Nicotine Pouches

A Scientific Factsheet

Evidence on toxicology, harm reduction and public health impact

CONSIDERATE POUCHERS

Nicotine Pouches
Key Scientific Findings

Most harm comes from combustion - Not nicotine

Cigarettes

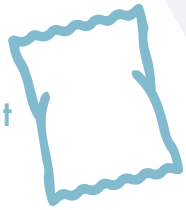
Burning tobacco creates toxic smoke containing thousands of harmful chemicals.

- Tobacco combustion occurs at temperatures above 800°C.
- Smoke contains 7,000+ chemicals, including carcinogens.
- Tar and carbon monoxide drive smoking-related disease.

VS

Pouches

Nicotine pouches deliver nicotine without burning tobacco.



- Nicotine absorbed through the oral mucosa, not the lungs.
- No smoke, tar, or carbon monoxide is produced.
- Toxicant exposure is far lower than cigarette smoke.

Key Evidence

Sweden Case Study

Sweden's smoking rate, at 5–6%, is the lowest in the EuropeanUnion.

Toxicology Evidence

No smoke, no tar, no carbon monoxide, and very low toxicant exposure.

Nicotine Science

Nicotine is not tar. It is addictive but not a carcinogen.

Environmental Impact

Cigarette filters are the most littered item globally - 4.5 trillion annually.

Switching Evidence

55–60% of former smokers report flavours helped them switch.

Public health policy should reflect major differences in product risk.

Protect youth | Maintain standards | Enable switching to lower-risk alternatives

INTRODUCTION

Cigarette smoking remains one of the leading preventable causes of death in the European Union, responsible for nearly 700,000 deaths annually (European Commission, 2021). The primary driver of smoking-related disease is not nicotine itself, but the toxic products of combustion such as tar, carbon monoxide, and thousands of harmful chemicals formed when tobacco burns (IARC, 2004). This conclusion is consistent with the Royal College of Physicians, which emphasises that the overwhelming majority of harm from tobacco use arises from inhaling smoke rather than from nicotine itself (Royal College of Physicians, 2016).

Nicotine pouches are tobacco-free oral products that deliver nicotine without combustion, smoke, or tar. Current toxicological and biomarker evidence indicates that exposure to harmful and potentially harmful constituents (HPHCs) is substantially lower than with cigarette smoking and comparable to some licensed nicotine replacement therapies (Azzopardi et al., 2022; Bishop et al., 2020).

While not risk-free and not appropriate for non-users, nicotine pouches represent a significantly lower-risk alternative for adult smokers who would otherwise continue smoking.

KEY TAKEAWAYS

- The vast majority of smoking-related harm arises from combustion, not nicotine (Royal College of Physicians, 2016).
- Nicotine pouches contain no tobacco and produce no smoke, tar, or carbon monoxide.
- Toxicant levels in nicotine pouches are substantially lower than in cigarettes and generally comparable to pharmaceutical nicotine products (Azzopardi et al., 2022).
- Evidence from Swedish snus - a similar oral nicotine product - shows markedly lower cancer and cardiovascular risks compared with smoking (Lee, 2013; SCENIHR, 2008).
- Sweden, where snus is widely used, has the lowest smoking prevalence in the EU and lower tobacco-related mortality (European Commission, 2023).
- Long-term data on modern nicotine pouches are still emerging; caution and continued surveillance are warranted.
- Risk-proportionate regulation better reflects differences in product harm than uniform restrictions.

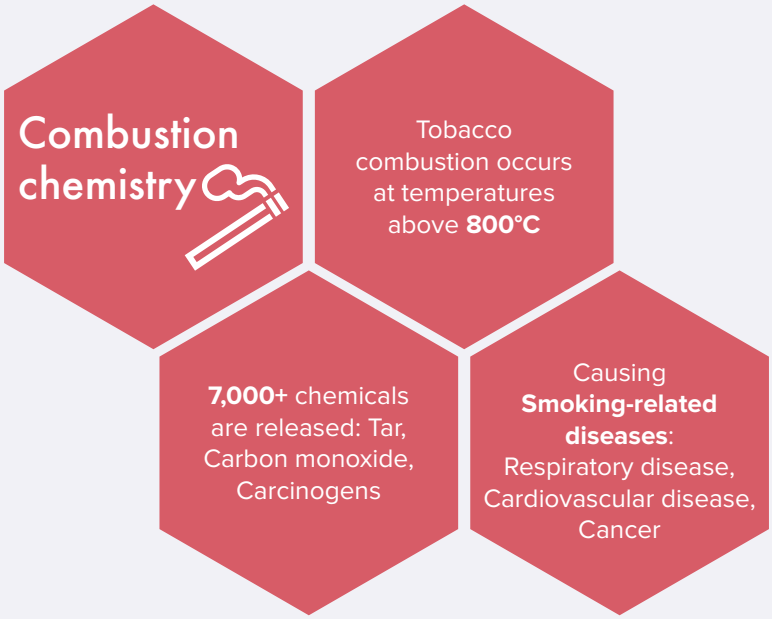
1. WHY COMBUSTION MATTERS: RELATIVE RISK & TOXICOLOGY

Cigarette smoke contains over 7,000 chemicals, including dozens of carcinogens such as polycyclic aromatic hydrocarbons and tobacco-specific nitrosamines (IARC, 2004). It is combustion, the burning of tobacco at temperatures exceeding 800°C that generates these toxicants.

Nicotine pouches do not involve combustion. They deliver pharmaceutical-grade nicotine through the oral mucosa. As a result:

- There is no tar.
- There is no carbon monoxide.
- There is no inhaled particulate matter.

Chemical analyses of nicotine pouches show very low levels of harmful and potentially harmful constituents compared to cigarettes and traditional smokeless tobacco (Azzopardi et al., 2022; Mallock et al., 2022). Measured nitrosamine levels are typically substantially below those found in conventional smokeless tobacco (ex. Chewing tobacco, moist snuff) products.



A detailed chemical characterization study of modern tobacco-free oral nicotine pouches demonstrated that nicotine pouches **"sit at the very bottom of the toxicant and risk continuums among nicotine products,"** indicating a substantially lower exposure profile than smoking (Azzopardi et al., 2021).

Other biomarker studies demonstrate that users of non-combustible oral nicotine products have dramatically lower exposure to combustion-related toxicants than smokers (Bishop et al., 2020).

According to The Global Case for Nicotine Pouches (We Are Innovation, 2025), cigarettes contain 84 toxic chemicals, many born from combustion - the very process that drives smoking-related disease. Nicotine pouches contain just five, a toxicological profile comparable to the nicotine gums and lozenges approved by medical authorities. Their relative risk score is 0.1, compared with 100 for cigarettes - a staggering difference for any individual seeking to avoid harm.

It is important to be clear: lower exposure does not mean zero risk. Nicotine itself has pharmacological effects, including increases in heart rate and blood pressure. However, major smoking-related diseases such as lung cancer, COPD, and most smoking-related cardiovascular damage are driven primarily by combustion toxins rather than nicotine (Royal College of Physicians, 2016).

2. PHARMACOLOGY & NICOTINE DELIVERY

Nicotine is an alkaloid naturally present in tobacco. It binds to nicotinic acetylcholine receptors in the brain, producing stimulant and reinforcing effects.

In nicotine pouches:

- Nicotine is typically present in salt form, improving stability and absorption.
- Absorption occurs via the oral mucosa.
- Delivery is slower than inhaled cigarette nicotine but sufficient to reduce cravings (Digard et al., 2013).

Cigarettes deliver nicotine to the brain within seconds, reinforcing addictive patterns. Oral products provide slower pharmacokinetics, similar to nicotine replacement therapies (NRTs), which may influence dependence potential.

Crucially, nicotine is not tar. It is addictive but not a carcinogen (IARC, 2007). Confusion between nicotine and smoking-related disease remains common in public discourse.

Modern pouches are tobacco-free, meaning they do not contain tobacco leaf material. This eliminates many tobacco-derived carcinogens present in traditional smokeless tobacco.

3. EVIDENCE FROM SWEDEN: A NATURAL EXPERIMENT

Sweden provides a unique European case study. Snus is a moist oral tobacco product that has been widely used for decades. As well as nicotine pouches - gaining popularity in recent years.

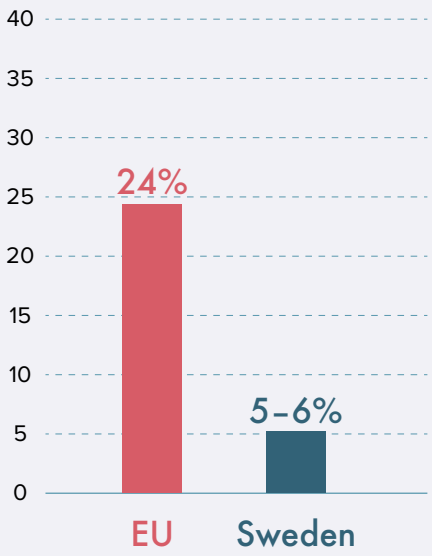
Key findings:

- Sweden has the lowest daily smoking prevalence in the EU (~5–6%) (European Commission, 2023).
- Male lung cancer rates in Sweden are among the lowest in Europe (WHO Europe, 2022).
- Multiple epidemiological reviews conclude that snus use carries substantially lower cancer risk than smoking (Lee, 2013; SCENIHR, 2008).

The European Commission's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR, 2008) concluded that the health risks of smokeless tobacco are "substantially lower than those of smoking."

Smoking prevalence in EU vs Sweden in 2023

% of population aged 15 or over



Modern nicotine pouches differ from snus in that they contain no tobacco, but toxicological analyses suggest even lower levels of harmful constituents.

A comprehensive review of snus epidemiology concluded that, compared with continued smoking, snus users experience substantially lower risks of major smoking-related diseases including lung cancer, oral cancer, and cardiovascular disease. The analysis found no consistent evidence that snus use is associated with increased all-cause mortality or respiratory disease, and only modest or non-significant associations with some oral conditions when compared with smoking (Ramström & Foulds, 2019).

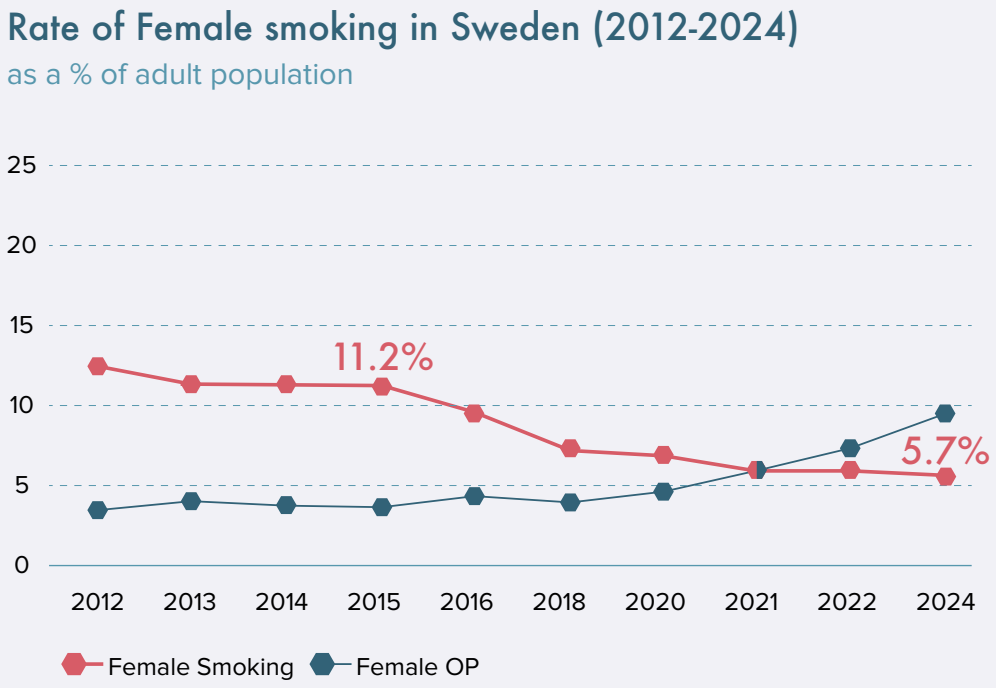
Correlation does not prove causation. However, Sweden's combination of high non-combustible nicotine use and low smoking prevalence is frequently cited in public health discussions.

4. WOMEN'S HEALTH CONSIDERATIONS

Nicotine is not risk-free, particularly in pregnancy. Nicotine exposure during pregnancy may affect fetal development. Therefore:

- Nicotine pouches should not be used during pregnancy unless under medical supervision.
- Non-users, especially adolescents and pregnant women, should not initiate use.

However, for pregnant women who would otherwise continue smoking, some public health bodies recognize that alternative nicotine products may present lower risk than continued smoking (NICE, 2021). Although evidence specific to nicotine pouches in pregnancy is limited.



Recent policy analysis has drawn attention to Sweden's experience in reducing smoking prevalence among women. According to Power in a Pouch: The Game-Changer for Women (Smoke Free Sweden, 2024), Sweden is approaching smoke-free status (defined as <5% smoking prevalence), with overall smoking declining by approximately 54% since 2012. The report attributes this decline

in part to a pragmatic harm-reduction approach that has allowed access to non-combustible nicotine alternatives, including snus and, more recently, tobacco-free nicotine pouches (Smoke Free Sweden, 2024).

Notably, female smoking rates in Sweden declined from 11.2% to 5.7% a reduction of roughly 49% over the period examined. The report suggests that the introduction and growing uptake of nicotine pouches since approximately 2016 may have contributed to closing the gender gap in smoking, particularly as these products differ in format and presentation from traditional smokeless tobacco (Smoke Free Sweden, 2024).
Survey data presented in the report indicate that many former smokers ranked nicotine pouches among the most helpful alternatives for quitting or switching. Between 55–60% of respondents cited flavours as an important factor in transitioning away from cigarettes (Smoke Free Sweden, 2024).

While such findings are based primarily on survey and qualitative data rather than long-term clinical trials, they highlight an important consideration in women's health policy: product acceptability, stigma, and usability may influence whether smokers successfully transition away from combustible cigarettes. These observations align with broader harm-reduction literature emphasising that access to acceptable non-combustible alternatives may support smoking reduction at the population level (Royal College of Physicians, 2016).

5. ENVIRONMENTAL IMPACT

Cigarette butts are the most littered item globally, with an estimated 4.5 trillion discarded annually (WHO, 2017). They contain cellulose acetate filters and residual toxicants.

Nicotine pouches:

- Produce no smoke.
- Produce no cigarette butts.
- Do not generate secondhand smoke or sidestream emissions.

However, pouches do create packaging waste (plastic cans, used pouches), though their environmental impact appears lower than combustible cigarette waste.

4.5 TRILLION CIGARETTES BUTTS ARE DISCARDED ANUALLY = 766,571 TONNES OF TOXIC TRASH

6. FINANCIAL & SOCIETAL CONSIDERATIONS

Smoking imposes major economic costs. In the EU, smoking-related healthcare and productivity losses amount to tens of billions of euros annually (European Commission, 2021).

At the individual level:

- Cigarette smoking is substantially more expensive than most nicotine pouches in many EU markets.
- Lower-cost and less harmful alternatives may reduce financial burden on low-income smokers.

Economic modeling studies in the United States suggest that switching from smoking to non-combustible alternatives could avert hundreds of thousands of premature deaths over decades (Levy et al., 2021). While models rely on assumptions, they provide insight into potential population impact.

Risk-proportionate taxation such as aligning taxes with relative risk is frequently discussed as a strategy to encourage switching while maintaining youth protections.

A pack of nicotine pouches typically costs between **€3 and €6**

Meanwhile daily cigarette costs can exceed **€10** *in many EU countries.*

7. WHAT RESPONSIBLE REGULATION COULD LOOK LIKE

A balanced EU approach could include:

- Strict age limits (18+ enforcement).
- Product quality standards and contaminant limits.
- Clear nicotine labeling.
- Risk-proportionate taxation reflecting relative harm.

Evidence supports the importance of maintaining youth protections while acknowledging relative risk differences.

International comparisons suggest that countries which combine traditional tobacco control measures with access to lower-risk nicotine alternatives may achieve faster declines in smoking prevalence. Sweden, where widespread use of non-combustible nicotine products coincides with the lowest smoking rate in the EU (~5–6%), is frequently cited in harm-reduction literature (Ramström & Foulds, 2019; European Commission, 2023).

Comparative policy analysis has also highlighted recent smoking declines in countries such as Czechia and Greece following regulatory environments that permit access to innovative nicotine products alongside conventional tobacco control measures (We Are Innovation, 2025).

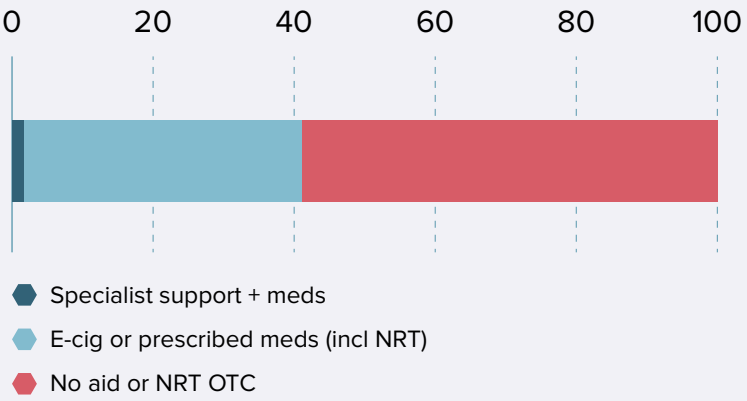
8. SMOKING CESSATION AND SWITCHING

Evidence specific to modern nicotine pouches and long-term cessation is emerging. Harm reduction research indicates that access to acceptable non-combustible nicotine alternatives can increase quit attempts and support switching away from cigarettes.

The Royal College of Physicians notes that alternative nicotine products, including e-cigarettes, are associated with increased quitting activity and may contribute to higher success rates compared with attempting to quit without support (Royal College of Physicians, 2016).

This suggests that providing a range of lower-risk options - including oral nicotine products - may play a role in reducing smoking prevalence.

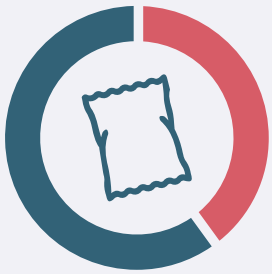
Percentage of attempts to quit smoking in 2015
by method used



9. THE ROLE OF FLAVOURS IN SWITCHING

Flavours are frequently cited by adult smokers as an important factor in switching away from cigarettes. Survey data from Sweden indicate that approximately 55–60% of former smokers who transitioned to nicotine pouches reported flavours as a key reason for making the switch (Smoke Free Sweden, 2024). Beyond preference, flavours may serve a functional role: they help differentiate non-combustible alternatives from combustible tobacco, reducing sensory cues associated with smoking and potentially lowering relapse risk. Broader harm-reduction literature has similarly noted that product appeal and acceptability influence switching behaviour among adult smokers (Royal College of Physicians, 2016).

At the same time, regulatory authorities emphasise the importance of preventing youth uptake. Evidence-based policy discussions increasingly focus on balancing youth protections - such as age restrictions, marketing controls, and retail enforcement - with maintaining product characteristics that support adult smokers in moving away from combustible cigarettes. This underscores the complexity of flavour regulation in the context of harm reduction.



55–60% of former smokers report flavours helped them switch.

10. MYTHS VS FACTS

Myth Nicotine causes cancer.

Fact Nicotine is addictive but not classified as a carcinogen (IARC, 2007).

Myth All tobacco and nicotine products are equally harmful.

Fact Combustion products carry dramatically higher risk (Royal College of Physicians, 2016). Multi-criteria decision analysis (MCDA), a structured approach to assess relative harms across nicotine-containing products, has consistently positioned non-combustible alternatives far below combustible cigarettes on key health risk dimensions. In a landmark 2014 MCDA exercise involving international tobacco experts, cigarettes ranked highest in overall harm, while oral tobacco products, including snus, as well as nicotine replacement therapies exhibited substantially lower harm scores across chemical toxicity, disease outcomes, and population health impact domains. This, again, supports the consensus that product risk varies considerably and that combustion is the dominant determinant of harm (MCDA Working Group, 2014;).

Myth Oral nicotine is as dangerous as smoking.

Fact SCENIHR (2008) concluded smokeless tobacco risks are substantially lower than smoking.

Myth Smoke-free Sweden is unrelated to snus and pouch use.

Fact Sweden's low smoking rates coincide with widespread non-combustible nicotine use (European Commission, 2023).

CONCLUSION

Nicotine pouches are not harmless. But current toxicological, biomarker, and comparative epidemiological evidence indicates they are likely to be substantially lower risk than combustible cigarettes.

In an EU context where smoking remains a major preventable cause of death, the central scientific question is not whether nicotine pouches are risk-free, because they are not, but how their risk compares to continued smoking.

Balanced, evidence-based policy requires acknowledging differences in product risk, protecting youth, ensuring quality standards, and maintaining transparency about uncertainties.
Public health decisions are strongest when grounded in science rather than assumptions.

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