

Comparative analysis of the impact of cigarette taxation on consumption, revenue and mortality in Jordan

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Abstract

Background: Tobacco taxes are a powerful tool for reducing tobacco consumption and a reliable source of revenue for government.

Aim: To investigate the potential efficacy of tobacco taxation strategies in Jordan in relation to their fiscal and health-related outcomes.

Methods: Using Tobacconomics, we conducted a comparative analysis of several taxation scenarios: maintaining the status quo; increasing both specific excise and tiered taxes; increasing tiered tax rates alone; and raising specific excise taxes only.

Results: We obtained the projected fiscal and health outcomes under the different tax policy scenarios: current scenario with no adjustments; 20% increase in specific excise taxes coupled with a 10% boost in tiered tax rates; raising tier tax by 20%; and raising specific excise by 20%. A 20% increase in excise taxes will decrease cigarette consumption, increase government revenues and reduce deaths among adults and adolescents. It can provide up to 87.5% reduction in adolescent deaths if coupled with a 10% boost in tiered tax rates.

Conclusion: A consistent and aggressive approach to tobacco taxation can effectively decrease tobacco consumption and increase government revenue if Jordan's multi-tiered specific excise tax system is adjusted according to retail price.

Keywords: cigarettes, tobacco taxation, adolescents, tobacco use, tobacconomics, excise tax, mortality, Jordan

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Introduction

Jordan has one of the highest rates of tobacco smoking in the Eastern Mediterranean Region and globally (1). The Jordan National STEPwise Survey for Noncommunicable Diseases Risk Factors 2019 showed a high prevalence rate of daily tobacco smoking among individuals aged ≥ 18 years, which increased from 29.0% in 2007 to 34.6% in 2019 (2). The prevalence increased from 49.6% in 2007 to 58.0% in 2019 among men and from 5.7% in 2007 to 10.8% in 2019 among women. The economic burden of smoking was significant, costing approximately 1 billion Jordanian dinar in 2012, including money spent on tobacco and smoking-related diseases, which constituted 5% of Jordan's Gross Domestic Product (3).

Jordan adopted a national tobacco control strategy for 2017–2019 based on implementation of the WHO MPOWER (M: monitor, P: protect, O: offer, W: warn, E: enforce, R: raise) strategy. The strategy seeks to decrease tobacco use by 30% by 2025. Jordan scored low in implementing the MPOWER measures in most of its components and ranked 13th in the Eastern Mediterranean Region (4). However, Jordan has several

control policies to reduce demand for tobacco products. For example, in 2004, Jordanian Standard 446/2004 was the first regulation to place requirements for warning labels on cigarette packages. Since then, the country has implemented several laws and policies to control tobacco use, including Public Health Law 47/2008 which was amended in 2017. This law addresses smoke-free places, tobacco advertising and promotion, display of tobacco products, and sanctions for violations. The Tobacco Products Display Regulations of 2013 (amended in 2015) regulate point of sale, but excludes tobacco shops from most of the display regulations. Jordan Standard 466/2012 addresses cigarette packaging and labelling, the Traffic Law of 2008 prohibits smoking while driving, and the Juvenile Conduct Law 2006 prohibits the sale of tobacco to minors (3). Recently, the Ministry of Health opened > 30 smoking cessation clinics across Jordan, providing free counselling and medication services for smokers to help them quit. It is important to stress how the non-tax regulatory measures (specifically smoking cessation clinics) can complement the tax increase strategies. Despite all the tobacco control measures in Jordan, the

absence of enforcement is evident, resulting in increasing numbers of smokers.

A proven measure to reduce tobacco consumption is to decrease affordability through increasing prices (5). It is critical for preventing the switch to more affordable brands or types of tobacco, which usually occurs through illicit trade, often avoiding taxes and leading to substantial revenue loss for governments. More importantly, illicit trade increases affordability and accessibility of tobacco products, resulting in greater tobacco consumption, which is directly linked to significant increases in mortality and morbidity. The problem is amplified because illicitly sold cigarettes may not adhere to quality standards, potentially posing health risks from unknown ingredients. To date, Jordan does not have official estimates of the illicit trade of cigarettes or any other types of tobacco, hence the size of the problem is not clear. Effective policies to counter tobacco smuggling and other illicit sales should be implemented in accordance with the provisions of the WHO Framework Convention on Tobacco Control (FCTC) Protocol to Eliminate Illicit Trade in Tobacco Products (6).

Household surveys estimate that, from 2003 to 2013, tobacco consumption in Jordan increased by 58% and the average annual household member's expenditure on tobacco products increased by 172%. This was partly caused by the 115% increase in the average cigarette price over the same period. Similarly, the average annual household member's expenditure on tobacco products increased to 558 Jordanian dinar in 2017 (7), which may have been due to the significant tobacco price increase in 2017 and 2018.

A study of 4090 adults using tobacco in Jordan showed that the price was negatively correlated with the decision to smoke and the quantity smoked, while wealth was positively correlated with the quantity smoked. Data from the Economics of Waterpipe Smoking survey showed that the prevalence of cigarette smoking was lowest among men and women who reported having no source of income (9). However, in Jordan, low socioeconomic status is significantly associated with higher rates of cigarette smoking (10).

WHO recommends raising tobacco taxes to at least 75% of retail prices. Total taxes in Jordan are 78%; however, the excise tax share is 64.22%, indicating an opportunity to attain the recommended 70% minimum benchmark. Until 2014, Jordan had a mixed tobacco excise system with specific and *ad valorem* taxes, which was changed to a tier-specific excise system. The main unified specific excise tax gradually increased from 0.42 Jordanian dinar per pack in 2014 to 0.57 in 2018, or by 36% in 4 years. The additional tiered excise tax has different rates depending on cigarette price. Tobacco excise revenue in Jordan increased from 312 million Jordanian dinar in 2012 to 554 million in 2016. Therefore, the tobacco taxation policy was beneficial for government. In May 2019, the government imposed a 200% tax on electronic cigarettes, vapes and their paraphernalia. Tobacco price increase between 2010 and 2016 was moderate, and affordability was almost

unchanged. Such a situation was partly caused by the pricing policy of the tobacco industry. In 2017 and 2018, tobacco price increase was substantial, the reduction in tobacco affordability was significant, and this potentially decreased tobacco consumption (6).

Tobacco pricing is an important factor, given that decreasing affordability is the most effective strategy to reduce uptake of smoking among young people (11). The WHO FCTC recommends that taxation policy should take into account the price elasticity of demand to reduce consumption, and that all tobacco products should be taxed comparably to avoid unintended consequences, such as product substitution (12). A growing body of evidence globally, including from many low- and middle-income countries, clearly demonstrates that tobacco taxes are a powerful tool for reducing consumption, while providing a reliable source of government revenue.

Specifically, the affordability elasticity of demand is greater in high-income countries than in low- and middle-income countries. Per capita cigarette consumption decreased by 10% if the relative income price of cigarettes went up by 10% in high-income countries, compared with < 2% in low- and middle-income countries, indicating that cigarette affordability was more elastic in high-income countries (13). It has been found that price increases have a more substantial impact on reducing tobacco consumption among children and adolescents than adults. Consequently, a reduction in tobacco consumption can alleviate the associated health burden, including lowering direct costs of medical treatment and indirect costs of lost productivity due to illness and death (14–16).

In Jordan, for example, implementing the package of FCTC policy measures could prevent 34% of the economic losses expected from smoking over the next 15 years; secure significant health and economic returns; and begin to reclaim the 1.6 billion dinar lost annually to tobacco consumption (3). In other words, Jordan would save about 6.5 billion dinar over 15 years that would otherwise be lost if it did not implement the FCTC policy package of tobacco control measures; the equivalent of ~435.2 million dinar in annual avoided economic losses (3). The FCTC policy package could prevent 843.8 million dinar in healthcare expenditure (56.3 million annually) over 15 years, with 65% of the savings going to the government.

This study aimed to analyse the potential effects of tax increases on cigarette consumption, tax revenues, and mortality from smoking in Jordan in 2024 by administering hypothetical price increases. The findings may serve as an important reference for health authorities to revise tobacco prevention and control policies.

Methods

Model and data sources

The general Tobacconomics model developed by the Tobacconomics team (at the University of Illinois, Chicago) was used. The model simulates the increase in

government revenues and public health benefits, due to changes in cigarettes taxes. The results show the benefits of taxation policy changes specifically through reduced tobacco consumption in the population (decreased prevalence, consumption and mortality) (16). The model is versatile, capable of incorporating various tobacco products apart from cigarettes, including roll-your-own tobacco, smokeless tobacco, cigars, and e-cigarettes, which is crucial for comprehensive tobacco control strategies. The model framework considers substantial excise tax increases, as gradual changes are often rendered less effective by rapid adaptation of the tobacco industry. It uniquely addresses the responsiveness of different demographic groups, notably adolescents, who are more sensitive to price changes because of lower income and lesser degrees of addiction. This sensitivity is critical for effective smoking prevention and control among younger populations. The model accounts for potential consumer shifts to cheaper alternative products if their taxes remain unchanged, a scenario that could undermine the intended effects of cigarette tax increases.

The model consists of 2 main components: one that projects changes in government revenue based on consumption patterns, price elasticity and excise taxes, and another that forecasts public health outcomes. These projections include reduced smoking prevalence and the associated decrease in premature deaths, factoring in the elasticity of prevalence and potential increases in product prices.

The Tobacconomics model offers robust projections and has been successfully applied in several countries, including Bangladesh, Egypt, India, Pakistan, the Philippines, Türkiye and the United States of America; however, it is not without limitations. The main challenge lies in the availability and reliability of tobacco market data, which can significantly affect the accuracy of the simulations. The extent of illicit trade is also considered in the model, adding a layer of complexity to the simulations. Despite these challenges, the flexibility and adaptability of the model make it a valuable tool for policy-makers worldwide, providing a detailed forecast of the outcomes of excise tax adjustments on tobacco products. The model incorporates various economic indicators to simulate the impact of tax changes, although it does not fully capture the socioeconomic nuances and regional variations within Jordan, nor does it reflect the cultural factors that influence smoking behaviour (16).

The Tobacconomics model operates by running multiple scenarios, each altering a specific variable within the taxation framework, such as the specific excise tax rate, VAT rate or inclusion of tiered tax rates, to predict their individual and collective effects on key outcomes. By adjusting these variables, the model can simulate the market response in terms of changes in cigarette consumption and consumer behaviour and subsequent variations in tax revenue. The scenarios range from moderate increases in specific taxes to more aggressive tax increases, as well as the introduction of new tax tiers that could target different price segments

of tobacco products. The simulation outputs provide a quantitative forecast of potential changes in cigarette affordability, smoking prevalence and government tax collection. Such a model is pivotal for policy-makers, enabling them to visualize the probable ramifications of tax adjustments before implementation and thus make informed decisions that balance public health objectives with fiscal needs.

The results of different scenarios were meticulously analysed to determine the optimal taxation strategy for Jordan, aiming to curb tobacco consumption and maximize government revenue effectively. This study used multiple primary data sources to compile a comprehensive baseline profile of the cigarette market in Jordan. It included adult smoking rates from health surveys and administrative data from the General Budget Department at the Ministry of Finance on sales tax revenues and excise taxes. Data on population and other demographics were retrieved from the Department of Statistics. The study also used data published in journals on average number of packs smoked per day, along with prevalence data from health surveys and population data from the Department of Statistics to calculate total consumption.

Consumption of cigarette products was calculated based on annual cigarette consumption per capita for those aged ≥ 15 years. The retail price for a pack of cigarettes that consumers pay included all applicable taxes plus the producer or industry price (base price) net of taxes. The retail price of a pack of cigarettes, can be calculated as:

$$\text{Retail price} = \text{pre-VAT price} + \text{VAT} = [\text{excise tax} + (\text{tier} + \text{base price})] + \text{VAT}$$

Basic aggregated data about the Jordanian cigarette market, including current cigarette consumption, excise tax rates and prices are shown in Tables 1 and 2.

Results

Table 3 shows the projected fiscal and health outcomes under different tax policy scenarios.

Scenario 1 (current scenario)

Without any adjustments in pricing, cigarette consumption is expected to increase to 685.96 million packs with an increase in total tax revenues to reach 906.76 million Jordanian dinar. This scenario may result in an additional 6220 adolescent smokers and a total of 386 708 new smokers, with anticipated adult deaths at 1437 and future new adult deaths projected at 5579. Adolescent deaths are estimated to be 359, with an expectation of 958 new deaths in this age group.

Scenario 2 (20% increase in specific excise taxes coupled with a 10% boost in tiered tax rates)

Cigarette consumption is projected to decrease to 653.6 million packs, with tax revenues increasing to 991.73 million Jordanian dinar. The policy is predicted to lower future adolescent smokers by 11 877, decrease adult

Table 1 Cigarette tax structure, cigarette consumption, retail prices and premature deaths, 2023

Variable	Input value	Data source
Consumption		
Total cigarette consumption in 2018	12.6 billion	(22)
Population in 2018	10.5 million	(23)
Population in 2023	11.3 million	(24)
Total consumption in 2023	680.4 million packs	Authors calculation (12.6/10.5) * 11.3 * 1000 12.6 billion: Total cigarette consumption in 2018 10.5 billion: number of population in 2018 11.3 million: number of population in 2022
Tax revenue		
Excise tax (million JOD)	767	Authors calculation 942-175=767
Sales tax revenue (million JOD)	175	Jordan's General Budget Department at the Ministry of Finance
Total tax revenue (million JOD)	942	(25)
Population		
Total population	11.34 million	(26)
Percentage of population aged >15 years	66%	(26)
Population aged >15 years	7.41947 million	(26)
Population aged 0–14 years	3.88253 million	(26)
Smoking prevalence (%)	41.0%	(2)
Number of adult smokers	3.04 million	Authors calculation Population of adults Prevalence of smoking
Number of young smokers	0.38 million	Authors calculation Population of adults Prevalence of smoking for youth (9.8%)
Average packs per adult smoker (per year)	188.34	Authors calculation (total consumption/total number of smokers) Number of adult smokers/total smokers
Premature deaths	13687.0	(27)
Adult smoking deaths	0.00414 million	(28)
Youth smoking deaths	0.000599 million	(28)
Total smoking deaths	0.004741 million	(28)

OD = Jordanian dinar

deaths by 2744, and adolescent deaths by 686. However, it may result in 1397 new adult deaths, while potentially reducing new adolescent deaths by 87.5.

Scenario 3 (Raising tier tax by 20%)

Cigarette consumption may reduce to 674.8 million packs, with an increase in collected taxes to 937.44 million Jordanian dinar. The number of future adolescent smokers could decrease by 6229, and there may be a decrease of 1439 adult deaths and 360 adolescent deaths. Conversely, there could be an increase of 2941 total new deaths, including 238 among adolescents and 2702 among adults.

Scenario 4 (Raising specific excise tax by 20%)

A reduction in cigarette consumption to 663.1 million packs is anticipated, alongside a boost in tax revenue to 968.08 million Jordanian dinar. There is an expectation of a decrease in future adolescent smokers by 6560, and

a potential decrease of 1515 in adult deaths and 379 in adolescent deaths. However, this may lead to an increase of 2845 in total new deaths, with 219 among adolescents and 2626 among adults.

In each scenario, the tax policy adjustments are shown to influence both revenue generation and public health metrics, reflecting the trade-offs and synergies between economic objectives and health outcomes.

Discussion

This study analysed the potential effects of tax increases on cigarette consumption, government tax revenue, and mortality related to smoking in Jordan in 2024 by administering different scenarios of hypothetical price increases. The analysis supports a regular increase in the excise tax rate and tier tax to outpace inflation and

Table 2: Cigarette tax structure and retail prices, 2023

Variable	Input value	Data source
Excise tax		
Specific tax: fixed	0.57	Jordan's General Budget Department at the Ministry of Finance
Tier	0.545	
VAT rate (%)	16%	
Retail price	1.5	
Base price	0.178	
Expected income growth (percentage)	2.50%	
Expected population growth (percentage)	1.0%	
Expected inflation rate (percentage)	2.2%	
Elasticities		
Price elasticity of demand	-0.365	Awawda, S., Chalak, A., Khader, Y., Mostafa, A., Abla, R., Nakkash, R., ... & Abu-Rmeileh, N. M. (2022). Gender differences in the price elasticity of demand for waterpipe and cigarette smoking in Lebanon, Jordan and Palestine: a volumetric choice experiment. <i>BMJ open</i> , 12(7), e058495. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9297203/pdf/bmjopen-2021-058495.pdf
Income elasticity of demand	0.327	Ho, LM., Schafferer, C., Lee, JM. et al. Raising cigarette excise tax to reduce consumption in low-and middle-income countries of the Asia-Pacific region:a simulation of the anticipated health and taxation revenues impacts. <i>BMC Public Health</i> 18, 1187 (2018). https://doi.org/10.1186/s12889-018-6096-z
Other		
Price elasticity of smoking prevalence	-0.18	Standard assumption to half the total elasticity
Percentage of smokers who die prematurely	17.0%	https://tobaccoatlas.org/factsheets/jordan/
Percentage of people saved from premature death by quitting/not starting	34.0%	Standard assumption used for modelling cigarettes
Youth elasticity factor	2	Standard assumption used for modelling cigarettes

income increases, thereby reducing tobacco affordability and consumption.

The outcomes outlined in this study provide a thorough understanding of the potential impact of various tobacco taxation scenarios in Jordan. As noted from the findings of the current analysis, keeping the current cigarette prices without any increase will ultimately lead to a significant escalation in cigarette consumption and mortality for adolescents and adults. Remarkably, raising both taxes by 20% seems to be the best policy scenario in Jordan as it significantly will decrease both cigarette consumption and future deaths and simultaneously increase government revenue. Raising tier tax by 20% could lead to a reduction in consumption and population death, raising both taxes by 20% will result in a more significant, desirable impact on consumption, mortality and government revenue. This scenario suggests a reduction in total government revenue. Although the suggested scenario of raising specific excise taxes by 20% is expected to reduce consumption and total deaths, it still has less impact on these outcomes when compared to raising both taxes by 20%. In summary, our analysis indicates that a strategy of increased specific excise taxes, alongside a tiered tax structure, would not only reduce tobacco consumption but also augment government

revenue significantly. This dual effect underpins the critical role of tax policy as an instrument of public health and fiscal strategy.

Historically, Jordan has experienced changes in its tobacco taxation framework, moving from a mixed system to one that is predominantly specific excise based. Our findings suggest that the simplicity of this structure is less prone to industry manipulation, leading to more predictable outcomes in consumption and revenue. Our study advocates the consistent escalation of excise taxes, exceeding the rates of inflation and income growth, to persistently reduce affordability of tobacco products, hence discouraging consumption. This is particularly important among adolescent smokers, given that 34.3% of the Jordanian population is aged < 15 years, while 62.0% is 15–64 years and 3.7% is > 65 years (19). The average tobacco and cigarette prices from 2010 to 2018 increased by 43%, while inflation over this period was 25%. In 2020, Jordan scored 3 out of 5 points in cigarette price on the Tobacconomics cigarette tax scorecard.

The results underscore the importance of the tax base in specific excise taxation; a quantity-based tax base is beneficial for its ease of administration and uniform application across tobacco products. Conversely, the tiered tax structures, although potentially contributing to

Table 3 Projected fiscal and health outcomes under different tax policy scenarios

Variable	Scenario 1: Status quo	Scenario 2: Raise specific excise tax rate by 20% and tier tax by 10 %	Scenario 3: Raise specific excise tax by 20%	Scenario 4: Increase in specific excise tax by 20%
Input				
Excise tax				
Specific	0.57	0.68	0.51	0.68
Tier	0.55	0.60	0.66	0.55
VAT (Tax base: Tax -paid price)	0.207	0.234	0.216	0.226
Retail price	1.50	1.70	1.57	1.64
Base price				
Net-of-tax price	0.18	0.18	0.18	0.18
Excise tax burden	76%	75%	75%	75%
Total tax burden	76%	69%	69%	73%
% change in price	13.0%	4.5%	4.5%	9.2%
% change in consumption due to price	-4.8%	-1.6%	-1.6%	-3.4%
% change in consumption due to income	1%	1%	1%	1%
New consumption	685.96	653.6	674.8	663.1
Excise tax				
Specific	447.06	346.18	346.18	53.56
Tier	391.83	445.38	445.38	364.71
	838.89	791.57	791.57	818.27
Other:				
VAT	152.84	145.87	145.87	149.81
Total	906.76	991.73	937.44	968.08
Impact on prevalence				
Change in prevalence due to price and income (in %)	0.82%	-1.56%	-0.82%	-0.86%
Change in prevalence (in population)	0.34%	-0.64%	-0.34%	-0.35%
New prevalence rate	41.34%	40.36%	40.66%	40.65%
Impact on number of adult smokers				
Fewer adult smokers	24,868.21	-47,478.87	-24,902.85	-26,225.57
New adult smokers	3,066,850.91	2,994,503.83	3,017,079.85	3,015,757.13
Impact on annual packs per smoker				
New average no. of packs per adult smoker per year	223.67	218.27	223.67	219.88
Change in average no. of packs per adult smoker per year	46.97	41.56	46.97	43.18
% Change in average no. packs of per adult smoker per year	26.58%	23.52%	26.58%	24.44%
Impact on future smokers				
Fewer future/adolescent smokers	6,220.98	-11,877.21	-6,229.64	-6,560.53
New Future smokers	386,708.92	368,610.73	374,258.30	373,927.41
Impact on deaths				
Adult				
Fewer adult deaths	1,437.38	-2,744.28	-1,439.38	-1,515.84
New adult deaths	5579.38	1397.72	2702.62	2626.16
Youth				
Fewer youth deaths	359.57	-686.50	-360.07	-379.20
New youth deaths	958.57	-87.50	238.93	219.80
Total				
Fewer total deaths	1796.95	-3430.78	-1799.46	-1895.04
New Total deaths	6,537.95	1,310.22	2,941.54	2,845.96

wider price variation, offer opportunities for consumers to switch to cheaper alternatives, thereby diluting the intended impact of tax increases. Currently, cigarette tax in Jordan is a sum of main unified specific excise tax, additional tiered specific excise tax, and general sales tax.

It is worth mentioning that the tobacco industry is influential in this regard, and is engaged in some actions to undermine national health policies and efforts by the government to control smoking in Jordan. In 2013, the tobacco industry responded to a tax increase on tobacco products by reducing the prices of cigarettes by 25%, claiming that lowering the price could reduce cigarette smuggling, but the effect was that it kept cigarettes affordable. Our study elucidates the impact of non-tax regulations on tobacco pricing. Therefore, pricing regulation may be considered to prevent the tobacco industry from exercising differential tax shifting, which it uses to ensure that large price gaps exist between premium and cheap cigarettes. However, pricing policies cannot be used alone. To make excise tax on tobacco products more effective in reducing overall consumption, all tobacco products must be taxed comparably. Regular assessment, evaluation and monitoring of the impact of tobacco tax policies over time are essential components of effective tax policy development and analysis.

The different scenarios presented in this study can encourage stakeholders and policy-makers to increase taxation on cigarettes, especially when the government revenue is expected to increase. According to the WHO Report on the Global Tobacco Epidemic, tobacco excise revenue in Jordan increased from 312 million Jordanian dinar in 2012 to 375 million in 2013 and 554 million in 2016. VAT tobacco revenue also increased from 67 million Jordanian dinar in 2013 to 120 million in 2016. The total amount of taxes on tobacco production increased from 345 million Jordanian dinar to 440 million in 2008 and 2011. From 2012 to 2015, the tax was stable at 420 million Jordanian dinar annually, but sharply decreased to 326 million and 269 million in 2016 and 2017. In 2018, an estimated 697 million Jordanian dinar in excise tax revenue was generated from LDS. This is equal to > 15% of central government tax revenue for 2018. Government revenues have gradually increased; however, the ongoing trend of consumers' switch to lower-value brands of cigarettes (implying a lower tax yield per cigarette, all else being equal) would have squeezed revenue.

In light of these insights, it is evident that Jordan's multi-tiered specific excise tax, which varies according to the retail selling price, has been instrumental in driving its tobacco control efforts. The ability of the tax structure to adapt to different price points appears to have played a key role in the observed changes in consumption patterns. The current taxation rates, which have seen a steady increase over the past few years, have shown that a combination of fixed and tiered rates can effectively contribute to the overall goal of reducing tobacco consumption. This aligns with Article 6 of the WHO FCTC, which supports taxation, and where appropriate, pricing policies, to curb the use of tobacco products

(17). Similarly, the MPOWER policy package of effective tobacco control policies emphasises that increasing the price of tobacco products through taxation is the most effective way to reduce smoking (18).

Tobacconomics cigarette tax scorecard evaluated Jordan's cigarette tax systems based on a 5-point rating system that incorporates international guidance and best practices in tobacco taxation. The evaluation of the 5-point index used data to score Jordan on: cigarette price; changes in cigarette affordability over time; share of taxes in retail cigarette prices; and structure of cigarette taxes. According to the 2023 Tobacconomics policy brief, the total score reflects an average of the 4 component scores. Based on this evaluation, Jordan scored 3.38 out of 5 points (20). This is significantly higher than the average score of countries in its region and income group. Jordan received the highest points in affordability change, with a score of 5 points. The average annual reduction in cigarette affordability was 11.5% between 2014 and 2020. Not surprisingly, Jordan scored 1 point out of 5 in the tax structure component due to tiered tax rates and a lack of uniform rates (20).

Conclusions and policy implications

The current modelling analysis indicates that a strategy of increased specific excise taxes, alongside a tiered tax structure, would not only reduce tobacco consumption but also augment government revenue significantly. This dual effect underpins the critical role of tax policy as an instrument of public health and fiscal strategy. This research posits that the pursuit of tobacco control in Jordan through taxation reforms is a testament to the country's commitment to public health. The intricate balance between health objectives and revenue generation is a hallmark of Jordan's tobacco taxation policy. As we move forward, the implications of our findings suggest a continued aggressive stance on tobacco taxation as a means to a healthier populace and improved public health outcomes. According to the 2023 Tobacconomics policy brief, Jordan should implement a new uniform specific excise tax structure that adjusts annually to outpace inflation and economic growth. Importantly, Jordan should increase the tax on cigarettes to increase the price of cigarettes to at least 3.03 Jordanian dinar (10.31 international dollars) and reduce affordability. By implementing more effective cigarette tax policies, Jordan would improve the health of its population, while raising additional tax revenue for the government.

Jordan's comprehensive taxation reforms represent a strategic commitment to enhancing public health by reducing tobacco consumption and its related expenses. This approach demonstrates a successful balance between health advancement and economic accountability. The study recommends progressively increased excise rates and adjusted tax tiers to further decrease tobacco consumption and maximize government revenue, thereby reinforcing the National Tobacco Control Strategy. Enhanced surveillance, reporting on tobacco

sales and prices, and rigorous measures against illicit trade are vital for the success of tobacco control efforts. Collectively, these steps will pave the way for a healthier Jordan, reducing tobacco consumption and its associated economic burden. Our recommendations align with those of WHO published in 2020: (1) tax should be comparable across all tobacco products because tobacco tax accounts for a smaller percentage of the retail price of waterpipe tobacco than cigarettes; (2) no duty-free allowances and banning sale of tobacco products; (3) specific excise tax to be regularly increased for both cigarettes and waterpipe; and (4) a share of tobacco tax would be earmarked for health purposes such as tobacco control strategies as tobacco tax revenue is not affected or increased.

The World Bank Group tobacco control country brief for Jordan (2019) supports our recommendations through an annual tobacco price increase of at least 20%, along with strengthening tobacco consumption surveillance and monitoring systems (including illicit trade tracking and tracing). Similarly, the FCTC investment case results for Jordan show that there is an evidence-based

opportunity to halt the tobacco epidemic and reduce its social and economic burdens through preventative actions that target tobacco consumption. By investing in tobacco control measures, the country can enhance its efforts towards achieving the Sustainable Development Goals with specific attention to the segments of the population that are at higher risk from smoking, such as males and people of lower socioeconomic status (21).

Future research in Jordan needs to focus on examining the long-term impact of increased tobacco taxes and pricing strategies on smoking prevalence and public health outcomes, especially among high-risk groups. Research should be urgently directed towards exploring the possible health and economic impact of emerging tobacco products such as e-cigarettes and vaping products. Researchers should immediately start investigating the magnitude of the problem of illicit trade and tobacco smuggling in Jordan to have a clear picture of a possible switch to cheaper brands.

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Analyse comparative de l'impact de la taxation des cigarettes sur la consommation, les recettes publiques et la mortalité en Jordanie

Résumé

Contexte : La taxation des produits du tabac constitue un instrument efficace en vue de réduire la consommation de tabac tout en assurant une source de revenus fiable pour les pouvoirs publics.

Objectif : Étudier l'efficacité potentielle de différentes stratégies de taxation du tabac en Jordanie selon leurs résultats fiscaux et sanitaires.

Méthodes : À l'aide de Tobacconomics, nous avons effectué une analyse comparative de plusieurs scénarios fiscaux : le maintien du statu quo ; l'augmentation simultanée des droits d'accise spécifiques et des taxes échelonnées ; l'augmentation des taux d'imposition échelonnés uniquement ; et l'augmentation des taxes d'accise spécifiques uniquement.

Résultats : Nous avons obtenu les résultats budgétaires et sanitaires escomptés selon les différents scénarios de politique fiscale : tout d'abord le scénario actuel sans ajustement, l'augmentation de 20 % des droits d'accise spécifiques couplée à une hausse de 10 % des taux d'imposition échelonnés, l'augmentation de 20 % de la taxe progressive et enfin l'augmentation de 20 % des droits d'accise spécifiques. Une augmentation de 20 % des droits d'accise permettra d'accroître les recettes publiques, de réduire la consommation de cigarettes ainsi que le nombre de décès chez les adultes et les adolescents. Cette mesure peut entraîner une réduction de 87,5 % du nombre de décès chez les adolescents si elle est associée à une augmentation de 10 % des taux d'imposition échelonnés.

Conclusion : Une approche cohérente et radicale de la taxation du tabac, fondée sur un système jordanien de droits d'accise spécifiques à plusieurs niveaux, ajusté en fonction du prix de vente au détail, peut réduire efficacement la consommation de tabac tout en augmentant les recettes publiques.

تحليل مقارنة لتأثير فرض ضرائب السجائر على الاستهلاك والإيرادات والوفيات في الأردن

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الخلاصة

الخلفية: فرض الضرائب على التبغ أداة قوية للحد من استهلاك التبغ، ويوفر في الوقت نفسه مصدرًا يمكن للحكومة الاعتماد عليه لتحقيق الإيرادات. **الهدف:** هدفت هذه الدراسة الى بحث الفعالية المحتملة لاستراتيجيات فرض الضرائب على التبغ في الأردن، بالاستناد إلى سيناريوهات محاكاة، فيما يتعلق بمخرجاتها المالية ومخرجاتها المتعلقة بالصحة.

طرق البحث: باستخدام *Tobacconomics*، أجرينا تحليلاً مقارناً لعدة سيناريوهات ضريبية: الإبقاء على الوضع الراهن، وزيادة كل من ضرائب البيع المحددة والضرائب المدرجة، وزيادة معدلات الضرائب المدرجة وحدها، وزيادة ضرائب البيع المحددة فقط.

النتائج: حصلنا على المخرجات المالية والصحية المتوقعة في ظل السيناريوهات المختلفة للسياسات الضريبية: سيناريو استمرار الوضع الحالي وعدم إجراء تعديلات، وزيادة ضرائب البيع المحددة بنسبة 20٪ مع زيادة بنسبة 10٪ في معدلات الضرائب المدرجة، وزيادة الضريبة المدرجة بنسبة 20٪، وزيادة ضرائب البيع المحددة بنسبة 20٪. ومن شأن زيادة ضرائب البيع بنسبة 20٪ أن تقلل استهلاك السجائر، وتزيد الإيرادات الحكومية، وتقلل الوفيات بين البالغين والمراهقين، مع انخفاض يصل إلى 87.5٪ في وفيات المراهقين، إذا اقترنت بزيادة قدرها 10٪ في معدلات الضرائب المدرجة. الاستنتاجات: إن اتباع نهج متسق وحازم في فرض الضرائب على التبغ يمكن أن يحقق الفعالية في الحد من استهلاك التبغ وزيادة الإيرادات الحكومية، إذا عدّل نظام الأردن لضريبة البيع المحددة المدرجة وفقاً لسعر البيع بالتجزئة.

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