OXFORD JOURNAL
OF STUDENT
SCHOLARSHIP

Alternative Policies for Tobacco Control in India

Yashas Acharya
yashas.acharya@candorschool.net

ABSTRACT

India is positioned as second only to China and Brazil apropos tobacco consumption and production, respectively. This paper examines India's tobacco epidemic - affecting 270 million users and imposing over USD 35 billion in annual economic costs through health, social, and environmental burdens; synthesizes the literature on these multifaceted impacts, as well as existing global policies for demerit goods; to then identify and suggest a dual-pronged alternative policy approach that could be employed in India's war against tobacco: complementary harm-reduction and cessation policies that address consumption and demand, augmented by production curtailment strategies that address supply.

INTRODUCTION

India is positioned as second only to China apropos the population of tobacco consumers. Recent estimates show that approximately 38% of men and 9% of women consume some form of tobacco in India, totaling the rate of tobacco consumption at around 24% of the Indian population (International Institute for Population Sciences, 2022). However, there has been a notable decrease in consumption levels across the board, especially in cigarette consumption (29.8% decrease), followed by smokeless tobacco, and finally bidi consumption. Tobacco smoking is the leading cause of preventable death in India, and the effects of tobacco smoking are significantly more pertinent than those of smokeless tobacco consumption, with close to 75% of the economic burden of tobacco consumption borne by tobacco smokers and second-hand smokers. This paradox of declining use amid persistent harm underscores the need for innovative, sustainable policies beyond conventional measures. This paper seeks to address the following question: What are the current economic implications of the Indian tobacco industry, and how might the government implement a dual-pronged plan of harm reduction and production curtailment to sustainably eradicate tobacco consumption and production in the near future?

Research shows that tobacco imposes significant health, social, and environmental costs by virtue of its production, intermediary processing, and consumption. Studies estimate annual global economic costs of smoking at USD $1.4 trillion, with India's tobacco-related disease burden contributing to millions in premature deaths and economic losses. Environmental analyses reveal extensive land use, deforestation, and persistent non-biodegradable waste from tobacco products. In parallel, research on policy interventions for tobacco and other demerit goods—such as alcohol and sugary drinks—demonstrates that

taxation, restrictions on availability, and advertising bans can effectively reduce consumption and associated externalities, though their impact varies by context and enforcement.

This paper proposes a dual-pronged approach—harm reduction and cessation strategies on the demand side, and production curtailment on the supply side—because tackling India's tobacco problem holistically requires coordinated interventions; not isolated measures. The harm-reduction strategies focus on regulated use of e-cigarettes (ENDS) and tobacco-free nicotine pouches (TFNP) to lower mortality and morbidity, using strict regulation to minimize youth uptake and maximize adult cessation potential, while addressing ethical debates on accessibility and potential gateway effects. Alongside, production curtailment addresses the resilience of tobacco farming by supporting crop diversification, enforcing environmental and labor compliance, and restructuring subsidies. Both strategies are necessary: harm reduction alone cannot offset entrenched supply, while production curtailment without demand management risks market imbalances and continued health burdens.

Both harm-reduction and production curtailment strategies play potentially essential roles in addressing India's tobacco crisis, each with distinct policy implications. Harm reduction, centered on regulated ENDS and tobacco-free nicotine pouches, offers immediate opportunities to reduce smoking-related mortality and morbidity among current users, complemented by cessation measures like nicotine content limits, flavor bans, and restrictions on loose cigarette sales. In contrast, production curtailment—through alternative crop subsidies and transition policies—targets the epidemic's root by reshaping agricultural livelihoods and long-term market dynamics, aligning with national food security goals. Given its transformative potential, the government should prioritize production curtailment while ensuring affected stakeholders receive adequate support, including guaranteed market access and skill development, to facilitate a sustainable transition. Balancing immediate health gains with structural change is critical for a holistic tobacco control policy.

The rest of the paper is structured as follows. Section 2 provides an in-depth literature review of health, social, and environmental costs attributable to tobacco consumption and production, as well as policies that have been used to curtail the negative externalities of similar demerit goods in the past. Section 3 illustrates the situation in India, expounding upon local consumption trends and statistics, economic burden of tobacco prevalence, international trade, and existing legal frameworks. Section 4 presents the dual-pronged approach for the curtailment of tobacco prevalence in India—specifically harm-reduction and cessation strategies to address consumption and demand, as well as production curtailment strategies to address supply. Finally, section 5 concludes the paper by comparing the policy approaches, identifying policies that the government should prioritise, emphasising opportunity costs that must be considered, and discussing limitations.

LITERATURE REVIEW

This paper sits within two branches of research: costs perceived in the production, intermediary processes, and consumption of tobacco products; and policies to curtail demerit goods and their externalities. Economic costs are constituted by health costs, social or external costs, and environmental costs.

Additionally, the negative externalities and policy implications of price inelastic demerit goods such as alcohol, marijuana, sugary drinks, and Electronic Nicotine Dispensary Systems (ENDS) or e-cigarettes, will be explored.

Section 2.1: Health Costs

Several papers have investigated the direct and indirect health costs attributable to tobacco consumption. Goodchild et al. (2018) conducted a study representing 97% of the world's smokers in 2012, and found that the total economic costs of smoking, including direct health costs and indirect productivity costs, was USD $1.4 trillion; 1.8% of the period's global GDP. Europe saw the highest burden at 2.5% of the region's annual GDP, compared to 3% for the US and Canada combined. However, this study underestimates the global economic costs by failing to account for smokeless tobacco use and second-hand smoke.

Section 2.2: Social/ External Costs

John et al. (2020) studied the situation in India using data from the second round of the Global Adult Tobacco Survey, and were able to extrapolate the total economic costs attributable to tobacco use (smoke and smokeless) from all diseases in India at over 8 times the excise revenue generated by the tobacco industry, or USD 27.5 billion. The costs of premature mortality alone made up three quarters of the economic costs: to put things into perspective, Jain et al. (2023) found that tobacco use was responsible for 23 million premature lives lost in India. Yet, John et al. (2020) fail to account for the social cost of smoke tobacco consumption - second-hand smoke inhalation by non-smokers - in their calculations. A study observed that the direct economic costs of all diseases attributable to second-hand smoke consumption in 2017 for persons greater than 15 years of age in India was USD 8.7 Billion (John et al., 2022), potentially concluding the total economic costs at over USD 35 Billion. Research shows that second-hand smoke almost universally affects women and children, residents of rural areas, and populations of low and middle-income nations disproportionately (John et al., 2022; Mbulo et al., 2016).

Section 2.3: Environmental Costs

Finally, abounding environmental costs arise in each stage of the tobacco supply chain. Zafeiridou et al. (2018) calculated that in 2014, 4 million hectares of land were employed in tobacco cultivation worldwide. Shubhajit Pahari (2022) studied the life cycle of tobacco in India and found that approximately 400,000 hectares of land are used for tobacco production, accounting for 0.4% of global deforestation. Additionally, the extensive practice of fumigation during the cultivation and curing stages contaminates drinking water sources, while the manufacturing stage gives rise to several toxic by-products (Novotny et al., 2015). Post-usage, Jain et al. (2024) find that cigarette, bidi, and smokeless tobacco generate 170330 tonnes of waste annually in India, a majority of which is non-biodegradable.

Section 2.4.1: Policies to Curtail Demerit Goods and Their Externalities - Taxation

Several policies have been employed worldwide to curtail the negative externalities imposed upon society by the consumption of demerit goods, the most ubiquitously implemented of which are excise taxes meant to discourage consumption by attenuating affordability, whilst simultaneously generating revenue for the government. Kilian et al. (2023) conducted a meta-analysis of 36 reports from various nations to test for a linear association between taxation and consumption, and found an average elasticity of -0.18 within the first year of a 100% tax increase. They also discovered that cross-beverage elasticities impede effective taxation, since some drinkers might shift consumption patterns if taxes are not holistically raised among all alcohol products. Guindon et al. (2022) conducted a similar meta-analysis but found significantly higher elasticities for beer, wine, and spirits. Many countries have similarly pursued excise taxes on sugary drinks (or sugary taxes) with research suggesting that excise taxes are the most cost-effective means by which the consumption of sugary drinks may be curtailed. A 10% sugary tax implemented in Mexico resulted in a 7.6% decrease in consumption over 2 years (Muth et al., 2019). Although discrepancies exist, most research hints at higher taxation driving lower consumption rates, with a reduction in associated externalities (Burton et al., 2016).

Section 2.4.2: Policies to Curtail Demerit Goods and Their Externalities - Restrictions on Availability

Restrictions on availability are another means by which the consumption of demerit goods may be lessened. One such policy involves temporal restrictions on the availability of said goods, such as limiting purchasing hours or days. A systematic review (Burton et al., 2016) showed that shortening late-night sales by one hour led to a 10-20% reduction in alcohol-related violence and hospitalisations, while Kilian et al. (2023) found that restricting alcohol sales by one day resulted in a 3.6% decrease in alcohol consumption. Freisthler et al. (2014) found that the availability of medical marijuana through dispensaries and delivery services was positively related to current marijuana use and frequency of use in California, implying a correlation between marijuana availability and likelihood of consumption that is akin to that of alcohol.

A full-fledged restriction would manifest in the form of a prohibition on the sale of demerit goods. The U.S National Alcohol Prohibition (1920-1933), as outlined by Wayne Hall (2010), can offer insight into the ramifications of such drastic policy measures. Initially, prohibition cut alcohol use, reducing arrests for drunkenness and alcohol psychosis. However, weak enforcement spurred a large black market, organised crime, and corruption. By the late 1920s, consumption rose to 60-70% of pre-prohibition levels, showing bans weaken as illegal markets adapt. In Great Britain, disposable vape use among 18-year-olds, especially current smokers, rose over 15% between 2021 and 2023 (Jackson et al., 2024), prompting calls for a ban on disposable vape use. Yet, a qualitative study warns that ex-smokers might return to cigarettes; with one stating, “I’d maybe start smoking cigarettes” due to poor alternatives, and others planning to buy disposables illegally (Carr et al., 2025). Cannabis criminalization has been shown to disproportionately affect marginalized communities–with Black individuals in the US facing arrest rates 3.64 times higher than whites despite similar usage; divert law enforcement resources and cost taxpayers millions while

failing to deter use; sacrifice excise revenues from a potentially billion-dollar industry; and fuel illicit market activity (Wu et al., 2024).

Section 2.4.3: Policies to Curtail Demerit Goods and Their Externalities - Restrictions on Promotion

Lastly, restrictions on the promotion or advertisement of demerit products are a popular strategy to curb the consumption of demerit goods. However, there is controversy regarding the efficacy of these policies. A Quebec ban on fast food ads targeting children reduced weekly purchases by 13% in affected households, suggesting such measures can curb consumption (Dhar & Baylis, 2011). Conversely, evidence on cannabis and alcohol is less conclusive. Cannabis advertising restrictions may lower youth initiation and overall use, but findings are inconsistent and enforcement-dependent (Hall, 2012). A Cochrane review on alcohol ad bans found limited evidence of significant consumption reduction, with most studies showing minimal or no impact (Siegfried et al., 2014). Studies consistently show that e-cigarette brands employ tactics such as bright colours, models, celebrity and social media influencer endorsements, and attractive flavours to encourage youth uptake, with one paper finding that all 154 ads studied had some form of animation (Jeong et al., 2024; Padon et al., 2017; Smith and Hilton, 2023).

CONTEXT

This section explores the quantitative and qualitative facets of the Indian tobacco industry, viz, recent consumption trends, the relationship between consumption and economic burden segregated by type, and the import-export market for tobacco in India to establish a firm quantitative contextual backdrop; as well as a summary of the existing legal framework to provide the qualitative context.

Section 3.1: Tobacco Consumption Trends in India

India is positioned as second only to China with regards to the population of tobacco consumers. Concerning rates, recent estimates show that approximately 38% of men and 9% of women consume some form of tobacco in India, totaling the rate of tobacco consumption at around 24% of the Indian population (International Institute for Population Sciences, 2022; Chhabra et al., 2021).

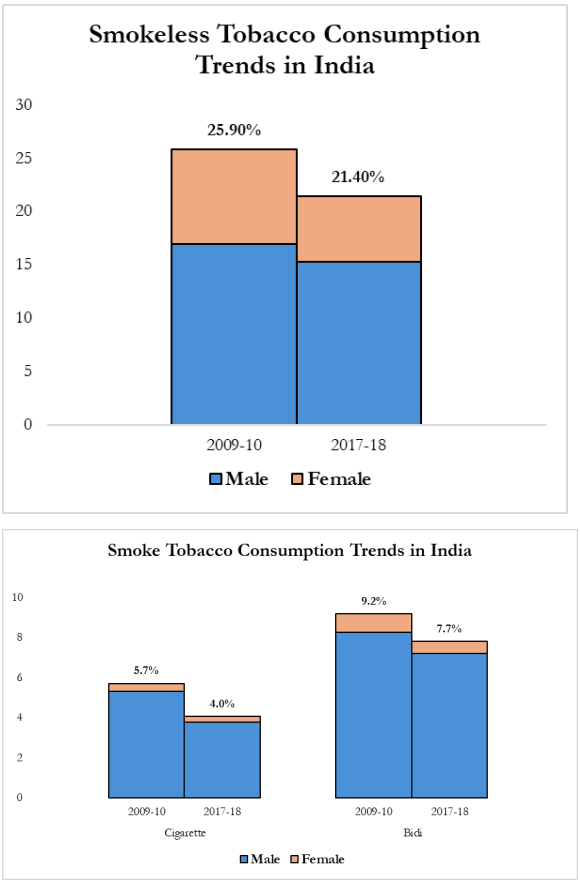

Figure 1: Smoke and Smokeless Tobacco Consumption Trends in India

Figure 1 compares the findings from the GATS I (2009-2010) and GATS II (2017-2018) surveys with respect to smokeless tobacco, cigarette, and bidi consumption, whilst segregating by gender. A notable observation is the general decrease in consumption levels across the board, the steepest of which can be attributed to cigarettes (29.8% decrease), followed by smokeless tobacco, and finally bidi consumption. Possible explanations for this trend include increased adherence to the Framework Convention on Tobacco Control's (WHO-FCTC) MPOWER recommendations, such as comprehensive tobacco cessation services, graphic health warnings on product labels, prohibition of tobacco advertisements on digital media, as well as increased public awareness of associated health detriments (WHO, 2025). However, a bleaker perspective associates declining consumption trends with a general increase in global populations, rather than a reduction in the number of smokers (Peruga et al., 2021). The male demographic bears greater consumption rates than their counterpart across all types, and the reduction in consumption of women is comparatively greater than that of men for smokeless tobacco and bidi. However, this observation does not hold for cigarettes, where men experienced a 29% decrease while women experienced a 25% decrease. This discrepancy in female smoking prevalence can be attributed to targeted advertising by tobacco companies through false but compelling imagery, growing empowerment and

spending power among women, weakening of socio-cultural constraints due to globalisation, job stress, and peer pressure, to name a few (Jafari et al., 2021; Goel et al., 2014).

Section 3.2: Tobacco Consumption and Economic Burden Segregated by Type

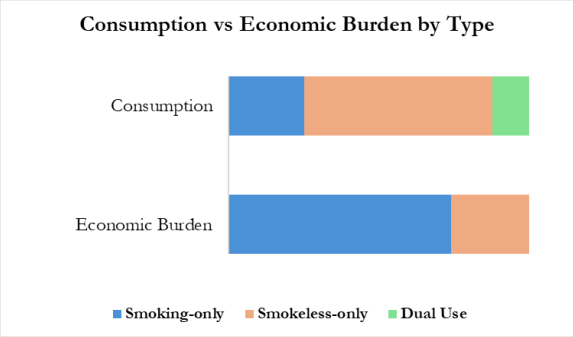

Figure 2: Consumption vs Economic Burden by Type

With regards to consumption by type, smokeless tobacco is by far the most prevalent form of tobacco consumed at 21.4% of the population in 2019 (GATS II), followed by smoked tobacco, including cigarettes and bidi consumption, at 10.7% of the population, as shown in Figure 2. While smokeless tobacco consumption is twice that of its counterpart, the economic burden attributed to it makes up a quarter of the total economic burden attributable to tobacco use, with the rest associated with smoking tobacco use (John et al., 2020). This juxtaposition may be clarified by differentiating between the health impediments attributable to both. Smoked tobacco is strongly linked to non-communicable diseases (NCDs) like lung and oral cancers, chronic obstructive pulmonary disorder (COPD), ischemic heart disease (IHD), and ischemic stroke, which require costly treatments that total INR 1.3 trillion of smoking-attributable costs in 2018 (John et al., 2020). The effects of Bidi smoking were more pertinent than cigarette smoking, with 10.7 million years of life lost (YLLs) and approximately 478,000 deaths in 2019 for the former, compared to 8.26 million YLLs and 341,000 deaths for the latter. Further, an overlooked epiphenomenon of smoked tobacco consumption is second-hand smoke (SHS), or side-stream smoke passively consumed by non-smokers, which some studies suggest is more toxic than directly inhaled smoke (Martins-green et al., 2014; Sharma et al., 2023). John et al. (2022) found that SHS led to direct economic costs of INR 0.56 trillion, with effects majorly borne by women (71%). Smokeless tobacco is associated with oral and stomach cancers, IHD, and ischemic stroke, resulting in 4.3 million YLLs and around 171,000 deaths in 2019 (Jain et al., 2023), and does not result in by-products of the same puissance as that of smoked tobacco consumption.

Section 3.3: Tobacco Import and Export Trends in India

India is a significant exporter of raw tobacco and manufactured tobacco products; in fact, the second-largest exporter globally, after Brazil (Ministry of Commerce: Tobacco Industry and Exports in India). As evidenced by Figure 3, exports have seen over a 100% increase in the dollar value due to rising

global demand, concomitant with supply chain issues post-COVID. Net exports of raw tobacco, manufactured smoking tobacco, and processed non-smoking tobacco have grown from approximately USD 895 million in 2016-17 to approximately USD 1845 million in 2023-24 - or a 106% growth in 7 years. This rise has coincided with a staggering 149% increase in the dollar value of raw tobacco exports over the past 7 years, propelling India's position from the fifth largest to second-largest exporter of raw tobacco within the same timeframe. This development, depicted in Figure 4 (World Integrated Trade Solution), has led to earnings growth for farmers by up to 10% (Kulkarni and Kurmanath, 2025; Tobacco Board, 2023).

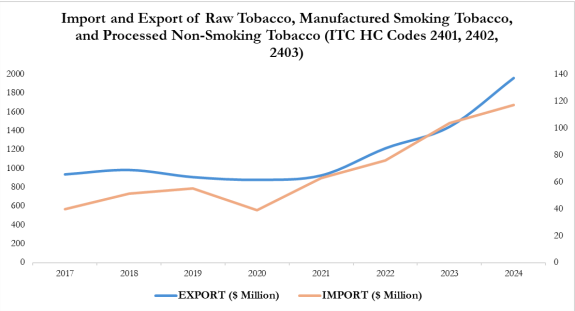

Figure 3: Import and Export of Raw Tobacco, Manufactured Smoking Tobacco, and Processed Non-Smoking Tobacco

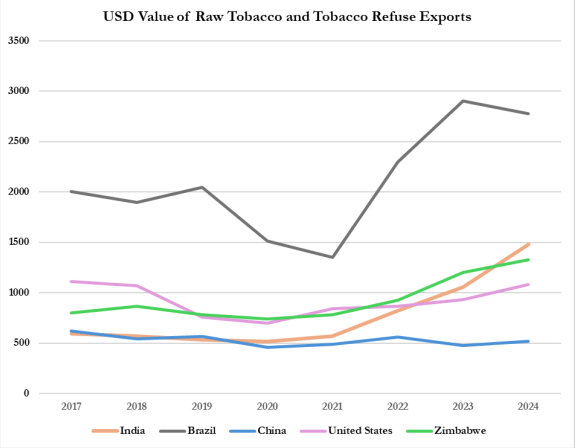

Figure 4: USD value of Raw Tobacco and Tobacco Refuse Exports (HS Codes 240110, 240120, 240130)

Tobacco imports, though significantly lesser, have steadily reciprocated the growth in exports, which are expected to meet the USD 2 billion mark by the end of FY 2025. India exports to around 115 countries worldwide—with its largest buyers in 2023 being the United Arab Emirates and Belgium—while

importing mainly from Zimbabwe, Turkey, and Brazil (The Observatory of Economic Complexity, 2023). Higher prices in international markets have translated to higher bids in domestic auctions, greatly benefiting tobacco growers.

Section 3.4: Legal Framework Concerning Tobacco in India

India's legal framework concerning tobacco is a multifaceted system designed to mitigate the public health burden of tobacco use through stringent regulations, public awareness, and cessation support. The Cigarettes and Other Tobacco Products Act (COTPA) 2003 forms the backbone, prohibiting smoking in public spaces like healthcare facilities, schools, and public transport; banning tobacco advertising across most media, including online platforms; restricting tobacco sales to minors and near educational institutions; and mandating pictorial health warnings covering 85% of tobacco packaging (COTPA 2003 and the Rules Made Thereunder, 2018). The Prohibition of Electronic Cigarettes Act of 2019 bans the production, sale, and distribution of e-cigarettes, addressing emerging nicotine delivery systems to curb potential youth uptake. The National Tobacco Control Programme (NTCP), launched in 2007, operationalises these laws by establishing cessation centres in district hospitals and medical colleges, offering counselling and therapy to support quitting. Further, India's ratification of the WHO Framework Convention on Tobacco Control (FCTC) aims to align policies with global standards, albeit failing to do so optimally; taxation rates fall short of best practice levels, public spaces such as airports contain designated smoking-permissible areas in direct disobedience of FCTC suggestions, and bans on point-of-sale and mass-media advertising are either capriciously enforced or blatantly circumvented. Finally, the Food Safety and Standards Act, 2006, bans tobacco in food products like gutkha (a form of smokeless tobacco made of areca nut and loose tobacco), reinforcing harm reduction by limiting smokeless tobacco variants. However, weak enforcement and bureaucratic ineptitude have rendered this ban ineffective, with enforcement mostly limited to urban regions - antithetical to defeating a demerit good most consumed by the rural demographic (Gupta et al., 2025).

ANALYSIS

The analysis will develop a two-pronged approach for the holistic curtailment of tobacco prevalence in India: the first prong dealing with harm reduction and cessation strategies, while the second deals with strategies to sustainably attenuate tobacco production. Policies such as taxation, advertising bans, and spatial bans on consumption will not be addressed, since there exists copious amounts of research that covers their bases.

Section 4.1: Harm Reduction

Harm reduction is defined as the decrease in total tobacco-related mortality and morbidity via the use of a product, even if said usage may involve continued exposure to tobacco-related toxicants (Institute of Medicine, 2001). The purpose of harm-reduction is not to replace or undermine, but complement existing cessation efforts. The two tools identified in this study that could potentially reduce tobacco-related harms

are e-cigarettes or electronic nicotine dispensary systems (ENDS), and oral nicotine products—specifically, tobacco-free nicotine pouches. The merits and demerits of both approaches will be discussed, followed by policies to address the demerits to the harm-reductive efficacy of these tools.

Section 4.1.1: Electronic Nicotine Dispensary Systems

ENDS heat a liquid containing nicotine to produce aerosols that users inhale. These liquids can contain various additives, including flavours and chemicals, some of which can be detrimental to the users' health (WHO, 2025). A 2021 study by Jerzyński et al. estimates that the number of e-cigarette users in 2020 was roughly 68 million. However, they acknowledge that information on use was lacking for half the global adult population. Going by this statistic, the global prevalence of e-cigarette use lies between 5-10% of the worldwide prevalence of tobacco use, making it a relatively small but rapidly growing phenomenon, since estimates of global prevalence increased to 83 million within a year of the 2021 study (Jerzyński and Stimson, 2023). India enacted a comprehensive ban on e-cigarettes in 2019, effectively criminalising the distribution of ENDS due to concerns of youth uptake - especially pertinent in a country with 65% of its population under the age of 35 (Pettigrew et al., 2023).

Research demonstrates that ENDS expose users to significantly fewer toxicants and carcinogens compared to combustible cigarettes, with a 2018 report by the National Academies of Sciences, Engineering, and Medicine showing that a complete switch from smoking combustible cigarettes to using e-cigarettes results in reduced short-term adverse health effects for users. For established smokers, particularly those who have failed previous cessation attempts, ENDS provide an effective transition mechanism (Foxon et al., 2024). Evidence from randomised controlled trials indicates that e-cigarettes are at least as effective as nicotine replacement therapy (NRT) for smoking cessation, with some studies showing significantly superior outcomes when combined with behavioural support (Feeney et al., 2022). Studies also show that ENDS diminish tobacco dependence regardless of nicotine content, and their smoking cessation capabilities, when compared to traditional NRT, were observed to be more pronounced (Myers et al., 2022). Additionally, many papers have found that among middle-aged and older adult subgroups, former smokers constitute a larger proportion of current e-cigarette users, implying that ENDS are being utilised as a harm-reducing tool by tobacco users (Bandi et al., 2023; Jackson et al., 2024; Agrawal et al., 2024; DeCicca et al., 2022).

However, ENDS' feasibility as a harm-reduction tool has witnessed severe contention over the past decade due to a variety of drawbacks that manifest in countries with liberal policies regarding its use. The primary concern with ENDS prevalence is the alarming rates of youth uptake. One study found that in the United States, e-cigarette use was highest amongst 18-24-year-olds - with over half of the cohort reporting that they had never smoked cigarettes prior to the study (Cornelius et al., 2020) - with many others establishing that a majority of the adolescents who use e-cigarettes are not established or ever-smokers (Shahab et al., 2021; Martinelli et al., 2023; Jensen and Wilson, 2019; Margarete et al., 2018), undermining the reductive capacity of ENDS and giving rise to concerns of the Gateway Effect—a causal relationship between e-cigarette use and subsequent tobacco use (Martinelli et al., 2023). Proponents of ENDS restrictions also cite the potential of e-cigarettes to attract new generations of youth

into nicotine addiction (England et al., 2015), stimying decades of tobacco control and cessation efforts (Hatsukami and Carroll, 2020). There exists mounting evidence that nicotine exposure may affect adolescent brain development and cognition, and is linked to poor impulse control, impaired attention, and learning. Additionally, concerns of nicotine addiction and poisoning in children are growing, with a US Centers for Disease Control and Prevention report observing that between 2022 and 2023, 87.8% of the total e-cigarette exposure cases occurred among children less than 5 years of age (Tashakkori et al., 2025). While findings and opinions on the gateway theory of e-cigarettes are divided (Chapman et al., 2019; Sokol and Feldman, 2021; Aladeokin and Haighton, 2019; Martinelli et al., 2023), the fact that e-cigarette use among adolescents and never-users of tobacco products is a concern that merits immediate intervention is almost universally agreed upon.

Yet there exists apprehension towards adult use of ENDS as well. Dual-use patterns, where individuals concurrently consume both ENDS and combustible tobacco, represent perhaps the most pressing limitation. One study found that almost half of all US adults who use e-cigarettes are smokers of combustible cigarettes (Feeney et al., 2022), while another found that 85% of Korean men who vape practice dual use (Kim et al., 2020). Research suggests that dual use may be as harmful as exclusive cigarette smoking in terms of exposure to toxicants, but this depends on the pattern of dual use, since sustained e-cigarette use with intermittent cigarette smoking might not be as harmful as exclusive cigarette smoking (Coleman et al., 2022). Studies also highlight the risk of prolonged use of ENDS post-cessation of tobacco smoking, higher risks of relapse, as well as the paucity of data on the long-term effects of ENDS usage (Feeney et al., 2022).

Section 4.1.2: Oral Nicotine Stimulants

Oral nicotine stimulants, notably tobacco‑free nicotine pouches (TFNP), offer a discreet, combustion‑free means of nicotine delivery that can reduce exposure to many toxicants inherent in not only smoking, but also smokeless tobacco. While NRT - including nicotine gum - was legalised and recognised as an essential drug in 2022, nicotine pouches are still illegal in India (Using NRT in India — Global State of Tobacco Harm Reduction, 2023). Nicotine pouches deliver nicotine through buccal absorption without generating harmful combustion products, resulting in substantially lower toxicant exposure compared to both cigarettes and smokeless tobacco products (Grandolfo et al., 2024). To this end, the FDA introduced a Modified Risk Tobacco Product (MRTP) claim for certain snus products, allowing manufacturers to market these products with the claim, “Using General Snus instead of cigarettes puts you at a lower risk of mouth cancer, heart disease, lung cancer, stroke, emphysema, and chronic bronchitis” (Hatsukami and Carroll, 2020). Clinical studies indicate that high‑dose pouches can achieve plasma nicotine levels comparable to those from cigarettes while producing fewer positive subjective effects and lower abuse liability scores (Chapman et al., 2022).

However, these products are not without drawbacks. They sustain nicotine addiction, and surveys report that a notable fraction of tobacco‑naïve youth remain susceptible to flavoured pouches, raising concerns of initiation among non‑smoking adolescents, though initiation rates are much lower than that of e-cigarette consumption (St. Helen G, 2024). One study finds that dual use of cigarettes and snus

(Swedish powdered tobacco pouches) among Nordic adolescents is prevalent and raises concerns for public health, particularly regarding addiction, increased exposure, and complexity for prevention efforts (Raitasalo et al., 2022). Emerging clinical evidence also links chronic pouch use to adverse oral health effects: in a six-week observational study among habitual Swedish snus users who switched to tobacco-free pouches, lesion severity at the pouch placement site decreased, but a subset of users still exhibited gingival recession and mild mucosal inflammation, underscoring potential tissue irritation with long-term use (Alizadehgharib et al., 2022).

Section 4.1.3: Harm Reduction Policy Proposals for India

By calibrating regulation to balance adult harm reduction with youth and non-smoker protection - rather than enacting blanket bans - India could potentially harness ENDS and TFNP to reduce the burden of smoking-attributable disease while safeguarding the next generation. Dorothy K. Hatsukami and Dana M. Carroll, in their narrative review, identified five key regulatory considerations for e-cigarette policymaking: toxicology—spanning e-fluid constituents, coil composition, voltage, and battery type; consumer appeal—targeting primarily youth demographics through product flavors, descriptors, and potentially the design of the device; addictiveness—denoted by the nicotine type and content; advertising and marketing towards youth and non-smokers; and youth product access.

Along these lines, India may adopt stringent product standards for both ENDS and TFNP regulation, which cap nicotine concentration and mandate toxicant testing and disclosure. This ensures that permissible e-liquids and pouch formulations meet rigorous safety thresholds, minimising inhalation or mucosal exposure to harmful constituents, as well as risks of nicotine addiction or poisoning (Aaron et al., 2023; Benowitz et al., 2016; Mallock et al., 2024;). Flavour restrictions should prohibit sweet, fruit, or candy descriptors that disproportionately attract adolescents (Falarowski et al., 2025), reserving only tobacco or alcohol analogues for informed adult use (Pepper et al., 2016; Buckell et al., 2019; Meernik et al., 2019; Dowd et al., 2024). Packaging and labelling must be standardised, eschewing youth-oriented imagery and descriptors akin to India's graphic warnings on combustible packs, while compelling on-product health warnings about nicotine's addictiveness (Wu et al., 2024; Katz et al., 2018; Mays et al., 2023). Marketing bans should extend to digital, point-of-sale, and sponsorship channels, mirroring India's UAPA restrictions, to eliminate youth-targeted promotions (Klein et al., 2020). Retail access controls should enforce age verification at purchase via biometric or Aadhaar-linked authentication (the legal age for ENDS or nicotine pouch consumption should be in line with tobacco regulations) and restrict online sales to licensed pharmacies or designated tobacco vendors. Finally, post-market surveillance and independent research funding should monitor product uptake, dual-use patterns with combustible tobacco, and youth initiation trends, enabling policy refinement and preemptive action should unprecedented harms emerge. It is pertinent that these policies be enacted in concomitance, for the regulation of one variable in isolation can lead to unintended consequences (Talih et al., 2021; Friedman and Pesko, 2022; Weng et al., 2025; Klein et al., 2020). Since regulatory policies for ENDS and TFNP align, the process of exploiting their harm-reductive potential, as well as the ensuing policy implications post-legalisation, should be rather streamlined.

Section 4.1.4: Cessation Strategies

Numerous synergistic cessation strategies can be employed in parallel to the harm-reduction strategies outlined above. Incidentally, nicotine content and flavour restrictions on combustible cigarettes would go together with similar restrictions whose imposition was proposed as harm-reduction policies previously. Buckell and colleagues find that an isolated ban on flavoured e-cigarettes might increase cigarette consumption, and vice versa, implying that governments must strike a balance between youth appeal and helping adults transition from combustible tobacco to safer means of exposure to nicotine (Buckell et al., 2019). Moreover, research has shown that reducing the nicotine content in cigarettes autochtonously results in increased rates of smoking cessation, quit attempts, and intentions to quit (Apelberg et al., 2018), with some studies finding that such an intervention can synergise well with the availability of safer alternatives, such as the ones discussed prior (Smith et al., 2018; Higgins et al., 2024; DeCicca et al., 2022).

A comprehensive ban on loose cigarette sales in India could significantly enhance tobacco cessation efforts by synergising with the outlined harm-reduction strategies. Article 16 of the WHO-FCTC recommends a ban on the sale of loose tobacco products to abate youth accessibility and affordability, but India has failed to enforce this recommendation thus far. Further, the loose cigarette trade bypasses the mandates of warning labels on packaging and taxation of tobacco products. Evidence suggests that 22% of users would reduce consumption if loose cigarettes were banned, with 16% considering quitting and 9.5% planning to quit completely (Sakhuja et al., 2024). By eliminating the affordability barrier that loose cigarettes provide, youth initiation could potentially witness a significant decline. ENDS and TFNP could serve as substitution pathways for smokers unable to quit completely, as loose cigarette users often purchase singles to limit consumption rather than buy full packs (Kapoor et al., 2021).

Section 4.1.5: Ethical Considerations

India has enacted a blanket ban on e-cigarettes and tobacco-free nicotine pouches under the Prohibition of Electronic Cigarettes Act, 2019. This has led to significant deliberation and discourse regarding the harm-reduction capacity of these products. Proponents argue that legalising these products would support the rights of the approximately 300 million adult smokers in India, giving them access to safer alternatives, and that the policy shift could reduce the 1.35 million (approx.) tobacco-related deaths each year, thereby reducing economic burden. Hatsukami and Caroll (2020) claim that ENDS contain fewer carcinogens than traditional cigarettes, and believe that this aligns with harm reduction by respecting the autonomy of smokers. Chapman et al. (2019) support this perspective, noting that as vaping rises, adolescent smoking rates are dropping, though debates persist around the causative potential of this argument.

In India, cultural barriers and limited support make quitting smoking more challenging. Legalising ENDS could assist adults in their efforts to stop smoking, offering better choices for those who find it hard to quit on their own. Regulation could also reduce the risks of dual use (Prakash et al. 2025).

On the other hand, those against legalisation emphasise ethical values that focus on protecting future generations from harm. Opponents warn that legalisation might normalise nicotine addiction again, reversing decades of anti-smoking efforts. Martinelli et al. (2021) found that e-cigarettes increase the likelihood of smoking among people who have never smoking. This raises concerns about a gateway effect that could affect young people. Shahab et al. point out biases in studies on the gateway effect, but Jackson et al. raise new concerns, showing that 7.1% of young adults who have never smoked are now vaping. Legalisation risks worsening addiction among a group already experiencing significant exposure to nicotine and second-hand smoke, and undermine cessation efforts particularly given India's socioeconomic inequalities.

The point of contention lies in balancing adult rights and protecting youth populations while promoting fairness. Legalisation could result in many non-smokers in India developing new addictions, making it difficult to enforce bans on flavours or nicotine and raising social justice concerns. Prohibition limits smokers' freedom of choice, which could perpetuate the cycle of addiction. A careful ethical consideration requires strong regulations, including age checks, flavour restrictions, and marketing bans as mentioned previously, to protect vulnerable groups. Tattan-Birch et al. support such strategies, which align with India's commitments to the FCTC.

Section 4.1.6: Implications of Harm-Reduction and cessation Strategies on Producers

For tobacco producers, ENDS and TFNP present both challenges and opportunities. While traditional cigarette and SLT demand may decline, the transition to harm-reducing alternatives' manufacturing can leverage existing supply chains and nicotine extraction capabilities. Tobacco-extracted nicotine offers economic advantages over synthetic alternatives, being approximately 4 times less expensive to produce while maintaining virtually equivalent pharmacological properties (John Baker, 2025; Nisathar et al., 2024). This cost differential provides tobacco producers with competitive advantages in ENDS liquid manufacturing or nicotine extraction for stimulant manufacturing, potentially offsetting revenue losses from declining cigarette and SLT sales. Moreover, thriving export markets ensure that existing tobacco farmers will not be heavily impacted by domestic declines in demand within the short to medium term. However, the Indian government must look to protect farmers' welfare, especially because a majority of the tobacco farming community is constituted by smallholder and marginal farmers who may lack the capital to weather sustained falls in commodity prices (Vinayak Prasad, 2007).

Section 4.2: Production Curtailment

The persistence of tobacco cultivation across 400,000 hectares, involving approximately 6 million farmers, necessitates comprehensive production curtailment policies that address not only demand and consumption, but also supply-side dynamics. While existing interventions have demonstrated limited

success, strategic improvements to production-side policies could significantly accelerate tobacco cultivation decline while ensuring farmer welfare and food security.

Section 4.2.1: Existing Frameworks

India's existing production curtailment efforts operate through multiple mechanisms, though with varying degrees of effectiveness. The Crop Diversification Programme, implemented across tobacco-growing states, has facilitated the transition of 111889 acres from tobacco to alternative crops by 2022 (Ministry of Agriculture and Farmers Welfare, 2022). Despite these policy intentions, challenges remain in translating subsidies into sustained reductions in tobacco acreage. Tobacco enjoys resilience in certain Indian regions, thanks to both state-supported inputs and its suitability for local agro-ecologies; it can provide higher returns and offer flexibility in marketing (especially when farmers cure and store the crop themselves). Widespread adoption of retaliatory policies is hampered by market uncertainties, input risks, and persistent support from statutory bodies like the Tobacco Board.

For such curtailment strategies to succeed, evidence from both global recommendations and local fieldwork emphasises several improvements. Transition policies must be tailored to local conditions—promoting drought-resistant or high-value crops where appropriate, rather than imposing a one-size-fits-all approach. Assured market access is vital; developing storage, procurement, and cooperative structures for alternative crops can offer the security that has made tobacco attractive. Reform is also needed in subsidy allocation: as long as tobacco receives preferential credit, insurance, and seed support, farmer incentives for crop switching will remain muted (Natarajan et al., 2018; Walia and Goel, 2023; Lencucha et al., 2022).

Section 4.2.2: Environmental Frameworks

Tobacco cultivation imposes severe environmental costs, with research demonstrating that tobacco depletes soil nutrients faster than other crops and requires 600 million trees annually for production and curing processes (Novotny et al., 2015). Studies reveal tobacco farming reduces soil organic matter and increases erosion rates faster than other crops, while requiring more water per kilogram of yield (Ali et al., 2023). India could implement mandatory environmental impact assessments for tobacco cultivation, requiring farmers to demonstrate compliance with soil conservation, water usage, and pesticide management standards, potentially internalising environmental externalities currently ignored. Water quality monitoring presents another enforcement avenue, as tobacco cultivation often relies on saline water, degrading soil health while creating unfair cost advantages over food crops (Novotny et al., 2015). Implementing mandatory water quality testing with penalties for violations would eliminate these cost distortions.

Section 4.2.3: Labour Frameworks

Child labour and labour protection enforcement represent a critical but underutilised production curtailment mechanism that addresses both human rights concerns and operational costs. Research demonstrates that children working in tobacco fields absorb nicotine equivalent to smoking 50 cigarettes daily, leading to "green tobacco sickness" affecting one in four workers (Walia and Goel, 2023). Third-party monitoring systems could create automatic license suspension for child labour violations, requiring mandatory age verification, regular workplace inspections, and immediate remediation measures, including removal of children from hazardous work environments (Athena K. Ramos, 2018). Additionally, strict welfare requirements for all agricultural workers, including housing standards, health insurance, and wage protections, would increase compliance costs relative to alternative crops with less hazardous working conditions. These compliance requirements substantially increase operational costs while protecting vulnerable populations.

CONCLUSION

India's tobacco epidemic, encompassing 270 million users and imposing economic costs exceeding USD 35 billion annually, demands comprehensive policy interventions that transcend traditional demand-side approaches. This analysis examined two strategic policy frameworks: harm reduction through regulated nicotine alternatives and supplementary cessation strategies, as well as comprehensive production curtailment mechanisms. Each approach addresses different dimensions of tobacco's multifaceted challenge while offering synergistic pathways toward reducing India's tobacco burden.

Section 5.1: Identified Strategies

The harm-reduction strategy, centred on regulated ENDS and tobacco-free nicotine pouches, presents immediate opportunities to reduce smoking-attributable mortality and morbidity among India's existing tobacco users. Evidence demonstrates that complete transitions to these alternatives can significantly reduce toxicant exposure while providing effective cessation support. However, implementation requires stringent regulatory frameworks addressing youth access, flavour restrictions, product toxicology, and marketing controls to prevent unintended consequences, including gateway effects, dual-use patterns, etc. The cessation strategies which complement harm-reduction include nicotine content and flavour restrictions on existing tobacco products, as well as a comprehensive and sweeping ban on the sale of loose/ single cigarettes. Production curtailment through alternative crop subsidies and transition policies can offer a long-term structural transformation of India's tobacco landscape. Current initiatives have facilitated the transition of over 111,000 acres from tobacco cultivation, demonstrating their feasibility. However, potential impediments to crop-substitution, including market uncertainties and persistent subsidies, must be addressed by the government.

Section 5.2: Policy Priority

Based on the economic impact, long-term effects, and cost of implementation, the government should prioritise production curtailment strategies over harm-reduction and cessation strategies, as the primary intervention framework. The potential food security benefits alone—redirecting 400,000 hectares could produce millions of tonnes of essential crops, including rice, sugarcane, and vegetables—align with national food security imperatives whilst addressing tobacco control objectives. The economic multiplier effects of supporting 6 million farmers' transitions to sustainable agriculture exceed the immediate health cost savings from harm-reduction and cessation approaches; at any rate, throttling the supply of raw tobacco in India would drive domestic raw material costs higher, inevitably leading to increased prices for consumers. Moreover, production curtailment addresses the root causes rather than managing consequences. However, the opportunity costs of prioritising one policy branch over the other, as well as those imposed on opposing parties must be carefully managed, ensuring that affected stakeholders are provided with adequate transition support. For tobacco farmers, guaranteed market access for alternative crops, enhanced credit facilities, and skill development programs would mitigate income losses during transition periods. On the contrary, farmer livelihoods cannot be cited, by the government, as an excuse to nurture an industry that kills half its consumers, while actively preventing those currently bondaged to tobacco use from consuming less harmful alternatives.

Section 5.3: Limitations

While suggestions posited are backed by sound evidence, this paper is not without its limitations. The analysis examined policy frameworks largely in isolation without considering interactions with existing taxation mechanisms, advertising restrictions, or spatial consumption bans that constitute India's current tobacco control infrastructure. Additionally, the geographic focus on India limits direct applicability to countries with different agricultural systems, regulatory frameworks, or tobacco consumption patterns. Future research should model combined policy effects and potential synergies between demand-side and supply-side interventions. Ultimately, this paper still serves as a starting point for policymakers when considering alternative policies to curtail tobacco prevalence.

REFERENCES

Aaron, D. G., Wallace, C. R., & Sinha, M. S. (2023). Including E-Cigarettes in the FDA Rule Limiting Nicotine. JAMA, 330(12), 1129–1130. https://doi.org/10.1001/JAMA.2023.14254

Agrawal, S., Angus, K., Arnott, D., Ashcroft, R., Aveyard, P., Barry, R., Bauld, L., Beard, E., Benowitz, N., Bogdanovica, I., Braznell, S., Brennan, A., Britton, J., Brown, J., Bunce, L., Butler, A., Butler, S., Cheeseman, H., Cox, S., … Wilson, L. (2024). E-cigarettes and harm reduction: An evidence review. Royal College of Physicians. https://nottingham-repository.worktribe.com/output/34623125

Aladeokin, A., & Haighton, C. (2019). Is adolescent e-cigarette use associated with smoking in the United Kingdom?: A systematic review with meta-analysis. Tobacco Prevention & Cessation, 5(April), 15. https://doi.org/10.18332/TPC/108553

Ali, M. Y., Shahrier, M., Kafy, A. Al, Ara, I., Javed, A., Fattah, M. A., Rahaman, Z. A., & Tripura, K. (2023). Environmental impact assessment of tobacco farming in northern Bangladesh. Heliyon, 9(3), e14505. https://doi.org/10.1016/J.HELIYON.2023.E14505

Alizadehgharib, S., Lehrkinder, A., Alshabeeb, A., Östberg, A. K., & Lingström, P. (2022). The effect of a non-tobacco-based nicotine pouch on mucosal lesions caused by Swedish smokeless tobacco (snus). European Journal of Oral Sciences, 130(4), e12885. https://doi.org/10.1111/EOS.12885;PAGE:STRING:ARTICLE/CHAPTER

Apelberg, B. J., Feirman, S. P., Salazar, E., Corey, C. G., Ambrose, B. K., Paredes, A., Richman, E., Verzi, S. J., Vugrin, E. D., Brodsky, N. S., & Rostron, B. L. (2018). Potential Public Health Effects of Reducing Nicotine Levels in Cigarettes in the United States. New England Journal of Medicine, 378(18), 1725–1733. https://doi.org/10.1056/NEJMSR1714617/SUPPL_FILE/NEJMSR1714617_DISCLOSURES.PDF

Bandi, P., Star, J., Minihan, A. K., Patel, M., Nargis, N., & Jemal, A. (2023). Changes in E-Cigarette Use Among U.S. Adults, 2019–2021. American Journal of Preventive Medicine, 65(2), 322–326. https://doi.org/10.1016/J.AMEPRE.2023.02.026

Benowitz, N. L., Donny, E. C., & Hatsukami, D. K. (2016). Reduced nicotine content cigarettes, e-cigarettes and the cigarette end game. Addiction (Abingdon, England), 112(1), 6. https://doi.org/10.1111/ADD.13534

Buckell, J., Marti, J., & Sindelar, J. L. (2019). Should flavours be banned in cigarettes and e-cigarettes? Evidence on adult smokers and recent quitters from a discrete choice experiment. Tobacco Control, 28(2), 168–175. https://doi.org/10.1136/TOBACCOCONTROL-2017-054165

Burton, R., Henn, C., Lavoie, D., O'Connor, R., Perkins, C., Sweeney, K., Greaves, F., Ferguson, B., Beynon, C., Belloni, A., Musto, V., Marsden, J., Sheron, N., & Wolff, A. (2016). The Public Health Burden of Alcohol and the Effectiveness and Cost-Effectiveness of Alcohol Control Policies An evidence review The Public Health Burden of Alcohol and the Effectiveness and Cost-Effectiveness of Alcohol Control Policies: An evidence review 2 About Public Health England. www.facebook.com/PublicHealthEngland

Carr, R., Alattar, S., Al-Rifai, L. A.-H., Morfett, H., & Khouja, J. N. (2025). Exploring the potential consequences of the disposable vape ban in the UK: a qualitative study with young adults who use disposable vapes. https://doi.org/10.31234/OSF.IO/CNYV8_V1

Chapman, F., McDermott, S., Rudd, K., Taverner, V., Stevenson, M., Chaudhary, N., Reichmann, K., Thompson, J., Nahde, T., & O'Connell, G. (2022). A randomised, open-label, cross-over clinical study to evaluate the pharmacokinetic, pharmacodynamic and safety and tolerability profiles of tobacco-free oral nicotine pouches relative to cigarettes. Psychopharmacology, 239(9), 2931–2943. https://doi.org/10.1007/S00213-022-06178-6/FIGURES/4

Chapman, S., Bareham, D., & Maziak, W. (2019). The Gateway Effect of E-cigarettes: Reflections on Main Criticisms. Nicotine & Tobacco Research, 21(5), 695–698. https://doi.org/10.1093/NTR/NTY067

Chhabra, A., Hussain, S., & Rashid, S. (2021). Recent trends of tobacco use in India. Journal of Public Health (Germany), 29(1), 27–36. https://doi.org/10.1007/S10389-019-01091-3

Coleman, S. R. M., Piper, M. E., Byron, M. J., & Bold, K. W. (2022). Dual Use of Combustible Cigarettes and E-cigarettes: a Narrative Review of Current Evidence. Current Addiction Reports, 9(4), 353–362. https://doi.org/10.1007/S40429-022-00448-1/METRICS

Cornelius, M. E., Wang, T. W., Jamal, A., Loretan, C. G., & Neff, L. J. (2020). Tobacco Product Use Among Adults — United States, 2019. MMWR. Morbidity and Mortality Weekly Report, 69(46), 1736–1742. https://doi.org/10.15585/MMWR.MM6946A4

COTPA 2003 and Rules Made Thereunder, National Health Mission (2018). https://nhm.gov.in/index4.php?lang=1&level=0&linkid=459&lid=692

DeCicca, P., Kenkel, D., & Lovenheim, M. F. (2022). The Economics of Tobacco Regulation: A Comprehensive Review. Journal of Economic Literature, 60(3), 883–970. https://doi.org/10.1257/JEL.20201482

Dhar, T., & Baylis, K. (2011). Fast-food consumption and the ban on advertising targeting children: The Quebec experience. Journal of Marketing Research, 48(5), 799–813. https://doi.org/10.1509/JMKR.48.5.799/SUPPL_FILE/FASTFOODCONSUMPTION.PDF

Dowd, A. N., Thrul, J., Czaplicki, L., Kennedy, R. D., Moran, M. B., & Spindle, T. R. (2024). A Cross-Sectional Survey on Oral Nicotine Pouches: Characterizing Use-Motives, Topography, Dependence Levels, and Adverse Events. Nicotine & Tobacco Research, 26(2), 245–249. https://doi.org/10.1093/NTR/NTAD179

England, L. J., Bunnell, R. E., Pechacek, T. F., Tong, V. T., & McAfee, T. A. (2015). Nicotine and the Developing Human: A Neglected Element in the Electronic Cigarette Debate. American Journal of Preventive Medicine, 49(2), 286–293. https://doi.org/10.1016/J.AMEPRE.2015.01.015,

Falarowski, C., Pieper, E., Rabenstein, A., Mallock-Ohnesorg, N., Burgmann, N., Franzen, K., Gertzen, M., Koller, G., Nowak, D., Rahofer, A., Rieder, B., de Oliveira Pinto Kise, G. R., Schulz, T., Strohmeyer, E., Laux, P., Luch, A., & Rüther, T. (2025). Disposable e-cigarettes and their nicotine delivery, usage pattern, and subjective effects in occasionally smoking adults. Scientific Reports, 15(1), 1–10. https://doi.org/10.1038/S41598-025-97491-5;SUBJMETA=459,476,692,699,700;KWRD=DISEASE+PREVENTION,PSYCHIATRIC+DISORDERS

Feeney, S., Rossetti, V., & Terrien, J. (2022a). E-Cigarettes—a review of the evidence—harm versus harm reduction. Tobacco Use Insights, 15. https://doi.org/10.1177/1179173X221087524

Feeney, S., Rossetti, V., & Terrien, J. (2022b). E-Cigarettes—a review of the evidence—harm versus harm reduction. Tobacco Use Insights, 15, 1179173X2210875. https://doi.org/10.1177/1179173X221087524

Flavour accessories in tobacco products enhance attractiveness and appeal. (2025).

Food Safety and Standards Act 2006 (2006). https://fssai.gov.in/upload/uploadfiles/files/FOOD-ACT.pdf

Foxon, F., Selya, A., Gitchell, J., & Shiffman, S. (2024). Increased e-cigarette use prevalence is associated with decreased smoking prevalence among US adults. Harm Reduction Journal, 21(1), 1–11. https://doi.org/10.1186/S12954-024-01056-0/TABLES/2

Freisthler, B., & Gruenewald, P. J. (2014). Examining the relationship between the physical availability of medical marijuana and marijuana use across fifty California cities. Drug and Alcohol Dependence, 143(1), 244–250. https://doi.org/10.1016/J.DRUGALCDEP.2014.07.036

Friedman, A. S., & Pesko, M. F. (2022). Young adult responses to taxes on cigarettes and electronic nicotine delivery systems. Addiction, 117(12), 3121–3128. https://doi.org/10.1111/ADD.16002;PAGEGROUP:STRING:PUBLICATION

GATS 2 Global Adult Tobacco Survey GATS Objectives GATS 2 Highlights. (2017).

Global Adult Tobacco Survey (GATS) Fact Sheet 2009-2010. (n.d.). Retrieved July 19, 2025, from https://cdn.who.int/media/docs/default-source/ncds/ncd-surveillance/data-reporting/india/gats/gats-2009-india-fact-sheet.pdf?sfvrsn=adcaa00f_2&download=true#page=3.00

Goel, S., Tripathy, J., Singh, R., & Lal, P. (2014). Smoking trends among women in India: Analysis of nationally representative surveys (1993-2009). South Asian Journal of Cancer, 3(4), 200–200. https://go.gale.com/ps/i.do?p=HRCA&sw=w&issn=2278330X&v=2.1&it=r&id=GALE%7CA392473760&sid=googleScholar&linkaccess=fulltext

Goodchild, M., Nargis, N., & D'Espaignet, E. T. (2018). Global economic cost of smoking-attributable diseases. Tobacco Control, 27(1), 58–64. https://doi.org/10.1136/TOBACCOCONTROL-2016-053305

Grandolfo, E., Ogden, H., Fearon, I. M., Malt, L., Stevenson, M., Weaver, S., & Nahde, T. (2024). Tobacco-Free Nicotine Pouches and Their Potential Contribution to Tobacco Harm Reduction: A Scoping Review. Cureus, 16(2), e54228. https://doi.org/10.7759/CUREUS.54228

Guindon, G. E., Zhao, K., Fatima, T., Garasia, S., Quinn, N., Baskerville, N. B., & Paraje, G. (2022). Prices, taxes and alcohol use: a systematic umbrella review. Addiction, 117(12), 3004–3023. https://doi.org/10.1111/ADD.15966

Gupta, R., Bhatt, G., Singh, R., Chahar, P., Goel, S., & Singh, R. J. (2025). Enforcement of COTPA in India- current status, challenges and solutions. Indian Journal of Tuberculosis, 72(1), 94–97. https://doi.org/10.1016/J.IJTB.2024.06.007

Hall, W. (2010). What are the policy lessons of National Alcohol Prohibition in the United States, 1920–1933? Addiction, 105(7), 1164–1173. https://doi.org/10.1111/J.1360-0443.2010.02926.X

Hatsukami, D. K., & Carroll, D. M. (2020a). Tobacco harm reduction: Past history, current controversies and a proposed approach for the future. Preventive Medicine, 140, 106099. https://doi.org/10.1016/J.YPMED.2020.106099

Hatsukami, D. K., & Carroll, D. M. (2020b). Tobacco harm reduction: Past history, current controversies and a proposed approach for the future. Preventive Medicine, 140, 106099. https://doi.org/10.1016/J.YPMED.2020.106099

Higgins, S. T., Sigmon, S. C., Tidey, J. W., Heil, S. H., Gaalema, D. E., Lee, D. C., Desarno, M. J., Klemperer, E. M., Menson, K. E., Cioe, P. A., Plucinski, S., Wiley, R. C., & Orr, E. (2024). Reduced Nicotine Cigarettes and E-Cigarettes in High-Risk Populations: 3 Randomized Clinical Trials. JAMA Network Open, 7(9), e2431731–e2431731. https://doi.org/10.1001/JAMANETWORKOPEN.2024.31731

Illicit Trade | Tobacco Atlas. (2023, March 29). The Tobacco Atlas. https://tobaccoatlas.org/challenges/illicit-trade/

Jackson, S. E., Tattan-Birch, H., Shahab, L., & Brown, J. (2024). Trends in long term vaping among adults in England, 2013-23: population based study. BMJ, 386. https://doi.org/10.1136/BMJ-2023-079016

Jackson, S. E., Tattan-Birch, H., Shahab, L., Oldham, M., Kale, D., Brose, L., & Brown, J. (2024). Who would be affected by a ban on disposable vapes? A population study in Great Britain. Public Health, 227, 291–298. https://doi.org/10.1016/J.PUHE.2023.12.024

Jafari, A., Rajabi, A., Gholian-Aval, M., Peyman, N., Mahdizadeh, M., & Tehrani, H. (2021). National, regional, and global prevalence of cigarette smoking among women/females in the general population: a systematic review and meta-analysis. Environmental Health and Preventive Medicine 2021 26:1, 26(1), 1–13. https://doi.org/10.1186/S12199-020-00924-Y

Jain, Y. K., Bhardwaj, P., Joshi, N. K., Gupta, M. K., Goel, A. D., & Sharma, P. P. (2023). Death, Disability, and Premature Life Years Lost Due to Cigarettes, Bidis, and Smokeless Tobacco in India: A Comparative Assessment. Addiction & Health, 15(1), 53. https://doi.org/10.34172/AHJ.2023.1420

Jain, Y. K., Bhardwaj, P., Joshi, N. K., Singh, P. K., Lal, P., Kapoor, S., Gupta, M. K., Goel, A. D., Sharma, P. P., & Singh, S. (2024). India's environmental burden of tobacco use and its policy implications. The Lancet Regional Health - Southeast Asia, 20, 100329. https://doi.org/10.1016/j.lansea.2023.100329

Jeong, M., Weiger, C., Uriarte, C., Wackowski, O. A., & Delnevo, C. D. (2024). Youth attention, perceptions, and appeal in response to e-cigarette advertising features: A focus group study. Preventive Medicine Reports, 44, 102789. https://doi.org/10.1016/J.PMEDR.2024.102789

Jerzyński, T., & Stimson, G. V. (2023). Estimation of the global number of vapers: 82 million worldwide in 2021. Drugs, Habits and Social Policy, 24(2), 91–103. https://doi.org/10.1108/DHS-07-2022-0028

Jerzyński, T., Stimson, G. V., Shapiro, H., & Król, G. (2021). Estimation of the global number of e-cigarette users in 2020. Harm Reduction Journal, 18(1), 1–10. https://doi.org/10.1186/S12954-021-00556-7/FIGURES/5

John, R. M., & Dauchy, E. P. (2022). Healthcare Costs Attributable to Secondhand Smoke Exposure Among Indian Adults. Nicotine and Tobacco Research, 24(9), 1478–1486. https://doi.org/10.1093/NTR/NTAC048,

John, R. M., Narayanan, B., Chakravarthy, S., Bharathi, S., Sinha, P., Munish, V. G., & Goodchild, M. (2024). Economy-wide impact of a reduction in tobacco use in India. Tobacco Control. https://doi.org/10.1136/TC-2023-058471

John, R. M., Sinha Pgdm, P., Gill, V., Pgdbm, M., & Tullu, F. T. (2020). Economic Costs of Diseases and Deaths Attributable to Tobacco Use in India, 2017-2018. Nicotine & Tobacco Research, 2020, 1–8. https://doi.org/10.1093/ntr/ntaa154

Kapoor, S., Mehra, R., Yadav, A., Lal, P., & Singh, R. J. (2021). Banning Loose Cigarettes and Other Tobacco Products in India: A Policy Analysis. Asian Pacific Journal of Cancer Prevention, 22(S2), 51–57. https://doi.org/10.31557/APJCP.2021.22.S2.51

Katz, S. J., Erkkinen, M., Lindgren, B., & Hatsukami, D. (2018). Assessing the Impact of Conflicting Health Warning Information on Intentions to Use E-Cigarettes -An Application of the Heuristic-Systematic Model. Journal of Health Communication, 23(10–11), 874–885. https://doi.org/10.1080/10810730.2018.1533052

Kilian, C., Lemp, J. M., Llamosas-Falcón, L., Carr, T., Ye, Y., Kerr, W. C., Mulia, N., Puka, K., Lasserre, A. M., Bright, S., Rehm, J., & Probst, C. (2023). Reducing alcohol use through alcohol control policies in the general population and population subgroups: a systematic review and meta-analysis. EClinicalMedicine, 59, 101996. https://doi.org/10.1016/j.eclinm.2023.101996

Kim, C. Y., Paek, Y. J., Seo, H. G., Cheong, Y. S., Lee, C. M., Park, S. M., Park, D. W., & Lee, K. (2020). Dual use of electronic and conventional cigarettes is associated with higher cardiovascular risk factors in Korean men. Scientific Reports, 10(1), 1–10. https://doi.org/10.1038/S41598-020-62545-3;SUBJMETA=163,2037,2743,476,499,5,692,699;KWRD=ADDICTION,METABOLIC+SYNDROME,RISK+FACTORS

Klein, D. E., Chaiton, M., Kundu, A., & Schwartz, R. (2020). A Literature Review on International E-cigarette Regulatory Policies. Current Addiction Reports, 7(4), 509–519. https://doi.org/10.1007/S40429-020-00332-W/METRICS

Kulkarni, V., & Kurmanath, K. (2025, March 21). India's tobacco exports double over last 4 years, likely to top $2 billion this fiscal - The Hindu BusinessLine. The Hindu Business Line. https://www.thehindubusinessline.com/economy/agri-business/indias-tobacco-exports-double-over-last-4-years-likely-to-top-2-billion-this-fiscal/article69358268.ece

Lencucha, R., Drope, J., Magati, P., & Sahadewo, G. A. (2022). Tobacco farming: overcoming an understated impediment to comprehensive tobacco control. Tob Control, 31, 308–312. https://doi.org/10.1136/tobaccocontrol-2021-056564

Mallock, N., Schulz, T., Malke, S., Dreiack, N., Laux, P., & Luch, A. (2024). Levels of nicotine and tobacco-specific nitrosamines in oral nicotine pouches. Tobacco Control, 33(2), 193–199. https://doi.org/10.1136/TC-2022-057280

Martinelli, T., Candel, M. J. J. M., De Vries, H., Talhout, R., Knapen, V., Van Schayck, C. P., & Nagelhout, G. E. (2023). Exploring the gateway hypothesis of e-cigarettes and tobacco: a prospective replication study among adolescents in the Netherlands and Flanders. Tobacco Control, 32(2), 170–178. https://doi.org/10.1136/TOBACCOCONTROL-2021-056528

Martins-Green, M., Adhami, N., Frankos, M., Valdez, M., & Goodwin, B. (2014). Cigarette Smoke Toxins Deposited on Surfaces: Implications for Human Health. PLoS ONE, 9(1), 86391. https://doi.org/10.1371/journal.pone.0086391

Mays, D., Long, L., Alalwan, M. A., Wagener, T. L., Shang, C., Roberts, M. E., Patterson, J. G., & Keller-Hamilton, B. (2023). The Effects of Oral Nicotine Pouch Packaging Features on Adult Tobacco Users' and Non-Users' Product Perceptions. International Journal of Environmental Research and Public Health 2023, Vol. 20, Page 3383, 20(4), 3383. https://doi.org/10.3390/IJERPH20043383

Mbulo, L., Palipudi, K. M., Andes, L., Morton, J., Bashir, R., Fouad, H., Ramanandraibe, N., Caixeta, R., Dias, R. C., Wijnhoven, T. M. A., Kashiwabara, M., Sinha, D. N., & D'Espaignet, E. T. (2016). Secondhand smoke exposure at home among one billion children in 21 countries: Findings from the global adult tobacco survey (GATS). Tobacco Control, 25(e2), e95–e100. https://doi.org/10.1136/TOBACCOCONTROL-2015-052693,

Meernik, C., Baker, H. M., Kowitt, S. D., Ranney, L. M., & Goldstein, A. O. (2019). Impact of non-menthol flavours in e-cigarettes on perceptions and use: an updated systematic review. BMJ Open, 9(10), e031598. https://doi.org/10.1136/BMJOPEN-2019-031598

Muth, N. D., Dietz, W. H., Magge, S. N., Johnson, R. K., Bolling, C. F., Armstrong, S. C., Haemer, M. A., Muth, N. D., Rausch, J. C., & Rogers, V. W. (2019). Public policies to reduce sugary drink consumption in children and adolescents. Pediatrics, 143(4). https://doi.org/10.1542/PEDS.2019-0282/37217

Myers Smith, K., Phillips-Waller, A., Pesola, F., McRobbie, H., Przulj, D., Orzol, M., & Hajek, P. (2022). E-cigarettes versus nicotine replacement treatment as harm reduction interventions for smokers who find quitting difficult: randomized controlled trial. Addiction, 117(1), 224–233. https://doi.org/10.1111/ADD.15628

Natarajan, N. (2018). Moving past the problematisation of tobacco farming: insights from South India. Tobacco Control, 27(3), 272–277. https://doi.org/10.1136/TOBACCOCONTROL-2016-053471

National Academies of Sciences, E. and M. (2018). Public Health Consequences of E-Cigarettes. Public Health Consequences of E-Cigarettes. https://doi.org/10.17226/24952

National Family Health Survey (NFHS-5), 2019-21: India: Volume I. (2022). http://www.rchiips.org/nfhs

Nisathar, A., Chen, H., Lei, X., Zeng, Z., & Chen, J. (2024). Comparison of genotoxic impurities in extracted nicotine vs. synthetic nicotine. Frontiers in Chemistry, 12, 1483868. https://doi.org/10.3389/FCHEM.2024.1483868/FULL

Novotny, T. E., Bialous, S. A., Burt, L., Curtis, C., da Costa, V. L., Iqtidar, S. U., Liu, Y., Pujari, S., & D'Espaignet, E. T. (2015). Impacts environnementaux et sanitaires de la culture du tabac, de la fabrication de cigarettes et de leur consummation. Bulletin of the World Health Organization, 93(12), 877–880. https://doi.org/10.2471/BLT.15.152744

Novotny, T. E., Bialous, S. A., Burt, L., Curtis, C., Luiza Da Costa, V., Usman Iqtidar, S., Liu, Y., Pujari, S., & Tursan D'espaignet, & E. (2015). The environmental and health impacts of tobacco agriculture, cigarette manufacture and consumption. Bull World Health Organ, 93. https://doi.org/10.2471/BLT.15.152744

Padon, A. A., Maloney, E. K., & Cappella, J. N. (2017). Youth-Targeted E-cigarette Marketing in the US. Tobacco Regulatory Science, 3(1), 95. https://doi.org/10.18001/TRS.3.1.9

Pahari, S. (2022). Environment and its protection from tobacco: a step towards tobacco end game, a perspective from India. International Journal of Community Medicine and Public Health Pahari S. Int J Community Med Public Health, 9(11), 4273–4278. https://doi.org/10.18203/2394-6040.ijcmph20222925

Pepper, J. K., Ribisl, K. M., & Brewer, N. T. (2016). Adolescents' interest in trying flavoured e-cigarettes. Tobacco Control, 25(Suppl 2), ii62–ii66. https://doi.org/10.1136/TOBACCOCONTROL-2016-053174

Peruga, A., López, M. J., Martinez, C., & Fernández, E. (2021). Tobacco control policies in the 21st century: achievements and open challenges. Molecular Oncology, 15(3), 744–752. https://doi.org/10.1002/1878-0261.12918,

Pettigrew, S., Alvin Santos, J., Miller, M., Sudhir Raj, T., Jun, M., Morelli, G., & Jones, A. (2023). E-cigarettes: A continuing public health challenge in India despite comprehensive bans. Preventive Medicine Reports, 31, 102108. https://doi.org/10.1016/J.PMEDR.2022.102108

Prakash, Jyoti et al. "Vaping: The emerging epidemic and its psychiatric implications in India." Industrial psychiatry journal vol. 34,1 (2025): 1-3. doi:10.4103/ipj.ipj_465_24

Press Release:Press Information Bureau. (n.d.). Retrieved August 29, 2025, from https://www.pib.gov.in/PressReleasePage.aspx?PRID=1847512

Raitasalo, K., Bye, E. K., Pisinger, C., Scheffels, J., Tokle, R., Kinnunen, J. M., Ollila, H., & Rimpelä, A. (2022). Single, Dual, and Triple Use of Cigarettes, e-Cigarettes, and Snus among Adolescents in the Nordic Countries. International Journal of Environmental Research and Public Health, 19(2), 683. https://doi.org/10.3390/IJERPH19020683/S1

Ramos, A. K. (2018). Child Labor in Global Tobacco Production: A Human Rights Approach to an Enduring Dilemma. Health and Human Rights, 20(2), 235. https://pmc.ncbi.nlm.nih.gov/articles/PMC6293346/

Raw Tobacco in India Trade | The Observatory of Economic Complexity. (2023). The Observatory of Economic Complexity. https://oec.world/en/profile/bilateral-product/raw-tobacco/reporter/ind

Sakhuja, M., Macauda, M. M., Thrasher, J. F., Hebert, J. R., Pednekar, M. S., Gupta, P. C., & Friedman, D. B. (2024). "The ban is there, but it is not there": perceptions of cigarette users and tobacco vendors

regarding ban on the sale of loose cigarettes in India. Frontiers in Public Health, 12, 1375113. https://doi.org/10.3389/FPUBH.2024.1375113/BIBTEX

Shahab, L., Beard, E., & Brown, J. (2021). Association of initial e-cigarette and other tobacco product use with subsequent cigarette smoking in adolescents: a cross-sectional, matched control study. Tobacco Control, 30(2), 212–220. https://doi.org/10.1136/TOBACCOCONTROL-2019-055283

Sharma, A. D., Raghavan, R., Garg, S., Aggarwal, P., Kishore, S., & Bera, O. P. (2023). Challenges of Second-hand Smoke: Are We Asking the Right Questions? Indian Journal of Community Health, 35(1), 04–08. https://doi.org/10.47203/IJCH.2023.V35I01.002

Siegfried, N., Pienaar, D. C., Ataguba, J. E., Volmink, J., Kredo, T., Jere, M., & Parry, C. D. H. (2014). Restricting or banning alcohol advertising to reduce alcohol consumption in adults and adolescents. Cochrane Database of Systematic Reviews, 2017(12). https://doi.org/10.1002/14651858.CD010704.PUB2/MEDIA/CDSR/CD010704/IMAGE_N/NCD010704-CMP-007-01.PNG

Smith, M. J., & Hilton, S. (2023). Youth's exposure to and engagement with e-cigarette marketing on social media: a UK focus group study. BMJ Open, 13(8), e071270. https://doi.org/10.1136/BMJOPEN-2022-071270

Smith, T. T., Hatsukami, D. K., Benowitz, N. L., Colby, S. M., McClernon, F. J., Strasser, A. A., Tidey, J. W., White, C. M., & Donny, E. C. (2018). Whether to push or pull? Nicotine reduction and non-combusted alternatives - Two strategies for reducing smoking and improving public health. Preventive Medicine, 117, 8–14. https://doi.org/10.1016/J.YPMED.2018.03.021

Smoking, vaping, HTP, NRT and snus in India — Global State of Tobacco Harm Reduction. (n.d.). Retrieved August 10, 2025, from https://gsthr.org/countries/profile/ind/

Sokol, N. A., & Feldman, J. M. (2021). High School Seniors Who Used E-Cigarettes May Have Otherwise Been Cigarette Smokers: Evidence From Monitoring the Future (United States, 2009–2018). Nicotine & Tobacco Research, 23(11), 1958–1961. https://doi.org/10.1093/NTR/NTAB102

St.Helen, G. (2024). Commentary on Keller-Hamilton et al. : Oral nicotine pouches provide a less controversial route for tobacco harm reduction than electronic cigarettes. Addiction, 119(3), 476–477. https://doi.org/10.1111/ADD.16437

Synthetic Nicotine vs. Natural Nicotine: How They Differ. (n.d.). Retrieved August 17, 2025, from https://labstat.com/understanding-synthetic-nicotine-and-how-it-is-regulated-in-canada/

Talih, S., Salman, R., El-Hage, R., Karam, E., Karaoghlanian, N., El-Hellani, A., Saliba, N., Eissenberg, T., & Shihadeh, A. (2021). Might limiting liquid nicotine concentration result in more toxic electronic cigarette aerosols? Tobacco Control, 30(3), 348–350. https://doi.org/10.1136/TOBACCOCONTROL-2019-055523

Tashakkori, N. A., Rostron, B. L., Christensen, C. H., & Cullen, K. A. (2025). Notes from the Field: E-Cigarette–Associated Cases Reported to Poison Centers — United States, April 1, 2022–March 31, 2023. MMWR. Morbidity and Mortality Weekly Report, 72(25), 694–695. https://doi.org/10.15585/MMWR.MM7225A5

The Prohibition of Electronic Cigarettes Act 2019, The Gazette of India Extraordinary (2019). https://ntcp.mohfw.gov.in/assets/document/The-Prohibition-of-Electronic-Cigarettes-Production-Manufacture-Import-Export-Transport-Sale-Distribution-Storage-and-Advertisement)-Act-2019.pdf

Tobacco Board. (n.d.). Retrieved July 29, 2025, from https://tobaccoboard.com/indentives.php

Tobacco exports marked a record Rs12,005 crores in FY2024 - The Tribune. (n.d.). Retrieved August 2, 2025, from https://www.tribuneindia.com/news/business/tobacco-exports-marked-a-record-rs12005-crores-in-fy2024/

Tobacco Industry and Exports India. (n.d.). Indian Trade Portal. Retrieved July 29, 2025, from https://indiantradeportal.in/vs.jsp?lang=0&id=0%2C31%2C24100%2C24123

Trade Statistics - Mcommerce. (n.d.-a). Retrieved August 2, 2025, from https://www.commerce.gov.in/trade-statistics/

Trade Statistics - Mcommerce. (n.d.-b). Retrieved July 20, 2025, from https://www.commerce.gov.in/trade-statistics/

Vinayak, D., & Prasad, M. (2007). Case study of tobacco cultivation and alternate crops in India.

Walia, D., & Goel, S. (2023a). Need to prioritize supply-side intervention for curbing tobacco epidemic in India. Indian Journal of Medical Research, 158(56), 466–469. https://doi.org/10.4103/IJMR.IJMR_1293_23

Walia, D., & Goel, S. (2023b). Need to prioritize supply-side intervention for curbing tobacco epidemic in India. Indian Journal of Medical Research, 158(56), 466–469. https://doi.org/10.4103/IJMR.IJMR_1293_23

Weng, X., Song, C. Y., Liu, K., Wu, Y. S., Lee, J. J., Guo, N., & Wang, M. P. (2025). Perceptions of and responses of young adults who use e-cigarettes to flavour bans in China: a qualitative study. Tobacco Control, 34(4), 436–442. https://doi.org/10.1136/TC-2023-058312

WHO FRAMEWORK CONVENTION ON TOBACCO CONTROL. (2005). www.who.int/fctc

WHO report on the global tobacco epidemic, 2025: warning about the dangers of tobacco. (2025). https://www.who.int/publications/i/item/9789240112063

WITS - About WITS. (n.d.). Retrieved August 2, 2025, from https://wits.worldbank.org/about_wits.html

Wu, G., Durante, K. A., & Melton, H. C. (2024). Pipe dreams: Cannabis legalization and the persistence of racial disparities in jail incarceration. Journal of Criminal Justice, 94, 102230. https://doi.org/10.1016/J.JCRIMJUS.2024.102230

Wu, J., Trifiro, B. M., Ranker, L. R., Origgi, J. M., Benjamin, E. J., Robertson, R. M., Bhatnagar, A., Stokes, A. C., Xuan, Z., Wijaya, D., Plummer, B., Cornacchione Ross, J., Fetterman, J. L., & Hong, T. (2024). Health Warnings on Instagram Advertisements for Synthetic Nicotine E-Cigarettes and Engagement. JAMA Network Open, 7(9), e2434434–e2434434. https://doi.org/10.1001/JAMANETWORKOPEN.2024.34434

Zafeiridou, M., Hopkinson, N. S., & Voulvoulis, N. (2018). Cigarette Smoking: An Assessment of Tobacco's Global Environmental Footprint Across Its Entire Supply Chain. Environmental Science and Technology, 52(15), 8087–8094. https://doi.org/10.1021/ACS.EST.8B01533/ASSET/IMAGES/LARGE/ES-2018-01533U_0003.JPEG