

Tobacco harm reduction and better treatment of lung cancer could save 280,000 lives in Czechia by 2060

REPORT SUPPORTED BY INTERNATIONAL AND LOCAL TOBACCO HARM REDUCTION EXPERTS

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1. Executive Summary

GLOBAL PROGRESS TO END SMOKING HAS STALLED. CURRENT APPROACHES TO TOBACCO CONTROL HAVE NOT BEEN SUFFICIENT. THE WORLD HEALTH ORGANIZATION (WHO) PROJECTS THAT 1.27 BILLION PEOPLE GLOBALLY WILL SMOKE BY 2025. OVER EIGHT MILLION ANNUALLY WILL DIE FROM TOBACCO USE. THIS IS UNACCEPTABLE FROM A PUBLIC HEALTH PERSPECTIVE.

This report focuses on the Czech Republic (Czechia). Home to 10.6 million people including 2.4 million adults who smoke. About 18,000 people die prematurely from smoking every year. WHO projects that smoking prevalence in Czechia will decrease slightly from 30% to 26.5% in 2025. Notably, the smoking rate among women (26%) is among the highest anywhere in the world and portends a rise in smoking related deaths at a time when lung cancer deaths already account for 3 times the deaths from breast cancer. These trends call for urgent action.

The government of Czechia is uniquely placed to lead other countries to embrace tobacco harm reduction (THR) given that it has already integrated THR into its broader national harm reduction strategy and has implemented forward looking life-saving regulations to end smoking.

Data presented in this report shows that smoking combustible tobacco products contributes to several major causes of death that are set to increase over the next few decades. These include lung and oral cancer, COPD, heart disease, and stroke.

The report considers the benefits of tobacco harm reduction (THR) products could have on such trends. THR products use nicotine without the deadly exposures that cause harm. THR products (vapes, heated tobacco products, snus, nicotine pouches, and charcoal-free shisha) are rapidly gaining traction among consumers in Czechia with all categories of THR legalized for use. These innovations have not yet been fully embraced by physicians and governments as key to cutting premature deaths.

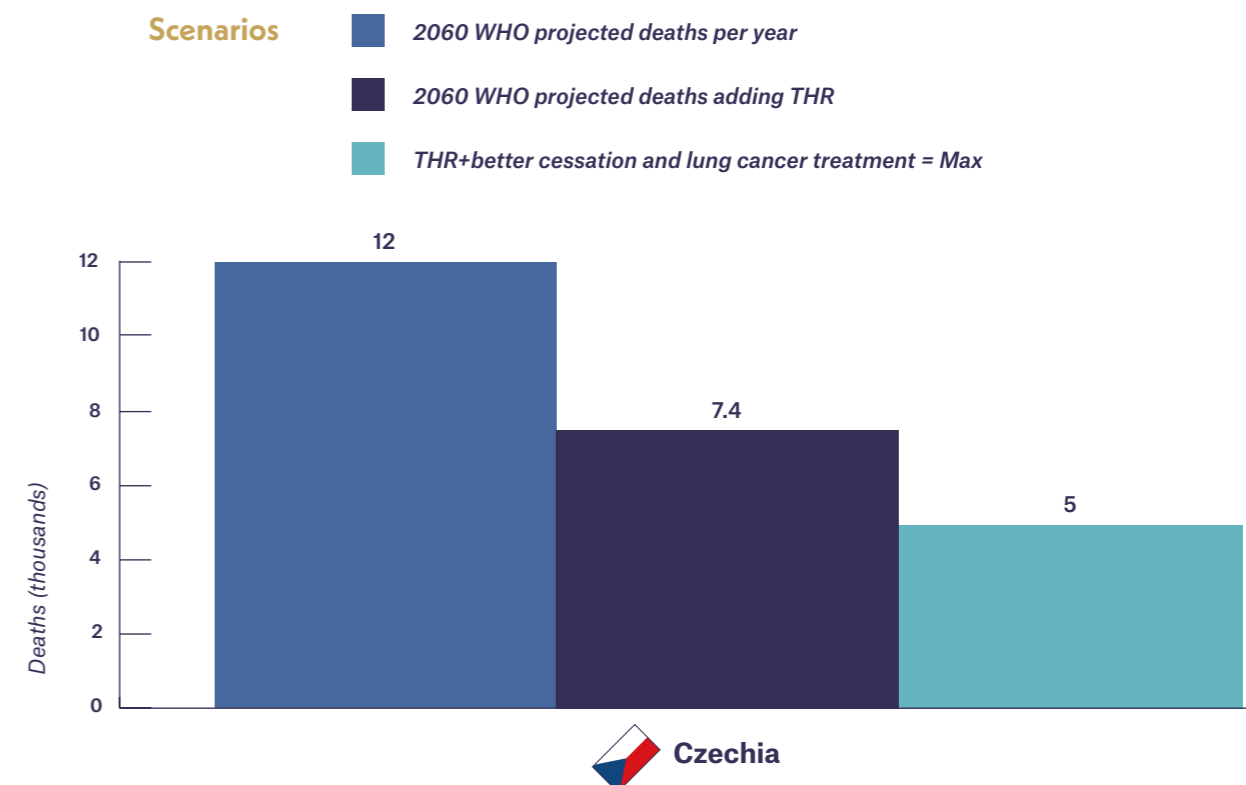
The report comes as the quality of evidence on the benefits of smoking cessation and THR has strengthened. Cessation at every age is associated with longer survival, and switching to THR products (especially vapes) is almost twice as effective for cessation as nicotine replacement therapies. While long-term studies on the health benefits effects of switching to other types of THR are still needed, results of studies using bio-markers of future diseases are promising.

We note that the use of the full range of THR products remains low in Czechia-creating opportunities for health gains if use increased. Czech scientists are at the forefront of research assessing the benefits of several THR products.

We calculated the combined impact of embracing THR, better cessation services, and improved lung cancer treatment in Czechia.

The analysis shows that 280,000 lives could be saved by 2060 through these interventions, compared to continuing with current WHO-directed tobacco control efforts alone.

Figure 1. Decrease in smoking related deaths, if THR were implemented in Czechia along with improved cessation and early diagnosis of lung cancer



To achieve these gains, key actions are needed, including:


- **Activating physicians to communicate the benefits of THR to patients in all clinical encounters, to counter disinformation about nicotine and the value of THR, and to develop a national equivalent of the Royal College of Physicians report on THR and vapes possibly by the Czech Academy of Sciences.**
- **Governments build on their unique support for integrating THR into broader national approaches to harm reduction by continuing to revise legislation and taxation to improve access to THR products and invest in national science and research to guide and advance THR.**
- **Strengthen the role and effectiveness of independent science-based consumer groups who advocate for THR progress and do so in an integrated way with other major national harm reduction advocacy and consumer groups.**
- **Continue to be a global advocate for harm reduction in general, and the need to incorporate THR into national harm reduction plans.**

Embracing THR, cessation, and improved lung cancer treatment represents a major opportunity for Czechia to dramatically improve the health of its populations and demonstrate needed global leadership.

2. Rationale

GLOBAL PROGRESS TO END SMOKING HAS STALLED

Current approaches to tobacco control have stalled. The World Health Organization (WHO) projects that 1.27 billion people globally will smoke by 2025,¹ and that smoking will kill 8.7 million annually.² Deaths are projected by WHO to increase to 10 million in five years before declining to about 6.5 million by 2060.³ This is not what public health success looks like.

In this report, we focus on **Czechia**. 

Czechia is unique among countries to have integrated THR into their National Strategy⁴ to address all aspects of harm associated addictive behaviour (see Table 1). The principle of harm reduction has been *“a pillar of Czechia addiction policy since the 1990s...the main aim is to achieve realistic goals in the field of addiction policy, protection of public health and human freedom and dignity. In Czechia, we see harm reduction as a key mechanism that leads to the protection of vulnerable groups and helps to reduce harm across the community of people who use drugs”*. According to the National Strategy, harm reduction is *“grounded in justice and human rights”*. This has powerful implications for how THR is supported by government and communicated to physicians, consumers and leading advocates.

Table 1. Harm reduction principles accepted in Czechia - three examples how it is translated into policies and actions

SMOKING The harm reduction paradigm in public health. Is the pursuit of the gold standard always beneficial? (sejm.gov.pl)	Higher taxes on combustible products compared to alternatives like e-cigarettes
	Ban on smoking in restaurants, but not on alternatives
	Treatment centers work with substitution treatments, including non-medical nicotine products
	Prevention and education programs include harm reduction messages
ALCOHOL GCDPC_information_1.pdf (gov.cz)	Brief interventions for alcohol users by health professionals are being expanded
	Outpatient treatment and aftercare services for alcohol users are being developed
	Approximately 25,000 people receive alcohol dependency treatment annually
MARIJUANA & OTHER DRUGS GCDPC_information_1.pdf (gov.cz)	Balanced approach focusing on prevention, harm reduction, treatment, and supply control
	Alternatives to criminal prosecution for drug users have been introduced
	Prison-based drug programs have been developed
	Expansion of prevention, treatment, and social rehabilitation programs

WHAT ARE THE BENEFITS OF INTERVENTIONS BASED ON TOBACCO HARM REDUCTION (THR) PRODUCTS?

THR products include nicotine without the deadly exposures that cause the harms. As stated in a recent article by 15 past presidents of the Society for Research on Nicotine and Tobacco, *“Nicotine is the chemical in tobacco that fosters addiction. However, toxic constituents other than nicotine, predominantly in smoked tobacco, produce the disease resulting from chronic tobacco use”*.⁵ These products include vapes (e-cigarettes), oral nicotine pouches, heated tobacco products, and mainly in the Middle East, charcoal-free shisha. They are gaining traction with consumers but are not yet embraced by physicians and governments as key to cutting premature deaths.

We address the benefits of better treatment for lung cancer, knowing it accounts worldwide for 2.5 million cases and 1.8 million deaths a year.⁶ Czechia has an advanced healthcare system that regularly updates its cancer diagnostic and treatment programs, making it very likely that emerging technologies to address lung cancer will be rapidly deployed.

WHO NEGLECTS THE LIFE-SAVING POTENTIAL OF TECHNOLOGICAL INNOVATION

The WHO Framework Convention on Tobacco Control (FCTC) is the first international treaty negotiated under the auspices of WHO. FCTC has led international control efforts for over two decades. Decisions taken at its governing body’s 2024 gathering (known as COP10) focused on a variety of worthy issues, including environmental effects of tobacco cultivation and cigarette filters, and guidelines for tobacco advertising and media promotion.⁷ However, COP10 did not have substantive, potentially life-saving discussions on tobacco harm reduction (THR). Nor did it address the role of innovation and technology improvements that could reduce smoking-related harms, and the need to adapt policies as these become available.⁸

The omission of a focus on THR has two unfortunate implications. First, it perpetuates a view among public health experts that innovation and new technology is irrelevant to ending smoking. Second, it implies that equity in access to effective, life-saving technologies does not matter in tobacco control. That partly explains why access to nicotine replacement therapies (NRT) remains paltry across LMICs.⁹ This is despite NRTs having been included on the WHO Essential Drug List in 2009.¹⁰

We have seen remarkable progress across the fields of biotechnology, pharmaceutical innovation and diagnostics led by private companies and supported in part by leading health research funders like the U.S. National Institutes of Health (NIH). The result is that a range of THR products have met the United States Food and Drug Administration (USFDA) criteria of being *“appropriate for the protection of public health”*.¹¹ To date, the FDA has authorised marketing of 45 products, including 34 tobacco and menthol-flavoured e-cigarette products and devices. They include four major categories: heated tobacco products, e-cigarettes, snus, and oral nicotine pouches.¹² All of them use nicotine. None involve combustion. All substantially reduce exposure to the toxic substances in combustible cigarettes.^{13,14}

In the Middle East one new addition, a charcoal-free shisha, represents a unique potential contribution to tobacco harm reduction led by Middle East innovation.^{15,16}

The regulatory status of non-combustible nicotine alternative products in Czechia is outlined in Table 2.¹⁷

Table 2: Czechia regulatory position by category of non-combustible nicotine products

Category	E-Cigarettes	Snus	Pouches	Heated Tobacco Products (HTP)
Regulatory Status	Allowed	Banned	Allowed	Allowed
Regulated as a Medical Product	YES	<i>Note: Snus is allowed as imports for personal use, but local sales are banned.</i>	X	X
Regulated as a Tobacco Product	YES		X	X

THE QUALITY OF EVIDENCE ABOUT THE BENEFITS OF THR FOR CESSATION AND HARM REDUCTION HAS STRENGTHENED

In recent months, leading medical journals have published views that support the value of smoking cessation and tobacco harm reduction.

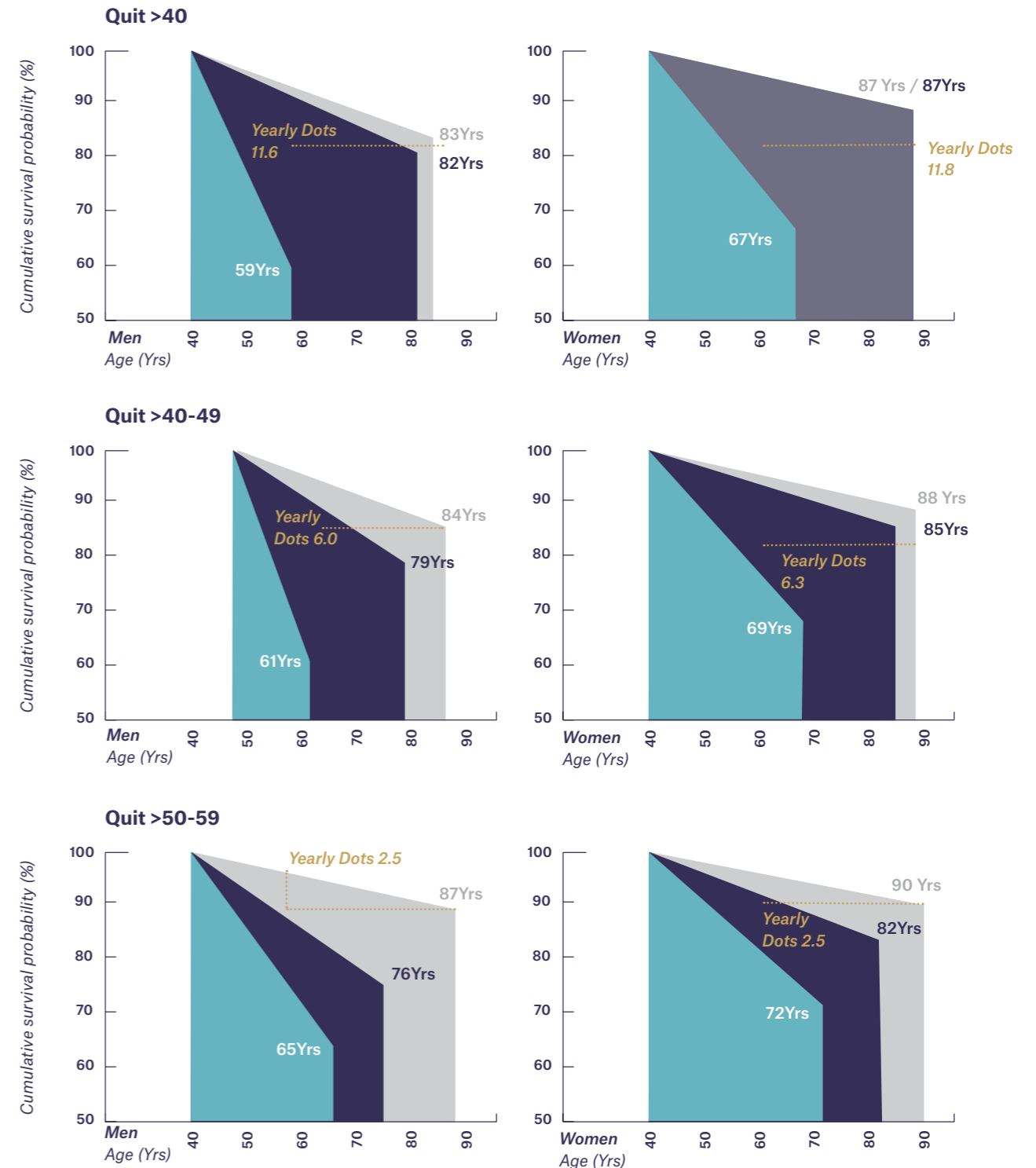
Cho and colleagues, writing in *NEJM Evidence*,¹⁸ draw on four national cohorts involving 1.48 million people followed for 15 years to produce updated data on the benefits of adult cessation by age. They state that **“Cessation at every age was associated with longer survival, particularly cessation before 40 years of age”**.

Cho et al. shows no differences in survival between men and women who never smoked, and who did formerly smoke before age 40, compared to a decade difference among those who quit between 50-59. Note that in the older age group, former smokers still show a decade advantage in survival compared to current smokers. No other public health interventions can achieve this for people at age 50. The study did not address the benefits of cessation among heavy smokers. This is likely to make a substantial difference for individuals and populations.

Figure 2. Life expectancy gains by age in men and women

This figure shows an illustrative model, based on the article by Cho et al, *NEJM Evidence*, 2024¹⁸

Key: ■ Never Smoked ■ Former Smoker ■ Current Smoker



Czechia - MEN

Czechia - WOMEN

Pair this with a Korean study from JAMA Network Open, focused on cancer risk following cessation. Almost three million people were followed for over 15 years. Regardless of quitting age, a significant reduction in cancer risk was observed.¹⁹

*The Lancet*²⁰ and the *New England Journal of Medicine*²¹ each recently carried articles calling for a greater focus on the value of THR for cessation. Beaglehole and Bonita (both previous directors of chronic diseases at WHO), writing in *The Lancet*, make the case for WHO to adopt THR to save lives. As they note, **“The FCTC does not prohibit harm reduction approaches but leaves it up to countries to decide how to regulate e-cigarettes and other novel nicotine products”**. Further, **“WHO’s lack of endorsement of tobacco harm reduction limits healthier choices for the 1.3 billion people globally who smoke and who are at an increased risk of early death”**.

Nancy Rigotti of Harvard Medical School, writing in the *NEJM*, suggests that we have reached a **“tipping point”** in the quality of trial evidence, that requires physicians to **“acknowledge this progress and add e-cigarettes to the smoking cessation toolkit”**.

WHY DOES THIS MATTER FOR THR?

Multiple studies, and Cochrane systematic reviews²², conclude that e-cigarettes (vapes) are almost twice as effective as achieving cessation than NRTs. In short, current evidence suggests that e-cigarettes are the most widely available effective means for smokers to quit. Cho et al.’s comments in the *NEJM* about the benefits of smoking cessation at every age do not differentiate between cessation methods; they apply to quitting with THR products or with NRTs.

More studies are needed to thoroughly assess the effectiveness of snus, nicotine pouches, and heated tobacco products as cessation interventions. Further, there is a major gap in knowledge about how to reach those who smoke, are older than 40 years of age, and smoke heavily (more than 20 cigarettes a day). The recent WHO guidelines on cessations ignore the potential health gains that addressing this group of smokers would achieve. They constitute about 20-25% of all adults who smoke yet account for over 70% of all lung cancer and COPD cases. Manufacturers of THR products have also not encouraged these adults to use THR products.²³

Table 3 shows the current state of play regarding clinical trials, cessation and all major THR categories. It shows that randomised clinical trials (RCTs) and solid evidence about the effectiveness of cessation is strongest form e-Cigarettes, research is underway in other categories. Given the diversity of THR use and legal availability, Czechia is well placed to carry out research across several THR categories.

The United States’ FDA has granted **“modified risk tobacco product”** status to some oral and heated tobacco products based on submitted scientific evidence.²⁴ Real-world evidence also exists, including meaningful reductions in cigarette smoking in countries such as Sweden and Japan due to switching to THR products.²⁵

Because these are newer technologies, we do not have studies on long-term effects of switching to THR products. In the meantime, we can look to the plethora of impressive studies using bio-markers of outcomes that have high predictive value for cancers, respiratory and heart disease.^{26,27,28} These studies are used by companies in their USFDA applications and deserve to be cited and used more extensively by the public health community when motivating policy makers.

Table 3: Status of randomised clinical trials (RCTs) to assess the effectiveness of THR for cessation

<p>E-CIGARETTES (VAPES)</p> <p>Several RCTs have been completed allowing for a continuously updated systematic review by the Cochrane Collaboration.</p>	<p>Electronic cigarettes for smoking cessation - Lindson, N - 2024 Cochrane Library</p>
<p>ORAL NICOTINE POUCHES</p> <p>No systematic review. Several studies are in progress.</p>	<p>Project 3: Randomised Placebo-controlled Trial of Nicotine Pouches in Smokers – Penn State (psu.edu)</p>
	<p>Clinical study protocol on electronic cigarettes and nicotine pouches for smoking cessation in Pakistan: a randomised controlled trial - PMC (nih.gov)</p>
	<p>Using Pod Based E-Cigarettes and Nicotine Pouches to Reduce Harm for Adults with Low Socioeconomic Status Who Smoke: A Pilot Randomised Controlled Trial Nicotine & Tobacco Research Oxford Academic (oup.com)</p>
	<p>JMIR Research Protocols - Bio-markers of Exposure and Potential Harm in Exclusive Users of Nicotine Pouches and Current, Former, and Never Smokers: Protocol for a Cross-sectional Clinical Study</p>
<p>SNUS</p> <p>Completed studies.</p>	<p>Randomised Trial to Compare Smoking Cessation Rates of Snus, With and Without Smokeless Tobacco Health-Related Information, and a Nicotine Lozenge Nicotine & Tobacco Research Oxford Academic (oup.com)</p>
	<p>Randomised clinical trial of snus versus medicinal nicotine among smokers interested in product switching Tobacco Control (bmj.com)</p>
	<p>Randomised Clinical Trial of Snus Examining the Effect of Complete Versus Partial Cigarette Substitution on Smoking-Related Behaviors, and Bio-markers of Exposure Nicotine & Tobacco Research Oxford Academic (oup.com)</p>
<p>HEATED TOBACCO PRODUCTS</p> <p>One study published with an update to 24 weeks being completed.</p>	<p>Comparing the Effectiveness, Tolerability, and Acceptability of Heated Tobacco Products and Refillable Electronic Cigarettes for Cigarette Substitution (CEASEFIRE): Randomised Controlled Trial - PMC (nih.gov)</p>

COUNTRY-SPECIFIC STUDIES OF LIVES SAVED ARE NEEDED TO DRIVE FOR NATIONAL CHANGE

Across diverse disciplines, there is a long history of using rigorous methods to provide data on alternative futures.²⁹ Such “foresight studies” provide policy makers and the public a compelling vision of a future that is better than the status quo and is possible through the application of knowledge and interventions available today. We apply such an approach to show that it is possible to influence the course of the smoking epidemic.

3. Analysis of Czechia Smoking and Mortality Data

Czechia has a population of 10.6 million people. 2.4 million adults smoke, and almost 18,000 people die prematurely every year from combustible tobacco and toxic smokeless tobacco products.³⁰


Data source: IMHE country profiles, <https://www.healthdata.org/research-analysis/health-by-location/profiles>

GDP per capita in Czechia is \$31,000 indicating the rapid developmental progress experienced over the last 3 decades. Life expectancy now exceeds 80 for women and is 74.4 for men.³¹

Data source: IMHE country profiles, <https://www.healthdata.org/research-analysis/health-by-location/profiles>

Smoking features as one of the top five risks driving the burden of death of disease among both men and women. Diet-related and clinical factors related to chronic disease also feature strongly as major risks driving the burden of disease.

Table 4: Smoking rates and numbers of smokers in Czechia ³²

 Czechia		
Indicator	Gender	Total
Smoking prevalence 2020 (%)	Men	33.4
	Women	26.5
Number of smokers (million)		2.4
WHO estimated 2025 prevalence		26.8

Data source: WHO global report on trends in prevalence in tobacco use 2000-2030. <https://iris.who.int/bitstream/handle/10665/375711/9789240088283-eng.pdf>

Table 4 shows that smoking rates exceed 25% in men and women. Further, the smoking rate among women in Czechia (26.5%) is among the highest recorded among women worldwide. The last WHO GYTS survey of 13-15 year-olds was completed in 2022.³³ It shows that girls smoke more than boys portending increases in smoking-related deaths and disease at a time when lung cancer death rates in women are already over twice the death rates caused by breast cancer.

All major categories of THR products are used in Czechia. In 2023, there were 358,000 adult consumers of vapes, equating to 4% of the population. Heated tobacco products are used by around 3% of the adult population.³⁴ Czechia is the 4th market among European countries, in terms of oral nicotine pouch market value, with 1.2% of adults taking advantage of the product.³⁵

The smoking rates and behavioural risks in Table 4 are reflected in the leading causes of death. The diseases with the highest attributable risks due to combustible tobacco use are ranked highest among all causes. Ischemic heart disease is ranked 1st, COPD is ranked 4th, lung cancer is ranked 5th and stroke is ranked 6th.³⁶

Cardiovascular disease (CVD), reflected by ischemic heart disease in the table, is the number one cause of death among the Czechia population. IHD is caused by several factors. These include high blood pressure, diabetes and unhealthy diets, a lack of physical activity, and genetics. However, smoking is singled out “as a major contributor of CVD burden,” and accounts for 26.5% of IHD mortality in Czechia.³⁷

A major 12-year cohort study among the Czechia population showed that poor education, smoking and hypertension contribute substantially to high IHD death rates. The cohort study importantly shows that there have been substantive declines in IHD mortality over the last decades but that the population remains far from having a “healthy lifestyle” with high smoking rates impeding progress.³⁸

Earlier studies showed that smoking rates are 2.5 times higher among people with the lowest levels of education compared to college educated Czechia citizens.³⁹ Closing the educational gap in smoking is a major global challenge and might be one that Czechia leadership, given their commitment to addressing the needs of the most vulnerable, could demonstrate leadership. This is critical for Czechia given the extent of inequalities in health outcomes by social class. This has been well documented in major national reports.⁴⁰

About 70-90% of lung cancer cases and deaths are attributable to combustible tobacco. About 60-70% of cases of oral cancer, laryngeal cancer, and oesophageal cancer are also caused by tobacco use. Czechian women have extremely high lung cancer death rates that are double the recorded death rates for breast cancer.⁴¹ The high smoking rate among girls who are 13-15 suggest that unless rapid action is taken, these cancer trends will worsen. Further, because of population aging combined with high levels of smoking, cancer diagnoses and deaths are expected to greatly increase by 2040, strongly affecting the healthcare system. This is a further motivation to address adult smoking rates with greater urgency and new interventions.

Calculating the “size of the price”: the aim

This study aims to provide national policymakers and public health experts with estimates of the value of THR, better cessation programmes, and improved access to lung cancer diagnostics and treatment to potential lives saved over the next three to four decades.

4. The Approach

We compare WHO projections of smoking-related deaths by 2060. These are based on continued and more effective implementation of the key components of the WHO Framework Convention on Tobacco Control (FCTC), simplified into six policy measures labelled collectively as MPOWER.⁴² Disappointingly, tobacco harm reduction (THR) was omitted from the MPOWER approach.

The WHO projections also leave out potential improvements in the effectiveness of cessation services, as well as access to rapidly improving diagnostics and treatments for lung cancer. We focus on lung cancer for two reasons. It accounts for 2.5 million of the 8.5 million smoking-related deaths, and better diagnostics and treatment suggest that within a decade, lung cancer will no longer have a five-year survival of about 10-20% but approach the survival rate of breast cancer which has reached 80-90% in western countries.

Smoking-related diseases are chronic conditions that take a few decades before the full benefits of cessation or harm reduction are visible in national data. This is a critical point to appreciate. Recent updates on the value of cessation (as described above) show that policy makers have overestimated how long it takes to achieve benefits from adult cessation: in terms of reduced overall mortality and in deaths from major smoking-related cancers.

All the expected premature smoking-related deaths by 2060 will occur in current adult smokers. If no person under 18 years of age started smoking today, lives saved among youth would take until the 2060s to become visible in national mortality data. This reinforces the need to focus on the behaviours of middle-aged smokers and users of toxic smokeless tobacco products, if we seek population health gains within the next several decades. Many of these smokers will be in touch with health services for early-stage COPD, heart disease and possible cancer. This creates opportunities for secondary prevention (see below).

RECENT APPROACHES TO ESTIMATING “LIVES TO BE SAVED”

There have been several recent efforts to model responses to the question: *“What would happen to the burden of disease if countries did embrace THR?”* These have been published by academics and industry. We refer readers to our earlier reports to obtain details: (Table 5).

Table 5: Potential lives saved 2020-2060, if THR were to be implemented in selected countries along with improved cessation and early diagnosis of lung cancer

Brazil	Lives Saved: Integrating Harm Reduction for Tobacco Control in Brazil (tobaccoharmreduction.net)
Middle East	Lives Saved: Integrating Harm Reduction into Tobacco Control in the Middle East (https://ecigintelligence.com/tobacco-harm-reduction-could-save-2m-lives-in-the-middle-east-says-new-report/)
Malaysia	Lives Saved Report: Tobacco harm reduction and better treatment could save nearly 880,000 lives up to 2060 in Malaysia and Uzbekistan
Uzbekistan	Lives Saved Report: Tobacco harm reduction and better treatment could save nearly 880,000 lives up to 2060 in Malaysia and Uzbekistan
LMICs (Kazakhstan, Pakistan, South Africa, Bangladesh)	INTEGRATING HARM REDUCTION INTO TOBACCO CONTROL How many lives could be saved by accelerating tobacco control policies in Kazakhstan, Pakistan, South Africa and Bangladesh?
New Zealand	Quitting Strong: New Zealand’s Smoking Cessation Success Story

WHY THIS STUDY IS IMPORTANT NOW

This study comes at a time when over a billion people smoke and THR products are used by 120-140 million people globally. We now have powerful evidence of the impact of THR use on the declining use of combustibles. This has been well described for countries such as Sweden, UK, Japan, and USA.⁴³ We believe that when faced with a clear choice of policies, responsible governments will act to save lives, and be supported by civil society. Czechia is well placed to provide a needed leadership role in implementing THR policies and has already made substantive progress.

METHODS

The approaches used by seasoned “modellers” were reviewed and simplified to their essential elements. Details are contained in earlier reports. The key assumptions are repeated below.

ASSUMPTIONS

The following **assumptions** are made in calculating lives saved.

- At present, NRTs are 10% effective in terms of cessation at one year. Vapes are twice as effective.⁴⁴
- The spectrum of THR products reduce toxic exposures by 80% and reduce smoking-related causes of premature death by 70%. While the use of these conservative values for comparability knowing the emerging evidence from exposure assessments and the use of bio-markers of outcome show far greater levels of reduced harm are likely.



- Lung cancer survival at five years will increase to 50% for most countries by 2050 driven by improvements in diagnosis and treatment.
- WHO estimates that cessation services (a mix of medications and behavioural support) will be 50% effective in achieving one-year quit rates by 2035 and be available to 50% of smokers by 2045. This effectiveness projection is not aligned with research findings⁴⁵, but for the purpose of this study it has been accepted as a “best case assumption”.
- The rate of decline in smoking will accelerate from 2035 onwards, which will lead to health impacts increasing sharply from 2045 onwards.
- WHO trends suggest that from 2000 to 2025 smoking rates will fall by a third in men. We believe this could accelerate to 50% from 2030 in all countries.

ESTIMATES FROM ABOVE ARE USED TO MODEL THREE SCENARIOS

SCENARIO 1: Status quo (standard tobacco control). Current trends using WHO estimates. The WHO estimate of a 35% decline in global smoking deaths from the peak of 10 million⁽³⁾ is used as the basis for calculating country-specific estimates.

SCENARIO 2: Tobacco control + Implementation of THR policies and availability of THR products. Trends that include THR uptake assuming that, as a group, they will lead to a 56% decline in smoking deaths and will become available increasingly from 2035.

SCENARIO 3: Tobacco control + THR uptake + Improved access to diagnostics and treatment of tobacco-related diseases. Trends that include THR and better access and use of diagnostics and treatments (focused mainly on lung cancer, which killed an estimated 1.8 million people in 2020).⁴⁶

The differences between the WHO projections and those where THR alone, and THR with other measures were calculated assuming a linear relationship between lives saved over the decades.

NOTE ABOUT THE QUALITY AND AVAILABILITY OF DATA

The quality of evidence used to develop THR policy needs to be methodologically sound. Polarization within the field of tobacco and nicotine science threatens the integrity of research.⁴⁷ Recent reviews of epidemiological and toxicological research related to THR have highlighted a range of basic concerns about methods used.^{48,49,50,51}

Common issues include unclear hypotheses or methods not appropriate to test stated hypotheses; unsupported claims of causality; not controlling for potential confounding variables; amounts of product exposure not standardized or specified; non-representative study participants; and not considering effects of participants’ previous combustible tobacco use. Laboratory studies testing new technologies (such as vaping and heated tobacco devices) often use poorly reported or non-reproducible methods, under conditions incompatible with real-world use.

Some papers have been formally retracted. Unfortunately, critiques and retractions cannot stop sloppy or slanted science from being repeatedly cited and potentially misleading policy makers, physicians and consumers.



5. Potential Lives to be Saved in Czechia

Table 6 contains the output of the expert analysis to calculate the number of lives to be saved between 2020 and 2060 if THR and related measures are implemented. These numbers represent the additional gains, beyond those WHO estimates, that will occur because of the roll-out of MPOWER. They represent a significant number of premature deaths. Two scenarios are listed: the first includes accelerated access to THR products, while the second also includes better access to more effective NRTs and better access and treatment of lung cancer.

These numbers are indicative of what could happen if governments, health professionals, industry and consumers aligned on policies and actions. Failure to do so will leave the WHO projection in place. It was beyond this report to calculate the impact on disease and disability or the economic benefits of THR. That requires a separate, more detailed set of analyses ideally led by countries. Of the lives saved using a background of no action, 50% will occur due to MPOWER strategies and an additional 50% due to THR, better cessation, and management of lung cancer.

Figure 3: Smoking related deaths and lives saved 2020-2060

The figure shows estimates for the number of smoking-related deaths expected to occur in 2060 using three scenarios: WHO projections using FCTC and MPOWER measures; WHO projections adding THR products; and WHO projections adding THR, smoking cessation and, lung cancer innovations.

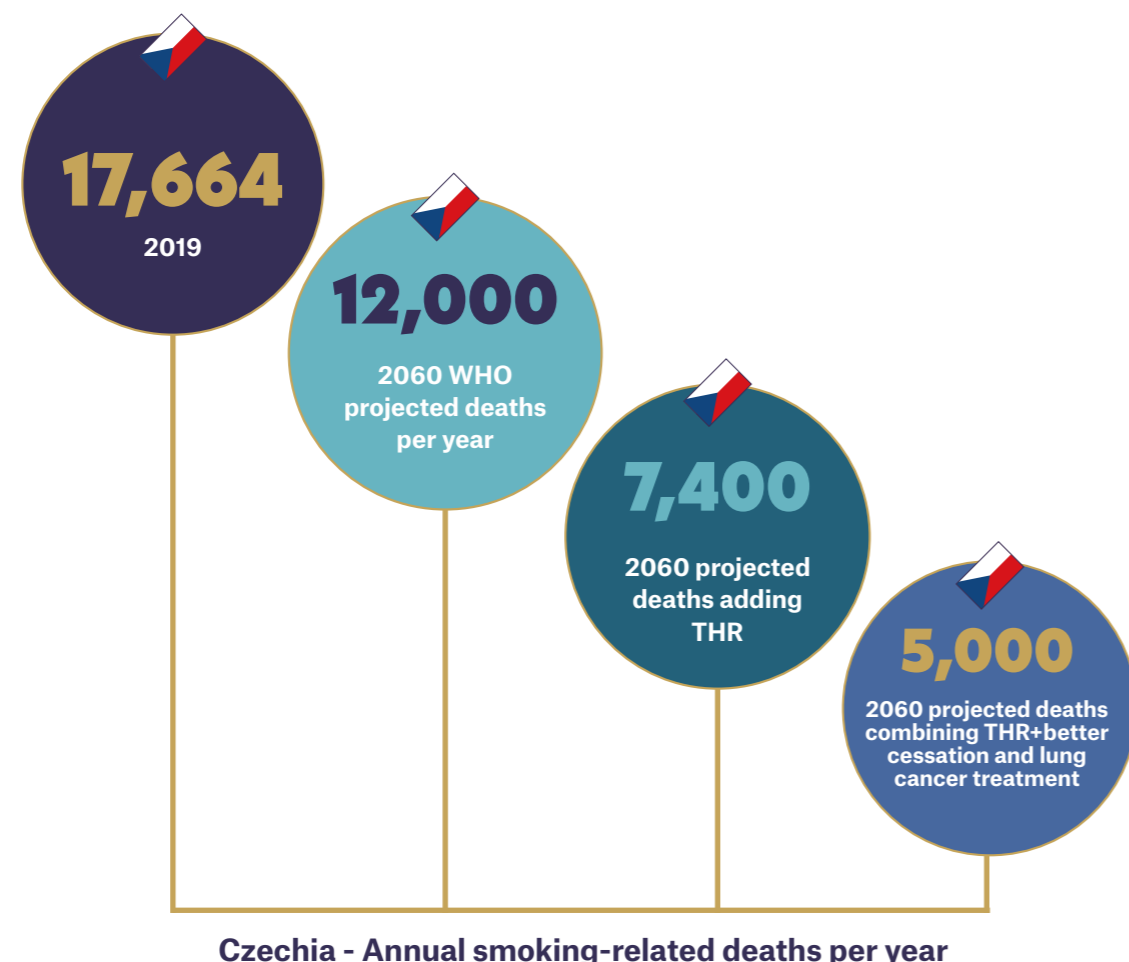


Table 6: Potential Lives Saved

This table shows the increased number of lives that could be saved if THR and additional innovations were implemented versus WHO projections.

Czechia: Potential Lives Saved	
2020-2060 total lives saved: If THR were to be implemented	184,000
2020-2060 total lives saved: If THR and improved cessation were implemented	280,000



280 THOUSAND

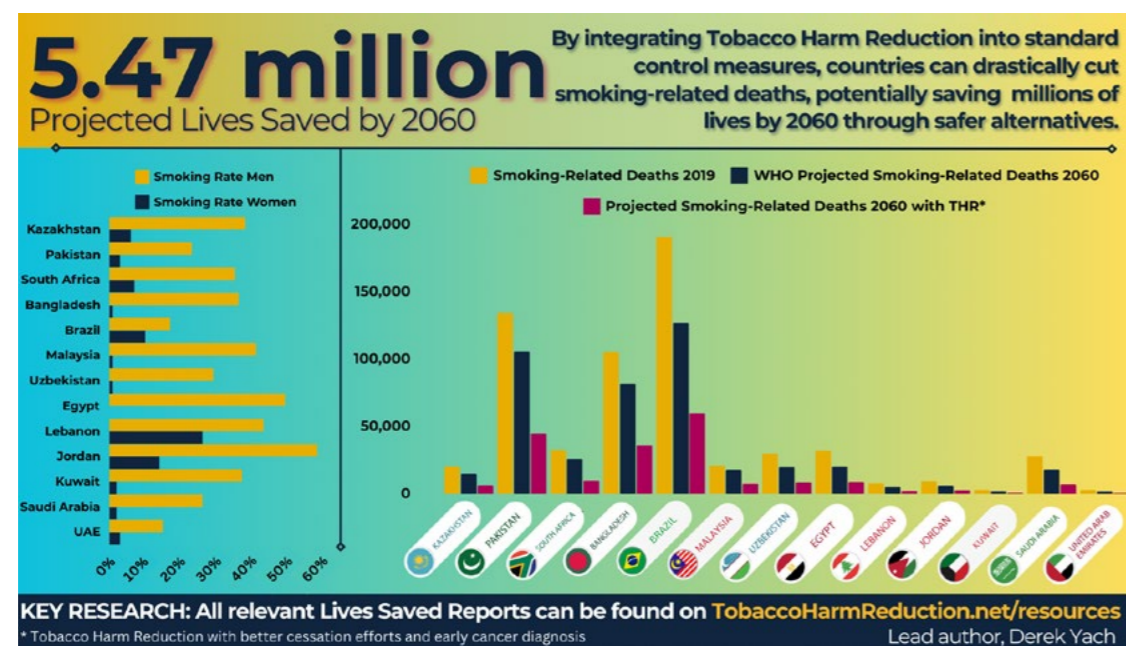
280,000 lives could be saved in Czechia

A total of 280,000 lives could be saved in Czechia if tobacco harm reduction products were made widely available, if better cessation services were developed, and if better treatment for lung cancer was introduced over the next four decades. **This represents a major opportunity for these countries to improve the health of their populations.**

6. Potential Lives to be Saved in other Countries

Along with the report on Czechia, our reports show by integrating tobacco harm reduction into standard tobacco control measures, countries can drastically cut smoking-related deaths. Millions of lives can potentially be saved through less harmful smoke-free nicotine alternatives. The countries shown in figure 4 include a population of 897 million people, with a significant number of adults who smoke. If these countries were to embrace THR, better cessation, and more effective treatment for lung cancer, we estimate that 5.47 million lives would be saved over the next decades. Note these are over and above lives to be saved by continuing with WHO's current programs alone, up to 2060.

Figure 4: Potential Lives Saved through THR integration with tobacco control



WHAT ACTIONS ARE NEEDED IF WE ARE TO SAVE LIVES?

Key actions needed include:

- Activating health professionals, particularly physicians, to communicate the benefits of THR to patients, to counter disinformation about nicotine, and to lead policy development.
- Governments should adopt risk-proportionate regulation to improve access to THR products and invest in national science and research to advance THR.
- Establishing more independent, science-based nicotine consumer groups able to advocate for their needs.

- A. Activating health professionals, physicians in particular, to counter disinformation about nicotine and the value of THR, to communicate the benefits of THR to patients in all clinical encounters. Drawing on the groundbreaking approaches used 60 years ago by the Royal College of Physicians, they should help lead policy development by publishing a major report on the state of smoking and the role of THR in preventing and controlling smoking-related disease, disability and premature death.

PHYSICIANS COMMUNICATE THE BENEFITS OF THR TO PATIENTS AND COUNTER DISINFORMATION

Physicians led in the early years of tobacco control in the UK and the USA. They were the subjects of the earliest cohorts that showed that smoking kills.⁵² They galvanised reports⁵³ that led to the first government actions. Doctors quit in large numbers once they understood the evidence, though this varied by region.⁵⁴ They started cessation services for their patients, and they led the development of public health policies to end smoking.

A new 16-country survey on trust and health⁵⁵, found that physicians remain the most trusted source of information. Physicians can be at the forefront of accelerating the demise of smoking and reducing smoking-related disease, disability, and death – if encouraged to communicate harm reduction strategies to their patients. This needs to start with correcting the massive extent of disinformation. In a 2022 survey of 15,335 physicians in 11 countries, 77% incorrectly believed that nicotine causes lung cancer.⁵⁶ However, on average over 80% of physicians were at least moderately interested in receiving training in cessation and THR.⁵⁷

Little information is available specific to physicians in Czechia. Studies to identify the distinctive perceptions and knowledge of doctors in Czechia are needed.

The respected polling firm Ipsos recently surveyed nearly 27,000 cigarette smokers in 28 countries, including Czechia, regarding their views of vaping.⁵⁸ It showed that the Czechia respondents were far more likely to see vapes as a safer alternative to smoking than most other countries already referenced. This might be a result of national tolerance and support of harm reduction and of governments positive efforts to make THR an easier option for smokers to access than cigarettes.

PHYSICIANS TACKLE MISSED OPPORTUNITIES FOR SECONDARY PREVENTION AMONG PATIENTS WHO SMOKE

Millions of people are diagnosed with conditions such as COPD, IHD, early stage cancer, stroke, other smoking-related diseases, and schizophrenia every year in Czechia. Over 70% of people with several of these conditions smoke at the point of diagnosis. A year or two after diagnosis, international research suggests that most still smoke. Tobacco cessation is either not attempted or fails. This accelerates clinical decline and substantially adds to the burden of disease and suffering experiences by patients. Physicians should review national data on this and implement programs that give high priority to cessation and access to harm reduction at every clinical encounter.

MEDICAL AND HEALTH EXPERTS DEVELOP A NATIONAL EQUIVALENT OF THE ROYAL COLLEGE OF PHYSICIANS REPORT ON E-CIGARETTES AND HARM REDUCTION

Over 60 years ago⁵⁹ the Royal College of Physicians published the first major report on the harm of smoking. Their voice over the decades has led policy development in the UK and around the world. Earlier this year they released their latest evidence review on e-cigarettes and harm reduction.⁶⁰

It is led by physicians and is meant to aid physicians in **“how e-cigarettes can be used to support more people to make quit attempts while discouraging young people and never-smokers from taking up e-cigarette use”**. An equivalent report for Czechia that was led by prestigious medical societies and academies could galvanise needed action. This could possibly include the Czech Academy of Sciences Basic Information - Institute of Experimental Medicine of the Czech Academy of Sciences (cas.cz).

B. Governments should continue to revise and establish risk-proportionate regulation, to improve access to THR products and invest in national science and research to advance THR. Czechia has made substantial progress as it further integrates THR into national harm reduction.

The government’s regulatory progress needs to be accompanied by extensive and continuous communications programs that engage leaders in healthcare and adults who use tobacco products.

The latest government review of smoking⁶¹ from 2023 highlights 4 key issues:

- **Health Impacts:** Smoking significantly contributes to cardiovascular and respiratory diseases, and cancer. Smokers live on average 10-11 years less than non-smokers.
- **Economic and Social Costs:** Smoking leads to financial losses due to increased healthcare costs and reduced productivity from premature deaths.
- **Alternative Products:** There are alternative nicotine products that are less harmful than traditional tobacco smoking.
- **Regulations:** The Czech Republic has strict regulations on tobacco and nicotine products, including bans on sales to minors and smoking in public places.

Czechia regulates alternative nicotine products proportionate to the risk they pose to health and in ways that maximise benefits and make healthier choices as easy as possible. Some examples are shown in Table 7.

Table 7: Risk-proportionate regulation of THR products in Czechia

Category	Progress Towards Risk-Proportionate Regulation of Nicotine Products
Vaping Products	Vapes are regulated under decree No 37/2017. It legalises the sale and use of vapes with age and nicotine content restrictions, and the inclusion of health warnings. Taxes are set to be less than cigarettes.
Heated Tobacco Products	Heated tobacco products are legal to market and use. Taxes are set to be less than cigarettes.
Oral Nicotine Pouches	Legal to market and use.
Snus	Snus sales are banned but personal use is legal. The ban is because of the EU Tobacco Products Directive.

The regulations aim to balance consumer access with public health concerns, particularly focusing on preventing youth uptake while allowing adult smokers access to THR alternatives.

Government should adapt policies that have reduced disparities in smoking prevalence between different population groups, such as the UK’s ‘Swap to Stop’ Scheme⁶² and New Zealand’s risk-proportionate excise tax (zero) on vaping products.⁶³

GOVERNMENTS INVEST IN NATIONAL SCIENCE AND RESEARCH

Most publicly funded research on THR is carried out in the US and Europe and exported worldwide. Local investment in science and scientists has three effects: it ensures that locally relevant research is developed, it leads to the creation of local expertise and building local expertise in science leads to better informed local policies and policy makers. This has been true in all successful areas of health and science. The good news is that there are academics deeply engaged in addressing tobacco control in Czechia.

One recent example is an actual use study in Czechia of a heated tobacco product among 300 adults who smoke. It showed that after 6 weeks of using Pulze+iD, 16% of smokers completely switched from cigarettes, 33% reduced their daily use by 50%, and that overall cigarettes consumption had decreased by 35%. These figures are equivalent to the best results achieved with medications and in line with similar studies across the world.⁶⁴

C. Creating independent science-based consumer groups able to advocate for their needs.

HIV/AIDS patients and advocates rallied for better policies under the banner of **“nothing about us, without us”**. This led to changes in government policies that included a commitment to harm reduction and led to better access to antiretrovirals. As a result, millions of people are living longer and healthier lives across LMICs. Similar progress could follow if we had effective new nicotine user groups around the world.

While there are many active nicotine user groups around the world, they have yet to galvanise into a movement with impact. Their advocacy to highlight that smoking-related deaths can be prevented, according to this study, is a much-needed element.

The wide support for harm reduction as a key public approach to addressing several major health issues - from alcohol and drugs, to HIV/AIDS and tobacco, suggests that Czechia-based leading NGOs and consumer groups could play important roles beyond Czechia and in countries where the start of understanding and support for harm reduction is still rudimentary.

These include as examples:

- **Sananim - largest non-governmental organizations in Czechia that provides complex services in prevention, treatment and re-socialization of non-alcoholic drug addictions.**
- **Podane ruce - non-governmental organization providing support and expertise on addiction and young people at risk.**



7. About the Authors



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Dr. Yach is a former employee of the World Health Organization and of PepsiCo. He received his MBChB from the University of Cape Town in 1979 and his MPH from Johns Hopkins School of Public Health in 1985. In 2007, he received an honorary DSc from Georgetown University. For several years Yach led major national epidemiological initiatives in South Africa. Yach then served under Director-General Gro Harlem Brundtland, as a cabinet director where he worked on the WHO Framework Convention on Tobacco Control and the Global Strategy on Diet and Physical Activity. He led global health at Yale School of Public Health and then at the Rockefeller Foundation before becoming SVP for Global Health and Agriculture Policy at PepsiCo. After 5 years developing and leading the Vitality Institute for Prevention in New York, he founded and led the Foundation for a Smoke Free World. Currently Yach is an independent global health consultant focused on ending smoking, supporting mental health and promoting healthy diets. He has served on advisory boards of the World Economic Forum, Clinton Global Initiative, and Wellcome Trust.



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Professor Marewa Glover is one of New Zealand's leading tobacco control researchers. She has worked on reducing smoking-related harm for 31 years. She is recognised internationally for her advocacy on tobacco harm reduction; and locally was a Finalist in the New Zealander of the Year Supreme Award in 2019 recognising her contribution to reducing smoking in NZ. In 2018, Dr Glover was appointed Tobacco Section Editor for the Harm Reduction Journal. In that year she also established the Centre of Research Excellence: Indigenous Sovereignty & Smoking, an international programme of research aimed at reducing smoking-related harms among Indigenous peoples globally. The Centre's research was funded with a grant from Global Action to End Smoking (formerly known as Foundation for Smoke-Free World), an independent, U.S. nonprofit 501(c)(3) grant making organisation, accelerating science-based efforts worldwide to end the smoking epidemic. Professor Glover contributed to this report independently.



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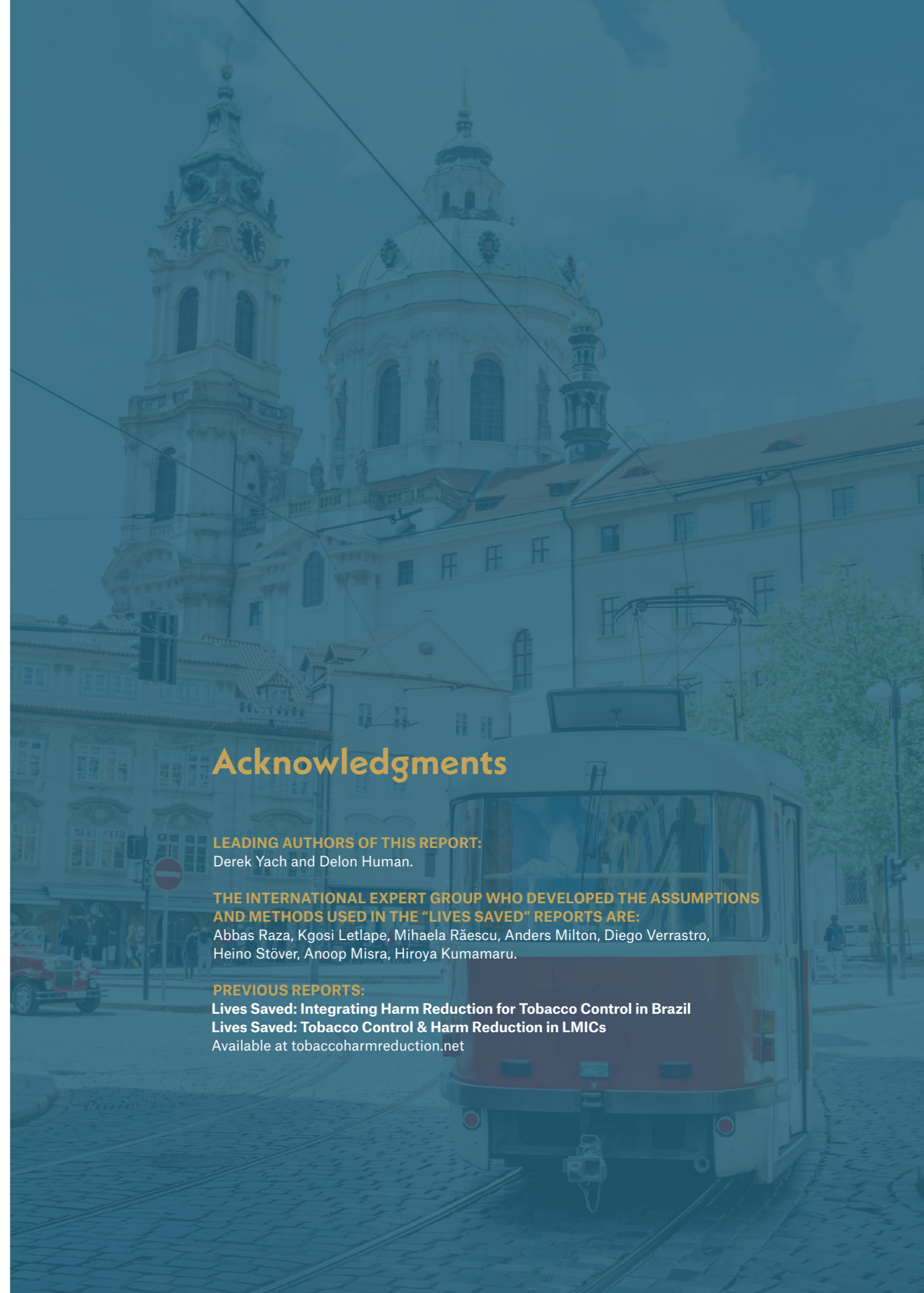
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