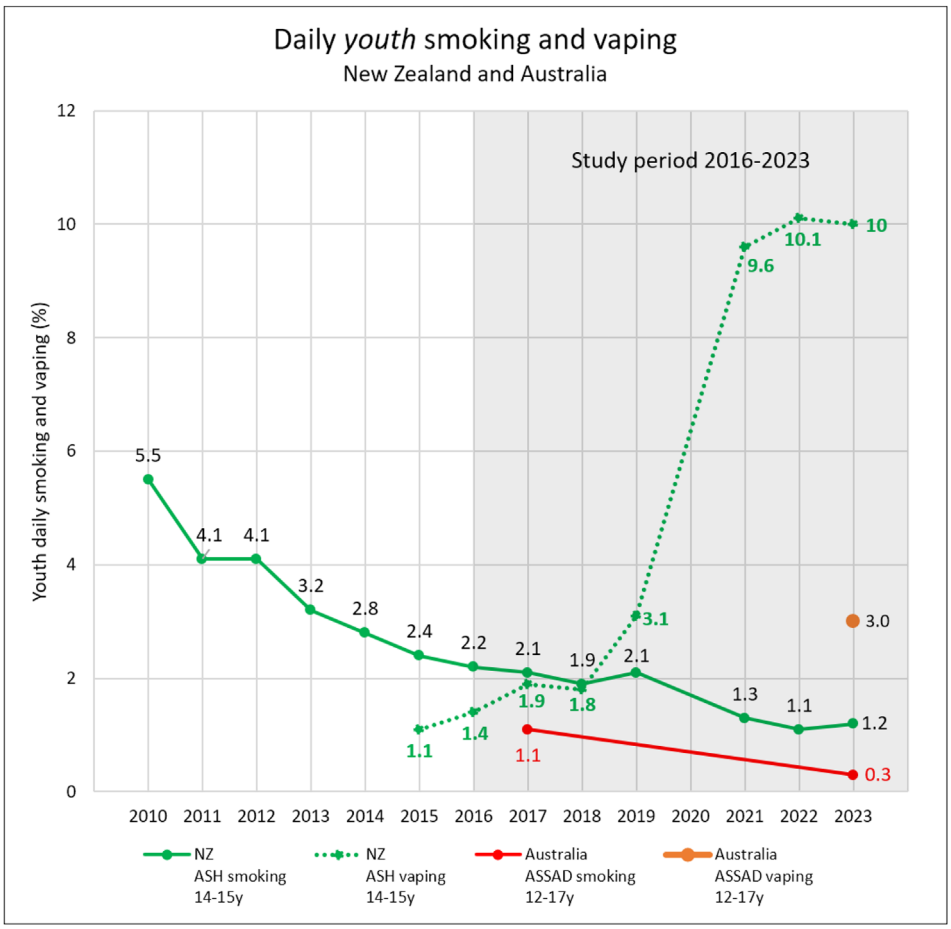

FIGURE 3 Daily youth vaping prevalence in Australia and New Zealand. Confidence Intervals are available in the Supplement, Table S6.

Explaining the difference in trends

A key question is whether the association between easier access to NVPs is causally related to the accelerated decline in smoking in New Zealand. Observational studies such as this cannot definitively infer causation because it is not possible to completely control for all potential confounding variables. However, the following evidence supports a possible causal hypothesis.

First, RCTs have shown that vaping is an effective quitting aid [22]. Trends in smoking and vaping in observational studies [23–25] are supportive of the controlled trials, including studies of vaping in people who smoke who did not intend to quit smoking (accidental quitters) [26–28].

Second, a causal hypothesis is supported by indications of a 'dose–response' relationship between the prevalence of vaping and declines in smoking [28]. As vaping prevalence increased in both countries, the rate of decline in smoking accelerated (Supplement 2, Table S8). Similar associations have been found in other population studies [29–31]. Fagerström identified a faster decline in smoking in several countries with a higher uptake of NVPs and other alternative nicotine products compared to declines in neighbouring countries with a lower prevalence NVPs and other alternative nicotine products [32]. In addition, the decline in smoking was greatest in the young adult age groups with the highest vaping rates (Figure 2). Similar findings with young adults have been reported in the United States and United Kingdom [33, 34]. Pesola found that the faster decline in smoking in countries with easier access to NVPs was most marked in young adults and in the lowest socio-economic groups [35].

Third, people who vape to quit smoking in countries with less restrictive environments are more likely to quit than people who smoke in countries with more restrictive policies [36]. It has been easier for people who smoke to purchase and use NVPs in New Zealand than in Australia and the policy environment in New Zealand also encourages and supports their use more than in Australia.

Youth smoking and vaping

Daily youth smoking reduced to very low levels by 2023 at a similar rate in both countries. The association between increased vaping and reduced youth smoking provides further evidence that vaping has not to date increased youth smoking at the population level (the gateway theory). This is consistent with research suggesting vaping and smoking are economic substitutes [37–39]. However, there is no conclusive evidence that the greater availability of vaping in New Zealand is facilitating the decline in youth smoking.

Daily vaping rates among youth in New Zealand were considerably higher than those in Australia, raising public health concerns.

However, the New Zealand ASH survey found that most of the rise in youth vaping occurred before the legalisation and regulation of vaping was enacted in 2021 (Figure 3). Since then, daily vaping among youth has decreased from 10.1% in 2022 to 8.7% in 2024 [40]. The different age ranges covered by the surveys mean direct comparisons should be approached with caution, especially regarding the magnitude of the difference.

Increased youth vaping followed by a decline was also seen in the United States. In the National Youth Tobacco Survey, 6% of students in grades 6 to 12 vaped frequently (20 or more days in the past 30) in 2019 [41] declining to 2.7% in 2023 [42]. This decline was likely because of regulatory measures, public health campaigns, school policies and shifts in social perception. It will become clear over time if this also happens in New Zealand.

Alternative explanations of the trends

The observed trends are unlikely to be explained by other tobacco control measures because no major policy changes occurred during the study period aside from those related to vaping. The only notable difference in policies we identified between Australia and New Zealand was a greater increase in tobacco tax during 2016 to 2022 in Australia (140%), compared to New Zealand (64%) (Supplement 1, Table S2). However, this would have predicted a greater smoking reduction in Australia than New Zealand rather than the observed differences.

If cigarettes were less affordable in New Zealand than in Australia, a more rapid decline in smoking prevalence would be expected [43]. However, the opposite was the case. Cigarettes are approximately 15% to 20% more affordable in New Zealand than in Australia based on the cost per pack, the annual average wage and the cost of living. (Calculations in Supplement 1, Table S2).

Plain (standardised) packaging was introduced in New Zealand in 2018, later than in Australia. After the introduction of plain packaging in Australia in 2012, there was no statistical change in the smoking rate over the next 3 years despite annual 12.5% increases in tobacco excise [44]. Further analysis has found little or no effect of plain packaging on smoking prevalence [45–47]. A Cochrane review concluded that plain packaging may have reduced smoking prevalence by 0.5% in one large observational study, but the certainty in this finding was low by GRADE standards [48]. If there was an effect from plain packaging on smoking rates in New Zealand this may have made a small contribution to the more rapid decline in smoking in New Zealand than Australia.

The coronavirus disease 2019 (COVID-19) pandemic was linked to reduced smoking cessation efforts and increased cigarette sales [49, 50]. However, it is unlikely to have contributed to New Zealand's more rapid decline in smoking. COVID-19 had a similar health impact in Australia and New Zealand, causing 5.3% of all deaths in Australia and 6.2% of all deaths in New Zealand in 2022 [51, 52]. COVID-19 imposed a larger economic burden in New Zealand, which could be expected to slow the decline in smoking rates in New Zealand relative to Australia [53]. However, the opposite trend was observed.

The economic downturn in recent years could potentially influence smoking rates [54]. However, New Zealand's entry into recession in 2023, its more aggressive monetary easing policies and significant emigration rates indicate it has been more significantly impacted than Australia [55–57]. These factors are more likely to slow the decline in smoking prevalence in New Zealand rather than accelerate it.

Heated tobacco products have been legally available in New Zealand since 2018. However, a review in 2021 to 2022 found very low levels of use [58]. The retail sale of heated tobacco products is banned in Australia and their use appears to be minimal.

Policy implications for Australia

With a daily adult smoking rate of 6.8% in 2023, New Zealand is making good progress toward its goal of 5% smoking or less by 2025 for the population as a whole [12]. This goal will not be achieved for Māori or the lower socio-economic populations. In contrast, Australia's current trajectory and a daily smoking rate of 8.3% indicate it is likely to miss its target of 5% daily smoking or less by 2030 [59] Modelling suggests a projected smoking prevalence of 7.6% for males and 4.8% for females in 2080 [60, 61]. If there is a causal relationship between smoking and vaping trends, then adopting the New Zealand model for vaping is likely to assist Australia in reaching its target earlier.

The rapid decline in smoking in the lowest socio-economic quintile in New Zealand as vaping rates increased suggests that vaping could also play a beneficial role in reducing health inequalities in Australia. Traditional smoking cessation treatments and public health campaigns have had limited appeal for lower socioeconomic groups [62]. In Australia, the disparity in smoking rates across the social spectrum has increased in recent years. Daily smoking in the most disadvantaged population increased from 2.7 times that of the highest socio-economic quintile in 2016 (17.7% vs. 6.5%) to 3.3 times in 2023 (13.4% vs. 4.1%) [3, 44].

The accelerated decline in Māori smoking rates as vaping rates increased suggests that vaping may also be beneficial for Indigenous Australian people who smoke for whom smoking rates have been declining more slowly.

It is also of note that Australia's restrictive model has helped create a thriving and increasingly violent illicit NVP market controlled by criminal networks [10, 11]. In contrast, there is no evidence of a significant organised illicit market for vapes in New Zealand [16]. Under a less restrictive policy, people who vape are more likely to purchase legal, regulated products.

Under a more liberal regulatory model, appropriate measures should be introduced to minimise the rise in youth vaping. These could include restricting the sale of vaping products to licensed retail outlets; strict age verification and use of closed-circuit television at point-of-sale; harsh penalties including the loss of licence for underage sales; restricted advertising and marketing to adolescents; restrictions on disposables; and banning flavour names, images and packaging, which appeal to young people [63].

Policy implications for New Zealand

Given the higher rates of daily vaping among youth in New Zealand, it is important to implement strategies like those above to reduce youth access to vaping products. Some measures have recently been announced [64, 65]. Care should be taken, however, to avoid excessive restrictions that could deter adults who smoke from switching to vaping or that could inadvertently foster a black market.

One possible consequence of the rise in youth and young adult vaping is greater overall use of nicotine-containing products. The potential harm from additional vaping needs to be balanced against the likelihood that vaping is diverting some young people who would otherwise have smoked away from cigarettes [37, 38].

However, modelling suggests a substantial net public health benefit from wider access to NVPs even after accounting for the potential harm from increased youth use [66–68].

LIMITATIONS

Differences in survey methodologies and age groups surveyed complicate this study's comparative analysis. However, careful comparisons of the trends that evaluate alternative explanations can provide information on the effects of national policies.

Adults are defined as 14+ years in the NDSHS and 15+ years in the NHS, NATSIHS and NZHS, so there is some overlap with the adult and youth smoking data. Smoking rates for adults age 18-years and older were not available for New Zealand for the full period of the study. However, smoking rates in the 14- to 17-year age range are low and would not make a meaningful change if they are included in the adult cohort. In Australia, the daily smoking rate for 14- to 17-year-olds was 2.2% in 2016, 1.9% in 2019 and 0.9% in 2023 (NDSHS 2023). In New Zealand, the daily smoking rate for 15- to 17-year-olds was 1.1% in 2016, 1.2% in 2019 and 0.3% in 2023 (NZHS).

Our analyses were based on published statistics from nationally representative surveys instead of individual-level survey responses as these data were not publicly available. However, the absence of individual-level responses was unlikely to explain the large effect found. Further, individual-level responses would not remove country-level confounding (e.g. differences in policy execution and enforcement).

Australia currently only surveys cigarette smoking triennially. It should conduct surveys at least annually of nationally representative samples with adequate sample sizes of adults and youth, using consistent collection methodology. Such data are essential to promptly respond to emerging trends in tobacco and other drug use.

Further, given the limitations in accessing the data, we relied on Monte Carlo simulation based on published statistics. More accurate estimations of the corresponding CI can be obtained if the original data are made available for independent analysis. However, this limitation is unlikely to change our conclusion because the effect sizes are very substantial, with the lower bound of the CI being well above zero.

CONCLUSION

Between 2016 and 2023, there was a larger decrease in the prevalence of adult smoking in New Zealand, a country with more liberal, risk-proportionate vaping regulations, than in Australia, which has adopted a more restrictive approach. The reductions were especially notable in subpopulations with the highest prevalence of vaping, namely young adults, less advantaged and Indigenous populations.

If the association is causal, the data suggest that increasing access to NVPs could improve public health in Australia by increasing the rate of decline in adult smoking, reducing social inequalities and diminishing the illicit vaping market. Increases in youth vaping in New Zealand, and to a lesser extent in Australia, remain a concern. Revised policies are needed to reduce youth use in both countries.

AUTHOR CONTRIBUTIONS

Colin Paul Mendelsohn: Conceptualization; writing—original draft; writing—review and editing. **Robert Beaglehole:** Writing—review and editing. **Ron Borland:** Methodology; writing—review and editing. **Wayne Hall:** Methodology; writing—review and editing. **Alex Wodak:** Conceptualization; methodology; writing—review and editing. **Ben Youdan:** Data curation; writing—review and editing. **Gary Chung Kai Chan:** Formal analysis; writing—review and editing.

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Nil

DECLARATIONS OF INTEREST

C.P.M. was an unpaid board member of the Australian Tobacco Harm Reduction Association (ATHRA), a registered health promotion charity, from October 2017 to January 2021. ATHRA accepted unconditional seed funding from the vape retail industry to become established. Funding ceased in March 2019. C.P.M. was a Director of ATHRA in March 2018 when it received a donation from Knowledge-Action-Change (KAC) Communications. The donation was sourced from a surplus arising from the Global Forum on Nicotine conference in May 2017. C.P.M. was an invited speaker at the World Vape Show Conference 2022 in Dubai and his travel expenses were paid by the conference organisers. C.P.M. is the author of *Stop Smoking Start Vaping*, published by Aurora Press. C.P.M. has never received payments from electronic cigarette or tobacco companies. A.W. has been an unpaid board member of the ATHRA, a health promotion charity, since October 2017. ATHRA received unconditional funding for establishment costs from small Australian vape businesses. Vape industry funding has not been accepted since March 2019. A.W. was a Director of ATHRA in March 2018 when it received a donation from KAC Communications. The donation was sourced from a surplus arising from the Global Forum on Nicotine conference in May 2017. A.W. has never received payments from electronic cigarette or tobacco companies. The other authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

Data Availability Statement included in Supplement 2 (Table S4).

ORCID

Colin Paul Mendelsohn https://orcid.org/0000-0001-9367-8870
Ron Borland https://orcid.org/0000-0003-0059-178X
Wayne Hall https://orcid.org/0000-0003-1984-0096
Alex Wodak https://orcid.org/0000-0003-0098-4225
Gary Chung Kai Chan https://orcid.org/0000-0002-7569-1948

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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