Global Effects of Increased Taxation of Tobacco, Alcohol, and Sugar-Sweetened Beverages on Tax Receipts: A Modelling Analysis

Prepared for the Task Force on Fiscal Policy for Health, 2024
By Amit Summan and Ramanan Laxminarayan, One Health Trust

ABSTRACT

The taxation of harmful commodities including tobacco, alcohol, and sugar-sweetened beverages (SSBs) can decrease an avertable health burden while generating tax revenues to fund key government programs. These underutilized tools are particularly useful in the current environment of tight fiscal space globally.

We simulated the economic effects of taxing cigarettes, alcohol, and SSBs over a five-year period employing mathematical models using global economic and consumption data. A 20% and 50% price increase were simulated. Price and tax data were imputed with region-income group averages for countries that were missing data. Economic effects for tobacco, alcohol, and SSBs were estimated for countries representing 91%, 92%, and 99% of the global population, respectively, after imputing missing price and tax data. These estimates were extrapolated to the global level by matching countries according to income level and region.

We find that taxes that raise the retail price of tobacco, alcoholic beverages, and SSBs by 20% could result in global additional tax revenues of $97.54 (95% uncertainty interval [UI]: $87.49 to $107.57) billion, $250.52 (95% UI: $230.91 to $270.13) billion, and $83.1 (95% UI: $69.0 to $97.1] billion annually, respectively. As a percentage of health expenditure, the South Asia region generates the most revenue for tobacco and alcohol, and the sub-Saharan Africa region generates the most revenue for SSB taxation. By income level, lower-income countries generate more tax revenue as a proportion of their health spending. We conclude that excise tax increases on tobacco, alcohol, and SSBs can raise substantial government revenues, which could be used to increase public health and social spending. Taxation of related goods including junk food and e-cigarettes should be explored in the future.

Introduction

The consumption of harmful commodities — including tobacco, alcohol, and sugar-sweetened beverages (SSBs) — causes a large preventable burden of morbidity and mortality globally. Tobacco consumption caused 7.2 million deaths in 2021,[1] concentrated heavily in low- and middle-income countries (LMICs) where 80% of tobacco smokers reside.[2] Alcohol use was responsible for over 72 million disability-adjusted life years (DALYs) in 2021 and ranks as the third highest risk factor for DALYs amongst the 15-49 years old age group globally. Per capita alcohol consumption is rising globally, and is projected to increase to 7.6 liters in 2030 from 6.5 liters in 2017, and at a higher rate in LMICs.[3] A move towards sedentary lifestyles and the increased consumption of unhealthy diets is linked to increase prevalence of several diseases globally; specifically the consumption of SSBs, which are high in added sugar and do not contain nutrients, is linked to type 2 diabetes, heart disease, stroke, and cancer.[4]

At the same time, many LMICs are facing challenges in generating tax revenue to fund key social and health programs. Fiscal space is projected to tighten in the future due to the lingering effects of the COVID-19 pandemic, population ageing, climate change, inequality, automation, and debt repayment obligations.[5,6] Taxation of unhealthy commodities or increasing 'health taxes' presents an opportunity to generate revenue while decreasing health burdens globally. Only 41 countries tax tobacco at the World Health Organization (WHO) recommended level, and from 2020 and 2022 the global population covered at this level decreased from 1.1 billion to 1 billion.[7] The global median excise tax as a percentage of price is only 13.4% and 24.8% for beer and spirits, respectively.[8] While the median excise tax and total tax as percentage of price for SSBs is only 3.4% and 18.4%, respectively.[9]

In previous work, we estimated the health and economic effects of implementing increased taxes on tobacco, alcohol, and SSBs over a 50-year period.[10] In this analysis, we simulate the short-term increases in taxation rates on these goods. These findings can be used to regalvanise efforts to increase tax rates to recommended levels to reduce consumption and generate revenue.

Methodological Approach

Overview

The economic effects of tobacco, alcohol, and SSB taxation on tax receipts were estimated using mathematical models that incorporated country-level demographic, economic, and consumption data. The outcomes were aggregated by World Bank country income group classifications: low-income countries (LICs), lower-middle-income countries (LMICs), upper-middle-income countries (UMICs), and high-income countries (HICs). Conceptually, the tax causes a price increase in the targeted product and reduces consumption. The price may change less than the tax if the producer absorbs the costs of the tax, but we assume "100% pass-through" to consumers of the tax based on previous studies.[11–13] The elasticity of demand determines the magnitude of the change in consumption due to a price increase. Figure 1 presents a simplistic conceptual framework. We assume a constant elasticity of demand function in our analysis.

Two scenarios were modelled, a one-off 20% and a one-off 50% price increase caused by tax increases. The time horizon for the model was 5 years, with 2023 as the baseline year. All results are presented in 2022 USD, converted at current exchange rates and present value estimates are discounted using a 3% rate. We also present estimates as a percentage of domestic general government health expenditure in 2021.[14] The models were implemented in Microsoft Excel 2021 (with Visual Basic for Applications).

Background Paper for the Task Force on Fiscal Policy for Health

Baseline scenario

Table 1 shows the input data sources and Table 2 presents the elasticity parameters.[1] Baseline consumption and use data were taken from the WHO for tobacco[7] and alcohol[15] and from the Global Dietary Database[16] (GDD) for SSBs. For tobacco consumption data were available until 2022. For alcohol and SSBs, the latest consumption data were available for 2016 and 2018 in daily pure grams of alcohol per capita and weekly consumption per capita, respectively. This was updated to 2023 levels using Euromonitor data, which has annual volume sold per year for alcohol and SSBs until 2023. For countries missing Euromonitor sales data, the average price change by income and region group was estimated and applied to these countries. GDD data was available for the 20+ population; this data was used for the 15+ population in our analysis. A standard drink was considered to have 14 grams of pure alcohol, and beer, wine, and spirits, have 350, 150, and 44 ml in a standard drink, respectively.

Alcohol price and tax data came from the 2023 WHO Report on Alcohol Taxes. Data were only available for spirits and beer. For wine price data, we took the ratio of wine to spirits prices from the 2014 WHO Report on Alcohol, and assumed this ratio held in 2022.[17] Price data for 2022 was available for 128 countries for beer and 122 countries for spirits. This approach provided wine price data for 87 countries. For the wine tax, 22 countries were given a 0 tax rate as indicated by the WHO. For remaining countries, we assumed that the wine to spirt tax ratio in 2014 held in 2022. For countries missing price or tax data, we used the mean price or tax by region and income level and imputed this for the missing countries; if the corresponding income level-region mean was unavailable, we used the mean by income level. The same approach was taken for SSBs and tobacco.

Targeted commodities and effects of taxation

For tobacco, we considered taxation of cigarettes, the most commonly consumed tobacco product. For alcohol, we considered three beverage categories: spirits, wine, and beer. Following previous modelling, for tobacco the price is assumed to reduce demand at the extensive margin (number of smokers) and the intensive margin (number of cigarettes smoked by each smoker).[10] Therefore, the price elasticity of tobacco was split evenly between change in the number of current smokers and the change in the intensity of consumption by smokers. Following previous alcohol modeling,[18] changes in the price of alcohol were modeled to affect drinking intensity. Substitution across drink categories was not modelled due to inconsistent evidence on cross-price elasticities. Additionally, the tax increases were simulated to lead to a uniform price increase across all three beverage categories resulting in no change in relative prices. Similarly, for SSBs, we assumed that the tax increase only affected the intensity of consumption. Substitution across the three modelled commodities was not considered, therefore, each model is independent of the other.

Estimating global effects

To estimate global effects for countries with missing data, we matched countries by region and income level, and imputed the population-weighted tax revenue for that country type. If the region-income level combination was unavailable, we matched by income level. Per capita consumption data was available for 91%, 92%, and 99% of countries globally. The availability of data for a large number of countries decreased the potential for error from extrapolation to the global level.

We conducted a sensitivity analysis using the Monte Carlo simulation on all estimates by varying elasticity parameters between 20% above and below their mean value using a uniform distribution

---

[1] Price elasticates used in previous modelling work for the Bloomberg Task Force were used here for consistency.

for 1,000 iterations. The mean of the resulting distribution, along with the 2.5th percentile and 97.5th percentile, are provided as a 95% uncertainty interval.

Results

The increases in estimated tax revenues for tobacco, alcohol, and SSBs are presented in Tables 3-5. Globally, a 20% tax-induced price increase results in an increase in tax revenues of $97.54 (95% uncertainty interval [UI]: $87.49 to $107.57) billion, $250.52 (95% UI: $230.91 to $270.13), and $83.1 (95% UI: $69.0 to $97.1] billion for tobacco, alcohol and SSBs, respectively. These amounts represent a range of 1.34% (SSBs) to 4.05% (alcohol) of annual global government health expenditure. The 50% tax-induced price increase almost doubles the tax revenue for tobacco and alcohol, but for SSBs the tax revenue slightly decreases; this is due to SSBs having elastic demand. Globally, a 50% tax-induced price increase results in an increase in tax revenues of $199.40 (95% UI: $167.39 - 231.4) billion, $473.58 (95% UI: $395.83 – $551.34) billion, and 64.30 (95% UI: $3.43 - 125.19) billion for tobacco, alcohol, and SSBs, respectively.

The largest tax receipts in absolute terms are from high-income countries. However, as a percentage of health expenditure, the largest tax receipts are from low-income countries. For alcohol and SSBs, the additional tax revenue generated is at least the equivalent of total domestic government health expenditure —100% and 212%, respectively. For all countries except for HICs, taxes as a percentage of health expenditure for a 20% price increase scenario results in revenue increases of 5.5%, 13.8%, 4.5% of total domestic government health expenditure, for tobacco, alcohol, and SSBs, respectively.   The taxes result in substantial decreases in consumption. The 20% tax-induced price increase results in a decrease in consumption of 22 billion fewer packs of cigarettes per year for males, 759 million fewer standard drinks of alcohol annually, and 234 billion fewer servings of SSBs annually. These represent approximately a 10%, 12%, and 24%, decrease in consumption, respectively. For a 50% simulated price increase, consumption decreases by approximately 24%, 30%, and 60%, for tobacco, alcohol, and SSBs, respectively. Additionally, the number of smokers that quit due to the taxes is provided in Table 3. The 20% and 50% price increases result in a decrease of 41.0 million and 102.6 million smokers, respectively. As we model only for one-year and five-year periods, these estimates do not account for the decrease in new smokers due to a lack of initiation, which would become apparent over a longer modeling period. Table 5 presents the results by region. As a percentage of health expenditure, the South Asia region generates the most revenue for tobacco and alcohol, and the sub-Saharan Africa region generates the most revenue for SSB taxation. This is consistent with lower-income countries generating the highest revenue in proportion to their government expenditure.

Discussion

Our estimates suggest substantial gains in tax receipts from increased taxation of tobacco, alcohol, and SSBs. These gains will primarily be concentrated in LMICs. Presenting the results as a percentage of government health spending shows how these tax revenues may be benchmarked where possible, and frames their importance. This is especially important because economic growth in advanced economies is projected to return to pre-COVID levels only by 2025, while it may take even longer in LMICs to reach these levels.[5] In addition to lower growth, the repayment of external debts is projected to put pressure on government budgets.[19] Almost half of all LMICs are projected to have lower public spending in 2024 than the average spending levels between 2010-2020.[2] Furthermore, social spending in LMICs, which consists of three components — health, education, and social protection — is currently significantly below recommended levels. There is a shortfall in spending of 0.9%, 4.7%, and 0.6% of GDP, on education, health, and social protection in LMICs, respectively.[5] These numbers mask regional disparities — sub-Saharan Africa and low-income countries have even higher gaps in spending.[5]

Although we have not modeled changes in health outcomes in this analysis, the estimated decrease in consumption indicates the significant impact that tax-induced price changes can have on overall health. In our previous analysis, we projected that over a 50-year period, a 20% tax-induced price increase on tobacco, alcoholic beverages, and SSBs would result in an additional 160.7 million, 227.4 million, and 24.3 million years of life, respectively. If extended further, for instance, to the end of the lifespan for the entire population, the model might reveal greater relative increases in YLL due to the tobacco tax compared to the alcohol tax, as the health benefits from reducing tobacco use accumulate over longer periods.

We have presented our results as a percentage of health spending to illustrate the magnitude of the tax receipts generated. This approach also underscores the importance of using these tax receipts to support complementary measures to taxation, such as implementing restrictions on advertising and supporting cessation programs, in addition to funding tax administration. Although legislative restrictions on earmarking may prevent this in some countries, earmarking taxes can garner public support for these taxes and increase funding for critical social and health programs. Moreover, taxation itself can help reduce public health expenditures.

While it is important to focus on the traditionally modeled commodities such as tobacco, alcohol, and SSBs, there are new commodities that need attention, including e-cigarettes, cannabis, and other unhealthy foods. Currently, there is limited data on preferences and demand for these newer products, and most price-elasticity data for these products come from higher-income countries. Future research should aim to model the health and economic effects of taxation on these emerging products.

Our model has many important limitations. First, similar to all modeling endeavors, our simulations depend on the parameters utilized in our analysis. These parameters are gleaned from the latest scientific studies and offer the best available estimates, yet they may reflect previous relationships among variables that might not hold true in the future. Restricting our modelling horizon to five years limits this issue. Additionally, our elasticity parameters were derived from meta-analyses. The greatest data challenges were encountered for alcohol, where comprehensive tax rates and prices across three beverage categories were unavailable, specifically for wine, that did not have post 2019 tax rates available. There is missing data for the wine tax, and we make an assumption that wine is taxed at the same rate as spirits, which on average is higher than beer. This would result in a lower increase in tax revenues from the simulated tax and a conservative estimate. Overall, this assumption should not affect total estimates drastically as wine is also the least consumed of the three beverage types.

Second, we have refrained from extensively modeling substitution effects due to a dearth of suitable parameters. In the case of alcohol, we uniformly augmented prices across all three beverage categories and incorporated within-product substitution by simulating price increases per serving of each beverage. Consequently, we may have underestimated the effects of taxation as we did not consider additional tax revenue generated from substitution to other products due to the tax. For tobacco, this may include other smoking products and for SSBs this may constitute other beverages such as diet drinks, water, and tea and coffee.

Our paper estimated the short-term economic effects of increased taxation on tobacco, alcohol, and SSBs. The tax-induced higher prices result in substantial economic benefits, particularly for LMICs. Future research should focus on monitoring the consumption of related harmful commodities and estimating the effects of their taxation.

REFERENCES

1.   Institute for Health Metrics and Evaluation. *Global Burden of Disease 2021*. https://vizhub.healthdata.org/gbd-results/ (2024).

2.   World Health Organization. Tobacco. https://www.who.int/news-room/fact-sheets/detail/tobacco (2023).

3.   Manthey, J. *et al.* Global alcohol exposure between 1990 and 2017 and forecasts until 2030: a modelling study. *Lancet Lond. Engl.* **393**, 2493–2502 (2019).

4.   World Health Organization. WHO calls on countries to tax sugar-sweetened beverages to save lives. https://www.who.int/news/item/13-12-2022-who-calls-on-countries-to-tax-sugar-sweetened-beverages-to-save-lives (2022).

5.   UNICEF. *COVID-19 and Shrinking Finance for Social Spending*. (2022).

6.   Organisation for Economic Co-Operation and Development (OECD). *Tax and Fiscal Policies after the COVID-19 Crisis*. https://www.oecd.org/coronavirus/policy-responses/tax-and-fiscal-policies-after-the-covid-19-crisis-5a8f24c3/ (2021).

7.   World Health Organization. *WHO Report on the Global Tobacco Epidemic, 2023: Protect People from Tobacco Smoke*. 248 (2023).

8.   World Health Organization. *Global Report on the Use of Alcohol Taxes*. (2023).

9.   World Health Organization. *Global Report on the Use of Sugar-Sweetened Beverage Taxes, 2023*. (2023).

10.   Summan, A. *et al.* The potential global gains in health and revenue from increased taxation of tobacco, alcohol and sugar-sweetened beverages: a modelling analysis. *BMJ Glob. Health* **5**, e002143 (2020).

11.   Verguet, S. *et al.* The consequences of tobacco tax on household health and finances in rich and poor smokers in China: an extended cost-effectiveness analysis. *Lancet Glob. Health* **3**, e206–e216 (2015).

12.   Manyema, M. *et al.* The Potential Impact of a 20% Tax on Sugar-Sweetened Beverages on Obesity in South African Adults: A Mathematical Model. *PLoS ONE* **9**, e105287 (2014).

13.   Jha, P., Joseph, R. & Li, D. *Tobacco Taxes: A Win-Win Measure for Fiscal Space and Health*. (2012).

14.   Goodchild, M., Perucic, A.-M. & Nargis, N. Modelling the impact of raising tobacco taxes on public health and finance. *Bull. World Health Organ.* **94**, 250–257 (2016).

15.   GHO | By category | Global Information System on Alcohol and Health. *WHO* http://apps.who.int/gho/data/node.main.GISAH?lang=en.

16.   Lara-Castor, L. *et al.* Sugar-sweetened beverage intakes among adults between 1990 and 2018 in 185 countries. *Nat. Commun.* **14**, 5957 (2023).

17.   WHO. *Global Status Report on Alcohol and Health 2014*. 1–392 http://www.who.int/substance_abuse/publications/global_alcohol_report/msbgsruprofiles.pdf (2014).

18.   Brennan, A. *et al.* The Sheffield Alcohol Policy Model - A Mathematical Description. *Health Econ.* **24**, 1368–1388 (2015).

19.   Stubbs, T., Kentikelenis, A., Gabor, D., Ghosh, J. & McKee, M. The return of austerity imperils global health. *BMJ Glob. Health* **8**, e011620 (2023).

20.   World Population Prospects - Population Division - United Nations. https://population.un.org/wpp/.

21.   World Bank. World Bank Group country classifications by income level for FY24 (July 1, 2023- June 30, 2024). *World Bank Blogs* https://blogs.worldbank.org/en/opendata/new-world-bank-group-country-classifications-income-level-fy24 (2023).

22.   Euromonitor International. *Euromonitor Sales*. (2024).

23.   IARC. Effectiveness of tax and price policies for tobacco control. **14**, (2011).

24.   Sornpaisarn, B., Shield, K., Cohen, J., Schwartz, R. & Rehm, J. Elasticity of alcohol consumption, alcohol-related harms, and drinking initiation in low- and middle-income countries: A systematic review and meta-analysis. *Int. J. Alcohol Drug Res.* **2**, 45–58 (2013).

25.   Nelson, J. P. Meta-analysis of alcohol price and income elasticities – with corrections for publication bias. *Health Econ. Rev.* **3**, 17 (2013).

26.   Cabrera Escobar, M. a, Veerman, J. L., Tollman, S. M., Bertram, M. Y. & Hofman, K. J. Evidence that a tax on sugar sweetened beverages reduces the obesity rate: a meta-analysis. *BMC Public Health* **13**, 1072 (2013).
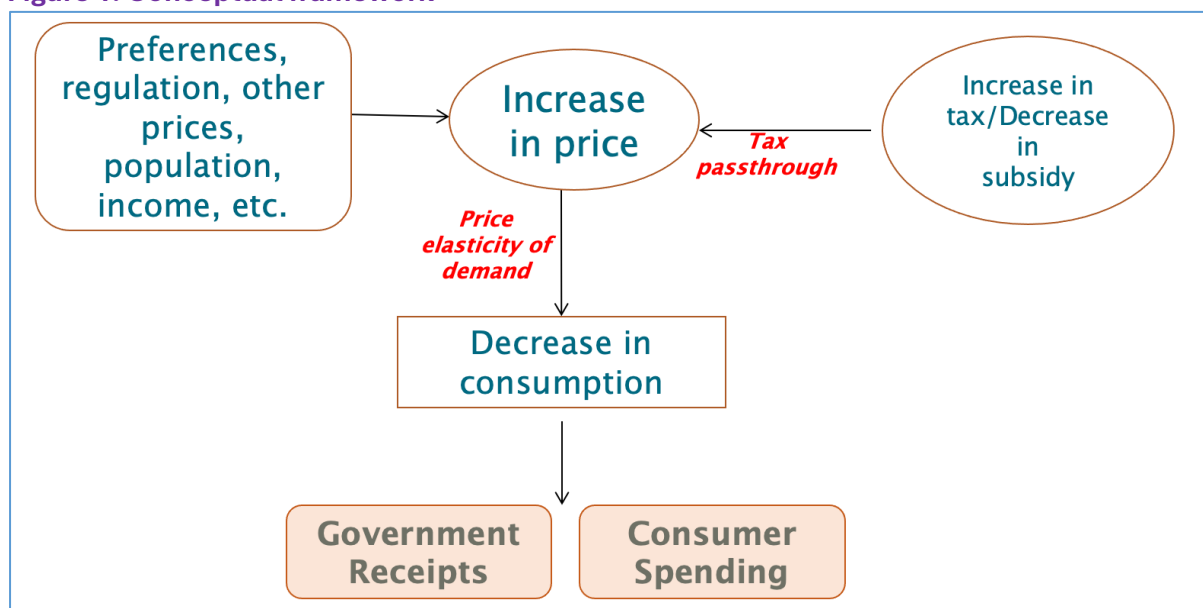
Figure 1: Conceptual framework

Table 1: Input Sources

Input	Source
Population	United Nations World Population Prospects[20]
Income groups	World Bank[21]
Domestic general government health expenditure per capita	WHO Global Health Observatory[15]
Tobacco	
Prices and taxes	WHO[7]
Smoking prevalence	
Cigarette consumption	Euromonitor[22]
Alcohol	
Prices and taxes	WHO[8]
Drinking prevalence	WHO Global Health Observatory[15]
Grams of pure alcohol consumption	
Sugar-sweetened beverages	
Prices and taxes	WHO[9]
Consumption	Global Dietary Database[16]

Table 2: Elasticity Parameters

Variable		Data source	Value
Tobacco			
Own-price elasticity	Cigarettes: LIC, LMIC, UMIC	Authors' assumptions based on International Agency for Research on Cancer[23]	−0.5
	Cigarettes: HIC		−0.4
Alcohol			
Own-price elasticity	Alcohol: LIC, LMIC, UMIC	Authors' assumption based on Sornpaisarn[24] Nelson[25]	−0.65
	Alcohol: HIC		−0.46
Sugar-sweetened beverages			
Own-price elasticity	Sugar-sweetened beverages	Authors' estimates based on Cabrera Escobar *et al.*[26]	−1.2

Table 3: Tobacco Tax Estimates

Income Level	Change in tax revenue, annual ($, billions)	Change in tax revenue, Annual (% of health expenditure)	Change in tax revenue, 5 years ($, billions)	Change in tax revenue, 5 years discounted ($, billions)	Decrease in annual packs smoked, millions	Change in smokers (millions)
20% Price Increase						
Low	0.87	15.01	4.33	4.09	414	1.1
	[.8 - .93]	[13.946 - 16.073]	[4.02 - 4.64]	[3.8 - 4.38]	[338 - 490]	[0.9 - 1.3]
Lower middle	7.82	6.15	39.12	36.90	3,896	9.6
	[6.87 - 8.77]	[5.403 - 6.894]	[34.37 - 43.86]	[32.43 - 41.38]	[3,181 - 4,611]	[7.8 - 11.4]
Upper middle	50.18	5.34	250.89	236.69	17,522	23.1
	[44.73 - 55.62]	[4.76 - 5.919]	[223.67 - 278.11]	[211.01 - 262.37]	[14,308 - 20,737]	[18.8 - 27.5]
High	38.67	0.76	193.33	182.39	3,258	7.3
	[35.09 - 42.25]	[.687 - .827]	[175.43 - 211.23]	[165.5 - 199.28]	[2,657 - 3,859]	[5.9 - 8.6]
Global	97.54	1.58	487.67	460.07	25,090	41.0
	[87.49 - 107.57]	[1.415 - 1.74]	[437.49 - 537.84]	[412.74 - 507.41]	[20,484 - 29,697]	[33.3 - 48.8]
50% Price Increase						
Low	1.78	30.81	8.89	8.39	994	2.6
	[1.56 - 1.99]	[27.074 - 34.542]	[7.81 - 9.97]	[7.37 - 9.4]	[819 - 1,168]	[2.1 - 3.1]
Lower middle	15.52	12.20	77.60	73.21	9,351	23.9
	[12.53 - 18.5]	[9.851 - 14.543]	[62.67 - 92.52]	[59.12 - 87.29]	[7,705 - 10,996]	[19.4 - 28.4]
Upper middle	100.41	10.69	502.07	473.66	42,053	57.9
	[82.95 - 117.88]	[8.827 - 12.544]	[414.75 - 589.38]	[391.29 - 556.03]	[34,651 - 49,455]	[47. - 68.7]
High	81.69	1.60	408.46	385.35	7,885	18.2
	[70.35 - 93.03]	[1.377 - 1.821]	[351.74 - 465.17]	[331.84 - 438.85]	[6,477 - 9,293]	[14.8 - 21.6]
Global	199.40	3.23	997.02	940.61	60,283	102.6
	[167.39 - 231.4]	[2.707 - 3.743]	[836.97 - 1,157.04]	[789.62 - 1,091.57]	[49,652 - 70,914]	[83.3 - 121.9]

Note: Baseline year is 2023. All estimates are in 2022 USD. Discount rate of 3% has been used.

Table 4: Alcohol Tax Estimates

Income group	Change in tax revenue, annual ($, billions)	Change in tax revenue, Annual (% of health expenditure)	Change in tax revenue, 5 years ($, billions)	Change in tax revenue, 5 years discounted ($, billions)	Decrease in daily servings, male (millions)
20% Price Increase					
Low	5.76	99.84	28.81	27.18	41
	[5.16 - 6.36]	[89.442 - 110.238]	[25.81 - 31.81]	[24.35 - 30.01]	[33 - 48]
Lower middle	86.85	68.26	434.24	409.67	279
	[78.03 - 95.66]	[61.329 - 75.182]	[390.17 - 478.3]	[368.09 - 451.24]	[227 - 332]
Upper middle	56.09	5.97	280.45	264.59	298
	[51.21 - 60.97]	[5.45 - 6.488]	[256.06 - 304.85]	[241.57 - 287.61]	[242 - 355]
High	101.82	1.99	509.12	480.31	141
	[96.51 - 107.14]	[1.889 - 2.097]	[482.53 - 535.7]	[455.23 - 505.39]	[115 - 168]
Global	250.52	4.05	1,252.62	1,181.75	759
	[230.91 - 270.13]	[3.735 - 4.369]	[1,154.57 - 1,350.66]	[1,089.24 - 1,274.25]	[617 - 902]
50% Price Increase					
Low	10.11	175.14	50.54	47.68	102
	[7.8 - 12.42]	[135.141 - 215.143]	[38.99 - 62.08]	[36.79 - 58.57]	[83 - 121]
Lower middle	152.94	120.20	764.71	721.44	698
	[118.84 - 187.05]	[93.396 - 147.004]	[594.18 - 935.23]	[560.56 - 882.32]	[567 - 829]
Upper middle	100.85	10.73	504.26	475.73	746
	[81.25 - 120.46]	[8.646 - 12.819]	[406.23 - 602.29]	[383.24 - 568.21]	[606 - 886]
High	209.68	4.10	1,048.39	989.07	353
	[187.94 - 231.41]	[3.679 - 4.529]	[939.72 - 1,157.06]	[886.55 - 1,091.59]	[286 - 419]
Global	473.58	7.66	2,367.90	2,233.92	1,899
	[395.83 - 551.34]	[6.402 - 8.917]	[1,979.12 - 2,756.66]	[1,867.14 - 2,600.69]	[1,542 - 2,256]

Note: Baseline year is 2023. All estimates are in 2022 USD. Discount rate of 3% has been used.

Table 5: Sugar-Sweetened Beverages Tax Estimates

Income level	Change in tax revenue, annual ($, billions)	Change in tax revenue, Annual (% of health expenditure)	Change in tax revenue, 5 years ($, billions)	Change in tax revenue, 5 years discounted ($, billions)	Change in total servings per year (millions)
		20% Price Increase			
Low	12.22	211.67	61.08	57.62	38,443
	[9.75 - 14.68]	[168.982 - 254.366]	[48.76 - 73.4]	[46. - 69.24]	[31,211 - 45,670]
Lower middle	23.68	18.61	118.39	111.69	74,109
	[19.95 - 27.41]	[15.678 - 21.539]	[99.74 - 137.03]	[94.1 - 129.28]	[60,166 - 88,050]
Upper middle	24.40	2.60	121.98	115.08	78,305
	[20.41 - 28.38]	[2.172 - 3.021]	[102.04 - 141.92]	[96.27 - 133.89]	[63,579 - 93,037]
High	22.75	0.45	113.76	107.33	43,175
	[18.89 - 26.61]	[.37 - .521]	[94.46 - 133.07]	[89.11 - 125.54]	[35,055 - 51,297]
Global	83.05	1.34	415.21	391.72	234,032
	[69. - 97.08]	[1.116 - 1.57]	[345. - 485.42]	[325.48 - 457.95]	[190,011 - 278,055]
		50% Price Increase			
Low	7.76	134.41	38.78	36.59	96,101
	[-2.69 - 18.2]	[-46.577 - 315.398]	[-13.44 - 91.01]	[-12.68 - 85.86]	[78,023 - 114,176]
Lower middle	20.04	15.75	100.22	94.55	185,274
	[3.36 - 36.73]	[2.639 - 28.866]	[16.79 - 183.64]	[15.84 - 173.25]	[150,427 - 220,128]
Upper middle	19.95	2.12	99.75	94.11	195,765
	[2.26 - 37.64]	[.241 - 4.006]	[11.3 - 188.21]	[10.66 - 177.56]	[158,941 - 232,590]
High	17.93	0.351	89.65	84.58	107,946
	[.95 - 34.91]	[.0186 - .683]	[4.76 - 174.55]	[4.49 - 164.67]	[87,639 - 128,248]
Global	65.68	1.06	328.40	309.83	585,085
	[3.88 - 127.48]	[.063 - 2.062]	[19.41 - 637.41]	[18.31 - 601.34]	[475,030 - 695,143]

Note: Baseline year is 2023. All estimates are in 2022 USD. Discount rate of 3% has been used.

Table 6: Summary of tax projections by region, 20% price increase

Product	Tobacco		Alcohol		SSB	
Region	Change in tax revenue, annual ($, billions)	Change in tax revenue, Annual (% of health expenditure)	Change in tax revenue, annual ($, billions)	Change in tax revenue, Annual (% of health expenditure)	Change in tax revenue, annual ($, billions)	Change in tax revenue, Annual (% of health expenditure)
Europe & Central Asia	24.73	1.24	47.10	2.35	11.34	0.57
	[27.64 - 21.83]	[1.381 - 1.09]	[50.98 - 43.21]	[2.546 - 2.158]	[9.5 - 13.17]	[.474 - .658]
Latin America & Caribbean	2.13	0.95	20.77	9.23	17.92	7.96
	[2.43 - 1.84]	[1.081 - .815]	[22.5 - 19.03]	[9.995 - 8.457]	[14.9 - 20.93]	[6.622 - 9.301]
Middle East & North Africa	5.19	3.53	3.19	2.17	3.82	2.60
	[5.73 - 4.64]	[3.9 - 3.157]	[3.5 - 2.88]	[2.379 - 1.958]	[2.92 - 4.72]	[1.99 - 3.21]
East Asia & Pacific	50.40	3.81	53.46	4.04	9.19	0.70
	[55.61 - 45.18]	[4.206 - 3.418]	[57.82 - 49.1]	[4.373 - 3.714]	[8.03 - 10.36]	[.607 - .784]
North America	11.47	0.48	48.12	2.00	9.99	0.42
	[12.16 - 10.78]	[.506 - .449]	[49.86 - 46.39]	[2.076 - 1.932]	[8.26 - 11.72]	[.344 - .488]
South Asia	2.35	5.40	60.96	140.12	4.78	11.00
	[2.62 - 2.08]	[4.206 - 3.418]	[66.88 - 55.05]	[4.373 - 3.714]	[3.83 - 5.73]	[.607 - .784]
Sub-Saharan Africa	1.31	3.27	16.93	42.10	26.00	64.65
	[1.42 - 1.2]	[1.74 - 1.416]	[18.61 - 15.25]	[4.369 - 3.735]	[21.55 - 30.44]	[1.116 - 1.57]