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Viewpoint

A public health message on tobacco smoking from New Zealand

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Abstract

Tobacco smoking is the leading cause of preventable death and disease worldwide. New Zealand has taken a leading role in controlling tobacco smoking for many years and has now adopted a more radical tobacco control strategy. The new Smokefree Aotearoa 2025 Action Plan will be the most comprehensive anti-tobacco policy in history and could make New Zealand the first country in the world to achieve smoke-free status, defined as an adult smoking rate of no more than 5%. The new policies restricting the availability of tobacco, reducing the nicotine content of cigarettes, and eventually prohibiting the sale of tobacco may lead to less smoking, less nicotine dependence and improved public health. Moreover, new legislation implementing the policy could reduce health inequities between ethnic and socioeconomic groups. Electronic cigarettes are the most common tobacco product used by youths. However, the replacement of smoking by vaping raises health concerns. While vaping is thought to be less harmful than smoking, it is not harmless. It exposes users to nicotine and toxicants, which can lead to addiction and harmful health effects. Public health action is needed to help young non-smokers to remain both smoke-free and vape-free. The tobacco endgame, aiming to permanently end rather than simply reduce the use of combustible tobacco, requires strong political will, since the influence of the tobacco industry is likely to delay any substantive action. Should New Zealand succeed in its large-scale experiment, it may set an example for public health systems worldwide.

Keywords: Tobacco smoking; Tobacco control; Smoke-free policy; Vaping; New Zealand; Public health.

Eine Botschaft zum Tabakrauchen und zur öffentlichen Gesundheit aus Neuseeland

Tabakrauchen ist weltweit die Hauptursache von vermeidbaren Krankheiten und Todesfällen. Neuseeland ist seit vielen Jahren führend bei der Bekämpfung des Tabakkonsums und hat nun eine noch radikalere Strategie zu seiner Eindämmung verabschiedet. Der neue Aktionsplan "Smokefree Aotearoa 2025" wird die umfassendste Anti-Tabak-Politik der Geschichte sein und könnte Neuseeland zum ersten Land der Welt machen, das den Status "rauchfrei" erreicht, d. h. eine Raucherquote unter Erwachsenen von höchstens 5%. Die neue Politik, die die Verfügbarkeit von Tabak einschränkt, den Nikotingehalt von Zigaretten reduziert und schließlich den Verkauf von Tabak vollständig verbietet, könnte zu weniger Rauchen, weniger Nikotinabhängigkeit und einer besseren öffentlichen Gesundheit führen. Außerdem könnten die neuen Rechtsvorschriften gesundheitliche Ungleichheiten zwischen ethnischen und sozioökonomischen Gruppen verringern. Der Ersatz des Tabakrauchens durch elektronische Zigaretten (Dampfen) bleibt allerdings ein kritisches Thema. Dampfen gilt zwar als weniger schädlich als Rauchen, ist aber ebenfalls nicht unbedenklich. Elektronische Zigaretten, das am häufigsten von Jugendlichen verwendete Tabakerzeugnis, setzen die Nutzer Nikotin und Schadstoffen aus, die zu Abhängigkeit führen und gesundheitsschädliche Auswirkungen haben können. Im Bereich der öffentlichen Gesundheit sind Maßnahmen notwendig, die junge Nichtraucher dabei unterstützen, sowohl rauch- als auch dampffrei zu bleiben. Das Endspiel um den Tabakkonsum, das darauf abzielt, den Konsum von brennbarem Tabak nicht nur zu reduzieren, sondern dauerhaft zu beenden, erfordert einen starken politischen Willen, da der Einfluss der Tabakindustrie wahrscheinlich jede substanzielle Maßnahme verzögern wird. Sollte Neuseeland mit seinem groß angelegten Experiment erfolgreich sein, könnte es zum Beispiel für die öffentlichen Gesundheitssysteme weltweit werden.

1. Introduction

Despite unequivocal evidence of the harm caused by tobacco, the substance continues to be a leading global cause of avoidable morbidity and mortality. Tobacco smoking remains one of the biggest public health threats and claims the lives of 8 million people worldwide annually (World Health Organisation, 2023). In the absence of intervention, the annual toll of deaths and the current 200 million disability-adjusted life-years attributable to smoking will increase over the coming decades (GBD 2019 Tobacco Collaborators, 2021). Ending the global tobacco epidemic is a defining challenge in global public health. Evidence-based policies seeking to effect a reduction in the prevalence of smoking remain to a large extent unimplemented.

New Zealand has long been a pioneer in fighting the epidemic of tobacco smoking, with a decades-long, well-developed tobacco control policy (Te Whatu Ora, 2020) (see Table 1). A combination of taxation, public health warnings, bans on the advertising of tobacco products, education as well as restrictions on public smoking have drastically reduced the number of smokers in New Zealand. The percentage of adults smoking daily has recently decreased by more than half, from 16.4% in 2012 to 8% in 2022 (Ministry of Health, 2022). The New Zealand government now intends to begin implementing the tobacco endgame with a view to permanently ending the use of tobacco. To this end, it is introducing a bold new tobacco control programme targeting the sale of tobacco. The measures seeking to make New Zealand smoke-free include a reduction, from 2024, of the number of retailers permitted to sell combustible tobacco and a decrease in the amount of nicotine permissible in cigarettes from 2025. However, the most far-reaching policy of the Smokefree Aotearoa 2025 Action Plan (Aotearoa is the Māori name for New Zealand) laid out by the government in December 2021 (New Zealand Ministry of Health, 2021) will criminalise, from 2027, the selling of cigarettes to anybody born in or after the year 2009. This age group will never be allowed to purchase combustible tobacco products legally. It is believed that the first two strategies will enable New Zealand to achieve the smoke-free goal. The third approach in preventing young people from buying cigarettes aims to make New Zealand permanently smoke-free. This groundbreaking new legislation is likely to help New Zealand achieve victory in the endgame against the tobacco companies and could make New Zealand the first country in the world to achieve smoke-free status, commonly defined as an adult smoking rate of less than 5%.

A further motivation for combating the smoking of tobacco in New Zealand much more decisively is to eliminate inequities in smoking rates and smoking-related illnesses between Māori, the indigenous peoples of New Zealand, and non-Māori. Smoking prevalence of indigenous people in high-income countries with colonial histories is often substantially higher than that of descendants of immigrants (Maddox et al., 2019) and is a significant contributor to health inequities (Blakely et al., 2018). New Zealand is no exception, with Māori having the highest prevalence of smoking among its main ethnic groups: 19.9% of adult Māori smoked daily in 2021–2022, compared to 7.2% of adults of European descent (Ministry of Health, 2022). Māori are also the most severely affected by the adverse health effects resulting from smoking (Blakely et al., 2010; Blakely et al., 2018).

The details of the three radical interventions featured in New Zealand's Action Plan are described below.

2. Restricting availability of tobacco

A substantial reduction in tobacco availability has been identified as a key strategy in tobacco control (Ackerman et al., 2017; Robertson et al., 2016). Substantial changes to the tobacco retail landscape, restricting the number, types and location of tobacco retailers, has been hypothesised to facilitate progress towards the tobacco endgame (Henriksen, 2015; Pearson et al. 2017; Pulakka et al., 2016). These restrictions would considerably reduce the overall availability of tobacco, change community norms around tobacco use, decrease cues to smoke and reduce the density of tobacco sales around schools (Marsh et al., 2020). One approach in New Zealand therefore calls for a reduction in the number of tobacco retailers by 95%, thereby making the obtaining of cigarettes more difficult. From 2024 onwards, cigarettes may no longer be sold at supermarkets, convenience stores, petrol stations or other tobacco outlets. The tobacco trade will be reserved for a small number of licensed shops. The expected effectiveness of reducing the number of retail tobacco outlets is supported by research. It has been suggested that people living near such places smoke more, adopt the habit more easily and find it more difficult to stop (Pearson et al., 2015). Based on available data, modeling studies showed that a decrease in the number of tobacco retailers in New Zealand by 90% combined with cessation advice would markedly reduce smoking over 10 years (Petrović-van der Deen et al., 2019).

3. Reducing nicotine content of cigarettes

It has long been posited that limiting nicotine content in cigarettes to a nonaddictive level may discourage smoking. The US Food and Drug Administration (2018, 2021) advocates the use of very low nicotine levels in smoked tobacco in order to reduce addictiveness, but the policy has not as yet been implemented anywhere in the world. While cigarettes with very low nicotine levels have been shown to promote smoking cessation in volunteers participating in clinical trials (Smith et al., 2018), it is unclear whether this will hold true outside trials (Britton, 2018).

Table 1. History of tobacco control in New Zealand (Te Whatu Ora, 2020)

1963	No advertising of cigarettes on television and radio
1973	No advertising of cigarettes on billboards and in cinemas
1974	Display of health warnings on cigarette packets
1979	Definition of tobacco as toxic substance in Toxic Substances Act
1984	First government tobacco control programme (taxation measures, health education, health warnings, support with quitting, smokefree environments, regulating tar in cigarettes, ban on tobacco event sponsorship)
1990	Smoke-free Environments Act: restrictions on smoking in many indoor workplaces; ban on smoking on public transport and some other public places (cafés, restaurants and casinos); ban on sale of tobacco products to people under the age of 16 years (raised to 18 years in 1998)
1990	Regular adjustment of tobacco tax for inflation from 1990 to 1998
1995	Removal of tobacco product signs from retail outlets; end of tobacco company sponsorships
1999	Launch of National Quitline service
2000	Introduction of subsidised nicotine patches and gum to aid quitters
2004	Smoke-free schools, licensed premises (restaurants, cafés, bars, casinos, sports clubs) and all other workplaces (offices, factories, warehouses, lunchrooms)
2008	Introduction of graphic health warnings covering most of cigarette packaging
2010	25% increase in excise on loose tobacco and 10% increase on all other tobacco products; introduction of annual 10% tax increases on tobacco until 2020
2011	Adoption of smoke-free by 2025 goal
2012	Ban on tobacco retail displays
2018	Introduction of plain packaging for all tobacco products
2020	Prohibition of smoking in vehicles carrying children
2021	Smokefree Aotearoa 2025 Action Plan: reduction of number of retailers allowed to sell combustible tobacco from 2024; decrease in nicotine amount permissible in cigarettes from 2025; purchase of combustible tobacco products illegal for people born after 2008

In accordance with these suggestions, the second provision of New Zealand's new action plan is a reduction in the nicotine content of cigarettes below addictive levels. In 2025, the nicotine content of legal cigarettes is to be drastically reduced by up to 95%. Banning cigarettes with high nicotine concentrations has been hypothesised to cause some smokers to respond by smoking more, which would increase the damage caused by cigarette smoke. However, the concern that smokers could compensate for the sudden lack of nicotine by consuming more cigarettes has been contradicted by research. Preliminary modelling suggests that a mandated denicotinisation policy could provide a realistic chance of achieving the New Zealand Government's Smokefree 2025 Goal. The probability of success would further increase if the policy were supplemented with other interventions, such as mass media campaigns with Quitline support (Wilson et al., 2022).

A large single-blind, parallel randomised trial explored the combined effect of cigarettes with very low nicotine content and usual Quitline care (nicotine replacement therapy and behavioural support) on short- and long-term abstinence rates in smokers motivated to quit. A clear increase in quit rates in comparison with usual Quitline care was found, with a positive impact on time to relapse and high participant acceptability (Walker et al., 2012). The findings of this trial support a strategy of a stepped reduction in the nicotine content of cigarettes (Gray et al., 2005; Hatsukami et al., 2010) or an immediate and significant reduction of nicotine to a level where no compensation occurs (Hatsukami et al., 2010) as a means to end smoking at population level. Furthermore, in a double-blind, randomised clinical trial conducted over 6 weeks in adults smoking five or more cigarettes per day, it could be shown that during week 6, the average number of cigarettes smoked per day was significantly lower for participants randomly assigned to cigarettes containing 2.4, 1.3 or 0.4 mg of nicotine per gram of tobacco (16.5, 16.3, and 14.9 cigarettes, respectively) than for those randomly assigned to their usual brand or to cigarettes containing 15.8 mg per gram (22.2 and 21.3 cigarettes, respectively) (Donny et al., 2015). The results of this study suggest that a substantial reduction in nicotine content is associated with reductions in smoking, nicotine exposure and nicotine dependence, with little evidence of nicotine withdrawal, compensatory smoking or serious adverse events (Donny et al., 2015). In summary, the effectiveness of denicotinisation has been demonstrated in clinical trials. The results of these studies show that cigarettes with drastically reduced nicotine content are barely or no longer addictive. This could account for the failure of the tobacco industry to offer them voluntarily. In addition, a recent modelling study reported

that denicotinisation could reduce health inequities between Māori and non-Māori (Ait Ouakrim et al., 2023)

Since the sudden reduction of nicotine content in cigarettes could cause abrupt withdrawal in addicted people, the new policy in New Zealand ensures that addiction treatment services for smokers will be expanded, and gum, patches or sprays containing nicotine will be available. Furthermore, electronic/e-cigarettes, especially those with a relatively high nicotine content, will remain legal for adults.

4. Prohibiting sales of combustible tobacco

New Zealand's strictest move to eradicate tobacco smoking is new legislation gradually raising the minimum age at which people are allowed to smoke (New Zealand Ministry of Health, 2021). The smoking age of 18 years will rise each year until it applies to the whole population. Since the law will make it illegal for those born after 2008 to buy cigarettes or other combustible tobacco products, people will, by 2050, have to be 40 years old to purchase them. The goal of this policy is to create an ever-growing cohort that never adopts the smoking habit. Since available evidence suggests that more than 80% of smokers start by age 18 and virtually all by 26 (Barrington-Trimis et al., 2020), young people will be protected by the new policy in the particularly vulnerable phase of adolescence and early adulthood. They will not experiment with cigarettes in the critical risk period for the onset of cigarette smoking and will therefore not become addicted to them for life.

Political regulations to mandate de facto prohibition for the next generation of potential smokers are considered unwise or unfeasible by some. However, those advocating strict control believe that historical experience supports their position. In the past, stiff taxation of tobacco products as well as smoke-free public places, workplaces and restaurants were also considered impossible but were successfully introduced in other countries after one country had led the way. The banning of sought-after substances may have unintended consequences, as alcohol prohibition once showed in America. As a result of the gradual prohibition of tobacco, New Zealand could suffer consequences such as a black market, organised crime and compromised quality of tobacco products due to uncontrolled addition of harmful substances. Illicit tobacco has been estimated to account for around 11% of today's tobacco consumption in New Zealand (KPMG, 2020). However, it has been argued that interests of the tobacco industry have exaggerated the black-market problem in order to alarm policymakers and that the true figure of contraband cigarettes is closer to 5% (Wilson et al., 2022). Targeted inspections of shipping containers entering the country may reduce illicit trade.

5. Acceptability of new policies

Public and stakeholder support is an important aspect of the acceptability and feasibility of policy interventions. A substantial reduction in the availability of tobacco as a strategy capable of achieving a smoke-free country was reported to have public support in New Zealand in investigations conducted before 2014 (Whyte et al., 2014). More recently, a comprehensive study investigated the support among smokers and quitters for the Smokefree 2025 goal and the measures proposed to help achieve it (Edwards et al., 2021). Substantial support for Smokefree 2025 and many of the related measures, such as mandated reductions in nicotine content of smoked tobacco products, was expressed by more than half of smokers and three-quarters of ex-smokers. Support was particularly strong for measures designed to reduce the uptake of smoking by adolescents and young people and to protect children from the effects of exposure to secondhand smoke. Support was similar among Māori and non-Māori participants (Edwards et al., 2021). The findings should persuade decision-makers that the implementation of a comprehensive strategy for achieving Smokefree 2025 is acceptable and feasible.

6. Further directions

6.1. Health inequalities

Many countries have indigenous, ethnic and socioeconomic inequalities in the use of tobacco. The findings of data modelling suggest that tobacco endgame strategies may have a major impact on both improving overall health status and reducing inequities in health (Ait Ouakrim et al., 2023). In view of the relatively high smoking rates among the Māori, the tobacco endgame strategies outlined in the 2021 Aotearoa Smokefree Plan could have a profoundly positive impact on the health of Māori and significantly reduce existing health inequities between Māori and non-Māori. For example, by 2040, a programme involving denicotinisation, a decrease in retail outlets by 95% and the tobacco-free generation strategy, in combination with media promotion, was estimated in a modelling study to reduce the gap in the all-cause mortality rate between Māori and non-Māori in people aged 45 years and older by 23.4% for females and 9.5% for males, compared to ongoing business-as-usual approaches. No other feasible health intervention would be capable of reducing ethnic inequalities in mortality by as much (Ait Ouakrim et al., 2023).

"Health in all policies" has emerged as a concept with the goal of promoting political action addressing the social determinants of health. This concept concerns prevention of disease, promotion of a healthy lifestyle and improvement of factors potentially harmful to the health of entire populations (Lange, 2021). The approach of health in all policies requires long-term commitment and vision, and legislative backing is needed to provide continuity and sustainability. Government-led tobacco endgame interventions, in particular denicotinisation of commercial tobacco, could dramatically reduce health inequities between ethnic and socioeconomic groups and would therefore contribute to the implementation of health-for-all policies.

6.2. Vaping instead of smoking

Smoking is normally associated with a dependence on nicotine. Smoke-free products, such as e-cigarettes (vaping) or heated tobacco, have the potential to reduce the enormous harm of smoked tobacco products by replacing cigarettes with less harmful routes of nicotine delivery (Beaglehole et al., 2019). These products do not necessarily use tobacco directly, but they deliver nicotine derived from the plant and have therefore become a new generation of tobacco commodities. The transition to smokeless tobacco products is encouraged by New Zealand's plan for a smoke-free generation, and the new laws will not restrict vape sales. While the percentage of people smoking tobacco in New Zealand has decreased by more than half in the last decade (Ministry of Health, 2022), the share of tobacco consumption lost by widespread cigarette regulations was replaced by smoke-free products.

Smoking and vaping differ in that smoking delivers nicotine by burning tobacco, which can cause smoking-related illnesses, and vaping delivers nicotine by heating a liquid in a less harmful way. The smoke from burnt tobacco contains tar and several thousand other substances, dozens of which are toxic and classified as carcinogenic. In contrast, the far less polluted aerosols from e-cigarettes are considered the comparatively better alternative, and New Zealand's treatment-resistant smokers are expected to switch to them. E-cigarettes provide both public health opportunities and risks (Farsalinos, 2018). They offer an alternative nicotine delivery system with lower health risks than combustible tobacco (Wilson et al., 2021) and may therefore be a potentially life-saving technology for nicotine-dependent smokers (Abrams et al., 2018). However, while vaping is less harmful than smoking, it also carries health risks. A wide range of negative health effects of vaping, such as acute lung injury (Gotts et al. 2019; Christiani, 2020) and chronic risks to cardiovascular, respiratory and oral health (Irusa et al., 2020; Peruzzi et al., 2020; Werner et al., 2020), have been reported. The effects of nicotine exposure on the development of the adolescent brain deserves particular attention (Leslie, 2020). Furthermore, e-cigarettes have only been widely available for some 10 years. Since the latency of respiratory illnesses caused by toxicant exposure may be up to 20–40 years (Archer et al., 2004; Alberg et al., 2013), the effects of long-term use are unknown.

Vapes and similar products may draw current smokers toward less harmful means of consuming tobacco. A recent Cochrane review found moderate certainty evidence that more people successfully stop smoking using nicotine e-cigarettes than using nicotine replacement therapy or non-nicotine e-cigarettes (Hartmann-Boyce et al., 2021). However, smoke-free products may also attract young people to tobacco use and may create the next generation of nicotine addicts. In 2019, a comprehensive youth health survey in New Zealand investigated smoking and vaping in secondary school students aged 13 to 18 years (Ball et al., 2021). Vaping was found to be 2–3 times more prevalent than smoking, with 10% of students vaping regularly (monthly or more often) and 6% weekly or more often, compared with 4% and 2%, respectively, for tobacco smoking (Ball et al., 2021). More than 80% of those who had ever vaped reported they were nonsmokers when they started vaping, and half of regular vapers had never smoked (Ball et al., 2021). Public health action is required to protect young people from health effects of vaping and smoking (Walley et al., 2019). Creating a new generation addicted to nicotine would clearly represent a failure of the Smokefree 2025 Action Plan.

In light of the progressive investment by cigarette companies in smoke-free products, the argument put forward that e-cigarettes, as an alternative means to deliver nicotine, have the potential to disrupt the cigarette industry (Beaglehole and Bonita, 2022) seems questionable. Most major e-cigarette brands are owned by big tobacco companies (Hsu et al., 2018), which use similar, deceptive marketing and advertising strategies to attract youths as they did with traditional tobacco products. Evidence on the long-term health consequences of e-cigarettes is lacking, and most of the constituents are untested. Since vaping fluids have the potential for harm, they should be tested carefully for toxicity, in the same way as other new products, before being marketed widely (Balmes, 2019). Nicotine vaping companies should therefore be required to prove that their products do not contain toxic compounds capable of producing acute or chronic disease.

6.3. International developments

Many countries worldwide will monitor the outcome of New Zealand's ambitious plan to eliminate smoking and eventually ban the sale of tobacco completely. Should this large-scale experiment succeed, it is likely to find imitators internationally. Several countries are studying tobacco-free generation policies. Malaysia and Denmark are considering a similar scheme, and Singapore may follow suit. However, other countries lag far behind in combating tobacco smoking. For example, the German government was recently criticised by the World Health Organisation for its lax approach to tobacco control, including insufficient tobacco regulations regarding tobacco prices, smoking bans and advertising (Deutsche Welle, 2023). Germany is one of the countries in Europe with the greatest need for action in tobacco control (German Cancer Research Center, 2020). Compared to other Western and Northern European countries, tobacco consumption in Germany is very high and very unequally distributed within the population according to socioeconomic criteria (Kotz et al., 2018). Despite this, Germany is, according to the WHO, among the slowest countries in Europe in taking measures to combat tobacco consumption. An extension of Germany's tobacco advertising ban to include advertising on billboards and in cinemas was introduced only relatively recently. The most recent price increases for cigarettes are below the inflation rate, making smoking effectively cheaper rather than more expensive. The smoking ban in public places is still inconsistent within Germany, and the advertising ban is poorly implemented. Political decisions on the implementation

of tobacco-control measures need to be protected against influence from the tobacco industry.

7. Conclusions

New Zealand's new policies restricting the availability of tobacco, reducing the nicotine content of cigarettes and eventually prohibiting the sale of tobacco may lead to a reduction in smoking and nicotine dependence and an improvement in public health. Moreover, health inequities between ethnic and socioeconomic groups could be reduced by the new legislation. However, the replacement of smoking by vaping remains an issue of concern. While vaping is believed to be less harmful than smoking, it may also damage health. Public health action is needed to support young people in remaining both smoke-free and vape-free. The tobacco endgame, striving to eradicate rather than merely reduce the use of combustible tobacco, requires creativity and especially strong political will, since the influence of the tobacco industry is likely to delay effective action. Should New Zealand succeed with its nationwide experiment, it may set an example, with public health systems worldwide following its lead.

Conflict of interest

The author declared no conflict of interest.

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