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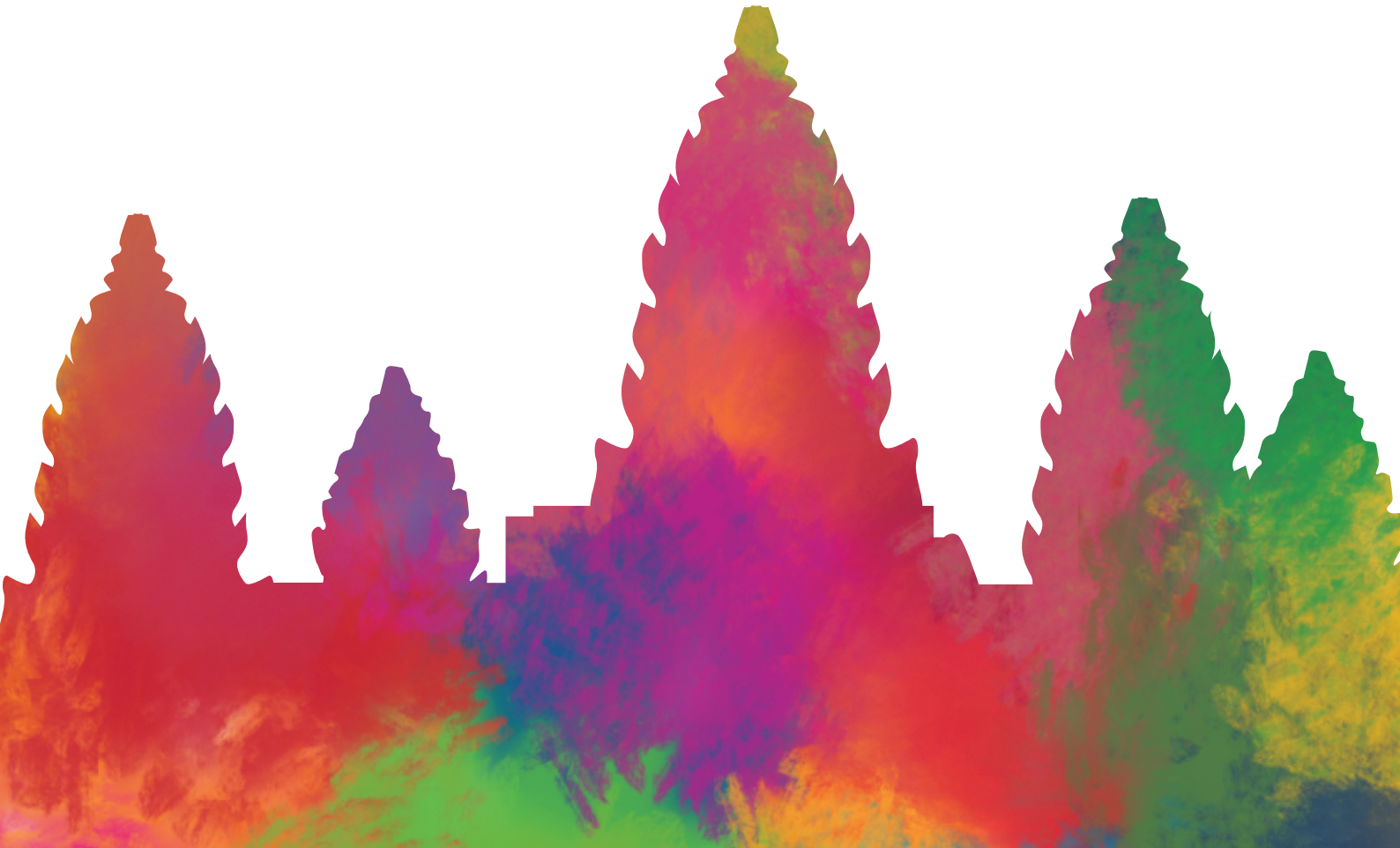
Investment Case for Tobacco Control in Cambodia

The case for scaling-up WHO FCTC implementation



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July 2019

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RTI INTERNATIONAL

World Health Organization

The Case for Investing in WHO FCTC Implementation in Cambodia

Prepared by
RTI International
United Nations Development Programme
WHO FCTC Secretariat
World Health Organization

July 2019

Funded by UK Government

15,000

Cambodian citizens die every year due to **tobacco-related diseases**.

33% of those deaths

occur amongst the lowest income group.

Tobacco cost Cambodia

KHR 2.7 trillion

every year, equivalent to

3.0% of its GDP

Investing now in five tobacco control measures will save

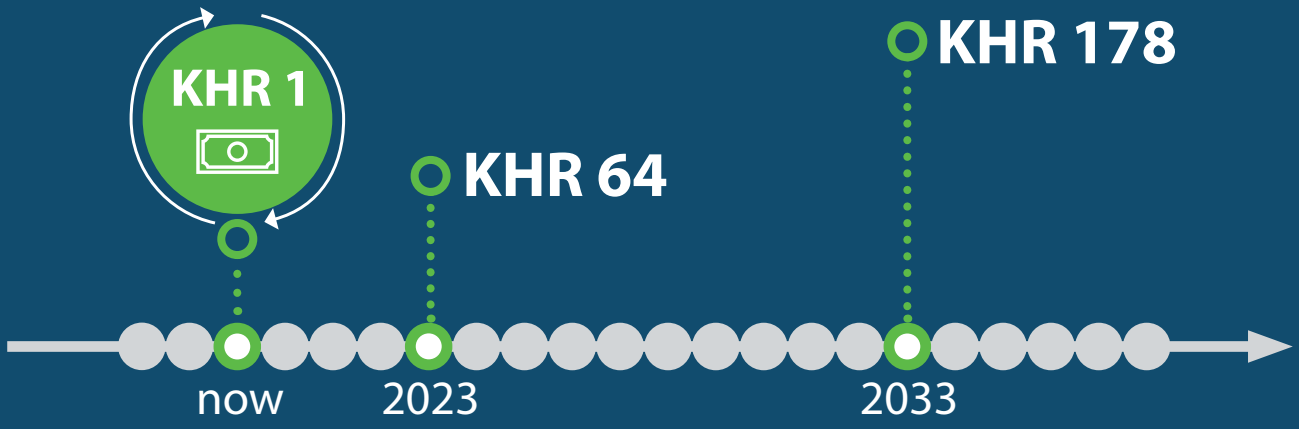
57,000 lives

and avert

KHR 7.9 trillion

in health costs and economic losses by 2033.

For every **Cambodian riel** invested in five tobacco-control measures now, Cambodia receives **KHR 64** in averted costs and economic losses by 2023 and **KHR 178** by 2033.



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1. Executive summary

Tobacco is a health and sustainable development issue. Tobacco consumption and production causes early death and disease, results in high health costs and economic losses, widens socioeconomic inequalities, and even contributes to environmental degradation. As a key risk factor for major non-communicable diseases (NCDs) including cancers, diabetes, chronic respiratory disease and cardiovascular disease, tobacco consumption is one of Cambodia's biggest public health threats. In 2017, tobacco consumption was responsible for the deaths of approximately 15,000 Cambodia citizens, equivalent to 290 lives lost every week. Thirty-three percent of tobacco-related deaths in 2017 were amongst the lowest-earning income quintile of Cambodia's population.

This report presents the findings of the case for investing in tobacco control in Cambodia. It measures the costs and benefits—in health and economic terms—of implementing five priority tobacco control measures, in line with the WHO Framework Convention on Tobacco Control and according to the stated priorities of the Government of Cambodia. These five policy measures are: (a) increase tobacco taxation to reduce the affordability of tobacco products (*FCTC Article 6*); (b) enforce bans on smoking in all public places to protect people from tobacco smoke (*FCTC Article 8*); (c) implement plain packaging (*FCTC Article 11*); (d) Increase the frequency and coverage of mass media campaigns (*FCTC Article 12*); and (e) enact and enforce a comprehensive ban on all forms of tobacco advertising, sponsorship and promotion (*FCTC Article 13*). Because stakeholders expressed interest in other outcomes that can result from increasing tobacco taxation, the investment case also examines its impact on equity considerations and projected tax revenue. In addition, the investment case examines current losses in tax revenue due to illicit trade.

The results indicate that current levels of tobacco use in Cambodia are leading to enormous economic and health losses.

Each year, tobacco use causes KHR 2.71 trillion in total economic losses, the equivalent of 3.0 percent of 2017 GDP. These costs include a) KHR 268.3 billion in healthcare expenditures, and b) KHR 2.4 trillion in lost productive capacities due to premature mortality, disability or sickness, and workplace smoking. Large productivity losses from tobacco use (90 percent of all tobacco-related costs) indicate that tobacco use causes problems that resonate far beyond the health sector.

Every year tobacco use kills 15,000 Cambodians and results in the loss of over 237,000 life years. Continuation of these trends will hinder Cambodia's progress towards delivering on the key priorities stipulated in the National Development Strategic Plan of 2019–2023.

By taking action now, the government of Cambodia can reduce the burden of tobacco use. The investment case findings demonstrate that enacting and enforcing five FCTC tobacco control measures will:

Avert KHR 7.9 trillion in economic losses over the next 15 years. This includes about 7.1 trillion in lost economic output. The tobacco control measures stimulate economic growth by ensuring that fewer Cambodians 1) drop out of the workforce due to premature mortality, 2) miss days of work due to disability or sickness, and 3) work at a reduced capacity due to smoking.

Lead to KHR 795 billion in healthcare expenditure savings (KHR 53 billion annually) over 15 years. By preventing the onset of cardiovascular disease, diabetes, respiratory infections, cancer, and other smoking-attributable diseases, the tobacco control measures improve the health of the population, lowering demand for expensive medical care and treatment. Fifty-nine percent of the healthcare savings accrue to citizens and 26 percent of those savings accrue to the government.

Save 57,000 lives over the next 15 years, or 3,815 lives annually. Enacting the five FCTC tobacco control measures would contribute to Cambodia's efforts to meet SDG Target 3.4 to reduce by one third premature mortality from NCDs by 2030. Enacting the FCTC measures would prevent over 16,500 premature deaths from the four main NCDs by 2030, the equivalent of about 11 percent of the needed reduction in premature mortality to fulfill SDG Target 3.4.

Provide total economic benefits (KHR 7.9 trillion) that significantly outweigh the implementation cost (KHR 0.04 trillion). The gains from each tobacco control measure exceed the costs over the 15-year period. Increasing taxes would have the highest return on investment (ROI): for every Cambodian riel invested, one can expect to see 882 riels in economic gains in return. Enacting more stringent bans on advertising has the next highest ROI (1:284), followed by plain packaging (1:218), implementation of national-scale tobacco-control mass media campaigns (1:173), and increasing compliance with bans on smoking in public places (1:137).

Tobacco taxes lead to significant health and economic benefits for the poor.

Increasing tobacco taxes leads to a greater decrease in smoking prevalence among the majority of Cambodians compared to the higher income quintile, lowering healthcare expenditures and the incidence of catastrophic expenses that can trap individuals in poverty. **Under the first year of the described tax increase, increasing taxes could prevent 1,499 cases of impoverishment caused by out-of-pocket spending on tobacco-attributable diseases, and 16,823 catastrophic healthcare expenditures.**

In addition, lowering prevalence prevents tobacco-attributable deaths. Under the first year of the described tax scale up, the tax increase would avert 1,171 deaths, 46 percent of which would have occurred among Cambodia's lowest-income quintile.

Tobacco taxes represent a significant untapped source of the government revenue.

Increasing tax rates and adopting the tax structure changes that are designated in Cambodia's 2019–2023 Tobacco Tax Roadmap could generate **KHR 920 billion in additional revenue over the first five years** after the changes are implemented.

Illicit trade of cigarettes is contributing to tobacco use and lowering tax revenue collection. The investment case finds that if illicit trade had been completely eliminated in 2017:

Smokers would have consumed 1.6 million fewer packs of cigarettes.

Smokers would have purchased 16.9 million more licit packs, meaning the government of Cambodia would have **collected 6.8 percent more tax revenue (KHR 8.5 billion).**

Credit: © Staffan Scherz via Flickr

The investment case results show that there is an opportunity to reduce the health and economic burden of tobacco by enacting WHO FCTC policy measures that target tobacco smoking. By advancing its multisectoral response to tobacco and investing in the health of the population, the government of Cambodia can save lives, increase its revenue stream, generate strong economic gains, and reduce poverty.

Credit: © Juan Antonio Segal via Flickr

2. Introduction

In Cambodia, about 22 percent of individuals 15 and older currently use some from tobacco,[1] meaning 2.4 million Cambodians are at a substantially increased risk of morbidity and early mortality from cancer, cardiovascular disease, respiratory illnesses, and many other tobacco-attributable diseases. Many more Cambodians are at risk from exposure to secondhand smoke. In 2017, tobacco use was responsible for around 15,000 deaths, 55 percent of which occurred in individuals under age 70.[2]

In addition to the immense toll tobacco takes on human health and wellbeing, it also imposes a substantial economic burden. Worldwide, healthcare expenditures to treat diseases and injuries caused by tobacco totaled nearly six percent of global health expenditures.[3] Further, tobacco use can reduce productivity by permanently or temporarily removing individuals from the work force due to poor health.[4] When individuals die prematurely, the labour output that they would have produced in their remaining years is lost. In addition, individuals with poor health are more likely to miss days of work (absenteeism) and, when they are at work, to operate at a reduced capacity (presenteeism, smoking breaks).[5, 6]

The Sustainable Development Goals recognize that current tobacco use trends, in Cambodia and around the world, are incompatible with sustainable development. Through Sustainable Development Goal (SDG) Target 3.4., Agenda 2030 commits Member States to achieve a one-third reduction in premature mortality from NCDs (i.e. deaths between 35 and 69) by 2030. Accelerating progress on NCDs requires strengthened implementation of the World Health Organization Framework Convention on Tobacco Control (WHO FCTC); SDG Target 3.a. Tobacco control is not just a primary means to improve population health, but also a proven approach to reduce poverty and inequalities, reduce premature mortality, grow the economy, address environmental issues, and advance sustainable development broadly.

Cambodia signed the WHO Framework Convention on Tobacco Control (WHO FCTC) in 2004 and ratified it the following year. As of 2017, Cambodia has enacted many of the obligations under the WHO FCTC. The national tobacco control law bans smoking in public places to protect people from tobacco smoke; mandates large graphic health warnings and messages on tobacco packages that describe the harmful effects of tobacco use, and; legislates bans on advertising, promotion, and sponsorship of tobacco products.

By legislating and funding these important measures, Cambodia has set the stage for curbing the tobacco epidemic. However, despite these efforts, millions still suffer from tobacco use.

Opportunities exist to intensify enforcement of existing policies and implement new measures. Concrete and coordinated efforts from all sectors of the government, and cooperation from the private sector (with the exception of the tobacco industry) can generate new wins and catalyze health and economic gains.

Given these considerations, a joint programming mission to Cambodia was undertaken to launch a tobacco control investment case. In partnership with Cambodia's Ministry of Health, the mission was conducted by the FCTC Secretariat, UNDP, and WHO.

An investment case analyses the health and economic costs of tobacco use as well as the potential gains from scaled up implementation of FCTC measures. It identifies which FCTC demand-reduction measures can produce the largest health and economic returns for Cambodia (the return on investment; ROI). In consultation with the Cambodian Ministry of Health, five policies were selected to model in the investment case.

Increase tobacco taxation to reduce the affordability of tobacco products. *(WHO FCTC Article 6)*

Enforce bans on smoking in all public places to protect people from tobacco smoke. *(WHO FCTC Article 8)*

Implement plain packaging.
(WHO FCTC Article 11: Guidelines for Implementation)

Increase the frequency and coverage of mass media campaigns.
(FCTC Article 12)

Implementing and enforcing a comprehensive ban on tobacco advertising, sponsorship and promotion. *(FCTC Article 13)*

In addition to these policies, the investment case team also considered the impact that increasing cigarette taxes has on different income quintiles; the impact that increasing cigarette taxes would have on government revenue, and; the amount of tax revenue that is lost due to illicit trade of cigarettes.

This report presents findings from the investment case. **Section 3** describes tobacco use in Cambodia, examines the current state of implementation of WHO FCTC measures, and examines target goals to reduce tobacco use. **Section 4** briefly summarizes the methodology for the economic analysis. **Section 5** reports the main findings of the economic analysis, including the extent to which tobacco use damages Cambodian people's health and drains the economy, and the ability of WHO FCTC measures to restore health and catalyze economic gains. **Section 6** presents the results of the equity, tax revenue, and illicit trade analyses.

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3. Tobacco control in Cambodia: Status and context

3.1 Tobacco use prevalence, social norms, and awareness-raising

According to the 2014 National Adult Tobacco Survey of Cambodia, approximately 22 percent of Cambodians aged 15 and older use some form of tobacco.[7]

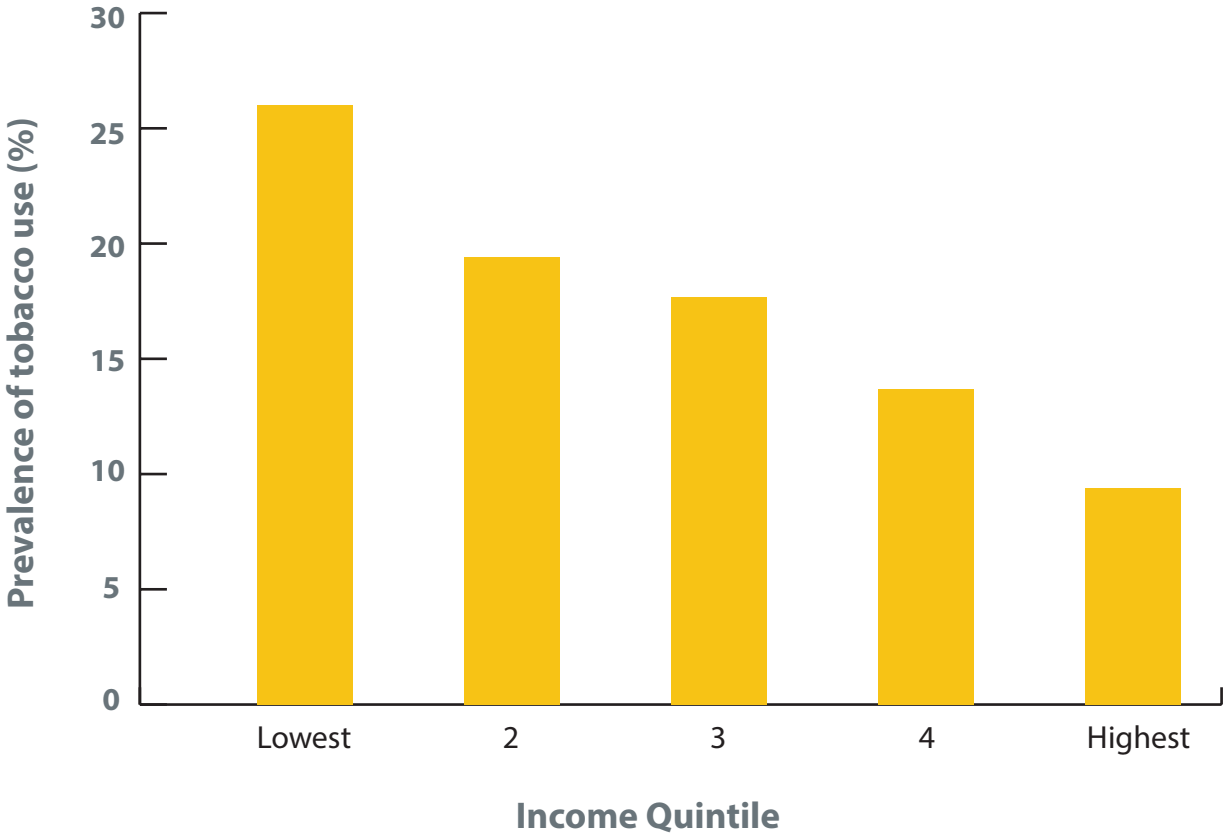
Seventeen percent of Cambodians smoke tobacco, while 4.9 percent use some form of smokeless tobacco, such as chewing tobacco.[8] Smoking prevalence is much lower among youth. According to the 2016 Global Youth Tobacco Survey for Cambodia, 1.8 percent of boys and 1.2 percent of girls aged 13 to 15 currently smoke tobacco.[9]

Tobacco use varies significantly by demographic group. Smoking prevalence is higher among men than women. About 32.9 percent of men smoke tobacco in Cambodia, close to the global male average of 35 percent, whereas 2.4 percent of women smoke, below the global female average of 6 percent.[10, 11] The gender disparity is reversed (women, 8.6%; men, 0.8%) for smokeless tobacco .

Smoking is more common in rural areas—where 17 percent of individuals are smokers, compared to 10.4 percent of the urban population—and varies with income and education levels. 20.4 percent of adults with six years of education or less smoke, while those with 7 to 12 years of education have a smoking prevalence rate of 13.7 percent.[12]

Tobacco use affects all Cambodians, but is more common among low income groups. Smoking rates among the lowest-income quintile are nearly three times greater than the wealthiest quintile (**Figure 1)**. Almost all (97.6%) smokers consume at least one cigarette per day, and the average smoker consumes 15 cigarettes per day.

Fig. 1: Adult prevalence of smoking, by income quintile *(Income quintiles are created by dividing the population into five equal groups, by income. Quintile 1 is composed of the bottom 20 percent of income-earning Cambodians, while quintile 5 contains the wealthiest 20 percent. Data source: 2014 Cambodia Demographic and Health Survey)*



3.2 Tobacco control regulatory measures

Cambodia has a set of tobacco policies in place to reduce demand for tobacco products and protect the health of its population. Beginning with an issuance banning smoking in government buildings, since 1994 Cambodia has enacted over 20 laws, sub-decrees and regulations relating to tobacco control, including the headline Law on Tobacco Control of 2015.

Strengthening existing regulations and implementing new ones is an essential component of continuing the fight against tobacco in Cambodia. Recognizing this, the Government of Cambodia made tobacco control an integral component of the government's National Multisectoral Action (MSA) Plan for the Prevention and Control of Noncommunicable Diseases 2018–2027. Specific goals include strengthening enforcement of the laws on smoke-free places; expanding bans on advertising, promotion, and sponsorship; increasing tobacco taxation; establishing cessation services at health facilities; and, providing public health education campaigns about the harms of tobacco use.[13]

Smoking Ban in Public Places

Cambodia has legislated a nearly total **ban on smoking in public places**, except in airports where smoking rooms are allowed.[14] In collaboration with relevant ministries, the Ministry of Health is the authoritative institution for guiding, disseminating, enforcing and implementing smoke-free public places. The ministry imposes fines on individuals (KHR 20,000—equivalent to US$4) and institutions (KHR 50,000—equivalent to US$12) that violate the ban.[15] Overall, compliance with the law is rising (61% of establishments displayed "no smoking" signs in 2017, compared to 56% in 2016); however, in some establishments such as nightclubs and massage parlors, "no-smoking" signs are rarely displayed.[16] Increased enforcement of the law would reduce the 60 percent of non-smokers who are unintentionally being exposed to second-hand smoke.[17]

Tobacco Advertising, Promotion and Sponsorship

The Law on Tobacco Control, adopted in 2015, bans most forms of **tobacco advertising, promotion, and sponsorship (TAPS)** in Cambodia. The law is relatively comprehensive in banning direct and indirect forms of TAPS; however, it permits point of sale product displays (one pack per brand), and allows for some indirect forms of advertising (e.g., sponsorship of public events if tobacco products or brand names are not shown, toys that resemble tobacco, retailer incentive programs).[18] Despite bans and penalties for violations, 13.3 percent of students aged 13 to 15 have noticed advertisements or promotions at points of sale during the past month, one in four own something with a tobacco brand logo on it, and 65 percent noticed tobacco use on TV or in movies in the past month.[19]

Taxes

Taxes on cigarettes in Cambodia are among the lowest in ASEAN, with the tax share equivalent to only 25 percent of the retail price of domestic cigarettes and 31.1 percent of the retail price for imported cigarettes.[20] The tax structure is comprised of an ad valorem excise tax equal to 20 percent of 90 percent of the cigarette invoice price, a value-added tax (VAT) of 10 percent, Public Lighting Tax of 3 percent, and import tariffs ranging from 7 to 35 percent.[21] Scaling up taxes to represent 75 percent of the retail price required by the WHO FCTC Article 6 Guideline would generate additional health and revenue gains for Cambodia.

Graphic Warning Labels

Graphic warning labels are required to cover 55 percent of the top, front, and back of cigarette packs, meeting WHO FCTC obligation to cover at least 50 percent of packaging. Two graphic warnings and messages are in circulation, with refreshment required annually. There is no law requiring plain packaging of tobacco products[i].

Anti-tobacco Mass Media Campaigns

From December 2015 to February 2016, the National Centre for Health Promotion of the Ministry of Health aired a national **mass media campaign** to warn about the danger of secondhand smoke to children. The campaign was broadcast through TV, radio, newspaper, magazines, Internet, community theatre, billboards, and pamphlets. Fifty-four percent of individuals reported seeing or hearing messages from the campaign.[22] No other campaign has taken place since.[23] Implementing consistent, national-scale public-awareness campaigns about the harms of tobacco use can further draw the prevalence curve downward.

Table 1 summarizes the existing state of WHO FCTC measures analyzed in the investment case and compares them against the WHO FCTC target goals for each measure. Within the investment case, where Cambodia has not yet met the FCTC target goal, we analyze the impact that reaching that goal would have on tobacco consumption, population health, and the economy.

i Neutral color package with no branding or logos

Table 1: Summary of the current state of WHO FCTC measures in Cambodia, and target goals modelled in the investment case

Tobacco Policy	Baseline	Target
Implement and enforce bans on smoking in all public places to protect people from tobacco smoke. *(FCTC Article 8)*	Smoking is currently banned in indoor public and private spaces, however challenges with compliance remain.	Strengthen enforcement and compliance to achieve 100 percent smoke-free public spaces.
Enact and enforce a comprehensive ban on all forms of tobacco advertising sponsorship and promotion. *(FCTC Article 13)*	TAPs is mostly banned, with some exceptions such as allowing one pack per brand to be displayed at point of sale and certain allowances for indirect forms of TAPS.	Expand the law to ban all forms of advertising, promotion, and sponsorship, and strengthen implementation of existing laws to achieve full compliance.
Increase tobacco taxation to reduce the affordability of tobacco products. *(FCTC Article 6)*	Taxes currently represent about 25 percent of the retail price of the most-sold brand of cigarettes.	Following the 2019–2023 Tobacco Tax Roadmap, implement a specific tax and phase out the ad valorem tax, scaling the specific tax over 15 years in order to reach a tax share that represents 75 percent of the retail price of tobacco.
Mandate that tobacco products and packaging carry large graphic health warnings describing the harmful effects of tobacco use. *(FCTC Article 11)*	Cambodia has met and exceeded the target goal of 50 percent coverage for graphic warning labels, with content refreshed frequently.	**√ Fully implemented – Graphic warning labels meet FCTC obligations**
Mandate plain packaging of all tobacco products. *(FCTC Article 11: Guidelines)*	There is no law that currently mandates plain packaging of tobacco products.	Implement a law requiring plain packaging.
Promote and strengthen public awareness about tobacco control issues and the harms of tobacco use through mass media information campaigns. *(FCTC Article 12)*	A mass media tobacco control campaign was run for three months in 2015–2016 but no mass media campaign has been run since.	Implement consistent, national-scale public-awareness campaigns.

* In this table, the "baselines" originate from information compiled by Dr. Davavuth Yel in an unpublished document titled "Update on Tobacco Control"[24]

3.3 National coordination, strategy and planning

Strengthening enforcement of the Law on Tobacco Control of 2015 and its provisions requires strategic alignment and coordination between government institutions, civil society and international development partners, including the UN country team.

Prior to WHO FCTC ratification, Cambodia took its first step towards improving national coordination mechanisms, first establishing the Inter-Ministerial Committee for Education and Reduction of tobacco use in 2001.

In 2017, this committee was rebranded as the National Tobacco Control Committee. Chaired by the Minister of Health and the National Centre for Health Promotion, the committee is composed of 23 institutions and includes all of the nation's provincial/city governors. The Ministry of Health plans to further establish the Tobacco Control Committee at the sub-national level.

3.4 Tobacco cultivation and manufacturing

Tobacco cultivation and manufacturing are both present in Cambodia — but both are declining in economic output and importance.

As of 2009, roughly 10 of Cambodia's 25 provinces were growing tobacco. However, land devoted to growing tobacco has declined over the past decade, and tobacco growing is only a small fraction of agriculture in Cambodia, with only 0.15% of agricultural land devoted to tobacco cultivation. Consequently, the number of families growing tobacco is decreasing—roughly 5,000 families still grow tobacco.

Research across the globe has found tobacco cultivation to not be profitable for the majority of smallholder farmers compared to alternative crops, and very often it presents unsustainable risks for farmers. Studies show that tobacco cultivation yields poor returns to labour, causes dependency and debt, imposes health risks on farmers such as green tobacco sickness and respiratory diseases, and can even contribute to food insecurity, and environmental destruction that includes deforestation as well as soil and water degradation.[25]

Articles 17 and 18 of the WHO FCTC call on Parties to protect the environment and support famers wishing to transition to alternative livelihoods. There are several policy options and investments the Government of Cambodia can take to support tobacco farmers to transition to more profitable, healthy and sustainable livelihoods.

Alongside cultivation, tobacco manufacturing has also declined. There were 15,068 metric tons of tobacco produced in Cambodia in 2014. By 2017 that number had dropped to roughly 9,000. While 19 tobacco manufacturing plants once operated in Cambodia, according to interviews with the Ministry of Trade and Handicrafts, fewer than 1,000 employees work in the six tobacco manufacturing plants that remain.

3.5 Trade and tobacco use

Free trade and economic liberalization agreements are meant to boost economic growth. However, a liberalized economy gives the tobacco industry more options to bypass regulations on tobacco-leaf export and may even promote illicit trade.

For example, the Association of Southern Asian Nations (ASEAN) promotes regional cooperation, economic growth, social progress and cultural development for—and between—its member states. Every ASEAN member state including Cambodia produces tobacco (except Brunei Darussalam and Singapore), and the Thailand and Viet Nam governments have full or partial control of tobacco manufacturing and distribution. Thus, including tobacco products within the "General Exception List"[ii] of the current ASEAN free trade agreement remains a political challenge. Work within ASEAN is ongoing to integrate tobacco products in the 'General Exception List'. This creates an opportunity for Cambodia and other ASEAN countries to increase tariffs on tobacco products (import and export) and generate additional revenues for the government that can be reinvested in national development priorities.

ii Products that are harmful for health are excluded from duty free provisions.

4. Methodology

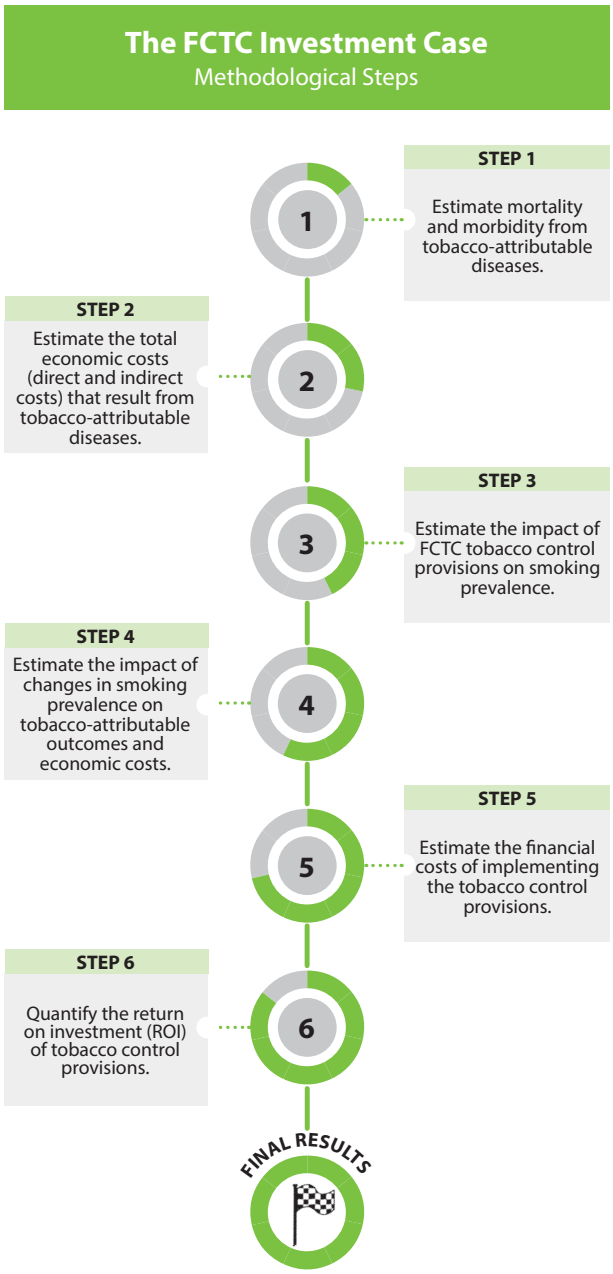
The purpose of the FCTC investment case is to quantify the current health and economic burden of tobacco use in Cambodia; estimate the impact that implementing tobacco measures would have on reducing the burden; and provide analysis of other impacts—e.g., on tax revenue, equity, illicit trade, agriculture—that may factor into Government decisions to implement tobacco control measures.

A RTI International model was developed to conduct the investment case, and perform the methodological steps in **Figure 2**. The tools and methods used to perform these steps are described in this report's Annex. Interested readers are referred to this report's separate Technical Appendix for a more thorough account of the methodology.

The FCTC Investment Case team worked with partners in Cambodia, including the National Center for Health Promotion and the General Department of Taxation, to collect national data inputs for the model. Where data was unavailable from government or other in-country sources, the team utilized publicly available national, regional, and global data from sources such as the World Health Organization (WHO), World Bank database, Global Burden of Disease (GBD) study, and academic literature.

Within the investment case, costs and monetized benefits are reported in constant 2017 Cambodian riels, and discounted at a rate of three percent.

Fig. 2: Investment case: Methodological steps



5. Results

5.1 The burden of tobacco use: health and economic costs[iii]

Tobacco use undermines economic growth. In 2017, tobacco use caused 15,000 deaths in Cambodia, 55 percent of which occurred in Cambodians under age 70.[26] As a result, Cambodia lost productive years in which those individuals would have contributed to the workforce. The economic losses due to tobacco-attributable premature mortality are estimated at KHR 1.15 trillion.

While the costs of premature mortality are high, the consequences of tobacco use begin well before death. As individuals begin to acquire tobacco-attributable diseases (e.g., cardiovascular disease, cancer, COPD), expensive medical care is required to treat them. Spending on medical treatment for illnesses caused by tobacco use cost the government KHR 70.3 billion in 2017, with Cambodia's citizens paying an additional KHR 157.1 billion on healthcare out-of-pocket (OOP). OOP healthcare expenditures have significant implications for poverty reduction efforts given the relationship between OOP health spending and impoverishment. Private insurance and other types of health coverage covered KHR 40.9 billion in tobacco-related health expenditures. In total, tobacco use caused KHR 268.3 billion in healthcare expenditures.

In addition to generating healthcare costs, as individuals become sick, they are more likely to miss days of work (absenteeism) or to acquire illnesses or diseases that cause them to be less productive at work (presenteeism). The cost of excess absenteeism due to tobacco-attributable illnesses was KHR 242.0 billion and the costs of presenteeism was KHR 630.3 billion.

Finally, even in their healthy years, working smokers face productivity losses due to smoking. Smokers take at least 10 minutes more per day in breaks than non-smoking employees.[27] If 10 minutes of time is valued at the average workers' salary, the compounding impact of 2.2 million employed daily smokers taking ten minutes per day for smoke breaks is equivalent to losing KHR 421.3 billion in productive output annually.

In total, tobacco use cost Cambodia's economy KHR 2.71 trillion in 2017, the equivalent of about 3.0 percent of Cambodia's gross domestic product (GDP) that year. **Figure 3** breaks down direct and indirect costs, and **Figure 4** illustrates the annual health losses that occur due to tobacco use.

iii In assessing the 'current burden' of tobacco use, the economic costs of premature mortality include the cost of premature deaths due to any form of exposure to tobacco (including of smoking, second-hand smoke, and the use of other types of tobacco products). Only smoking-attributable (not tobacco-attributable) costs are calculated for healthcare expenditures, absenteeism, presenteeism, and smoking breaks. While other forms of tobacco may also cause losses in these categories, no data is available to pinpoint those losses.

The current burden of tobacco use: health costs

Fig. 3: Breakdown of direct and indirect economic costs of tobacco use in 2017, KHR billions

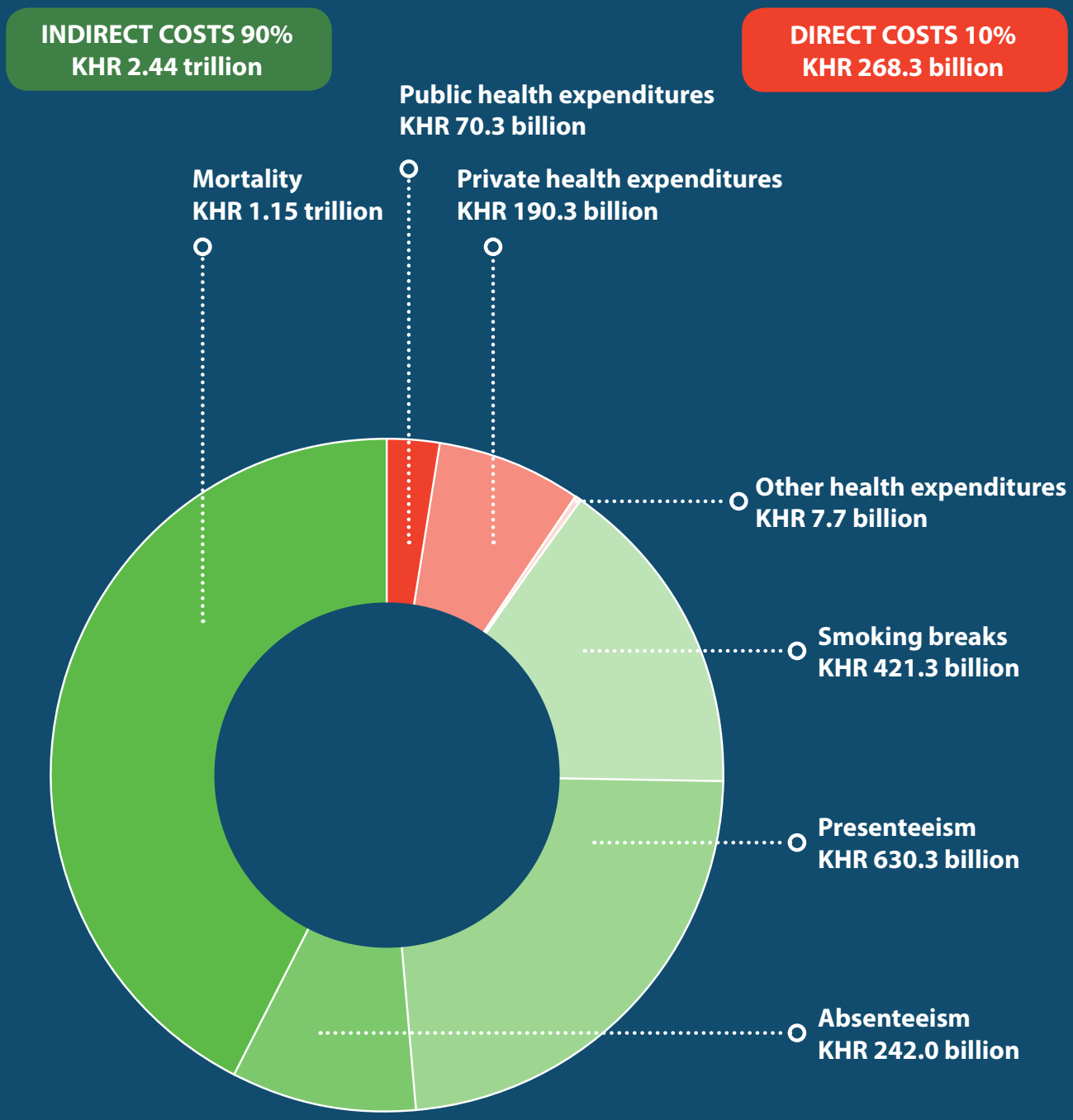


Fig. 4: Tobacco-attributable deaths by disease, 2017 *(Data source: IHME Global Burden of Disease. "Other diseases" category includes stomach cancer, peptic ulcer disease, lip and oral cavity cancer, liver cancer, colon and rectum cancer, esophageal cancer, larynx cancer, leukemia, bladder cancer, cervical cancer, pancreatic cancer, nasopharynx cancer, breast cancer, prostate cancer, aortic aneurysm, other pharynx cancer, kidney cancer, atrial fibrillation and flutter, gallbladder and biliary diseases, rheumatoid arthritis, peripheral artery disease, and multiple sclerosis.)*

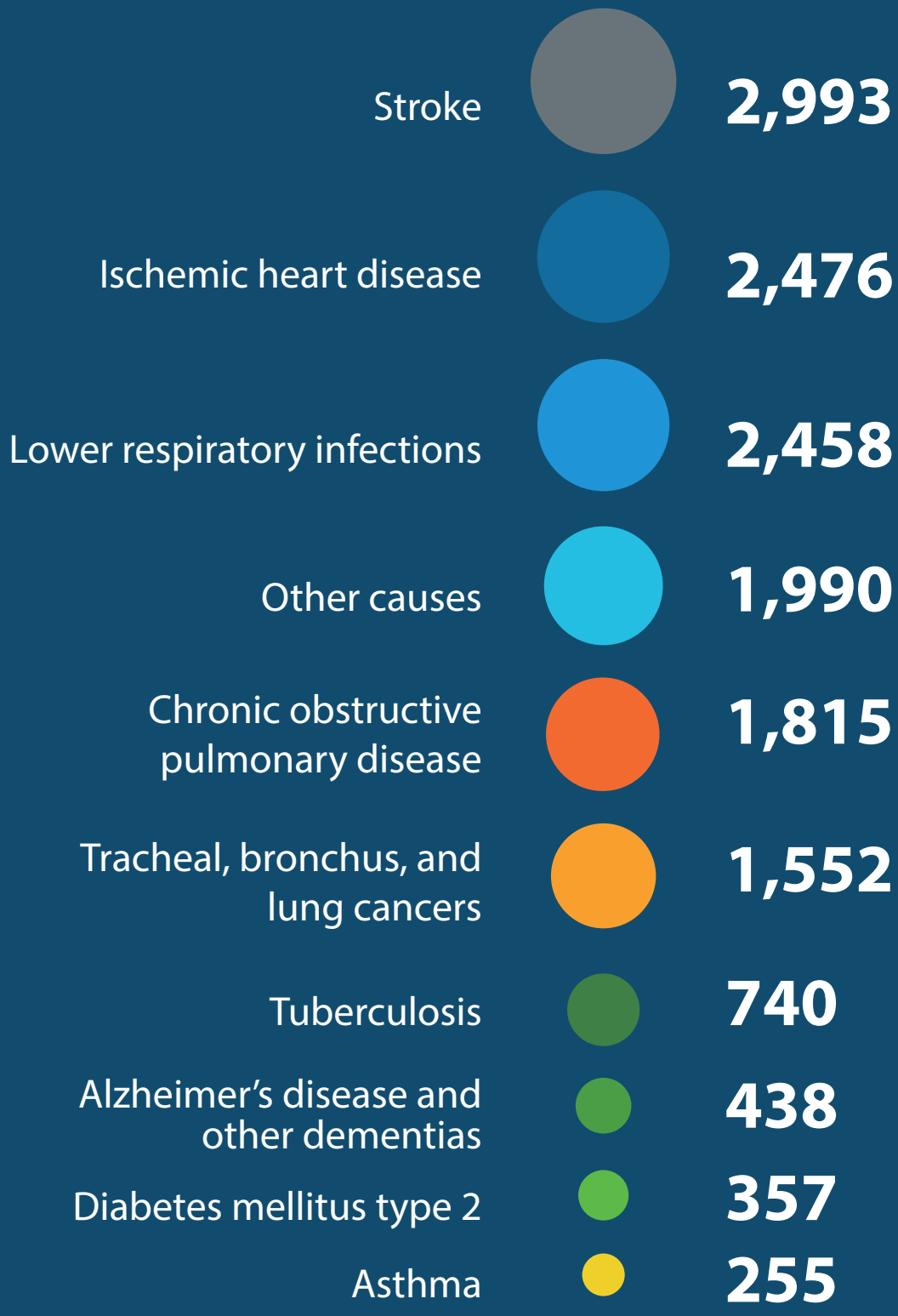
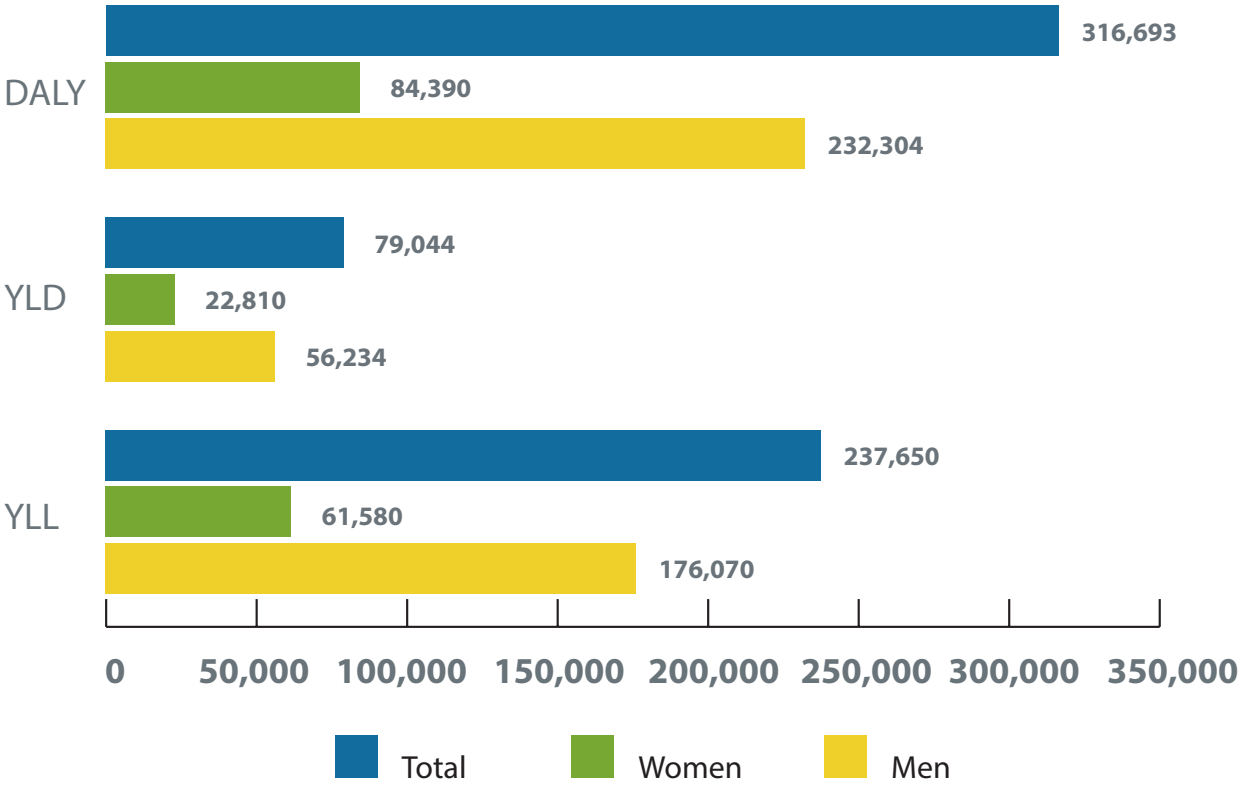


Fig. 5: Tobacco-attributable DALYs, YLDs and YLLs, 2017, by gender[iv]



5.2 Implementing policy measures that reduce the burden of tobacco use[v]

By implementing new FCTC policy measures, or intensifying existing ones, Cambodia can secure significant health and economic returns, and begin to reduce the KHR 2.7 trillion in direct and indirect economic losses that occur due to tobacco use.

This section presents the health and economic benefits that result from selected policy actions to: 1) increase compliance with bans on smoking in public places; 2) enact comprehensive bans on advertising, promotion and sponsorship; 3) raise the share of taxes on cigarettes to represent 75 percent of the retail price of tobacco; 4) enact a law requiring plain packaging of tobacco products, and; 5) broadcast consistent, national-scale tobacco-control information campaigns to warn about the harms of tobacco use. In addition, it calculates the return on investment of each intervention by comparing the economic benefits against the costs to implement each of the policy measures.

iv YLDs are "years lived in less than ideal health…[YLDs are] measured by taking the prevalence of a [disease] condition multiplied by the disability weight for that condition. Disability weights reflect the severity of different conditions." YLLs are "calculated by subtracting the age at death from the longest possible life expectancy for a person at that age." DALYs "equal the sum of YLLs and YLDs. One DALY equals one lost year of healthy life." Source: IHME. (2018). Frequently asked questions. Retrieved from <http://www.healthdata.org/gbd/faq#What%20is%20a%20DALY?>

v All impacts in this section are on reducing the health or economic costs of smoking. While some FCTC demand-reduction measures (e.g., raising taxes, or graphic warning labels) may have an impact on other forms of tobacco use, we have not quantified them here. Therefore, in this section, all results refer to reductions in the smoking-attributable burden that can occur as a result of implementing FCTC demand-reduction measures.

5.2.1 Health benefits—Lives saved

Enacting the WHO FCTC measures as a complete policy package would lower the prevalence of smoking, leading to substantial health and associated economic gains. Enacting the package would reduce the prevalence of cigarette smoking by 43 percent over 15 years, helping to save 57,000 lives from 2018–2033, or about 3,815 lives annually.

5.2.2 Economic benefits

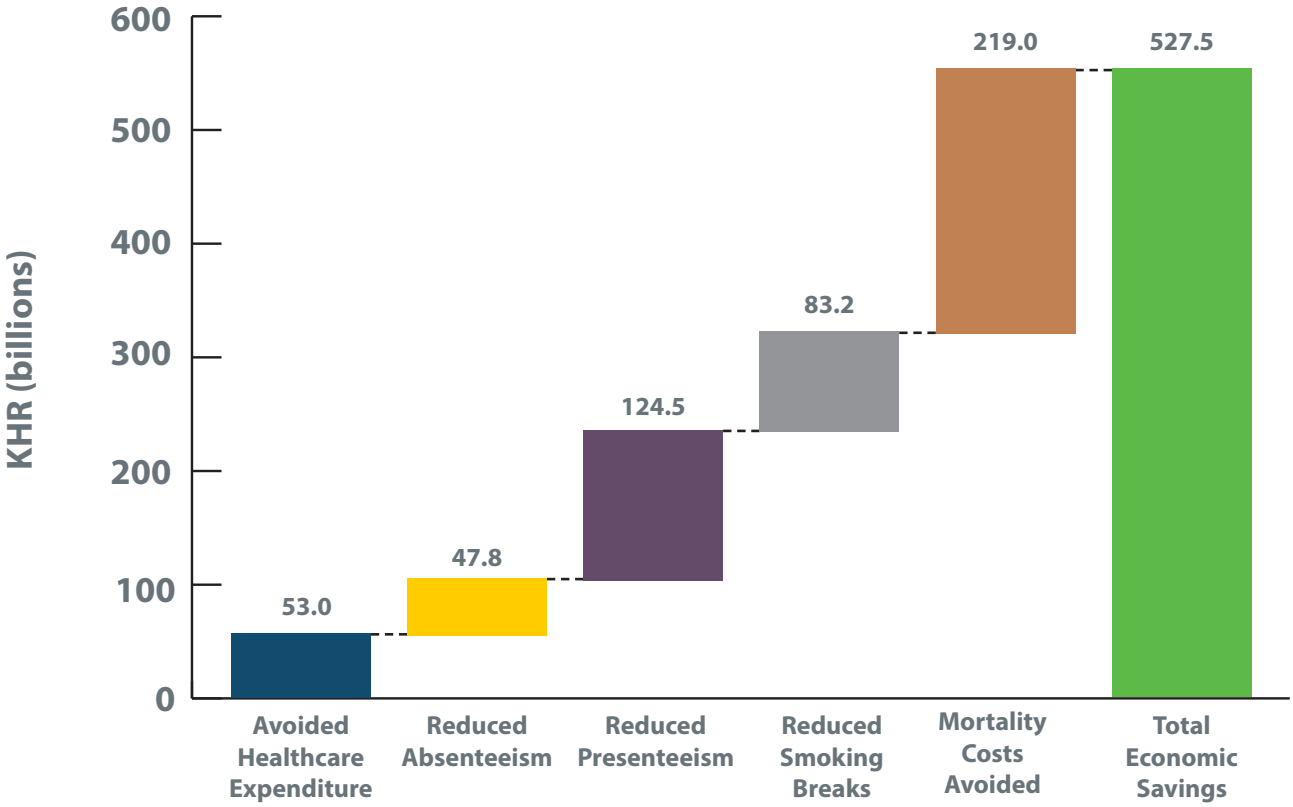
Implementing the package of interventions would result in Cambodia avoiding 24 percent of the economic losses that it is expected to incur from smoking over the next 15 years. **Figure 6** illustrates the extent to which Cambodia can shrink the economic losses that it is expected to incur if no action is taken.

Fig. 6: Tobacco-attributable economic losses over 15 years: What happens if Cambodia does nothing, versus if the government implements tobacco measures to reduce demand for smoking?

In total, over 15 years Cambodia's economy would save about KHR 7.9 trillion that would otherwise be lost if it does not implement the package of tobacco measures, which is the equivalent of about KHR 528 billion in annual avoided economic losses.

Figure 7 breaks down the sources from which annual savings accrue. The annual largest savings result from avoiding premature mortality that removes working-age individuals from the labor force (219.0 billion). The next highest source of savings is derived from reduced presenteeism (KHR 124.5 billion), followed by reduced numbers of smoking breaks (KHR 83.2 billion), avoided healthcare expenditures (KHR 53.0 billion), and reduced absenteeism (KHR 47.8 billion).

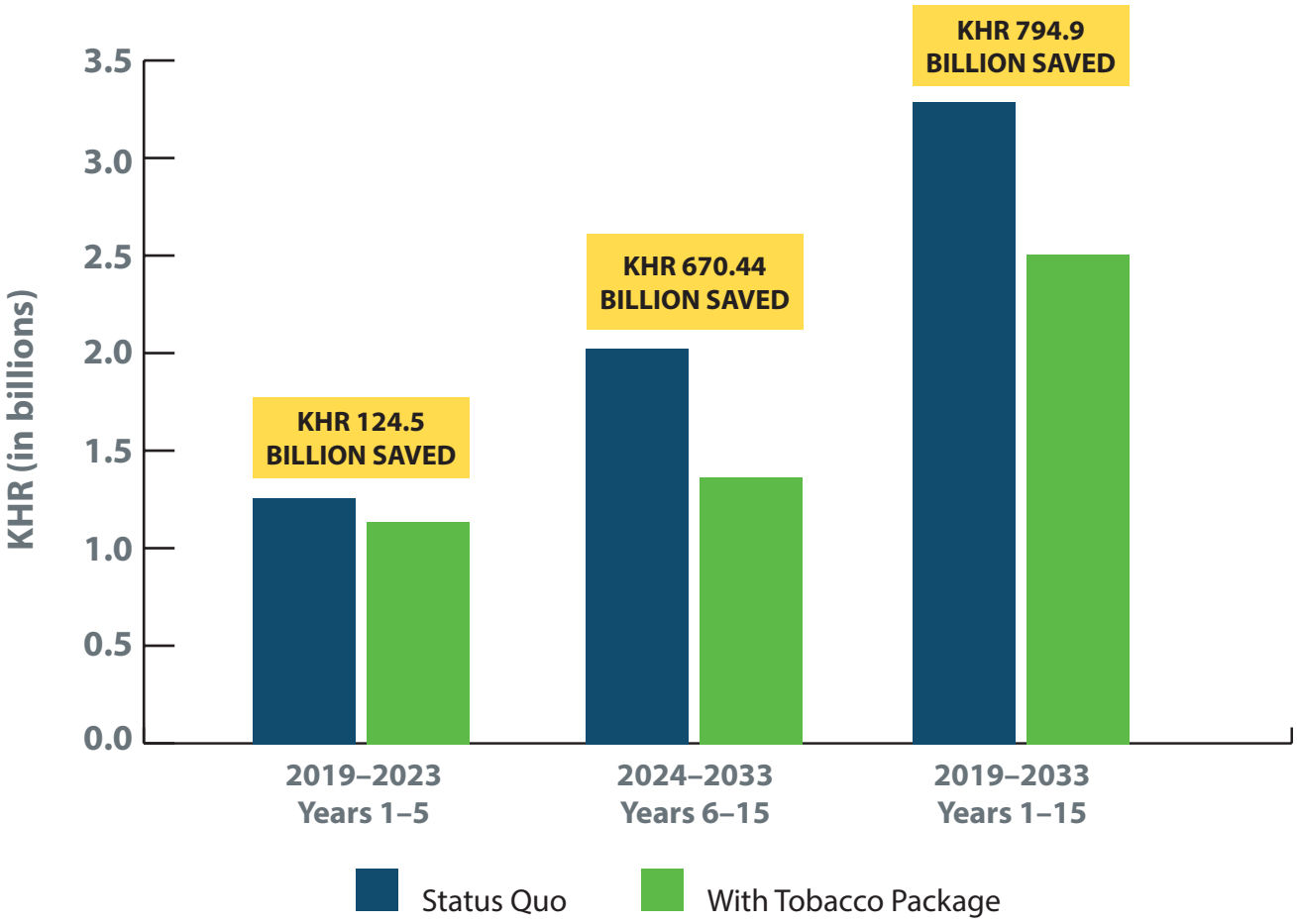
Fig. 7: Sources of annual direct and indirect economic savings as a result of implementing the tobacco policy package



Importantly, implementing the package of tobacco measures reduces medical expenditure for both citizens and for the government. Presently, private and public annual healthcare expenditures in Cambodia total about KHR 4.97 trillion,[28] of which an estimated 5.4 percent is directly related to treating disease and illness due to tobacco use (≈ KHR 268.3 billion).

Year-by-year, the package of interventions lowers smoking prevalence, which leads to less illness, and consequently less healthcare expenditure. Over the 15-year time horizon of the analysis, the package of interventions averts KHR 795.0 billion in healthcare expenditures, or KHR 53.0 billion annually, (see **Figure 8**), with 26 percent of those savings accruing to government, 59 percent to individual citizens who would have paid out-of-pocket for healthcare, and the remainder to other private healthcare pay schemes. Thus, government stands to save about KHR 208.3 billion over 15 years.

Fig. 8: Private and Public Healthcare costs (and savings) over the 15-year time horizon



5.2.3 The Return on Investment

An investment is considered worthwhile if the gains from making the investment outweigh the costs. A return on investment (ROI) analysis measures the efficiency of the tobacco control investments by dividing the economic benefits that are gained from implementing the WHO FCTC measures, by the costs of the investments. For the investment case the ROI for each intervention was evaluated in the short-term (period of five years) and in the medium- to long-term (period of 15 years). The ROI shows the highest return on investment for each intervention, and for the full package of measures. Net benefits are a measure of which interventions are expected to have the largest impact.

Table 2 displays costs, benefits, and ROIs by intervention, as well as for all interventions combined. All interventions have a positive ROI within the first five years, meaning that the government will recoup anywhere from 37 to 283 times its investment, depending on the intervention. The ROIs for each intervention continue to grow over time, reflective of the increasing effectiveness of policy measures as they move from planning and development stages, to full implementation.

Table 2: Return on investment, by WHO FCTC measure (KHR billions)

	First 5 years (2019–2023)			All 15 years (2019–2033)		
	Total Costs (KHR billions)	Net Benefits (KHR billions)	ROI	Total Costs (KHR billions)	Net Benefits (KHR billions)	ROI
Tobacco Package* *(combined interventions)*	19.2	1,239.4	**64**	44.5	7,912.1	**178**
Raise cigarette taxes *(FCTC Article 6)*	2.2	614.9	**283**	4.7	4,151.2	**882**
Increase compliance with bans on smoking in public places *(FCTC Article 8)*	4.9	178.4	**37**	10.2	1,393.7	**137**
Plain Packaging *(FCTC Article11 Guidelines)*	2.3	134.1	**59**	4.8	1,051.2	**218**
Mass media campaign *(FCTC Article12)*	4.9	285.4	**58**	12.8	2,210.0	**173**
Bans on advertising, promotion, and sponsorship *(FCTC Article 13)*	2.2	178.4	**80**	4.9	1,393.7	**284**

* The combined impact of all interventions is not the sum of individual interventions. To assess the combined impact of interventions, following Levy and colleagues' (2018), "effect sizes [are applied] as constant relative reductions; that is, for policy i and j with effect sizes PRi and PRj, (1-PR ii) x (1-PR j) [is] applied to the current smoking prevalence [[29], p. 454].

Increasing taxes would have the highest return on investment: for every Cambodian riel invested, one can expect to see 882 in return. This high ROI is driven by Cambodia's current low level of tobacco taxation, one of the lowest in the region, which allows for a great deal of room to increase taxation, drive down prevalence, and derive large benefits. Enacting more stringent bans on advertising has the next highest ROI (1:284), followed by plain packaging (1:218), implementation of national-scale tobacco-control mass media campaigns (1:173), and increasing compliance with bans on smoking in public places (1:137). Combined, the package of interventions provides an ROI of 178.

5.2.4 Tobacco control as an accelerator for the SDGs

Enacting five measures[vi] designed to reduce demand for tobacco will enable Cambodia to fulfill SDG Target 3.A to strengthen the implementation of the WHO FCTC. Moreover, taking action now will contribute to Cambodia's efforts to meet SDG Target 3.4 to reduce by one third premature mortality from NCDs by 2030.

In Cambodia in 2017, 30,000 premature deaths between the ages of 30 to 69 were caused by the four main NCDs (CVD, diabetes, cancer, and COPD). Roughly 16 percent of these premature deaths occurred due to tobacco use.

Enacting the FCTC measures identified in the Investment Case would reduce tobacco use prevalence—a key risk factor driving NCD incidence—preventing 16,566 premature deaths from the four main NCDs over the next 12 years (2019 to 2030). Preventing those deaths contributes the equivalent of about 11 percent of the needed reduction in premature mortality to fulfill SDG Target 3.4.

SDG Target 3.A

By 2030 the FCTC measures would...

Lower the prevalence of tobacco use by over two-fifths from present day levels.

Reduce economic costs due to tobacco use by KHR 6.0 trillion, including saving more than KHR 601.5 billion in healthcare expenditures.

Lead to savings that significantly outweigh the costs (see **Table 3**).

vi Increasing tobacco taxation to reduce the affordability of tobacco products; implementing and enforcing bans on smoking in all public places to protect people from tobacco smoke; mandating plain packaging of all tobacco products; promoting public awareness about tobacco control issues and the harms of tobacco use through mass media; and, enacting a comprehensive ban on all forms of tobacco advertising, sponsorship, and promotion.

Table 3: Return on Investment through the SDG era (2030), by tobacco policy/intervention (KHR billions)

	Total Costs	Net Benefits	ROI
Tobacco Package* *(all policies/interventions implemented simultaneously)*	**KHR 5,986.2 billion**	**KHR 38.1 billion**	**KHR 157**
Bans on advertising *(FCTC Article 13)*	KHR 1,053.0 billion	KHR 4.2 billion	**KHR 248**
Raise Taxes *(FCTC Article 6)*	KHR 3,037.0 billion	KHR 4.1 billion	**KHR 744**
Protect people from tobacco smoke *(FCTC Article 8)*	KHR 1,053.0 billion	KHR 9.0 billion	**KHR 117**
Mass media campaigns *(FCTC Article 12)*	KHR 1,670.8 billion	KHR 10.7 billion	**KHR 156**
Plain packaging *(FCTC Article 11, in accordance with COP Guidelines for Implementation)*	KHR 794.0 billion	KHR 4.2 billion	**KHR 189**

6. Beyond the economic model

Raising cigarette taxes has the highest return on investment of the five policies included in the investment case analysis. Cambodian stakeholders expressed interest in analyzing other outcomes that can result from increasing tobacco taxes. The investment case examines the impact of taxes on equity and projected tax revenue. In addition, the investment case analyzes current losses in tax revenue due to illicit trade.

6.1 Equity: Higher taxes disproportionately benefit lower-income Cambodians

When taxes are increased, a common concern and misconception voiced by the tobacco industry is that the burden will fall disproportionately on lower-income groups since the tax burden represents a higher proportion of their income than of the income of wealthier tobacco users.

In reality, Cambodians with lower incomes stand to benefit from raised taxes; relative to rich smokers, lower-income smokers are more likely to quit smoking when taxes increase. Thus, tobacco users with lower incomes benefit disproportionately from the subsequent decrease in tobacco-attributable healthcare costs, and productivity losses. Avoiding these costs is critical to lift those in the lowest-income quintile out of poverty and to reduce inequalities in Cambodia. Reduced household spending on tobacco products and tobacco-attributable diseases can unlock disposable income for those with lower incomes to spend on food, children's education and other productive investments.

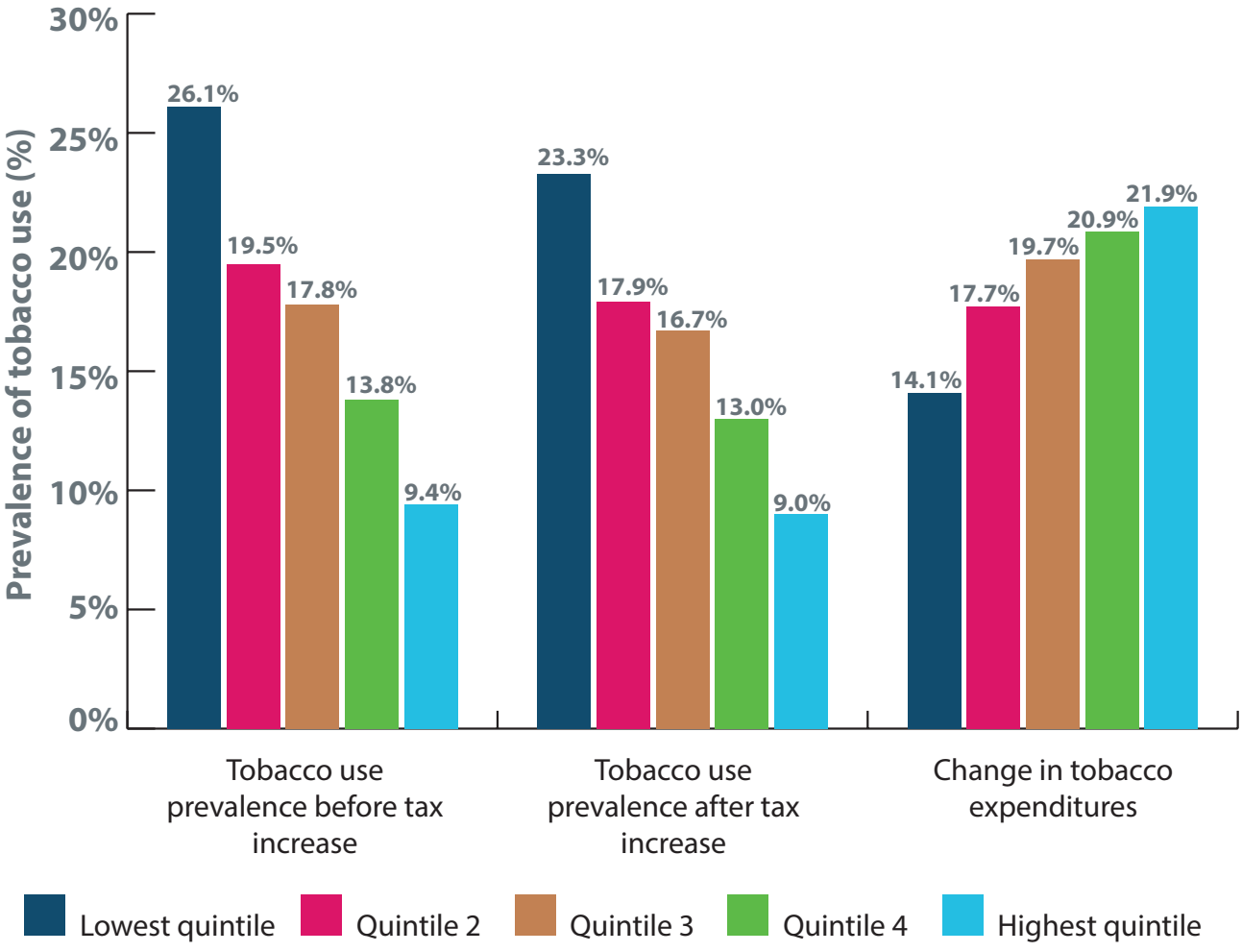
Assessing how different economic groups react to changes in price, as well as how much money they spend on medical costs, are important components of determining whether a policy of increased tobacco taxation is pro-poor. Studies from Lebanon,[30] China,[31] and other countries [32] consistently show that years of life saved, healthcare expenditures averted, and the additional taxes that are paid are not evenly distributed, but strongly benefit the lowest-income groups. For example, in Lebanon, a 50 percent increase in price is estimated to prevent 23,000 new cases of poverty over 50 years,[33] and that same increase would avert 2.1 million catastrophic health expenditures in India, 440,000 in Bangladesh, and 359,000 in Viet Nam.[34]

To analyze the extent to which a tobacco tax could be considered pro-poor and inclusive in Cambodia, the investment case estimates the effect of increasing the average price of cigarettes

from KHR 2,000 to KHR 2,550. This represents a 28 percent increase in the retail price[vii]. We estimate the effect of this increase on five income quintiles. Income quintiles are created by dividing the population into five equal groups, by income, where quintile 1 is the lowest 20 percent of income earners in Cambodia and quintile 5 contains the wealthiest 20 percent.

Because people with lower income are more responsive to changes in price, and because people with lower incomes use tobacco at higher rates in Cambodia, the tax increase causes the largest drop in smoking prevalence in the lowest-income group (quintile 1), as shown in **Figure 9**. Additionally, relative to other income quintiles, the change in the amount of money spent on tobacco due to the tax increase is lowest in the lowest-income quintile. While the lowest-income quintile increases spending on cigarettes by 14.1 percent due to the increased price, the highest-income quintile increases spending by 21.9 percent.

Fig. 9: Effect of tax increase on prevalence and cigarette expenditures, by income quintile



vii Reflective of the amount that cigarette prices would increase as a result of implementing a per pack KHE 400 specific excise tax and changing the ad valorem tax base from 90 to 100 percent of the invoice price. These changes are part of a roadmap to gradually shift away from an ad valorem only tax structure to reliance on specific excise taxes. The full 5-year plan to alter the tax structure and increase tobacco taxes is described in Section 6.2, and is derived from the policy option 2 of the Tobacco Tax Roadmap Cambodia – 2019-2023.

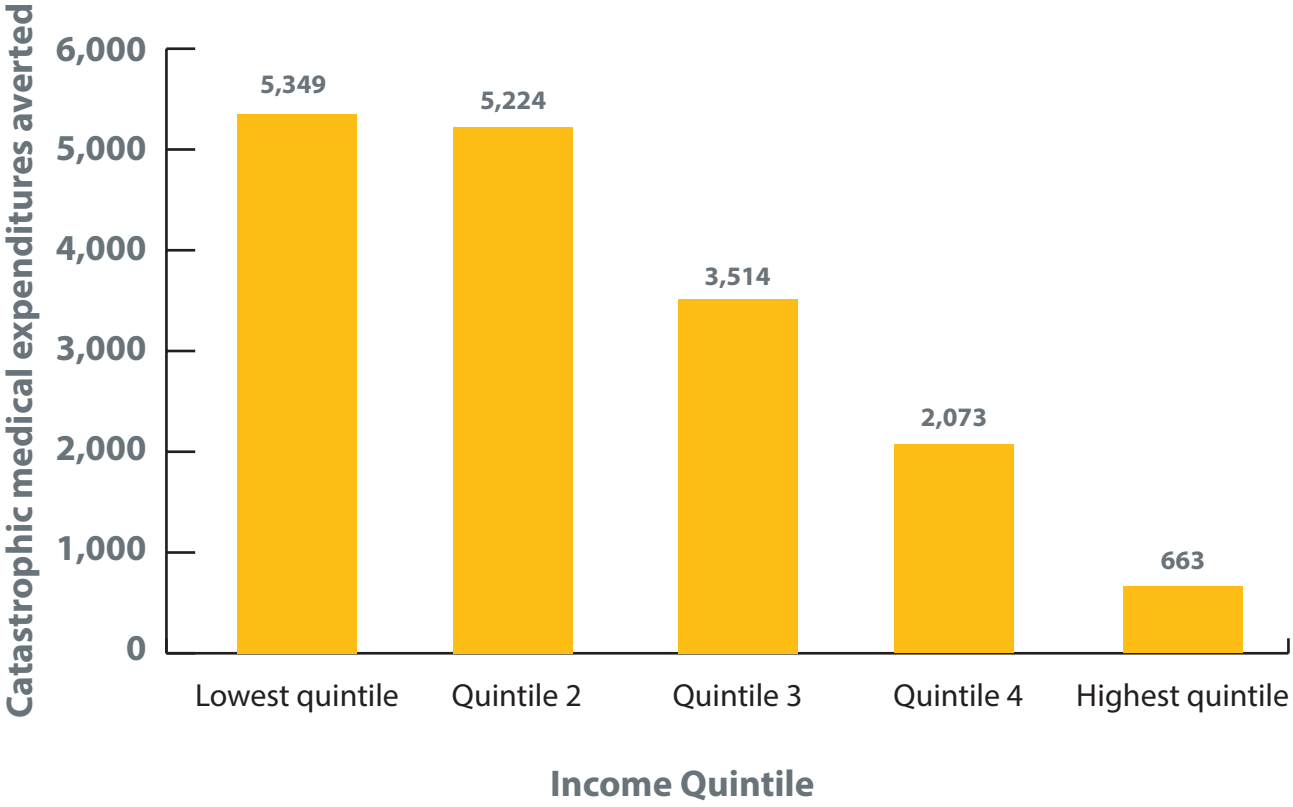
Lower rates of smoking translate to health gains. Prior to the tax increase, of the 15,000 tobacco-attributable deaths observed in 2017, 33 percent occurred among the lowest-income group (quintile 1). However, because the tax increase causes smoking prevalence to fall the most in the lowest-income quintile, health benefits disproportionately accrue to them. The investment case finds that nearly half (46 percent) of the 1,171 smoking-attributable deaths that will be averted due to the tax increase will be among the lowest-income quintile. The second lowest-income quintile will contain 23 percent of averted deaths, the middle quintile will contain 16 percent, the second richest will contain 10 percent, and the richest quintile will contain 5 percent of averted deaths.

A tax increase can also provide financial risk protection by decreasing the amount of money that must be spent on healthcare. To conduct a financial risk protection analysis, out-of-pocket (OOP) spending for three categories of tobacco-attributable diseases (cancer, cardiovascular diseases, and diabetes) is needed. Because no primary data on OOP spending for these diseases in Cambodia was identified, the investment case drew on national health accounts (NHA) data and epidemiological and health service utilization estimates to estimate the average per incidence cost of these diseases. These estimates were adjusted by the average amount of OOP spending for each quintile and the percentage of individuals in each quintile who are exempt from medical fees as reported in the 2009 Cambodian Socio-Economic Survey (CSES).[35] For more information on methodology, please see the methods annex.

The first measure of financial risk protection is cases of medical impoverishment averted. This measure estimates the impact that the tobacco tax increase has on the chance that an individual will fall below the poverty line due to OOP spending from a tobacco-attributable disease. By reducing the incidence of tobacco-attributable disease and thus OOP spending, a tax increase can reduce the number of people who fall into poverty as a result of OOP spending on tobacco-attributable diseases. With this level of tax increase it's estimated that in one-year Cambodia can prevent 1,499 cases of medical impoverishment from tobacco-attributable diseases. Continuing tax increases in future years would accelerate and grow the impact.

The second measure of financial risk protection is the total reduction in catastrophic health expenditures, where "catastrophic is defined as an out-of-pocket expenditure that is more than 40 percent of a household's non-subsistence spending". This measure is more inclusive than cases of medical impoverishment averted because it includes households who are already below the poverty line and wealthier households in which OOP spending may be a significant portion of available resources, but not enough to take them below the poverty line. As shown in **Figure 10** the described tax increase could avert 16,823 catastrophic health expenditures, with 53 percent of cases in the lowest- and second-lowest-income quintiles. These estimates clearly demonstrate the pro-poor effect of the tobacco tax increase.

Fig. 10: Catastrophic healthcare expenditures avoided due to tax increase, by income quintile



6.2 Cigarette taxes: A win-win for health and government revenue

The investment case projects the extent to which increases in cigarette taxes can reduce cigarette consumption and increase government-collected tax revenues. Projected increases follow changes to the tobacco tax structure and increases in excise taxes that are laid out in Cambodia's 2019–2023 Tobacco Tax Roadmap.[36]

1. In year one, a specific excise tax is implemented, and the ad valorem tax base is changed from 90 to 100 percent of the invoice price.
2. In years 2–4, the specific excise tax is raised 200 riels per year, and the ad valorem tax as a percentage of the retail price is gradually raised to 50%.
3. In year 5, the ad valorem component of the excise tax is dropped, and the specific excise tax is increased by an additional 1,000 riels.

Raising cigarette taxes would result in significant government revenue gains. This occurs because reducing the affordability of tobacco products leads some people to quit smoking or reduce consumption, but many more people continue to smoke—largely because of the addictive nature of tobacco—paying higher taxes to the government each time they purchase cigarettes.

Evidence from other countries in the region shows that a 10 percent increase in price is expected to result in a five percent decrease in consumption[viii].[37,38,39,40] Thus, purchases of cigarettes remain relatively unresponsive to price changes: Under the described tax increase pattern and elasticity, licit cigarette consumption would drop from the present amount of about 246 million packets annually[ix], to 176 million during the five years after changes to the tax structure and rates are introduced.

Even though fewer cigarettes are being consumed, they are being purchased at higher tax rates. Thus, government revenue increases, with the government of Cambodia adding an expected KHR 920 billion[x] in revenue during the first five years after the changes, or about KHR 184 billion annually.

6.3 Illicit trade

Findings should be cautiously interpreted, given the lack of definitive data on the size of the illicit market, and the price of illicit cigarettes in Cambodia.

Illicit trade in tobacco products can weaken tobacco control efforts. Illicit cigarettes often contravene requirements to display graphic warning labels, undermining a key government policy designed to reduce smoking. In addition, smokers who purchase cigarettes on the illicit market often pay lower prices. Consequently they do not feel the incentive to quit or to reduce smoking when prices are raised on the licit market via tax increases. Higher rates of consumption mean these smokers continue to be exposed to higher risks of morbidity and death due to tobacco use. And, the government loses out on the tax revenue that it would have received if the smokers had purchased their cigarettes on the licit market.

Few independent assessments of the size of the illicit market in Cambodia exist; however, Euromonitor estimates that the global illicit market comprises around seven percent of all cigarette consumption. While various studies have shown inconsistencies in Euromonitor's illicit trade methodology and estimates,[41] we use those figures simply to illustrate the point that high illicit trade reduces government revenue and undermines tobacco control. Applying the global seven percent estimate to Cambodia's market, around 18.5 million packs of cigarettes were purchased in 2017 that were not subject to government taxes.[xi]

viii This partial response is measured as a price elasticity of demand. Price elasticities specific to Cambodia were not available; however, the average elasticity among neighboring countries (Thailand, Indonesia, Bangladesh, Vietnam is about -0.5, meaning a 10 percent increase in price is expected to result in a five percent decrease in consumption.

ix Assumes 423.6 million packs of cigarettes were bought on the licit market in Cambodia in 2017, based on calculations backed out from information in: Seiha, Um. (2018). Progress & Challenges of Tobacco Excise Tax in Cambodia. The 12th APAC Conference, Bali, Indonesia.

x Discounted value.

xi See footnote xi.

To estimate how much tax revenue is lost due to purchases made on the illicit market, the investment case follows Joosen and colleagues (2009) and assumes that the average price of illicit cigarettes is equal to the price of licit cigarettes minus two-thirds of the tax.[42] Thus, the average price of illicit cigarettes (1,668 riels) is about 83 percent of the price of licit cigarettes (2,000 riels). Lower prices encourage smoking. If the ability to purchase cigarettes at a lower price was eliminated (i.e., if illicit trade didn't exist in 2017, and all smokers faced the same price), smokers would have consumed 1.6 million fewer packs of cigarettes.

While facing higher prices on the licit market would reduce consumption, many smokers who previously made purchases on the illicit market would continue to smoke, meaning that some purchases that previously occurred on the illicit market would occur within the licit market. If illicit trade were completely eliminated, we estimate that Cambodia's tax revenue would have been 6.8% higher in 2017, generating an additional KHR 8.5 billion in revenue.

Credit: © Staffan Scherz via Flickr

7. Conclusion and recommendations

Each year, tobacco use costs Cambodia KHR 2.7 trillions in economic losses and causes substantial human development losses. Fortunately, the investment case results show that there is an opportunity to reduce the health, social and economic and social burden of tobacco through stronger tobacco control policies and implementation in Cambodia. Enacting the recommended multisectoral tobacco control policy measures would save tens of thousands of lives each year and reduce the incidence of disease, leading to savings from averted medical costs and averted productivity losses. In economic terms, these benefits are substantial, adding up KHR 7.9 trillion over the next fifteen years.

By investing now in tobacco control measures, Cambodia would not only reduce tobacco consumption, improve health, reduce government health expenditures and grow the economy, it would also reduce hardships, particularly among those with low incomes. As the investment case shows, contrary to common misperception, tobacco control would benefit people in lower-income categories the most. For example, higher cigarette taxes would not only help those with lower incomes (and others) avoid out-of-pocket health expenditures, it would also raise revenue for the Government of Cambodia that can advance any of its sustainable development efforts, a priority identified by the Ministry of Economy and Finance. Many countries reinvest savings from healthcare expenditures and revenue from increased tobacco taxes into national development priorities such as universal health coverage, which is another proven pro-poor and inclusive policy measure.

The investment case has identified strong tobacco control investments that Cambodia can make. It offers compelling economic and social arguments to implement core WHO FCTC measures. The full benefits of the investment case are more likely to be realized if the following actions are pursued.

1 Raise awareness among the public and government stakeholders of the true costs of tobacco use and the enormous economic, pro-poor and other development benefits of tobacco control.

Policy makers across sectors are encouraged to share the investment case findings broadly among all sectors of government, parliament, civil society, the public, and all sectors of government development partners and academic institutions. Doing so will generate, sustain and strengthen broad public and political support for tobacco control. An advocacy strategy with key messages (e.g. how tobacco control can support economic growth and reduce hardships on the poor) can assist policymakers in disseminating the message.

As recommended in the FCTC needs assessment, the Ministry of Health should work with the Ministry of Education to ensure tobacco control is incorporated into the teachers' instruction manual and student textbooks under the new curriculum under development. Also important is collaboration between Ministry of Health, the Ministry of Information and others to develop a comprehensive communications strategy to inform the public about the harms of tobacco use (particularly of chewing tobacco) and second-hand smoke, as well as about the tobacco control law and the enormous benefits of stronger tobacco control at the individual, household, and business levels.

2 Strengthen multi-sectoral engagement in tobacco control.

The Government can leverage the investment case findings to demonstrate that tobacco control is a win-win development strategy for Cambodia with implications for ministries of finance, economy, education, social welfare, labour, and health as well as parliamentarians. However, effective tobacco control requires the 'whole-of-government,''whole-of-society' approach.

The investment case findings should be effectively used to advocate stronger collaboration and coordination among different sectors, particularly through strengthening the governance of the National Tobacco Control Committee. The Ministry of Health, Ministry of Economy and Finance, and other stakeholders could also champion integration of tobacco control into relevant national and sectoral planning and policy documents. Given the development dimensions of tobacco use and production, many ministries in Cambodia see tobacco control as a win-win opportunity. Such a view should also be equally shared by the UN and other development partners in Cambodia. A policy brief "Tobacco Control as an Accelerator for Sustainable Development Goals in Cambodia," a joint publication of UNDP, WHO and the FCTC Secretariat, can provide useful entry points to engage non-health stakeholders.

3 Strengthen the legal, policy and regulatory frameworks for tobacco control.

Cambodia's 2015 tobacco control law is a strong piece of legislation that protects the Cambodian population. However, it does not cover some areas critical to effective tobacco control. For example, the investment case demonstrates the additional benefits of strengthening enforcement of the ban on smoking in public places, as well as increasing tobacco taxes, strengthening TAPS, and implementing new measures such as instituting plain packaging.

The MoH can initiate the process of reviewing and amending the current legal, policy and regulatory framework for tobacco control to achieve such strengthened measures, working with the Parliamentarians, the Attorney General's Office, and relevant ministries. This can also include initiating the legal process for joining the Protocol to Eliminate Illicit Trade in Tobacco Products. International partners can assist with legal expertise.

4 Advocate for additional increases in tobacco taxes.

Though all individual interventions delivered a return on investment at both 5 and 15 years, increasing cigarette taxes was the most cost-effective of the five tobacco control measures examined. They deliver an impressive return of 882 Cambodian riels for every riel invested, and increase government revenue. Tobacco tax levels in Cambodia are currently far below the WHO FCTC recommended level of 75%.

It is recommended that the Ministry of Health continue to work with the Ministry of Economy and Finance to create an enabling political, policy and social environment for tax increases on tobacco products including by restructuring (simplifying) the tax system and increasing tobacco tax rates on a regular basis to decrease affordability of tobacco products. Policy makers who advocate for additional tobacco-tax increases can now cite robust, Cambodia-specific evidence from this report that tobacco tax increases are pro-economy, and pro-development, benefiting the lowest-income segments of society the most. Extending tax increases to all tobacco products (not just cigarettes) should be pursued.

Credit: © Juan Antonio Segal via Flickr

8. Methodology annex

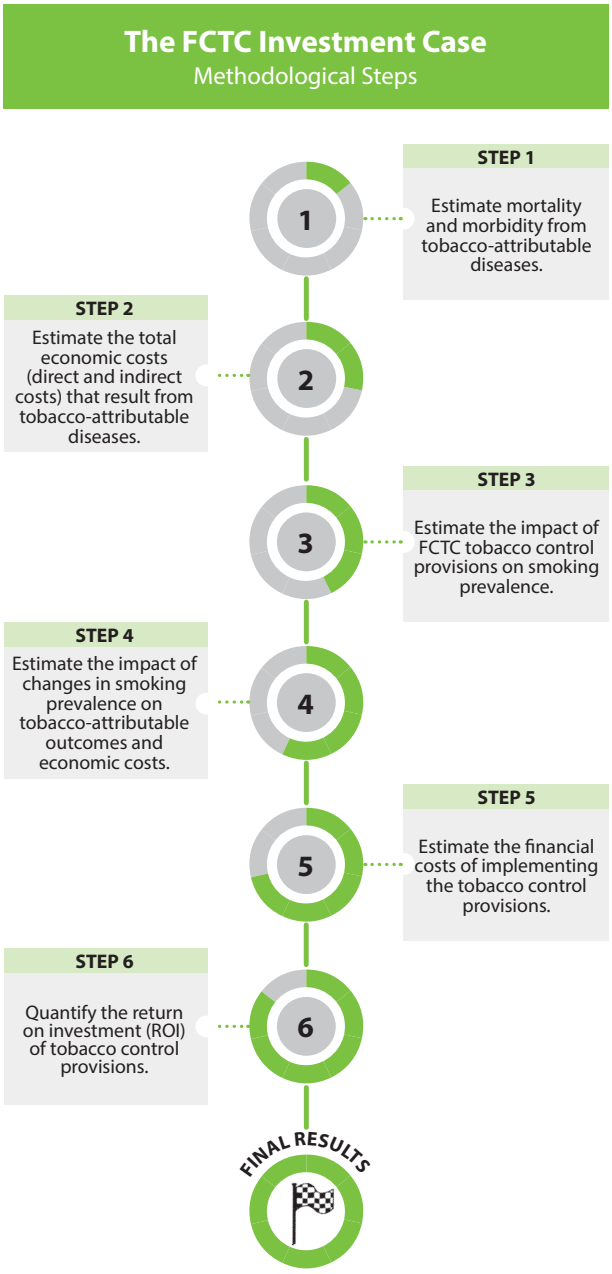
8.1 Building the FCTC investment case

The purpose of the FCTC investment case is to quantify the current health and economic burden of tobacco use in Cambodia; estimate the impact that implementing tobacco measures would have on reducing the burden; and provide analysis of other impacts—e.g., on tax revenue, equity, illicit trade, equity, agriculture—that may factor into Government decisions to implement tobacco control measures.

A RTI International model was developed to conduct the investment case, and perform the methodological steps in **Figure 11**. The tools and methods used to perform these steps are described in this report's Annex. Interested readers are referred to this report's separate Technical Appendix for a more thorough account of the methodology (available upon request).

The FCTC Investment Case team worked with partners in Cambodia to collect national data inputs for the model. Where data was unavailable from government or other in-country sources, the team utilized publicly available national, regional, and global data from sources such as the World Health Organization (WHO), World Bank database, Global Burden of Disease (GBD) study, and academic literature. Within the investment case, costs and monetized benefits are reported in constant 2017 Cambodian riels, and discounted at a rate of three percent.

Fig. 11: Building the FCTC Investment Case



8.1.1 Overview

The economic analysis consists of two components: 1) assessing the current burden of tobacco use and 2) examining the extent to which FCTC provisions can reduce the burden. The first two methodological steps depicted in **Figure 11** are employed to assess the current burden of tobacco use, while methodological steps 3–6 assess the costs and benefits of implementing or intensifying FCTC provisions to reduce demand for tobacco. The tools and methods used to perform these methodological steps are described in detail below.

8.1.2 COMPONENT ONE: CURRENT BURDEN	The current burden model component provides a snapshot of the current health and economic burden of tobacco use in Cambodia.

STEP 1

Estimate mortality and morbidity from tobacco-attributable diseases.

The investment case model is populated with country-specific data on tobacco attributable mortality and morbidity from the 2017 Global Burden of Disease Study (GBD).[43] The study estimates the extent to which smoking and exposure to second-hand smoke contribute to the incidence of 31 diseases, healthy life years lost, and deaths, across 195 countries.

STEP 2

Estimate the total economic costs (direct and indirect costs) that result from tobacco-attributable diseases.

Next, the model[xii] estimates the total economic costs of disease and death caused by tobacco use, including both *direct* and *indirect* costs. Direct refers to tobacco-attributable healthcare expenditures. Indirect refers to the value of lives lost due to tobacco-attributable premature mortality, and labour-force productivity costs: absenteeism, presenteeism, and excess smoking breaks.

xii In assessing the current burden of tobacco use, the economic costs of premature mortality include the cost of premature deaths due to any form of exposure to tobacco (including of smoking, second-hand smoke, and the use of other types of tobacco products). Only smoking-attributable (not tobacco-attributable) costs are calculated for healthcare expenditures, absenteeism, presenteeism, and smoking breaks. While other forms of tobacco may also cause losses in these categories, no data is available to precisely calculate those losses.

Direct costs – Direct costs include both tobacco-attributable public (government-paid), private (insurance, individual out-of-pocket), and other healthcare expenditures. The proportion of healthcare costs attributable to smoking was obtained from Goodchild and colleagues (2018), who estimated smoking to account for 5.4 percent of total healthcare expenditures.[44]

Indirect costs – Indirect costs represent the monetized value of lost time, productive capacity, or quality of life as a result of tobacco-related diseases. Indirect costs accrue when tobacco use causes *premature death*, eliminating the unique economic and social contributions that an individual would have contributed in their remaining years of life. In addition, tobacco use results in productivity losses. Compared to non-tobacco users, individuals who use tobacco are more likely to miss days of work (*absenteeism*); to be less productive at work due tobacco-related illnesses (*presenteeism*); and to take additional breaks during working hours in order to smoke.

- *The economic cost of premature mortality due to tobacco use* – Premature mortality is valued using the human capital approach, which places an economic value on each year of life lost. Using GBD data on the age at which tobacco-attributable deaths occur, the model calculates the total number of years of life lost due to tobacco, across the population. Each year of life is valued at 1.4 times GDP per Capita, following the 'full income approach' employed by Jamison et al (2013).[45]

- *Productivity costs* – Productivity costs consist of costs due to absenteeism, presenteeism, and excess work breaks due to smoking. The model incorporates estimates from academic literature on the number of extra working days missed due to active smoking (2.6 days per year).[46] Presenteeism losses are obtained similarly, under research that shows that smokers in China, the US, and five European countries experience about 22% more impairment at work because of health problems compared to never-smokers.[47] Lost productivity due to smoking breaks is valued under the conservative assumption that working smokers take ten minutes of extra breaks per day.[48]

8.1.3 COMPONENT TWO: POLICY/INTERVENTION SCENARIOS

This component estimates the effects of FCTC tobacco control provisions on mortality and morbidity, as well as on total economic costs (direct and indirect) associated with tobacco use. Mortality and morbidity, as well as economic costs, for the tobacco control policy/intervention scenarios are compared to the status quo scenario, which is based on the current burden estimates.

STEP 3

Estimate the impact of FCTC tobacco control provisions on smoking prevalence.

Selection of priority FCTC measures modeled within the investment case align with the Global Strategy to Accelerate Tobacco Control[49] developed following a decision at the Seventh session of the Conference of the Parties (COP7) to the WHO FCTC. Under Objective 1.1 of the Strategy, Parties seek to accelerate WHO FCTC implementation by setting clear priorities where they will be likely to have the greatest impact in reducing tobacco use. This includes priority implementation of price and tax measures (*Article 6*) and time-bound measures of the Convention, including bans on smoking in all public places (*Article 8*), health warnings and plain tobacco packaging (*Article 11*), and comprehensive bans on tobacco advertising, promotion and sponsorship (*Article 13*). In addition, given the importance of awareness in behavior change and shaping cultural norms, the investment cases include instituting mass media campaigns against tobacco use (*Article 12*) as a measure modeled.

The impacts of enforcing smoke-free air laws, graphic warning labels, mass media campaigns, implementing plain packaging, and intensifying advertising bans are derived from Levy et al (2018)[50] and Chipty (2016)[51], as adapted within the Tobacco Use Brief of Appendix 3 of the WHO Global NCD Action Plan 2013–2020.[52]

The impact of raising taxes on the prevalence of tobacco use is determined by the change in price resulting from tax increases, and the "prevalence elasticity", or the extent to which individuals stop—or reduce—smoking as a result of price changes. The modelled changes in price are based on projected tax increases and changes to the tobacco tax structure that are laid out in Cambodia's 2019–2023 Tobacco Tax Roadmap.[53]

1. In year one, a specific excise tax is implemented, and the ad valorem tax base is changed from 90 to 100 percent of the invoice price.
2. In years 2-4, the specific excise tax is raised 200 riels per year, and the ad valorem tax as a percentage of the retail price is gradually raised to 50%.
3. In year 5, the ad valorem component of the excise tax is dropped, and the specific excise tax is increased by an additional 1,000 riels.

Elasticity estimates specific to Cambodia were not available. Following research that shows that the elasticity of prevalence is approximately one-half of own-price elasticity of consumption,[54] the investment case uses a 0.25 prevalence elasticity within the analysis, which is half of the average elasticity of consumption in four nearby countries (Thailand, Indonesia, Bangladesh, Vietnam)[55, 56, 57, 58].

Within the analysis, it is assumed that implementation or intensification of new tobacco-control measures does not take place until year three of the analysis. With the exception of taxes—the impact of which is dependent on the timing of increases in tax rates—the full impact of the measures is phased in over a five-year period. The phase-in period follows WHO assumptions[59] that two years of planning and development are required before policies are up and running, followed by three years of partial implementation that are reflective of the time that is needed to roll-out policies, and work up to full implementation and enforcement.

Table 3 displays the impact sizes used within the investment case analysis. Additional information on their derivation can be found in the Technical Appendix.

Table 4: Impact size: Relative prevalence reduction over 15 years, by FCTC measure

Intervention	Relative reduction in prevalence of current smokers
Strengthen compliance with the ban on smoking in public places	6.44%
Enact comprehensive bans on advertising, promotion, and sponsorship	6.44%
Increase taxes on cigarettes	23.21%
Implement large health warning on cigarette packages	**Already fully implemented √**
Implement plain cigarette packaging	4.83%
Run a mass media campaign to promote awareness about tobacco control	10.35%
Tobacco Package (all policies)	**42.7%**

* The combined impact of all interventions is not the sum of individual interventions. Following Levy and colleagues' (2018) "effect sizes [are applied] as constant relative reductions; that is, for policy i and j with effect sizes PRi and PRj, (1-PR ii) x (1-PR j) [is] applied to the current smoking prevalence [[60], p. 454].

8.1.4 The impact of changes in smoking prevalence

STEP 4

Estimate the impact of changes in smoking prevalence on tobacco-attributable health outcomes and economic costs.

To analyze the impact of policy measures on reducing the health and economic burden of smoking, the investment case calculates and compares two scenarios. In the status quo scenario, current efforts are 'frozen', meaning that, through the year 2033 (end of the analysis), no change occurs from the tobacco control provisions that are currently in place. In the intervention scenario, Cambodia implements new tobacco measures or intensifies existing ones, to reduce the prevalence of smoking. The difference in health and economic outcomes between the status quo and intervention scenarios represents the gains that Cambodia can achieve by taking targeted actions to reduce tobacco use.

The marginal effects of the policies are calculated using the status quo scenario as the comparison group. To calculate marginal effects, the model subtracts the outcome (risk factor attributable deaths, healthcare expenditures, etc.) under the intervention scenario from the same outcome under the status quo scenario. The difference between the two outcomes is the amount of change in the outcome associated with the policy.

Marginal Effects = Outcome Base Scenario — Outcome Intervention Scenario

Marginal effects are calculated as follows for each outcome:

- **Health outcomes:** To calculate the reductions in mortality and morbidity due to implementation of the policy measures, forecasted changes in smoking prevalence are applied directly to the GBD risk factor attributable outcomes from the status quo scenario. This means that the model adjusts the risk factor attributable outcomes for mortality and morbidity as reported by GBD based on year-over-year relative changes in smoking prevalence for each outcome.
- **For healthcare expenditures,** the model applies forecasted annual relative changes in smoking prevalence for each intervention scenario to the SAFs. SAFs are adjusted in proportions equal to the relative change in smoking prevalence for each intervention scenario.
- **Workplace smoking outcomes** are recalculated substituting actual (status quo) smoking prevalence for estimated annual smoking prevalence for each of the intervention scenarios that are modeled.

8.1.5 The financial costs of implementing tobacco control measures

STEP 5

Estimate the financial costs of implementing the tobacco control policies and interventions modeled, both individually and collectively.

The financial costs to the government of implementing new measures—or of intensifying or enforcing existing ones—is estimated using the WHO NCD Costing Tool. Full explanations of the costs and assumptions embedded in the WHO NCD Costing tool are available.[61]

The Tool uses a 'bottom up' or 'ingredients-based' approach. In this method, each resource that is required to implement the tobacco control measure is identified, quantified, and valued. The Tool estimates the cost of surveillance, human resources—for program management, transportation, advocacy, and enacting and enforcing legislation—trainings and meetings, mass media, supplies and equipment, and other components. Within the Tool, costs accrue differently during five distinct implementation phases: planning (year 1), development (year 2), partial implementation (years 3–5), and full implementation (years 6 onward).

Across these categories, the Tool contains default costs from 2011, which are sourced from the WHO CHOICE costing study. Following Shang and colleagues, the Tool is updated to reflect 2017 costs by updating several parameters: the US$ to local currency unit (LCU) exchange rate (2017), purchasing power parity (PPP) exchange rate (2017), GDP per capita (US$, 2017), GDP per capital (PPP, 2017), population (total, and share of the population age 15+, 2017), labor force participation rate (2017), and government spending on health as a percent of total health spending (2015) [[62], p. 5]. Unless government or other in-country parameters are received, data is from the World Bank database, with the exception of data on the share of government health spending, population figures, and the price of gas per liter. The share of government spending on health as a percent of total health spending is derived from the WHO Health Expenditures database, and population figures are from the UN Population Prospects.

8.1.6 The Return on Investment (ROI)

STEP 6

Quantify the return on investment (ROI) for the various tobacco control policies and interventions modeled, both individually and collectively.

The return on investment (ROI) analysis measures the efficiency of tobacco control investments by dividing the monetary value of health gains from investments by their respective costs. The ROI answers the following question: for every currency unit that the government invests in tobacco control measures, how much can it expect to receive in return?

ROIs were calculated for (i) each of the five tobacco control policies and interventions modeled, (ii) total economic losses and (iii) specific outcomes, such as lives saved or healthcare expenditures. Estimates from Step 3 and 4, were used to calculate ROIs for at 5- and 15-year intervals.

$$\textbf{Return on Investment (ROI)} = \frac{\text{Benefits of Intervention/Policy}}{\text{Costs of Implementing Intervention/Policy}}$$

8.2 Equity analysis

Because there has not been an analysis of elasticity of smoking participation in Cambodia, we use an average of studies from other countries in the region, summarized in the table below.[63, 64, 65, 66, 67]

Income Quintile	Thailand (urban)*	Thailand (rural)*	Indonesia**	Indonesia***	Bangladesh**	Vietnam****	Average
1	-0.5017	-0.2433	-0.03	-0.36625	-0.29	-0.885	-0.386041667
2	-0.1777	-0.0232	0.03	-0.328	-0.313	-0.885	-0.282816667
3	-0.06295	-0.014	0.09	-0.30625	-0.336	-0.735	-0.227366667
4	-0.04905	-0.0738	0.145	-0.29375	-0.303	-0.585	-0.193266667
5	-0.0209	-0.0343	0.2	-0.27775	-0.27	-0.585	-0.164658333

* Only overall price elasticity reported, prevalence elasticity derived by halving price elasticity.
** Study only reported on low, middle, and high, income groups. Second and fourth quintiles are averages.
*** Study reported on income deciles, quintiles derived from averaging two deciles. Only overall price elasticity reported, prevalence elasticity derived by halving price elasticity.
**** Study reported elasticity of top two quintiles together and bottom two quintiles together. Only overall price elasticity reported, prevalence elasticity derived by halving price elasticity.

In the first stage of our financial risk protection (FRP) analysis, we estimated out-of-pocket spending (OOPS) on tobacco-attributable diseases in Cambodia. Because we did not identify any primary

data on OOPS for these diseases in the local context, we used an indirect approach drawing on national health accounts (NHA) data and epidemiological and health service utilization estimates.

The latest NHA data for Cambodia are from the calendar year 2012.[68] Health spending data were disaggregated by disease group and by source. We extracted estimates of total OOPS for the categories "neoplasms," "endocrine disorders," and "cardiovascular diseases"[xiii]. We then divided total OOPS by the total number of individuals expected to have utilized health services in 2012 to arrive at a "unit cost" per case.

To arrive at estimates of expected numbers of utilizers, we first extracted the total number of estimated incident and prevalent cases of these conditions (neoplasms, diabetes, and cardiovascular diseases) in Cambodia in the year 2012.[69] We then adjusted these numbers downward by 45 percent to reflect that general health service coverage in Cambodia is only approximately 55 percent,[70] meaning the remainder forgo care. These calculations provided us with average annual per-patient OOPS on cancer care, diabetes care, and cardiovascular disease care.

To arrive at annual per-patient OOPS for each disease by income quintile, we then adjusted these unit costs using two additional factors. First, we extracted estimates of total per-capita OOPS by quintile from the 2009 Cambodian Socio-Economic Survey (CSES).[71] Since some individuals (ranging 11% in quintile 1 to 1.8% in quintile 5) are exempt from fees,[72] we adjusted the per-capita estimates upwards by these proportions to arrive at total per-capita OOPS conditional on not being fee-exempt. We then calculated the ratio of quintile-specific per-capita OOPS to mean per-capita OOPS. This ratio was used to adjust the mean disease-specific (i.e., cancer, diabetes, and cardiovascular disease) average annual per-patient OOPS to quintile-specific values. The final estimated annual OOPS per prevalent case ranged US$2.3 – 28 for cancer, US$0.99 – 12 for diabetes, and US$8.3 – 100 for cardiovascular disease.

We constructed an income and expenditure profile of 1,000 individuals spread across five income quintiles corresponding to the "cohort" used in the taxation analysis described above. We first extracted income estimates from the most recent CSES.[73] These included estimates of monthly disposable income per capita at seven important quantiles which were used to parameterize a continuous population income distribution. Specifically, we used the 25th, 50th, and 75th percentiles to approximate the population mean (see method of Wan and colleagues).[74] We used the 5th and 95th percentiles of income to define 95% credible intervals. We then parameterized

xiii Admittedly, OOPS for these three broad groups may include spending on diseases that are not tobacco related – e.g., estimates for the "endocrine disorders" group may include spending on thyroid disease. However, tobacco-related diseases comprise the overwhelming majority of disease burden in each of these three groups, so we view group totals as a reasonable approximation of OOPS in this context.

a lognormal distribution using the (logged) mean and variance computed from these values. We took 1,000 random draws from this distribution and arranged the values into five income quintiles of 200 draws each. We then extracted estimates of household "capacity-to-pay" by income quintile from the 2009 CSES.[75] The mean and standard errors of these estimates were used to generate 200 draws of household capacity-to-pay for each of the five income quintiles (this variable was also assumed to be lognormally distributed; the method described above was used to generate the distributions in each quintile). In each quintile, the 200 draws of capacity-to-pay were then allocated randomly to the draws of individual income. This approach assumes that within a given quintile personal income and household expenditure patterns are not correlated. An alternative approach, not taken here because of time constraints, would be to use CSES microdata to estimate the joint distribution of individual income and household expenditure and use this information to generate a more "precise" set of 1000 income-expenditure draws.

The steps above produced the following results: mean annual disposable income by quintile was estimated at US$48, US$94, US$150, US$230, and US$520. Mean household capacity-to-pay was estimated at US$7.9, US$12, US$19, US$32, and US$98. These results were used as inputs to the financial risk protection calculations described below.

To estimate financial protection afforded (below), we also drew on estimates of nonfatal health events averted. These events were modeled for our tobacco tax impact analysis alongside the estimates of deaths averted. While a number of nonfatal disease outcomes were included in the health impact model, we only extracted estimates of cases of cancer, diabetes, and cardiovascular disease averted since the NHA only provided expenditure data for these disease categories. The major tobacco-attributable disease group that is excluded from the financial risk protection analysis is respiratory diseases, principally chronic obstructive pulmonary disease. (We aggregated the specific causes of disease in the impact model [e.g., oral cancer, lung cancer] into these broad categories [e.g., cancers].)

Medical Impoverishment Averted. This measure estimates the impact that the tobacco tax increase has on the chance that an individual will fall below the poverty line due to OOPS from a particular disease. It is a "statistical" measure in the sense that it aggregates individuals' risk of impoverishment across the population rather than estimates discrete events in a modeled environment. The number of cases of medical impoverishment averted $MIA_{j,k}$ in quintile j for cause-of-disease k is given by:

$$MIA_{j,k} = \sum_{i=1}^{n} \Delta P_{j,k} \times \begin{cases} 1 \; if \; y_i - c_{j,k} \leq PL \\ 0 \; if \; y_i - c_{j,k} > PL \end{cases}$$

Where PL is the local poverty line. Because our analysis focused on 1000 individuals rather than households, we estimated an "individual" poverty line based on individual income y_i. According to estimates by the Ministry of Planning in 2013, 22.9% of individuals in Cambodia lived in poverty.[76] Hence, we took the income of the 229th individual in our cohort as the disposable income at the poverty line. This level was US$429 per year. We used annual rather than monthly income as the reference value for this measure.

It should be noted that the main limitation of the medical impoverishment measure is that it does not capture financial outcomes among individuals currently living in poverty. Hence all of the poorest quintile and some of the second poorest quintile would not receive financial risk protection from the tobacco tax increase according to this measure.

Catastrophic Healthcare Expenditures Averted. This measure estimates the effect of the tobacco tax increase on reducing household expenditure relative to a threshold level of health expenditure defined as "catastrophic." Similar to the medical impoverishment measure, it is a "statistical" measure that aggregates individuals' risk of catastrophic health expenditure. The number of cases of catastrophic health expenditure averted $CHEA_{j,k}$ in quintile j for cause-of-disease k is given by:

$$CHEA_{j,k} = \sum_{i=1}^{n} \Delta P_{j,k} \times \begin{cases} 1 \; if \; {}^{c_{j,k}}/_{m_i} \geq z \\ 0 \; if \; {}^{c_{j,k}}/_{m_i} < z \end{cases}$$

Where m_i is household capacity-to-pay as estimated in the CSES and z is the threshold. In this analysis we chose a conservative value for z of 0.4, i.e., OOPS on tobacco-attributable illness would be considered "catastrophic" if it exceeded 40% of a household's capacity to pay for discretionary goods and services in a given month. The limitation of this measure is that it is very sensitive to the choice of z, and a value of 0.4 is arbitrary (though commonly used in the literature).

8.3 The impact of a tax increase on government revenue

We built an Excel Tool in order to analyze the impact of cigarette taxes on consumption and tax revenue. The Tool follows Goodchild, Perucic, & Nargis' (2016)[77] methodology to calculate the impact of tax increases on cigarette consumption and revenue. The Tool examines two scenarios. In the baseline scenario, Cambodia retains its current tax structure and taxes remain at their present level over 15 years. In the simulated scenario, Cambodia alters its tax structure (see description below) and scales taxes until they represent 75 percent of the retail price in 2033. The difference between the two scenarios represents the additional gains in tax revenue that Cambodia can achieve.

Consumption and revenue impacts are calculated under the assumption that the price of the most sold brand of cigarettes is representative of the overall market, which can reasonably be assumed in Cambodia, where both the most sold and lowest priced brands are reported to be equal in price.[78] We obtained data on the price of the most sold brand of cigarettes (≈$2,000 riels in 2017), the number of cigarette packs licitly sold (423.5 thousand in 2017) from Cambodia's Ministry of Economy and Finance.

Details on the existing tax structure are sourced from the 2019–2023 Tobacco Tax Roadmap. The tax structure is comprised of an ad valorem excise tax equal to 20 percent of 90 percent of the cigarette invoice price, a value-added tax (VAT) of 10 percent, Public Lighting Tax of 3 percent, and import tariffs ranging from 7 to 35 percent.[79] Regarding the scale up of taxes, the investment case analyzes the impact of implementing a policy option detailed in the Tobacco Tax Roadmap, which describes the following changes to the tax structure:

4. In year one of the analysis, a specific excise tax is implemented, and the ad valorem tax base is changed from 90 to 100 percent of the invoice price.
5. In years 2–4 of the analysis, the specific excise tax is raised 200 riels per year, and the ad valorem tax as a percentage of the retail price is gradually raised to 50%.
6. In year 5 of the analysis, the ad valorem component the excise tax is dropped, and the specific excise tax is increased by an additional 1,000 riels.

The specific excise tax is further raised 200 riels annually from year 6–15 of the analysis, until the tax share reaches the 75 percent share of the retail price required under the FCTC.

Information on the price elasticity of consumption of cigarettes is not available in Cambodia. The investment case uses the average (-0.5) of elasticities of consumption found in the literature for neighboring countries (i.e., Thailand, Indonesia, Bangladesh, Vietnam).[80,81,82,83] Prevalence elasticity is obtained following Goodchild and colleagues' assumption that the prevalence elasticity is one half of the price elasticity (-0.25).

In order to account for concerns that tax increases may cause individuals to switch to the illicit market, where they will continue to smoke, we model a scenario in which seven percent[xiv] of those who would have quit (based on the prevalence elasticity) actually continue to smoke. Current

xiv Euromonitor estimates that illicit consumption currently represents about seven percent of all consumption in Cambodia. Because there is no evidence of how many people will switch to the illicit market given a tax raise, we use seven percent to illustrate a "dampening" effect on the ability of tax increases to depress smoking prevalence, given the option to continue smoking less expensive products available on the illicit market. This example is for illustration only and to address country concerns about the impact of illicit trade on policy outcomes. It should not be taken as indicative of what will occur if taxes increase. Also of note, we do not take this into account in the revenue projections, only for smoking prevalence.

smoking prevalence among adult men and women was obtained from Cambodia's latest National Alcohol and Tobacco Survey.[84]

The Tool does not take into account switching between tobacco products. Nor does it project demographic changes or shifting trends in prevalence that are expected to occur during the next 15 years.

8.4 Calculating lost government revenue due to illicit trade

The investment case follows Joosens and colleagues' methodology (2009) to calculate lost revenue due to illicit trade and the decline in cigarette consumption that would occur if illicit trade were eliminated. The underlying equations are detailed in full within the Appendix 2 of their report.[85] We were unable to obtain transparent estimates of the size of the illicit market.[86] Euromonitor estimates that the illicit market comprises around seven percent of all cigarette consumption. While various studies have shown inconsistencies in Euromonitor's illicit trade methodology and estimates,[87] we use its figures here for lack of more accurate data.

Price is not always the dominant consideration for why smokers purchase cigarettes; perceptions about quality,[88] and attributes such as flavor[89] also play a role. These factors may impart enough value that illicit cigarettes sell for a higher price than licit cigarettes. Indeed, recent evidence from nine low- and middle income countries shows that in some countries the median price of illicit cigarettes is higher than the median price for licit cigarettes.[90] In Cambodia, no information is available on the price of illicit cigarettes. Thus, for this analysis, we follow Joosen and colleagues' assumption that the price of illicit cigarettes is equal to the price of licit cigarettes minus two-thirds of the tax,[91] which equates to the average price of illicit cigarettes (1,668 riels) being about 83 percent of the price of licit cigarettes (2,000 riels).

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