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The Changing Face of Tobacco: An Overview of Novel Products and Industry Innovations

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ABSTRACT

Tobacco use remains a leading cause of preventable morbidity and mortality worldwide, with nearly eight million deaths annually attributable to its consumption. Over the past decade, the global tobacco industry has introduced novel products-electronic nicotine delivery systems (ENDS), heated tobacco products (HTPs), and oral nicotine pouches-as alternatives to combustible cigarettes. Although promoted as reduced-risk, these products carry potential health risks and have generated debate in public health circles. This review outlines the emergence of these novel tobacco products, examines market penetration and consumer behaviours, evaluates regulatory frameworks across regions, and discusses public health impacts. It highlights both the potential benefits for adult smokers and the concerns regarding youth uptake, dual use, and long-term safety. Complete tobacco cessation remains the most effective strategy to minimize harm.

Keywords: Tobacco industry, ENDS, HTPs, nicotine pouches, e-cigarettes, regulatory frameworks

INTRODUCTION

The tobacco industry is no stranger to us as it always stood on the forefront of controversy, with its long history of health warnings and social backlash. Tobacco smoking continues to be the top cause of preventable illnesses and deaths worldwide **(1)**. In recent years, the industry has been shifting its focus towards developing new products. Though innovation is typically seen as beneficial, but what benefits business can sometimes be harmful to public health **(2)**. These novel products include electronic nicotine delivery systems (ENDS), heated tobacco products (HTPs), and nicotine pouches among others which are claimed to be reduced-risk alternative to traditional combustible cigarettes **(3)**. While cigarettes remain the most prevalent form of tobacco use, the emergence and popularity of newer products are appealing to both current smokers seeking alternatives and younger demographics attracted to new consumption methods **(4)**.

Over the past ten years, the global market share of these novel tobacco products has increased. Their quick market expansion, customers perception of less damage, and rising youth adoption are the main causes for concern. In 2023, the global e-cigarette and vape market was estimated to be worth USD 28.17 billion. From 2023 to 2030, it is projected to expand at a compound annual growth rate (CAGR) of 30.6%. The many customization possibilities offered by the producers, such as temperature control and nicotine dosing, are also expected to support product demand **(5)**. Due to regional regulations and market fluctuations, it is

challenging to determine the precise global percentage of "novel products" versus "traditional tobacco," but industry reports indicate that these products are gradually gaining growth and may account for more than 20% of the total nicotine market in some high-income countries by 2030 **(6)**.

Emergence of Novel Tobacco Products

Electronic Nicotine Delivery Systems (ENDS)

Electronic nicotine delivery systems (ENDS), commonly referred to as e-cigarettes or vapes, were first introduced to the global market in 2003 and have since become a prominent category within the tobacco industry. Electronic nicotine delivery systems consist of a battery powered device that heats a liquid (commonly known as e-liquid) which contains nicotine, propylene, glycol, glycerin, and flavorings to create an aerosol that the user inhales. These devices can resemble traditional tobacco cigarette, cigars or pipes or even everyday items like pens or USB memory sticks. Though they may appear in different designs, but they generally operate in similar manner and are made up of similar components **(7)**. The primary perceived benefit of e-cigarettes is to help smokers quit by cutting out the combustion which comes from burning tobacco, that produces harmful toxins such as tar and carbon monoxide. However, they still have the potential to be carcinogenic; destroying genetic material but in a more indirect manner **(8)**.

While some studies support the role of e-cigarettes in harm reduction others worry that the aerosols generated by ENDS is not free from harmful chemicals and research has also identified substances such as formaldehyde, acrolein and volatile organic compounds (VOCs) in the vapor, which may have adverse effects on respiratory and cardiovascular health. However, the long-term effects of vaping are still not fully understood **(9)**.

ENDS are different from regular cigarettes in a number of important ways. In contrast to the freebase nicotine present in conventional cigarettes, several ENDS use nicotine salts, which enable higher nicotine concentrations and a smoother inhalation experience. More control over nicotine consumption is possible with ENDS since users can choose from a variety of nicotine levels, including nicotine-free choices. With changeable e-liquid cartridges or refillable tanks, ENDS devices are frequently reusable and rechargeable, in contrast to traditional cigarettes, which are single-use and disposable after combustion **(10)**. The exhaled aerosol from ENDS may contain nicotine, volatile organic compounds, and other chemicals, but usually in smaller amounts than second-hand smoke from combustible cigarettes. This is known as second-hand exposure, because ENDS do not emit tobacco smoke **(11)**.

Additionally, there is growing concern about the usage of ENDS among adolescents and young adults, many of whom were non-smokers prior to trying these products. The most cited reasons for using e-cigarettes over traditional cigarettes among both youth and young adults are curiosity, flavoring/taste and low perceived harm compared to other tobacco products **(12)**.

Recent studies have shown that in the United States, 4.5% of persons who were 18 years of age or older currently used e-cigarettes, with males using them more frequently (5.1%) than women (4.0%). Interestingly, persons between the ages of 18 and 24 had the highest current e-cigarette use rate (11.0%) **(13)**. Since 2014, ENDS has been the most popular tobacco product among young people in the United States. Approximately 1 in 5 high school students and 1 in 20 middle school students were among the 3.6 million U.S. kids who

reported using ENDS in the previous 30 days in 2020 **(14)**. According to worldwide research, the current prevalence of ENDS use is 10.2% overall, with higher rates among males (10.2%) than females (7.5%) **(15)**.

Heated Tobacco Products (HTPs)

Heated tobacco products (HTPs) represent another major innovation within the tobacco industry. Unlike ENDS, which vaporize a nicotine containing liquid, HTPs heat real tobacco leaves at lower temperatures than traditional cigarettes. This process produces an inhalable aerosol with fewer harmful byproducts compared to conventional smoking **(16)**. Philip Morris International's IQOS is perhaps the most well HTP on the market and has been promoted as a reduced risk product in several countries.

While HTPs generate fewer toxicants than combustible cigarettes, they are not without risk. Studies indicate that HTP emissions still contain harmful chemicals, although in lower concentrations, including nicotine, carbonyls and volatile organic compounds (VOC) **(17)**. The public health community remains divided on the potential benefits of HTPs. While the content of toxic chemicals in the HTP aerosol appears to be less harmful than the cigarette smoke. However, their safety relative to complete cessation is unclear. Health experts have warned that HTPs may reduce some risk associated with smoking, but they are not risk free. There are no long-term toxicity data, and more research is needed to fully understand their health effects **(18)**.

Smokeless Nicotine Products

Beyond e-cigarettes and HTP, there are also various forms of smokeless nicotine products such as nicotine pouches. These products are placed in the mouth, do not contain tobacco and deliver nicotine directly to the bloodstream through mucous membrane in the mouth. As these products offer a tobacco free way to consume nicotine, they are marketed as a convenient and discrete alternative to smoking and vaping, particularly for individuals seeking to reduce their tobacco consumption in smoke free environment **(19)**.

One of the biggest selling points of nicotine pouches is their convenience. They do not produce smoke, vapor or even spit, making them a discrete option for nicotine users specially among adolescents and young adults. Studies also suggests that though these products offer reduced exposure to harmful chemicals but still they pose a risk of nicotine addiction particularly among new users **(20)**.

Market Growth and Consumer Behaviour

The market for novel tobacco products is emerging rapidly driven by both consumer demand and marketing strategy by the tobacco industry. ENDS have grown to become a multi-billion-dollar global industry with leading brands such as JUUL **(21)**. India ranks among the top global producers and exporters of tobacco, following countries like China and Brazil. The tobacco industry holds a significant place in India's economy due to its high revenue potential. Major tobacco producing states include Gujarat and Andhra Pradesh, where favorable weather conditions support large scale cultivation. In addition to conventional smoking tobacco, India has a strong market for smokeless tobacco products such as paan, gutka, and flavored tobacco, which are widely consumed by people of all ages due to their affordability and accessibility. Furthermore, single-stick cigarette sales account for a large proportion of the market (an estimated 75%) making it easier for consumers to bypass health warnings typically displayed on full cigarette packs **(22)**. Tobacco companies have positioned these products as part of a broader harm reduction strategy, targeting

smokers looking for alternatives to traditional cigarettes. Exposure to tobacco content on social media could lead to higher brand awareness, increased product appeal and susceptibility of using tobacco among adolescents and young adults, which raise concerns about the potential for nicotine addiction and the initiation of smoking behaviors **(23)**.

The tobacco industry uses a range of advanced marketing techniques to advertise new tobacco products, which greatly expands their market share:

Health and Quitting Messaging: To appeal to consumers who are concerned about their health, marketing materials for new tobacco products frequently highlight the items alleged health advantages and possible contribution to quitting smoking **(24)**.

Retail Incentive Programs: To improve product visibility and accessibility, the industry uses strategic techniques, including as incentive programs that require tobacco products to be prominently placed, promoted, discounted, and distributed in retail locations **(25)**.

Point-of-Sale Advertising: To draw in younger customers, point-of-sale advertising strategies include putting cigarettes next to snacks and sugary drinks, putting ads at children's eye level, pushing flavored cigarettes, and selling single sticks **(26)**.

Adolescent-Oriented Advertising: To stimulate adolescent experimentation, lower the incentive of smokers to stop, and urge former smokers to restart their use, the industry employs marketing methods **(27)**.

India contributes significantly to the global tobacco business in terms of both exports and production. India produced over 760,000 metric tons of tobacco in the fiscal year 2021 **(28)**. With almost 9% of global production, India ranked as the second-largest tobacco producer in the world, behind China, as of 2020 **(29)**. India's tobacco exports have increased by 87% in the last five years, rising from ₹6,408.15 crore in the 2019–20 fiscal year to a record ₹12,005.89 crore (about $1.45 billion) in the 2023–24 fiscal year **(30)**. In fiscal year 2024, India's top tobacco export partner was the United Arab Emirates, which imported tobacco valued at about ₹24 billion. Belgium came in second with about ₹22 billion **(31)**.

Public Health Concerns and Regulatory Responses

The rapid proliferation of novel tobacco products has prompted significant public health concerns, particularly regarding their appeal to youth and the potential for dual use with traditional cigarettes. A major concern is the increasing use of ENDS among adolescents which is seen as an emerging public health crisis **(32)**. Regulatory bodies around the world are grappling with how to manage the risk of these products. Some have banned certain products outright, while others have implemented strict regulations regarding advertising and sale, particularly to younger audiences. The Prohibition of Electronic Cigarettes Act, 2019, bans the production, sale, import, export, transport, distribution, storage, and advertisement of electronic cigarettes across India. This legislation was implemented to protect public health by preventing the potential harm posed by e-cigarettes **(33)**.

Regulatory Strategies in Various Nations and Areas:

Pouches of nicotine: Nicotine pouches are prohibited in several nations. For example, both tobacco-derived and synthetic nicotine pouches are regulated in Brazil, Brunei Darussalam, India, Iran, and Thailand, so making their sale illegal [Greenhalgh & Scollo, 2024]. Nicotine pouches are only available with a prescription in some countries, highlighting strict regulations to limit their dissemination **(34)**.

Products containing heated tobacco (HTPs): As a safeguard against these new items, nations including Singapore, Brazil, and India have banned the sale of HTPs. At least 61 nations and one territory have implemented excise taxes in areas where

HTPs are allowed to reduce consumption through financial means **(35)**.

E-cigarettes, or electronic cigarettes: E-cigarette regulations have been put in place in 68 different nations. To manage consumption and safeguard the public's health, these rules include things like minimum age-of-purchase laws, indoor-use bans, marketing restrictions, and, in certain situations, taxes **(36)**.

Recent Advancements

Belgium's Disposable Vape Ban: Citing health and environmental concerns, Belgium became the first EU nation to outlaw the sale of disposable vapes on January 1, 2025. This action is a component of a larger plan to lower smoking rates and reach almost zero new smokers by 2040 **(37)**.

Although these efforts are made, still certain issues remain. The tobacco industry has increasingly marketed these products and public health initiatives have faced major obstacles because of the tobacco industry's representation of new products as safer substitutes such as:

Undermining Health Campaigns: The tobacco industry misrepresents science, hinders public health initiatives, and fights anti-tobacco legislation by positioning new nicotine products as safe substitutes **(38)**.

Targeting Vulnerable Populations: Historically, the business has focused its marketing efforts on vulnerable populations, including as young people and expectant mothers, to undermine public health initiatives that strive to lower tobacco use among these groups **(39)**.

False Health Claims: The tobacco control community has been split over the promotion of new pharmaceuticalized products, with certain institutions and public health experts doubting the industry's intentions and the products' true capacity to reduce harm **(40)**.

Studies in public health have shown that the "truth" campaign is successful in lowering the initiation of smoking. However, rather than concentrating only on tobacco corporations, the tobacco industry's own studies indicated that these negative advertisements successfully reframed cigarettes as a detrimental consumer product **(41)**.

This kind of messaging can confuse consumers and thwart public health campaigns to reduce tobacco use. The tobacco industry, by contrast, is fighting back and often claiming that these products should be treated as part of the solution to the smoking epidemic rather than a new problem **(42)**.

The Future of Tobacco Products

The tobacco industry is clearly undergoing a significant shift. Whether these new products will ultimately be beneficial or harmful remains uncertain, but one thing is evident, they are reshaping how people view tobacco and nicotine. As consumers increasingly prioritize their health, the industry will likely keep innovating and introducing new products. It will be the responsibility of regulators, researchers and the public to ensure these developments result in improved outcomes for all.

CONCLUSION

The tobacco industry is actively adjusting to shifting public health trends and smoking behaviors by launching new products they claim are less harmful than conventional cigarettes. While these alternatives may present a lower risk option, its crucial to acknowledge that they still carry risks. The long-term health impacts of e-cigarettes, heated tobacco products and nicotine pouches are not yet fully understood, requiring further research to assess their safety. For now, the most effective way to minimize the risks linked to tobacco use remains complete cessation.

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