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# Smoke-free nicotine products can accelerate the end of the smoking epidemic

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Increased use of smoke-free nicotine products such as vapes could help to achieve an ambitious global goal of reducing smoking prevalence below 5% by 2040.

Despite two decades of progress under the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC), smoking remains responsible for more than seven million deaths each year, and declines in prevalence are slowing in many high-burden countries. Population growth, ageing and uneven implementation of proven policies mean that current approaches are unlikely to deliver reductions at the pace required to meet global non-communicable disease targets.

The rapid emergence of regulated non-combustible (smoke-free) nicotine products has created a historic opportunity to accelerate the end of the smoking epidemic. We argue that tobacco harm reduction should be formally integrated into FCTC implementation and propose a global smoke-free 2040 goal of adult daily smoking prevalence below 5% by 2040 as a realistic, measurable and equitable target. Achieving this goal will require combining established FCTC measures with wider access to regulated smoke-free nicotine alternatives. Evidence from countries where smoke-free alternatives have been widely adopted indicates that this goal is achievable at the same time as maintaining strong youth protection from both smoking and vaping. If replicated globally, such progress could accelerate declines in smoking far beyond those projected under current policy trajectories.

## The continuing global burden of smoking

After decades of tobacco control efforts, one billion people worldwide still use tobacco – predominantly through cigarette smoking, the most lethal form of nicotine consumption[1]. Tobacco use, mostly among men, remains the single largest avoidable cause of non-communicable diseases globally. Beyond mortality, smoking contributes substantially to morbidity, healthcare costs and lost productivity, and places sustained pressure on health systems that are already challenged by population ageing and the growing prevalence of chronic disease.

The burden of smoking is highly concentrated. China and India alone account for more than one-third of all adults who smoke, which reflects both population size and persistently high prevalence (particularly among men). In most countries, smoking rates are declining only slowly and prevalence is usually higher among populations that face socioeconomic disadvantage, which reinforces health inequalities.

Since its entry into force in 2005, the FCTC has been the cornerstone of global tobacco control. With 183 parties covering more than 90% of the world's population, the treaty catalysed the adoption of smoke-free public spaces, advertising restrictions, pictorial health warnings and increases in tobacco taxation[1]. In its early years, the FCTC transformed tobacco control from a fragmented national endeavour into a coordinated global public health movement.

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Two decades on, progress has slowed. Implementation of FCTC measures has plateaued in many regions, and political momentum has waned. Forty-nine countries still lack a single WHO-recommended demand-reduction measure at the highest level, which leaves around two billion people inadequately protected from the harms of tobacco use[2]. In high-burden countries such as Indonesia, Russia, India and China, where state-owned tobacco enterprises have a dominant role, conflicts of interest impede effective policy action.

Neither the WHO voluntary target of a 30% reduction in tobacco use by 2025 nor the Sustainable Development Goal target of reducing premature mortality from non-communicable diseases by one-third by 2030 is on track. Progress in reducing non-communicable disease mortality has slowed or reversed in a large number of countries compared with the previous decade, which underscores the central importance of tobacco control to future health gains[3]. The political declaration of the fourth UN high-level meeting on non-communicable diseases included a target of fewer than 150 million people using tobacco by 2030[4], a goal that would leave the global burden of tobacco largely unchanged.

## Why current approaches will not deliver rapid declines

The public health priority is to eliminate combustible tobacco rather than nicotine use per se. Conventional tobacco control relies primarily on demand-reduction measures, especially increased taxation, together with advertising and promotion bans, regulation of smoke-free areas and cessation support. Although these approaches remain important, their capacity to drive smoking prevalence down rapidly is limited. As prevalence falls, the remaining population of people who smoke increasingly comprises older and disadvantaged adults and people with higher levels of nicotine dependence who have already made multiple unsuccessful quit attempts.

In some policy debates, tobacco control objectives are framed increasingly in terms of nicotine elimination rather than

eliminating exposure to smoke, and potentially conflate nicotine use with the harms of smoking. Decades of evidence demonstrate that it is exposure to smoke from combustion — not nicotine — that drives tobacco-related disease[5].

## Tobacco harm reduction is the missing strategy

Harm reduction reflects a long-established public health principle: reducing the adverse consequences of risky behaviours when elimination is difficult or unrealistic. Tobacco harm reduction offers people who smoke access to substantially less harmful, smoke-free nicotine products.

Importantly, harm reduction is explicitly recognized in Article 1(d) of the FCTC as a component of comprehensive tobacco control, alongside supply and demand reduction strategies. In practice, however, it has remained underdeveloped, inconsistently regulated and politically contentious. In many settings, harm reduction is treated as peripheral or opposed to tobacco control, rather than as a complementary strategy aimed at accelerating the decline of smoking.

The rapid evolution of smoke-free nicotine products such as nicotine replacement therapy, oral snus, electronic cigarettes (vapes), heated tobacco products and nicotine pouches has altered the policy landscape. By eliminating combustion, they expose users to far lower levels of toxicants than cigarettes, which generate thousands of harmful and carcinogenic compounds. Although no nicotine product is risk-free, the relative risks of these smoke-free products are substantially lower than the risks of smoking to access nicotine[5].

Evidence from countries where tobacco harm reduction has been prioritized illustrates its positive population effects. In Sweden, widespread use of snus has been associated with some of the lowest smoking rates and tobacco-related disease burdens in Europe, including lung cancer rates less than half the European Union average[6]. In Japan, the introduction of heated tobacco products in 2016 was followed by unprecedented declines in cigarette sales[7]. In the USA, declines in smoking prevalence have coincided with increased uptake of vaping among adults who smoke[8].

The New Zealand experience is particularly instructive. Smoking prevalence declined gradually for decades following the introduction of FCTC-aligned measures but the rate of decline accelerated sharply after 2018, which coincided with broader access to regulated vaping products[9]. The steepest declines occurred among Māori and other disadvantaged groups (populations that historically have experienced the highest smoking rates), which suggests that harm reduction also contributed to reducing health inequities.

## Regulating nicotine in proportion to risk

Achieving the potential of tobacco harm reduction requires regulatory coherence; cigarettes remain widely available, while many less harmful alternatives face greater regulatory constraints. This misalignment risks protecting the most dangerous products while limiting access to safer substitutes.

A risk-proportionate regulatory framework would reverse this logic by recognizing the continuum of risk across nicotine products and aligning regulation, taxation and public communication accordingly[5]. Combustible tobacco should be subject to the strongest restrictions and highest excise taxes, as a reflection of its uniquely harmful nature. Smoke-free alternatives should be regulated to ensure product safety, restrict marketing to youth, minimize environmental harm and prevent uptake among non-smokers, without undermining their capacity to displace smoking.

Public communication is central to this approach. Misperceptions about the relative harms of nicotine products are widespread, fuelled by alarmist media coverage and ambiguous public health messaging that conflates nicotine with smoking-related harm[10]. Clear, evidence-based communication — including by the WHO — that most of the harm of tobacco comes from smoke rather than nicotine will support informed decision making by people who smoke.

## Addressing concerns regarding youth use, uncertainty and dual use

Concerns about tobacco harm reduction have focused on youth uptake, uncertainty about long-term health effects, and the dual use of cigarettes and smoke-free products. These concerns warrant careful attention but should be evaluated in proportion to the well-documented harms of continued smoking.

The gateway hypothesis that vaping leads young people to smoking has been widely debated. Many studies reporting associations between youth vaping and subsequent smoking are confounded by shared risk factors such as sensation-seeking behaviour and social context[11]. At the population level, youth smoking has continued to decline in countries where vaping has become more common, and has often reached historic lows. In New Zealand, regular vaping among never-smokers is rare, experimentation has declined in recent years and youth smoking prevalence is now around 1%[12]. Similar trends have been observed in the USA, where declines in youth smoking began well before vaping became widespread and coincided with the implementation of core FCTC measures[13].

Uncertainty about the long-term health effects of newer products, including nicotine pouches, also deserves attention. Ongoing surveillance and independent research are essential. Nonetheless, the absence of combustion makes these products intrinsically far less hazardous than cigarettes[5]. The balance of evidence indicates that e-cigarettes are among the most effective cessation aids available and that their use is associated with net population-level benefits rather than harms[14].

Dual use is often portrayed as a failure of harm reduction. In practice, dual users are heterogeneous. Some dual users substantially reduce cigarette consumption before quitting entirely, whereas others make only partial or temporary changes. Biomarker studies consistently show lower exposure to toxicants among dual users compared with exclusive smokers[15].

## Towards a global smoke-free 2040 goal

The rapidly evolving market for smoke-free nicotine products, combined with their increasing uptake among people who smoke, presents an unprecedented opportunity to rethink global tobacco control ambition. We propose a global smoke-free 2040 goal, defined as an adult daily smoking prevalence below 5% by 2040.

In 2024, an estimated 16% of the global population aged 15 years and over smoked tobacco, approximately 28% of men and 5% of women[1]. If current trends continue, global smoking prevalence is projected to fall to around 10% by 2040. Achieving a prevalence below 5% within the same timeframe would require a substantial acceleration in the current annual rate of decline, similar to that recently observed in New Zealand.

Attention has been given to legislative 'endgame' measures intended to drive prevalence well below low single-digit levels. In New Zealand, legislation passed in 2022 included a smoke-free generation law, mandatory denicotinization of cigarettes and a substantial reduction in tobacco retail outlets. Following a change in government, most of this legislation was repealed before implementation, which reflected

concerns about feasibility, equity and unintended consequences. The New Zealand experience suggests that implementation of FCTC measures, complemented by well-regulated smoke-free alternatives, reduces the need for more coercive approaches and offers a more politically sustainable path to rapid smoking declines while controlling the illicit trade in cigarettes and vapes.

## Implications for low- and middle-income countries

Low- and middle-income countries face distinct challenges, including high tobacco affordability relative to income, limited cessation services and variable regulatory capacity. Fiscal policy will therefore be critical. Risk-proportionate taxation – with higher excise taxes on combustible tobacco and lower taxes on smoke-free alternatives – can incentivize switching while maintaining government revenue and reducing long-term healthcare costs.

Context-specific research, capacity building and policy innovation are urgently needed to adapt harm reduction strategies to different regulatory, cultural and health-system environments. Large countries with state-controlled tobacco industries, such as China and Indonesia, face particular challenges that will require leadership at the highest levels of government. The WHO could have a catalytic role in legitimizing harm reduction as part of comprehensive tobacco control in these contexts.

## Conclusion

The scientific evidence, policy tools and real-world experience needed to end the global smoking epidemic now exist. What remains limited is political willingness to fully integrate tobacco harm reduction into global tobacco control. A global smoke-free 2040 goal – focused on eliminating smoked tobacco rather than nicotine use per se – offers a clear and achievable pathway to accelerating declines in smoking and reducing one of the world's largest preventable causes of death.

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## Competing interests

The authors declare no competing interests.