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Stochastic Scenario Modelling of Tobacco Taxation in Nepal: Evaluating 5–10 Year Pathways to Achieve a 75 Percent Tax Share

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Abstract: Tobacco consumption is a major public health and economic burden in Nepal, and taxation is a central policy tool for its reduction while increasing fiscal revenue. However, the most effective pathway to achieve the WHO-recommended 75 percent tax share under different reform timelines remains unclear. This study assesses whether 5-, 7-, or 10-year tobacco tax reform scenarios best achieve this benchmark while reducing consumption and prevalence in Nepal. Secondary data from the Cost Recovery and Revenue Estimator (CoRRE) from The Tobacco Atlas were used to construct baseline price and consumption pathways. A Monte Carlo simulation with 10,000 iterations was implemented in STATA v14 to incorporate uncertainty in key parameters, from most recent empirical evidence of price elasticity of demand, income elasticity of demand, inflation, income growth, and tax passthrough rates. Consumption was projected as a function of these variables, while prevalence was derived as a proportional transformation of consumption change. Results reveal that the 5-year accelerated scenario produces the largest and most consistent reductions in consumption and prevalence across all uncertainty bounds. The 7-year scenario yields moderate reductions but with uncertainty intervals crossing zero, indicating possible weak or non-significant effects. The 10-year scenario shows the weakest impact, with a high likelihood of negligible or positive consumption changes due to income growth offsetting price effects. In conclusion, faster tax escalation is more robust and effective in achieving the WHO 75 percent benchmark and reducing tobacco use in Nepal. Gradual reforms are more feasible politically but less reliable in public health impact.

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Policy should prioritize accelerated tax increases, alongside stronger enforcement against substitution and illicit trade, and future models should incorporate socioeconomic heterogeneity for improved precision.

Keywords: tobacco policy; taxation; scenario analysis; Monte Carlo; Nepal

1. Introduction

Nepal's tobacco governance has undergone a transformative transition, pivoting from the state-led expansion of industry during the late 20th century to a modern public-health-led model defined by fiscal interventions. This transformation is particularly notable given that Nepal lacked a formal tobacco taxation (generally called excise tax or sin tax) policy before 1990; instead, the government actively encouraged tobacco production and consumption. The trajectory of tobacco taxation and its related governance have gradually shifted from revenue collection to a public-health–led control movement [1]. Early promotion of tobacco products, including cigarettes, bidi, and tobacco leaves, to meet domestic demand was emphasized from the First Five-Year Plan (1956–1961) to the Seventh (1985–1990), including the establishment of the Janakpur Cigarette Factory and the Tobacco Development Board of Nepal [1]. However, by that time, advocacy efforts by civil society organizations and other non-state actors had prompted the Government of Nepal (GoN) to recognize the health risks associated with tobacco use and begin shifting its policy approach. It marked this shift by observing the World No Tobacco Day (WNTD), banning smoking in public places, mandating health warning messages on cigarette packages, and restricting tobacco advertisements across electronic and print media [2]. As a financial intervention, the first health tax, a tobacco-specific levy aimed at supporting public health, of one paisa (Nepalese currency, 0.01) was levied per stick of cigarette on 11 July 1993, and doubled per stick in 1994 [1]. This policy shift marked a transition from promoting tobacco production for economic purposes to recognizing tobacco control as a public health priority, leading to the introduction of the first health tax on cigarettes.

Despite the GoN's positive efforts, between 1993 and 2006, the implementation of anti-tobacco tax provisions was heavily delayed by corporate litigation, until concerted indirect pressure from the World Health Organization (WHO) and strategic public interest litigation by civil society coalitions ultimately forced a judicial resolution [2]. In the meantime, as adopted by the 56th World Health Assembly on 21 May 2003, and entering into force on 27 February 2005, the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) was a landmark international treaty aimed at combating the global tobacco epidemic. As the first treaty negotiated under the WHO, it is among the most widely ratified in the United Nations' (UN's) history [3]. Legal and obligatory measures were initiated only as and after Nepal signed the WHO FCTC on 3 December 2003 and officially ratified it on 7 November 2006 [4]. Following its ratification of the WHO FCTC, Nepal formally committed to developing and implementing comprehensive tobacco control policies, strategies, directives, and programs in line with its international obligations [3]. As a result, tobacco laws were endorsed after four years of ratification, on 11 April 2011.

Despite long-standing evidence from the WHO that elevating tobacco excise to at least 75 percent of retail price is the most potent with highest return of investment (ROI) and cost-effective instrument within the MPOWER framework [5], it remains the most underexploited policy intervention [6], especially in Nepalese context. The WHO's 2025 observatory data showed that Nepal leverages less than two-fifths (31.39%) of WHO-recommended benchmark, which is quite lower than neighboring countries such as Thailand (78.6%), Bangladesh (73.1%), and Sri Lanka (68.4%), which have already moved closer to or exceeded this threshold. Even other regional peers like Pakistan (60.9%) and India (58.3%) maintain considerably higher tax burdens than Nepal [7]. This paper aims to assess which of the 5-, 7-, or 10-year scenarios is the most effective in achieving the WHO-recommended level of 75.0 percent [4].

2. Data and Methods

2.1. Data Source

Secondary data were extracted from the Cost Recovery and Revenue Estimator (CoRRE) tool from The Tobacco Atlas (https://tobaccoatlas.org/corre/nepal/, accessed on 18 April 2026) [8] to estimate tobacco control outcomes in Nepal. To determine the impact of meeting the target of 75 percent tax share [4], two datasets were used: (i) in the first set, there were estimations of economic cost recoveries for various smoking prevalence rate reductions based on the 2022 smoking prevalence of 12.9 percent; and (ii) the second set contained estimations of projected cigarette prices and tax levels for meeting the target tax share for alternative implementation periods.

The two sets were reconciled by using the same smoking prevalence rate and taxation as baseline. The adult smoking prevalence of 12.9 percent as derived from the CoRRE database in the year 2022 is considered as the baseline since this was the latest rate that was estimated. Similarly, the year 2025 is taken as the policy baseline for forecasting the impact of tax implementation on smoking prevalence. There is no interpolation made between the years 2022 and 2025. Three policy scenarios were developed: a 5-year (accelerated), 7-year (strong), and 10-year (conservative) strategy to demonstrate the potential implementation timelines for the goal of increasing taxes on tobacco to the level recommended by the WHO (75%). This stochastic approach was aimed to evaluate a range of possible outcomes.

2.2. Modelling, Selection of Parameters and Analysis

A Monte Carlo simulation with 10,000 iterations was conducted using STATA v14 to incorporate parameter uncertainty. Parameter values of price elasticity of demand (PED), effective price change, income elasticity, and percentage change in cigarette consumption were simulated from normal probability distributions based on mean estimates, standard errors, and the passthrough values obtained from previous literature relevant to Nepal and comparable economies. The distributions were generated for 95 percent uncertainty intervals (UI) based on the 2.5th (3rd lowest value) and 97.5th (3rd highest value) percentiles of the simulated data. Inflation and income growth were included to capture real affordability effects over time. Similarly, smoking prevalence was calculated as 50 percent of the change in the proportion of cigarette use. Mean values and confidence intervals based on percentile measures of uncertainty were used for summarizing model outputs. It was possible to conduct a comparative analysis of alternative policy strategies using the simulation approach.

The model is based on the idea of a causal chain linking tobacco taxation policy to consumption and prevalence outcomes. In step 1, exogenous tax policy determines the planned annual cigarette price increase (pricechg), reflecting the intended fiscal intervention under each scenario. In step 2, this policy shock is transmitted into actual market prices through the passthrough parameter, generating the effective price change (eff_pricechg) faced by consumers. Step 3 translates this price and income environment into behavioral responses using price and income elasticities, producing the proportional change in cigarette consumption (conschg). Finally, step 4 converts this consumption response into new consumption levels (cons) and derives implied changes in smoking prevalence through an assumed decomposition of total consumption effects into participation and intensity components. Overall, the model captures how taxation influences affordability, which in turn reduces both cigarette consumption and smoking prevalence through economically grounded demand responses (Figure 1).

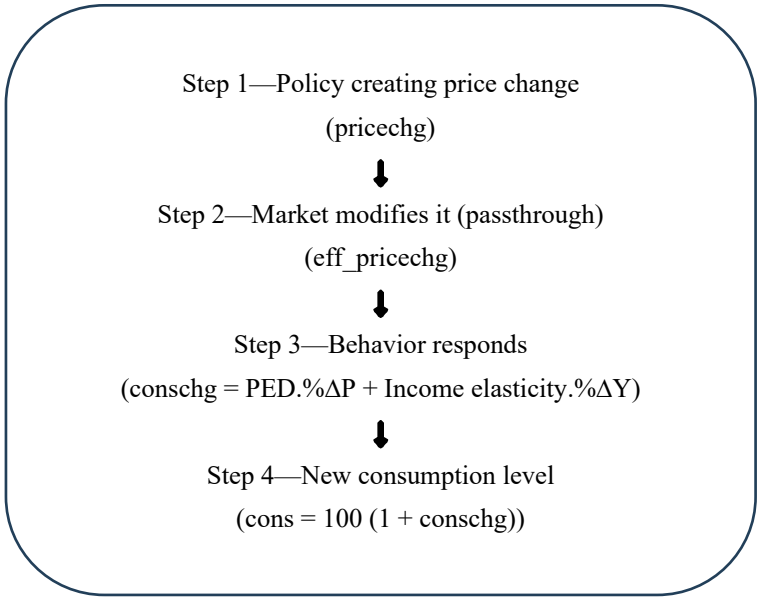

Figure 1. Proposed model structure.

The model specifies a structural simulation framework linking economic determinants of tobacco demand to consumption and prevalence outcomes, estimated through Monte Carlo methods with 10,000 stochastic draws.

$$\text{Tobacco consumption} = f(\text{PED, price change, income elasticity, inflation, income growth}) \quad (1)$$

In Equation (1), tobacco consumption is modeled as a functional relationship of key economic drivers: PED, effective price change, income elasticity, inflation, and income growth. This specification captures both price-driven substitution effects and income-driven affordability effects, while allowing macroeconomic conditions (inflation and income growth) to modify real purchasing power and consumption behavior. The Monte Carlo simulation introduces parameter uncertainty by repeatedly drawing from the distributions of these inputs, generating a probabilistic range of consumption outcomes rather than a single point estimate.

$$\text{Tobacco prevalence} = 0.5 \times \text{Tobacco consumption} \quad (2)$$

In Equation (2), following previous tobacco taxation studies, it was assumed that 50% of the reduction in cigarette consumption is attributable to a decline in smoking prevalence, while the remaining 50 percent reflects reduced smoking intensity among continuing smokers [9]. This is based on the general approach used in decomposing tobacco tax impact, which assumes that a reduction in the consumption of tobacco as a result of quitting or not initiating the habit as well as reducing the intensity of smoking. Since the contribution of both varies in different circumstances, the assumption should be taken as an approximation. Together, these equations allow estimation of both behavioral (consumption) and population-level (prevalence) impacts of taxation under uncertainty, producing policy-relevant distributions rather than deterministic outcomes.

For simulation, the model was parameterized using empirically estimated elasticities and macroeconomic indicators estimated for Nepal and similar economies. The price elasticity of demand of −0.576 (Standard Error, SE, 0.107) reflects a moderately inelastic but responsive cigarette demand, indicating that price increases significantly reduce consumption. An income elasticity of 1.058 (SE, 0.262) suggests tobacco behaves as a normal good with consumption increasing proportionally with income growth, reinforcing the role of affordability in shaping demand. This is crucial as the WHO (in 2023) estimated Nepal's affordability of the most sold brand cigarette was 22 percent (highly affordable; the higher the percent, the less affordable) [10]. Further, inflation (7.7%, SE 3.9) and income growth (4.4%, SE 4.0) are incorporated to adjust real purchasing power over time, ensuring that long-term simulations reflect changing economic conditions (Table 1).

Table 1. Selection of input parameters and uncertainties for tobacco tax simulation.

Variables	Mean (SE)/Range	Reference Period/Year	Reference	Remarks
Price elasticity of demand	−0.576 (0.107)	2015–2018	[11]	
Income elasticity	1.058 (0.262)	2015–2018	[11]	
Inflation	0.077 (0.039)	1981–2030	[12]	Average inflation rate
Income growth	0.044 (0.040)	2013–2022	[13]	GNI per capita growth in annual %
Passthroughs	0.85–1.25 (5-year: 1.05–1.25; 7-year: 0.95–1.15; 10-year: 0.85–1.05)		[14]	Oligopolistic, Low specific and VAT; 5-year overshifting, and 10-year undershifting risk

Passthrough rates are modelled as scenario-specific ranges (0.85–1.25), reflecting heterogeneity in tax transmission across market structures dominated by specific excise and VAT components. The 5-year scenario assumes higher passthrough (1.05–1.25) due to potential overshifting in oligopolistic market conditions, while the 7-year and 10-year scenarios incorporate lower ranges (0.95–1.15 and 0.85–1.05) reflecting increasing risks of partial undershifting over time. These parameters collectively capture both behavioral responsiveness and market imperfections in price formation. Together, they enable a robust simulation of consumption and revenue outcomes under alternative taxation trajectories (Table 1).

3. Results and Discussion

In Nepal, the macro-fiscal imbalance associated with tobacco use is substantial. In FY 2022/23, the total economic cost of tobacco use (both direct and indirect costs) was estimated at NPR 45.4 billion (approximately 1% of GDP), while tobacco tax revenues amounted to NPR 31.2 billion, offsetting only 68.7% of this burden. This gap suggests that tobacco taxation has not yet fully internalized the economic costs of tobacco use and highlights the potential for further fiscal gains through excise tax reform [15].

In addition to its fiscal justification, further tobacco tax increases appear to be politically feasible. Survey evidence from the Nepal Development Research Institute (NDRI) indicates that approximately three-quarters of the population (including a majority of smokers) support further increases in tobacco tax, providing additional support for more ambitious tobacco taxation policies [15].

A closer look at the tax structure further underscores these differences. Nepal relies primarily on specific excise (17%) and value-added tax (11.5%), with minimal contribution from other tax instruments, resulting in a relatively narrow and less effective tax base. In contrast, countries such as Bangladesh and Thailand employ a more diversified mix of ad valorem and specific taxes, while the Maldives and Afghanistan rely heavily on import duties, indicating varying strategic approaches to tobacco taxation. Importantly, higher-performing countries tend to combine multiple tax instruments, enhancing both revenue generation and price impact on consumers (Table 2).

Table 2. Percentage of retail price for tobacco tax in Nepal and neighboring countries [@]

Country	Specific Excise	Ad Valorem	Value Added Tax	Import Duties	Other Taxes	Total
Nepal	16.97	0.00	11.50	0.00	3.43	31.39
Bangladesh	0.00	57.69	14.42	0.00	0.96	73.08
Pakistan	43.91	0.00	15.25	0.00	1.74	60.91
Bhutan	0.00	19.67	0.00	3.93	0.00	23.60
India	28.92	2.09	21.88	0.00	5.37	58.25
Maldives	0.00	0.00	5.66	59.38	0.00	65.04
Sri Lanka	50.99	0.00	15.25	0.00	2.12	68.37
Afghanistan	0.00	0.00	0.00	20.68	0.00	20.68
Thailand	35.71	23.36	6.54	0.00	13.00	78.62

Data sourced from WHO, used in accordance with its data reuse policy; [@] Most sold brand of cigarettes (20 sticks) in 2024 except Afghanistan (2020) [7].

3.1. Tobacco Demand Elasticities by Consumption Behavior Among Nepalis

In 2008, WHO approximated that cigarettes, including tobacco and tobacco products have relatively inelastic demand and an increase of 10 percent in the price will lead to a reduction of four and eight percent consumption in developed and low- and middle-income (LMIC) nations, respectively [5]. Similarly, between 2003 and 2022, the income responsiveness of cigarette demand appears to have shifted drastically from weakly elastic (~0.18), where a 10 percent rise in income increased consumption by only 1.8 percent, to unitary or greater elasticity (1.06; 95% CI: 0.54–1.57) [11], indicating that cigarette consumption now rises in proportion to, or more marginally than, income growth. In such a demand environment, moderate or static tax adjustments are insufficient, as rising incomes will outpace price increases and sustain consumption.

In Nepalese context, the PED for tobacco increased from −0.88 in 2003 [16] to −0.58 in 2018 [11], indicating that a 10 percent increase in price was associated with a reduction in consumption of 8.8 percent earlier, compared to a smaller decline of 5.8 percent over the 15-year period, which infers that the smokers are less responsive in consumption to any changes in price. Moreover, the poor and the young population groups are the most sensitive to price changes[16]. Similarly, income elasticity of demand for tobacco was positive but small (0.18) in 2003, implying that ten percent rise in income led to 1.8 percent rise in tobacco consumption [16].

Using CoRRE, three progressive scenario-based taxation strategies were modelled for Nepal, taking the 2022 adult tobacco prevalence of 12.9 percent as baseline, with smoking-attributable national 15-year cumulative cost of NPR 215.32 billion. The modelling assumes a constant net-of-tax price (~USD 1.88 per pack), thereby isolating fiscal policy effects from industry pricing behavior. At baseline, the average retail cigarette price is USD 2.74 per pack, with total tax at USD 0.86 (31.39% of retail price). This tax share is substantially below than the 75 percent benchmark recommended under the WHO FCTC Article 6 guidelines. The baseline reflects limited fiscal leverage: despite a large national tobacco-attributable economic burden (USD 1826.77 million), the tax structure captures only a modest proportion of potential revenue and cost recovery. Under moderate tax escalation, prevalence reductions of 1–3 percentage points (11.9% to 9.9%) require retail price increases from USD 3.80 to USD 5.92 per pack. Correspondingly, total tax rises to USD 1.92–4.04 per pack, increasing the tax share to 50.52–68.24 percent. Expected national recovery ranges from USD 101.11 million (−1%) to USD 300.39 million (−3%). Similarly, aggressive tax reform targeting 4–5 percent prevalence reduction (8.9–7.9%) requires price increases to USD 6.98–8.05, with the total tax per pack reaching its maximum. Tax share rises to 73.20–76.64 percent, effectively aligning with the WHO FCTC 75 percent recommendation. Projected cost recovery reaches its maximum (Table 3).

Comparatively, the conservative strategy (1–2% prevalence reduction; 50–61% tax share) represents a politically feasible but fiscally suboptimal transition, generating modest recovery while remaining below the 75 percent benchmark recommended under the WHO FCTC Article 6 guidelines. The progressive strategy (3% reduction; 68% tax share) substantially improves cost recovery and approaches best practice, yet still falls short of the optimal taxation threshold necessary to significantly curb affordability. In contrast, the accelerated strategy (4–

5% reduction; 73–77% tax share) aligns with or exceeds international recommendations, maximizes economic recovery, and delivers the strongest structural deterrent to consumption. Thus, while incremental reform offers administrative pragmatism, only the optimal strategy achieves both fiscal sufficiency and efficiency in the Nepalese context (Table 3).

Table 3. Cost recovery from different reduction strategies of tobacco prevalence.

Reduction Thresholds; Tobacco Prevalence *		Expected National Cost[$] or Recovery (Million)	Recommended Cigarette Price per Pack	Recommended Total Tax per Pack of Cigarettes	Recommended Net-of-Tax Price	Expected Tax % (of Total Cost)
[@] Baseline 12.9%	USD [#]	1826.77	2.74	0.86	1.88	31.39
	NPR	215,321.38	322.97	101. 37	221.60	
−1% (11.9%)	USD [#]	101.11	3.80	1.92	1.88	50.53
	NPR	11,917.83	447.90	226.31	221.60	
−2% (10.9%)	USD [#]	201.24	4.86	2.98	1.88	61.31
	NPR	23,720.16	572.85	351.25	221.60	
−3% (9.9%)	USD [#]	300.39	5.92	4.04	1.88	68.24
	NPR	35,406.97	697.79	476.19	221.60	
−4% (8.9%)	USD [#]	398.59	6.98	5.10	1.88	73.20
	NPR	46,981.80	822.73	602.31	221.60	
−5% (7.9%)	USD [#]	495.84	8.05	6.17	1.88	76.64
	NPR	58,444.66	948.85	727.26	221.60	

***** Data calculated from The Tobacco Atlas, CoRRE (Cost Recovery and Revenue Estimator), used in accordance with its data reuse policy [8]; [$]Cost is cumulative over 15 years [8]; [@] Baseline taken for 2022; [#] 1 USD = 117.87 NPR (2022) [17].

The three prospective timelines illustrate the fiscal trade-offs between speed of reform and annual adjustment burden in achieving a 75 percent tax share per stick. Under the aggressive 5-year strategy (2025–2030), the retail price rises from NPR 6.74 to NPR 26.60, requiring a steep annual increment of NPR 3.97, with tax (T) increasing six-fold to NPR 19.95—front-loading both fiscal gains and affordability reduction. The 7-year conservative pathway smooths the transition (annual hike NPR 3.45), reaching a higher final price (NPR 30.86) and tax level (NPR 23.14), thereby balancing political feasibility with sustained revenue growth. In contrast, the 10-year weak reform scenario minimizes annual adjustment (NPR 3.18) but delays optimal impact, despite ultimately producing the highest terminal tax (NPR 28.93) and price (NPR 38.57); this deferral risks prolonged affordability and cumulative health losses in the interim. Collectively, while all three trajectories achieve the 75 percent threshold consistent with the WHO FCTC Article 6 guidance, the shorter horizon maximizes early public health gains, whereas longer horizons prioritize gradualism over immediacy of impact (Table 4).

Table 4. Projected prices for 75 percent tax per stick for three timeline strategies.

Price		Baseline (2025) [#]	Scenario A: Accelerated (5-Year)			Scenario B: Moderate (7-Year)			Scenario C: Conservative (10-Year)		
			(2025–2030)	Expected per-Year Hike	Average (%) Increase per Annum	(2025–2032)	Expected per-Year Hike	Average (%) Increase per Annum	(2025–2035)	Expected per-Year Hike	Average (%) Increase per Annum
Total retail price (P = T + C)	USD [@]	0.049200	0.194291	0.029018	31.7	0.225405	0.025172	22.5	0.281665	0.023246	18.8
	NPR	6.74	26.60	3.97		30.86	3.45		38.57	3.18	
Total tax (T)	USD [@]	0.015695	0.145722	0.021764		0.169054	0.018879		0.211249	0.017435	
	NPR	2.15	19.95	2.98		23.14	2.59		28.93	2.38	
Total net-of-tax (C) *	USD [@]	0.033505	0.048569	0.007255		0.056351	0.006293		0.070416	0.005811	
	NPR	4.59	6.65	0.99		7.72	0.86		9.64	0.80	

[@] Conversion rate (1 USD = 136.92 NPR) of 1 July 2025[17]; [#] Calculated from the CoRRE [8] and NDRI report based on the projected population (29339353) of 2025 (433.01 cigarettes per person per year; cigarettes with 70–85 mm with filters comprising > 99% market share) with baseline tax of 31.39% [7,15,18]; * Adjusted to annual consumer price index (CPI) inflation value of 7.71% (1981–2030) [12].

3.2. Comparative Analysis of Three Scenarios

A comparative analysis of the key inputs, particularly passthrough and price change, shows that these factors propagate to consumption and prevalence outcomes across the three scenarios. In the 5-year scenario, the high annual price increase (0.317) combined with a mean passthrough of 1.15 (SD 0.057; UI: 1.05–1.24) yields a consistently strong effective price change (mean 0.365), with a narrow uncertainty band. This translates into a reduction in consumption (−0.166; UI: −0.279 to −0.039) and thereby the prevalence (−0.083; UI: −0.140 to −0.020), with both intervals entirely below zero, indicating statistical certainty. The relatively low dispersion suggests stability of outcomes even under parameter uncertainty, supporting internal validity and policy reliability (Table 5).

Table 5. Simulation results with uncertainty (probabilistic analysis).

Inputs/Outputs (Observations = 10,000)	**5-Year**	**7-Year**	**10-Year**
Change in tobacco price rate (per year)	0.317	0.225	0.188
Passthrough [#]	1.15 (0.057) [1.05, 1.24]	1.05 (0.057) [0.95, 1.14]	0.95 (0.057) [0.85, 1.05]
Change in effective tobacco price [#]	0.365 (0.018) [0.334, 0.395]	0.236 (0.013) [0.215, 0.258]	0.179 (0.011) [0.161, 0.197]
Change in tobacco consumption [#]	−0.166 (0.061) [−0.279, −0.039]	−0.092 (0.053) [−0.190, 0.022]	−0.059 (0.050) [−0.149, 0.051]
Change in tobacco prevalence [#]	−0.083 (0.031) [−0.140, −0.020]	−0.046 (0.026) [−0.095, 0.011]	−0.030 (0.025) [−0.074, 0.025]

[#] Figures in parentheses, SD; in square brackets, 95% UI (Uncertainty Intervals).

In the 7-year scenario, lower price growth (0.225) and moderate passthrough (mean 1.05) produce a reduced effective price change (0.236). While the mean consumption change remains negative (−0.092), the uncertainty interval crosses zero (−0.190 to 0.022), indicating potential variability in outcomes, including scenarios of negligible or adverse effects. A similar pattern is observed for prevalence. This reflects moderate sensitivity to parameter variation, particularly income elasticity and passthrough, suggesting that effectiveness is contingent on favorable economic conditions. Similarly, in the 10-year scenario, the weakest price signal (0.188) and lower passthrough (mean 0.95) result in the smallest effective price change (0.179). The mean consumption effect is minimal and statistically indistinguishable from zero (UI spans −0.149 to 0.051), indicating high uncertainty and potential policy ineffectiveness. Prevalence reductions are also marginal and uncertain. This scenario is highly sensitive to parameter variation, with income growth likely offsetting price effects (Table 5).

3.3. Limitations

This study has several limitations that warrant consideration. First, the model excludes forward-looking behavior, potentially underestimating long-term tax responses, and relies on theoretical passthrough rates rather than Nepal-specific data, introducing price transmission uncertainty. Furthermore, simplifying the translation of consumption changes into prevalence fails to capture population-specific quitting versus intensity reduction, while the exclusion of socioeconomic heterogeneity, such as income-driven brand substitution, may attenuate projected impacts. Additionally, the analysis omits structural factors like internal migration, nicotine dependence intensity, and real-world variability in inflation and income, while the illicit tobacco trade, though currently negligible (<1%) [19], remains a risk under accelerated tax scenarios. Consequently, these results should be interpreted as scenario-based projections anchored in specific assumptions rather than precise forecasts.

4. Conclusions and Ways Forward

From a feasibility perspective, the 5-year scenario is most effective but requires strong administrative and political capacity to sustain high tax increases. Recently formed government with a high majority of people's mandate in the Nepal election 2026 may be favorable for this. The 7-year and 10-year scenarios offer a more feasible and politically easier pathway, but less reliable. They lack statistical robustness and risk failing to reduce tobacco use. Overall, the analysis underscores that faster, accelerated tax increases are not only more effective but also more resilient to uncertainty, making them more applicable for achieving meaningful public health impact in Nepal. Importantly, empirical evidence from different countries highlights three crucial measures for an accelerated strategy [15,20]. These include combining ad valorem taxes with existing types, applying a uniform

specific tax to all cigarette types (and reducing the number of tiers), and requiring that the entire tax be paid by a single payer, either the producer or importer.

Furthermore, the strategy may also be helpful to curb the prevalence among the rising tobacco youth (15–24 years) consumers in Nepal, who are twice as price sensitive as the general population [16]. Also, as evidenced by higher consumption rates among lower educational achievers and poorer wealth quintiles [16], the strategy may not only help support the equality and universal health coverage, but also help collect the revenue for resource optimization.

Author Contributions

C.A.: conceptualized the topic, retrieved and simulated the data. C.A. and N.A.: analyzed the data and prepared the first draft. C.A., K.P.P., B.B.S., B.B.K., R.T., J.K.P. and S.R.D.: further contributed in the second draft. A.K.T., S.R.D. and A.P.: read, revised the second draft and drafted detailed answers to the reviewers' comments. C.A. and N.A.: together compiled and prepared the final draft and response to reviewers. K.S., S.P. (Sharada Pahari), S.P. (Sudarshan Paudel) and N.L.: reviewed the final draft. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

Use of AI and AI-Assisted Technologies

Generative AI tools, including ChatGPT, Perplexity, and Gemini, were used solely for language editing, syntax refinement, paraphrasing, and improving clarity of interpretation, mainly under the sections—methods, and results and discussion. These tools assisted in enhancing readability but did not contribute to the study design, data analysis, or substantive interpretation. All original ideas, analytical approaches, results, and inferences are the independent work of the authors. The authors take full responsibility for the accuracy, integrity, and originality of the content presented.

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