



Investment Case for Tobacco Control in GHANA



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Investment Case for Tobacco Control in

GHANA

**The case for scaling-up
WHO FCTC implementation**



Investment Case for Tobacco Control in Ghana

More than

6,700

Ghanaians die every year due to tobacco-related illness, accounting for

3% of all deaths in the country.



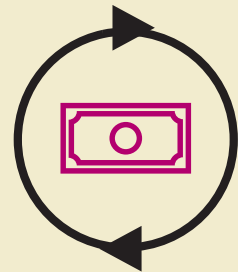
Investing now in five proven tobacco control measures will prevent more than

20,000 deaths

and avert

GHC 1.3 billion

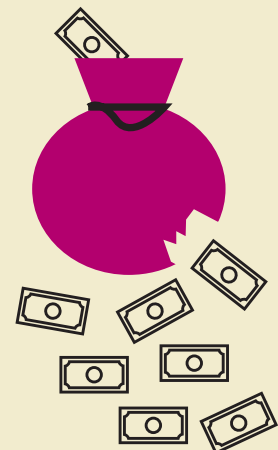
in economic losses by 2037.



Tobacco-attributable economic losses are about

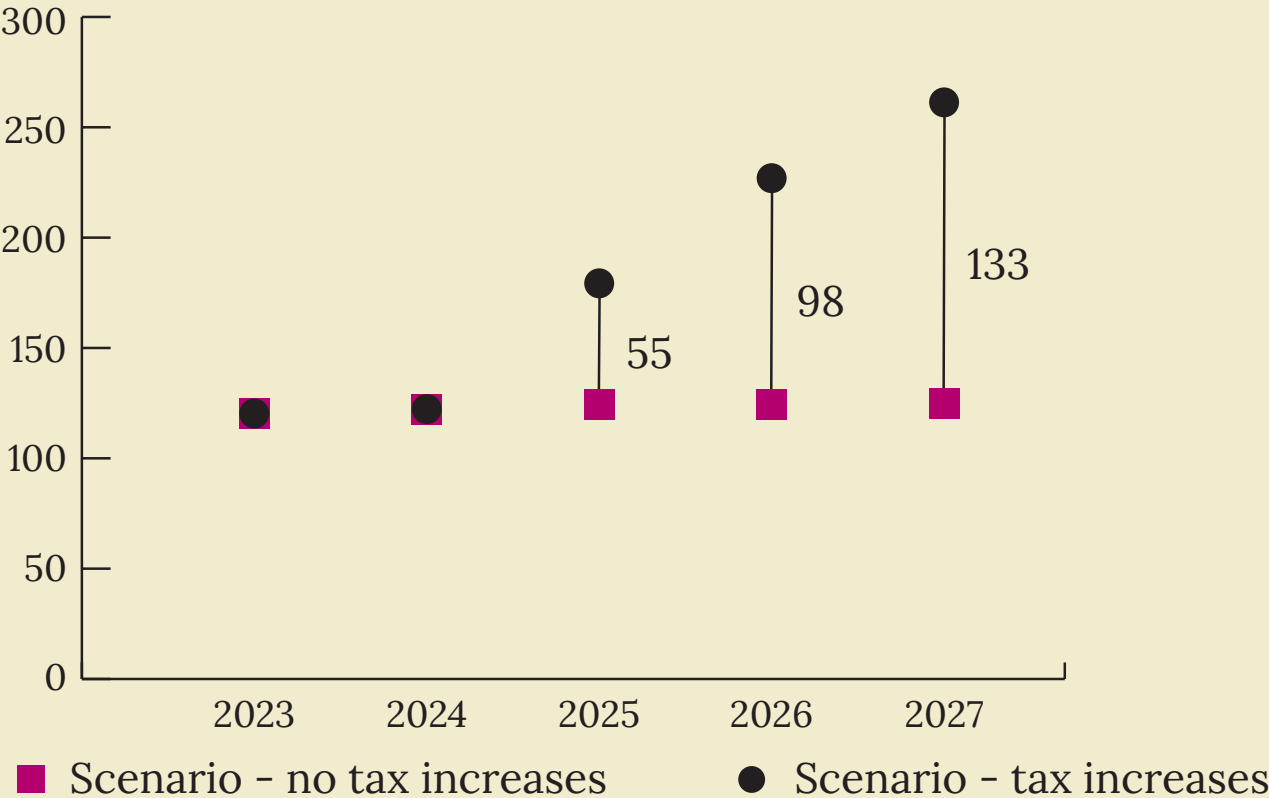
7 times larger

than the collected government revenue.



Figures subject to rounding.

Additional annual tax revenue (in GHC millions) in comparison to the baseline scenario, 2023-2027



Government tobacco tax revenue as a % of the tobacco burden



GHC 9.3



Burden

GHC 5



Retail price

Burden per licit cigarette pack sold versus retail price of most sold brand (GHC)

Tobacco costs Ghana **GHC 668 million every year**, equivalent to **0.2% of annual GDP**

Costs per adult smoker

GHC 1,541

Figures subject to rounding.

Acknowledgements

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This tobacco control investment case highlights the enormous costs of tobacco in Ghana and the set of recommended policy actions that will deliver substantial economic and public health benefits to the country. The implementation of effective tobacco control policies from the WHO Framework Convention on Tobacco Control can play an important role in strengthening sustainable development in Ghana.





Executive summary

Overview

Tobacco is a significant threat to health and sustainable development. Tobacco causes premature death and preventable disease that results in high health costs and economic losses, widens socioeconomic inequalities, and impedes progress towards the achievement of the Sustainable Development Goals (SDGs).

This report summarizes the costs and benefits—in health and economic terms—of implementing five key policy actions of the WHO Framework Convention on Tobacco Control (WHO FCTC) that focus on demand reduction. The five actions are:

- 1) Increasing tobacco taxation to reduce the affordability of tobacco products (WHO FCTC Article 6).
- 2) Creating smoke-free public places and workplaces to protect people from the harms of tobacco smoke (WHO FCTC Article 8).
- 3) Implementing plain packaging of tobacco products (*WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13*).
- 4) Enacting and enforcing a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship (WHO FCTC Article 13).
- 5) Promoting cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (WHO FCTC Article 14).

Main findings of the investment case

In 2019, tobacco use in Ghana imposed around 668 million Ghana cedis (GHC) in economic losses. These losses are equivalent to 0.2 percent of Ghana's gross domestic product (GDP). They include a) **GHC 172 million** in direct health-care expenditures to treat tobacco-related illness, b) tobacco-attributable mortality valued at **GHC 371 million**, and c) **GHC 126 million** in reduced workplace productivity from absenteeism and presenteeism. Productivity losses from current tobacco use in **Ghana**, representing **19 percent** of all tobacco-related economic losses, shows how tobacco use impedes development in **Ghana** beyond health. Multisectoral engagement is required for effective tobacco control, and other sectors benefit substantially from the implementation of tobacco control measures that create healthier communities and a more productive labour force.

Every year, tobacco use kills more than 6,700 Ghanaians, with **66 percent** of these deaths being premature, among people under the age of 70. About **18 percent** of lives lost from tobacco use are due to exposure to secondhand smoke. Deaths from tobacco are entirely preventable.

By acting now, the Government of Ghana can reduce the national burden from tobacco use. The investment case findings demonstrate that implementing five key evidence-based WHO FCTC policy actions would, over the next 15 years (2023-2037):

Save more than 20,000 lives and reduce the incidence of disease. This would contribute to Ghana's efforts to achieve Sustainable Development Goal (SDG) Target 3.4, which aims to reduce by one third premature mortality from non-communicable diseases (NCDs) by 2030. Enacting the five key WHO FCTC policy actions would prevent premature deaths from the four main NCDs – cardiovascular disease (CVD), diabetes, cancer, and chronic respiratory disease – in the equivalent of about **3 percent** of the needed reduction in premature mortality to achieve SDG Target 3.4.

Avert GHC 1.3 billion in economic losses, coming from:

- **GHC 248 million due to workplace productivity losses.** The tobacco control actions should stimulate economic growth because fewer people 1) miss days of work due to disability or sickness, and 2) work at a reduced capacity due to tobacco-related health issues.
- **GHC 338 million in savings through avoidance of tobacco-attributable health-care expenditures.** Of this, the Government would save **GHC 154 million** in health-care expenditures and citizens would save **GHC 122 million** in out-of-pocket health-care costs, with remaining savings going to other payers.
- **GHC 734 million in averted economic costs from tobacco-attributed mortality.**

Provide a return on investment (ROI) of 4:1.¹ This means that economic benefits (**GHC 1.3 billion**) significantly outweigh the costs of implementing the five WHO FCTC policy actions (**GHC 320 million**). For each individual measure, increasing cigarette taxes will have the highest ROI (**39:1**), followed by enforcing comprehensive bans on tobacco advertising, promotion, and sponsorship (**11:1**), implementing plain packaging of tobacco products (**7:1**), enforcing smoke-free public places and workplaces (**6:1**) and cessation support by training health professionals to provide brief advice to quit tobacco use (**0.4:1**).

1 For every 1 GHC invested in the five key WHO FCTC policy actions today, Ghana will avert GHC 1.6 in economic losses by 2027 and GHC 4.1 by 2037.

In addition to these main findings, the investment case separately examined the revenue-generating potential of cigarette tax increases. Under the examined scenario, committing to **cigarette tax increases over the next five years could generate GHC 287 million in government revenue**. This represents **GHC 57 million annually**, which is equivalent to about **1 percent** of annual government health expenditures.

Increasing cigarette taxes in **Ghana** will confer social benefits to all, but particularly the poor. Those with lower incomes are more likely to quit smoking when cigarette prices rise, helping them to avoid illness and catastrophic health-care expenditures [1]. During the first year of the modeled tax increase, **nearly three-quarters (72 percent)** of the deaths averted from increasing cigarette taxes will be among the poorest 40 percent of the population. Cigarette tax increases would further benefit **Ghanaians** with lower incomes if the resulting government tax revenue were reinvested in further WHO FCTC implementation and national development priorities such as universal health coverage. There is potential for even greater revenue increases from increases in taxes for all tobacco products, not only cigarettes.

Recommendations

This report provides comprehensive recommendations that the **Government of Ghana** can take to protect public health and realise the benefits of the WHO FCTC as a sustainable development accelerator, and it is not only focused on the five WHO FCTC policy actions modeled in this investment case.

Recommendations

- 1** Commit to fully implement the WHO FCTC.
- 2** Strengthen tobacco tax structures and increase tax rates (WHO FCTC Article 6).
- 3** Implement and enforce the other four tobacco control policies studied in this investment case:
 - comprehensive policies to make all public places and workplaces smoke-free (WHO FCTC Article 8);
 - plain packaging of tobacco products (WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13);
 - strengthened tobacco advertising, promotion and sponsorship (TAPS) bans that close loopholes (WHO FCTC Article 13); and
 - promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (WHO FCTC Article 14).
- 4** Strengthen multisectoral coordination for tobacco control and encourage the participation of civil society in WHO FCTC implementation (WHO FCTC Articles 5.2(a) and 4.7).
- 5** Develop a national tobacco control strategy (WHO FCTC Article 5.1).
- 6** Adopt a code of conduct to protect public health policy from tobacco industry interference (WHO FCTC Article 5.3).
- 7** Fully implement the Protocol to Eliminate Illicit Trade in Tobacco Products, including by building capacity to combat illicit trade (Protocol and WHO FCTC Article 15).
- 8** Strictly enforce the prohibition of the sale of tobacco to minors (WHO FCTC Article 16).
- 9** Identify opportunities to link the implementation of the WHO FCTC with wider sustainable development strategies.

Through the FCTC 2030 project, the Secretariat of the WHO FCTC, the United Nations Development Programme (UNDP) and the World Health Organization (WHO) stand ready to support the **Government of Ghana** to reduce the tobacco-induced social, economic, and environmental burdens through the implementation of evidence-based tobacco control laws and policies.

Table ES1. Summary of the main results of the Investment Case for Tobacco Control in Ghana 2023-2037*

Every year, tobacco use causes:

- More than 6,700 deaths.
- Tobacco-attributable mortality valued at GHC 371 million.
- GHC 172 million in health-care expenditures.
- Total social and economic losses equivalent to 0.2% of GDP in 2019.
- GHC 126 million in workplace productivity losses.

Implementing the modeled WHO FCTC measures now would, over the next 15 years:

- Prevent more than 20,000 deaths.
- Prevent GHC 981 million in losses due to tobacco-attributable mortality.
- Save GHC 338 million in health-care expenditures.
- Prevent GHC 248 million in workplace productivity losses.
- Generate economic benefits (GHC 1.3 billion) that significantly outweigh costs (GHC 320 million) of implementation and enforcement – a 4:1 return on investment.

* Figures subject to rounding.

1. Introduction

The tobacco epidemic is one of the greatest public health threats the world has faced, killing more than 8 million people a year, including some 1.2 million deaths from exposure to secondhand smoke [2]. Tobacco use is a main risk factor for non-communicable diseases (NCDs) including cardiovascular disease (CVD), diabetes, cancer and chronic respiratory disease, as well as a cause of many other diseases [3]. In Ghana, around four in every 100 adults currently use some form of tobacco product, with a higher prevalence among males (7 percent) than among females (0.4 percent) [4]. Tobacco use causes more than 6,700 deaths every year [5]; about 66 percent of them are premature, occurring among those under the age of 70 [5].

In addition to the cost to health and well-being, tobacco also imposes a heavy economic burden throughout the world. A 2018 study (based on 2012 data) found that the costs of smoking² were equivalent to 1.8 percent of the world's annual gross domestic product (GDP). Almost 40 percent of the costs occurred in developing countries, highlighting the substantial burden these countries suffer [6].

Tobacco use reduces productivity by permanently or temporarily removing individuals from the labour market due to poor health [7]. When people die prematurely, the labour output that they would have produced in their remaining years is lost. In addition, people with poor health are more likely to miss days of work (absenteeism) or to work at a reduced capacity while at work (presenteeism) [8], [9]. The labour and health consequences not only affect smokers, but also the people in their households who often need to take time off from work to care for those with tobacco-related diseases.

Tobacco use also displaces household expenditure that would otherwise go to fulfilling basic needs, including food and education [10], [11], [12], and it contributes to hunger and impoverishment of families [13], [14]. The use of tobacco imposes health and socio-economic challenges on vulnerable populations including the poor, women and young people [15].

Tobacco production causes environmental damage including soil degradation, water pollution, and deforestation. Tobacco's annual climate change impact is comparable to entire countries' emissions and represents 0.2 percent of the global total. As a result of the shift of tobacco production from richer countries to lower income countries its environmental impacts are now mostly borne by developing regions. By depleting these countries' valuable resources, polluting, and damaging their ecosystems, tobacco puts their livelihoods and development at risk [16], [17], [18].

2 Defined as either "direct costs" such as hospital fees or "indirect costs" representing the productivity loss from morbidity and mortality.

Given the far-reaching health and development impacts of tobacco, and the multisectoral nature of the interventions required, effective tobacco control needs non-health sectors to be operating in support of a whole-of-government and whole-of-society approach to policy making and implementation of the WHO Framework Convention on Tobacco Control (FCTC).

The WHO FCTC was developed in response to the globalization of the tobacco epidemic and is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. The Convention represents a milestone for the promotion of public health and provides new legal dimensions for international health cooperation. Ghana is a country that ratified the WHO FCTC at an early stage, and has been a Party since the Convention entered into force in 2005.

Ghana also became a Party to the Protocol to Eliminate Illicit Trade in Tobacco Products in 2021. The Protocol is an international treaty that builds upon Article 15 of the WHO FCTC, with the objective of eliminating all forms of illicit trade in tobacco products through a package of measures to be taken by countries acting in cooperation.

Tackling tobacco use across the world is a priority within the 2030 Agenda for Sustainable Development. Tobacco control is relevant to the achievement of Sustainable Development Goals (SDGs), particularly SDG Target 3.4 that calls for action to achieve a one-third reduction in premature mortality from NCDs by 2030. Target 3.a is a means of implementation of SDG 3.4 and calls for strengthened implementation of the WHO FCTC. But beyond health, tobacco control is also a proven approach to reduce poverty and inequalities, strengthen and expand the economy and advance sustainable development more broadly. Tobacco control is an SDG accelerator as it can contribute to many goals simultaneously across the economic, social, and environmental spheres [19]. In addition, reducing tobacco use is a one of the nine targets of the WHO Global action plan for the prevention and control of NCDs 2013-2030 [20].

Box 1. 2030 Agenda for Sustainable Development

In 2015, all UN Member States adopted the 2030 Agenda for Sustainable Development, outlining actions to achieve greater peace and prosperity. The core components of the Agenda are the 17 (SDGs) which are an urgent call for all countries to act together, recognizing that efforts to address poverty, inequalities, health, education, economy and climate change must be undertaken in unison [21].

Since joining the WHO FCTC as a Party in 2005, Ghana approved the Public Health Act in 2012, which includes tobacco control. The 2012 act introduced measures on smoking in public places; TAPS, tobacco package labelling and health warnings; age of purchasers; public education and addiction treatment services. The act provided details relating to implementation to be set out in regulations [22]. The Tobacco Control Regulations were established in 2016 which set out specific requirements relating to smoking in public places; TAPS; packaging and labelling; sale of tobacco; illicit tobacco; interactions between the tobacco industry and public officials; and offences and penalties [22].

Ghana has demonstrated leadership in the implementation of tobacco control policies, outpacing global implementation averages in many areas (see **Figure 2**). In 1982, Ghana became one of the first countries in the world to prohibit advertising of tobacco products [22]. However, Ghana's young population and growing incomes make it a prime target of tobacco industry expansion and more vulnerable to increases in tobacco use [22], [23]. Several key demand reduction measures within the WHO FCTC remain to be implemented and some require strengthening. Opportunities for Ghana to improve implementation of the WHO FCTC include: strengthening tobacco tax structures and increasing tax rates [24]; implementing comprehensive policies to make all public places and workplaces smoke-free by ending the use of designated smoking areas and ensuring robust enforcement; implementing plain packaging for tobacco products; closing loopholes in TAPS legislation and ensuring robust enforcement; and promoting cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use. In 2010, Ghana undertook a WHO FCTC Needs Assessment that made recommendations for the country to accelerate implementation of the Convention by establishing a national coordination committee, an enforcement infrastructure, budgets to implement the Convention, international cooperation with development partners including UN agencies to implement the Convention, systems for economically viable alternatives, and full implementation of the time-bound measures [25]. Realizing the full benefits of all of the above measures depends on concerted and coordinated efforts from multiple sectors of government with support from civil society.

In 2021, the Secretariat of the WHO FCTC, UNDP, and WHO undertook a virtual joint mission with partners in Ghana to initiate this investment case. The investment case is part of the support made available to Ghana as an [FCTC 2030](#) project country.³

Investment cases for tobacco control analyse the health and economic costs of tobacco use as well as the opportunities for potential gains from scaled-up implementation of key WHO FCTC measures. It identifies which WHO FCTC demand reduction measures are likely to produce the largest health and economic returns for Ghana, based on the return on investment (ROI). Taking into account the current implementation of WHO FCTC measures in Ghana, the investment case models the impact of the following five key WHO FCTC provisions:

3 The FCTC 2030 project is a global initiative funded by the Governments of Australia, Norway and the United Kingdom to support countries to strengthen WHO FCTC implementation to achieve the SDGs. As of 2022, Ghana is one of 33 countries worldwide that have participated in the FCTC 2030 project [26].

- 1 Increase tobacco taxation to reduce the affordability of tobacco products.** (WHO FCTC Article 6).
- 2 Create smoke-free public places and workplaces to protect people from the harms of tobacco smoke** (WHO FCTC Article 8).
- 3 Implement plain packaging⁴ of tobacco products** (WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13).
- 4 Enact and enforce a comprehensive ban on all forms of tobacco advertising (TAPS), promotion, and sponsorship** (WHO FCTC Article 13).
- 5 Promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use** (WHO FCTC Article 14).

Chapter 2 of this report provides an overview of tobacco control in Ghana, including tobacco use prevalence as well as challenges and opportunities. **Chapter 3** summarizes the methodology of the investment case (see the annex on methodology and the separate *Technical Appendix*, available upon request, for more detail). **Chapter 4** reports the main findings of the economic analysis. **Chapter 5** details the results of complementary analyses examining equity considerations of increasing tobacco taxes, as well as the projected impact on government revenue. Further, it also details the contribution of the WHO FCTC demand reduction measures to meeting SDG Target 3.4 to reduce premature mortality due to NCDs by one third by 2030. **Chapter 6** summarizes the results and provides recommendations to the government to further tobacco control. The annex provides information on the methods underlying the various analyses described in the report.

4 Plain (or standardized) packaging is defined as “measures to restrict or prohibit the use of logos, colours, brand images or promotional information on packaging other than brand names and product names displayed in a standard colour and font style”. Further information is available at: Guidelines for implementation of Article 11 of the WHO Framework Convention on Tobacco Control (decision FCTC/COP3(10)) November 2008, available at: <https://fctc.who.int/publications/m/item/packaging-and-labelling-of-tobacco-products>.

2. Tobacco control in Ghana: status and context

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

Around 4 percent of adults use tobacco products in Ghana [4]. Overall, tobacco prevalence is significantly higher among males than among females (7 percent of adult males use tobacco, compared to 0.4 percent of adult females) [4].

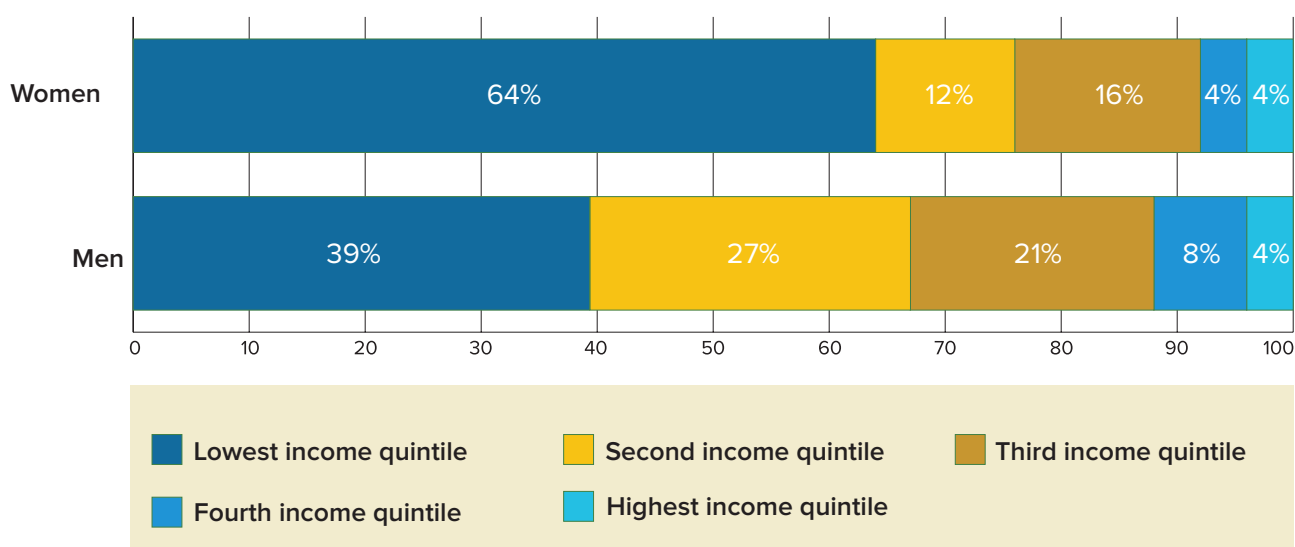
Tobacco use is more prevalent in the north of Ghana (Northern, Upper East and Upper West regions), where it is rural, remote and socioeconomic status is lower with the majority of the population living in the lowest wealth income quintile [27]. More women in the Northern region of Ghana use tobacco compared to other regions (3.1 percent compared to 0.5 percent or less). Likewise, more men in the Northern region (11.1 percent) and Upper East region (11.2 percent) use tobacco [27].

Only 2.2 percent of the adult population aged 15 years and older smoke cigarettes in Ghana (4.3 percent of men and 0.1 percent of women), the lowest rate of cigarette smoking out of all other countries not only in sub-Saharan Africa⁵ but across the world according to the *WHO report on the global tobacco epidemic, 2021* [4].

⁵ Neighbouring countries have a much higher adult tobacco use prevalence, some double, or even triple the prevalence in Ghana – 7.2 percent in Togo, 10 percent in Côte d'Ivoire and 15.2 percent in Burkina Faso. Tobacco use prevalence is even higher in other Sub-Saharan African countries – 20 percent in Botswana and 29 percent in Madagascar [4].

Tobacco consumption in Ghana is positively associated with being male, having very low income, and living in a rural area [28]. Smoking is more common among people who are less educated and among those with lower socioeconomic status [29]. Of adult men who smoke, around 39 percent are in the lowest income quintile while only about 4 percent are in the highest income quintile [27]. Of adult women who smoke, 64 percent are in the lowest income quintile [27].

Fig. 1. Proportion of current adult smokers by income quintile (%) in 2014



Source: These data are from the 2014 Demographic and Health Survey [27]. Smoking prevalence used in models is drawn from WHO estimates [4].

The most recent Global Youth Tobacco Survey (GYTS) in Ghana found that 8.9 percent of students 13-15 years old were current users of "any tobacco products" (use in the last 30 days) [30]. This means that youth tobacco use is more than double adult tobacco use prevalence in Ghana, which is a considerable cause for concern. The GYTS found that 6.5 percent of students are currently smoking tobacco, with 2.8 percent smoking manufactured cigarettes, 1.3 percent smoking shisha (water-pipe) and 4.1 percent smoking other types of tobacco [30]. Among students, 3.1 percent use smokeless tobacco [30]. A 2021 report based on stakeholder observations suggests that shisha (water-pipe) smoking is becoming more popular among adolescents in Ghana [31]. Not only are the rates of tobacco use among young people a considerable cause for concern, but so is the interest that young people appear to have in novel and other forms of tobacco products. To protect young people from the harms of tobacco, all tobacco control legislation and policies in Ghana should cover all forms of tobacco, not just manufactured cigarettes.

The GYTS found that 5.3 percent of girls smoke tobacco compared to 7 percent of boys. The gender gap is much smaller among youth than it is for adults, which suggests there may be a rising prevalence of tobacco use among the next generations of Ghanaian women. More girls use smokeless tobacco than boys (3.7 percent of girls compared to 2.5 percent of boys), giving further rationale for why tobacco control policies and legislation in Ghana must be comprehensive [30].

Among students who are current cigarette smokers, one in two reported that they were able to buy cigarettes despite their age, and over 70 percent purchased cigarettes from stores, shops, street vendors, or kiosks [30]. The GYTS also found that more than one third of students (39 percent) were exposed to secondhand smoke in indoor public places and 23 percent were exposed at home. Around one quarter of students noticed tobacco advertising or promotions at points-of-sale. Half of students said that they were taught about the hazards of smoking at school within the past year. Among current smokers, 60 percent recently tried to stop smoking and 63 percent wished they could stop smoking “now” [30].

Making tobacco products less affordable is one of the best ways to control tobacco use, and young people are particularly sensitive to the price of tobacco [32]. A 2022 study found that the affordability of cigarettes is negatively related to the probability of smoking initiation among adolescents in Ghana and concluded that raising tobacco taxes in line with income growth would make cigarettes less affordable and dissuade adolescents from initiating smoking [33]. Nevertheless the overall affordability of cigarettes in Ghana has not changed since 2010 [4].

Box 2. Tobacco and gender

While worldwide women and girls tend to use tobacco at lower rates than men, they can still be subjected to the harms of tobacco use—including exposure to secondhand smoke [34] and the effects of household income diverted to tobacco use. Since tobacco use prevalence is often lower for women than men, the tobacco industry sees this as an opportunity to scale up marketing targeted at women and girls [35]. Already in Ghana, more women in the Northern Region of Ghana, a low income, rural, and remote area, use tobacco more than other regions of the country (3.1 percent compared to 0.5 percent or less) [27]. Additionally, Ghanaian girls are consuming similar amounts of tobacco compared to boys and girls are outpacing boys in use of smokeless tobacco [30]. This is concerning as recent trends suggest tobacco use is increasing among girls in many countries of the world [36].



Photo: © World Bank via Flickr

Box 3. Tobacco and pregnancy

Tobacco use during pregnancy imposes significant health risks on the fetus, infant and mother. It increases the likelihood of miscarriages, stillbirths, preterm births, low birth weight, birth defects, and sudden infant death syndrome, among others [37], [38]. Exposure to secondhand smoke during pregnancy also increases the risks of having low birthweight babies, in turn increasing the risk of a mother and child developing health issues [38]. Mothers face additional health risks as pregnant smokers are more likely to experience heart and lung complications than pregnant nonsmokers [39]. Despite the strong evidence, the tobacco industry continues to aggressively target women and girls [38]. It is estimated that the global prevalence of smoking during pregnancy is 1.7 percent [40]. In Ghana, 0.2 percent of pregnant women use tobacco [27].

2.2 National tobacco control legislation, strategy and coordination

In 1982, the government introduced a directive to ban cigarette advertising in electronic and print media [41]. In 2002, Ghana joined the Quit and Win International Smoking Cessation Program, which continued until 2006 [22], [42]. Ghana is a country that ratified the WHO FCTC at an early stage, and has been a Party since the Convention entered into force in 2005. In 2006, the Ministry of Health (MoH) issued a directive to ban smoking in MoH facilities and the Ministry of Transportation issued a directive banning smoking in public as well as private commercial transport. In 2007, the Ghana Tourist Board formed a voluntary agreement with hospitality facilities to demarcate smoke-free areas (not an agreement that is in keeping with Article 8 of the WHO FCTC) [22].

Ghana became a Party to the WHO FCTC in 2005 and took an important step forward toward WHO FCTC implementation when the Public Health Act 2012 was passed. This act remains Ghana's primary tobacco control legislation. The act restricts smoking in indoor work and other public places including public transport, but permits designated smoking areas. In addition, the act bans most forms of TAPS; regulates tobacco packaging and labelling; mandates graphic health warnings on tobacco products; institutes minimum age restrictions; provides for public education on the harms of tobacco use; establishes tobacco cessation support; and prohibits sale of tobacco products in health facilities, educational institutions, cinemas, amusement parks, sports stadiums vending machines and on the internet [43].

With regulation powers from the Public Health Act 2012, Ghana made the Tobacco Control Regulations 2016 to provide further details relevant to the implementation of tobacco control measures in the Public Health Act 2012. These regulations provide detailed requirements

relating to pictorial health warnings (including an increased size), designated smoking areas, prohibitions on TAPS, age of sale (specifying 18 as the minimum age), tackling illicit trade, and controlling interactions between the tobacco industry and public authorities and public officers, as well as other measures [44].

In 2018, the Ghana Food and Drug Authority (FDA) adopted new guidelines for the Registration of Tobacco Products [45] and Labelling of Tobacco Products [46]. These lay the foundation for Ghana to build upon to meet obligations as a Party to the Protocol to Eliminate Illicit Trade in Tobacco Products, which Ghana ratified in October 2021 and which came into force in January 2022. The Protocol was developed in response to the growing illicit trade in tobacco products, often across borders. Illicit trade poses a serious threat to public health because it increases access to—often cheaper—tobacco products, thus fuelling the tobacco epidemic and undermining tobacco control policies. It also causes substantial losses in government revenues, and at the same time contributes to the funding of international criminal activities.

Ghana has a national coordinating mechanism (NCM) for tobacco control that was established in 2013, shortly after passage of the Public Health Act 2012, known as the Tobacco Control Inter-Agency Coordinating Committee (TC IACC). Ghana has a history of coordination for tobacco control, and former committees dedicated to tobacco control precede the TC IACC. The National Tobacco Control Steering Committee was established in 2002 [47] and the first Ghana Committee on Tobacco Control formed in 1993 [41].

As summarized by the MoH of Ghana, the MoH Chief Director formally launched the TC IACC to support formulation of tobacco control policy and legislation, noting that every agency in Ghana has a role to play in tobacco control. The TC IACC meets on an as-needed basis, with stakeholders invited to join when necessary. In addition to the MoH and the FDA, government stakeholders with involvement in the TC IACC include the Ghana Standards Authority, Ghana Health Service, Ministry of Foreign Affairs and Regional Integration, Ministry of Education, Ministry of Food and Agriculture, Ministry of Finance, Ghana Revenue Authority, Ministry of Justice and Attorney General's Department, Ghana Tourism Authority, Ghana Police Service, and the Parliamentary Select Committee on Health. Other stakeholders have contributed to the work of the TC IACC, including the civil society organization Vision for Alternative Development (VALD) and the NCD Alliance.

Government sectors have supported tobacco control in other ways including the Ministry of Finance, Ministry of Education, Ministry of Transport, Ministry of Environment, Science and Technology, and the Ghana Tourism Authority. For example, the Ministry of Finance is responsible for tobacco taxation which has significant benefits for public health, the Ministry of Education prohibits smoking by students and teachers during school and working hours, the Ministry of Transport restricts smoking on public transport and the Ghana Tourism Authority works with the hospitality industry to create fully smoke-free places [47].

Tobacco control is a priority of the Government of Ghana as set out in the National Medium-Term Development Policy Framework (2022-2025) [48]. However, there is no specific national tobacco control strategy in Ghana, but development of the first national strategy began in 2022, with support coordinated by the Secretariat of the WHO FCTC through the FCTC 2030 project.

Despite progress in establishing tobacco control coordination, policies and laws, there remains WHO FCTC and Protocol obligations that are not yet fully implemented in the country.

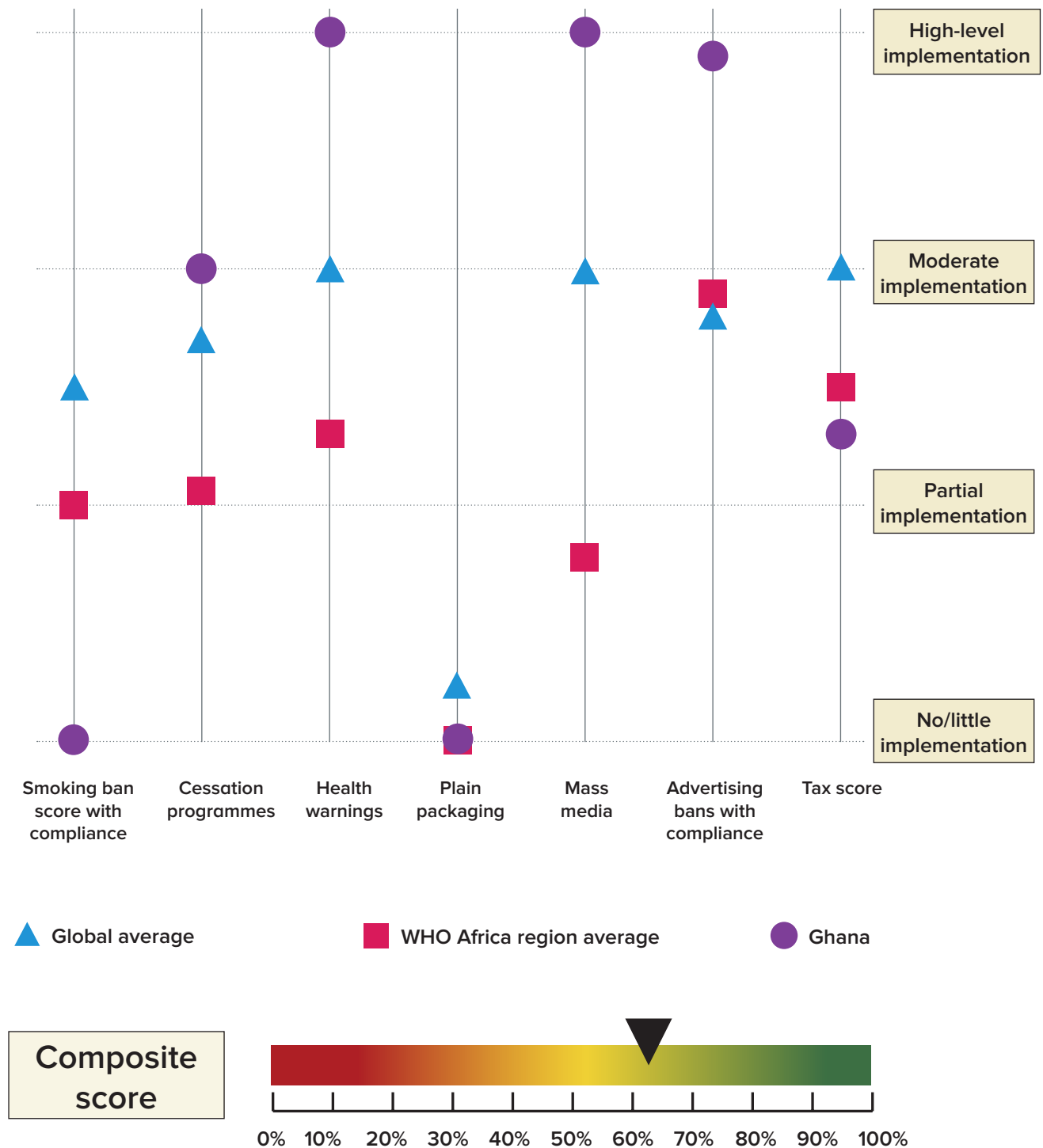
2.3 The status of WHO FCTC demand reduction measures

Strong fiscal and regulatory measures influence societal norms by signalling that tobacco use is harmful, not only for users but for the people around them including family, colleagues, and co-workers.

While Ghana has demonstrated progress towards the implementation of key demand reduction measures, it has been estimated that more than 800,000 Ghanaians continue to smoke cigarettes on a daily basis [49]. Implementing additional demand reduction measures or intensifying existing ones can draw Ghana into closer alignment with the WHO FCTC and reduce the substantial costs imposed by tobacco use. Below, the status of each of the demand reduction measure in relation to WHO FCTC recommendations is discussed.

Figure 2 summarizes the status of tobacco control demand reduction measures in Ghana from the *WHO Report on the Global Tobacco Epidemic, 2021* [4] and, for each, progress toward meeting WHO FCTC obligations. Overall, Ghana is assessed to be 64 percent of the way toward fulfilling the key WHO FCTC demand reduction measures, above the global average of 53 percent.⁶

⁶ This composite score represents a status quo implementation level of tobacco control demand reduction measures developed intentionally for tobacco control investment cases.

Fig. 2: Implementation of WHO demand reduction measures in Ghana

Source: WHO Report on the Global Tobacco Epidemic, 2021 [4]

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

In Ghana, total taxes comprise about 32 percent of the retail price of the most sold brand of cigarettes. As a member of the Economic Community of West African State (ECOWAS), Ghana is subject to the 2017 ECOWAS tax directive for tobacco products, including a minimum specific excise tax of (US\$0.02 per stick/US\$0.40 per pack) [24]. However, there is currently no specific excise tax for tobacco in Ghana. Tax on cigarettes consist of an ad valorem excise tax, value added tax (VAT) and other taxes (including health insurance, education trust fund and COVID-19 health recovery levies) [4] [and from interviews during development of the investment case].

There is substantial scope for action to reach what is considered in the *WHO Report on the Global Tobacco Epidemic* as a high-level of achievement, which is for total taxes to represent at least 75 percent of the retail price⁷ [4]. On tax design for tobacco products, WHO makes a number of recommendations including that governments should rely more on specific tobacco excises to drive price increases (rather than rely only on ad valorem excises), increase tobacco taxes significantly to reduce the affordability of tobacco products and automatically adjust specific tobacco taxes for inflation and income growth [50].

As tobacco tax rates have only increased slightly since 2010 (when Ghana switched from a tiered specific excise tax to ad valorem), there has been no real change in the affordability of cigarettes from 2010 to 2020 in Ghana [4]. This 2010 tax level (total taxes accounting for 22 percent of the retail price) represents a decrease from the 2008 tax level (total taxes accounting for 27 percent of the retail price) when Ghana employed a specific excise tax on tobacco products [4].

Prior to 2007, Ghana applied a flat ad valorem excise tax of 140 percent (of the cost, insurance and freight (CIF)) on all tobacco products. Ghana then changed the excise tax structure to a tiered specific for three years before returning to an ad valorem-based structure on CIF in 2010, albeit at a higher rate of 150 percent. As directed by the Excise Duty Act 2014, Ghana further increased the rate to 175 percent in 2015. Despite this increase, this tax currently represents only 4.8 to 14.4 percent of the retail price in Ghana, much lower than the median of the 15 ECOWAS countries at around 22 percent⁸ [24]. Additionally because the CIF is a small portion

7 The *WHO Report on the Global Tobacco Epidemic* classifies total tax share of 75 percent or more of the retail price as a high-level of achievement [4].

8 Median of the portion of the retail price for CIF, ex-factory values or import value across the ECOWAS countries.

of retail price, it is easier for the tobacco industry to manipulate to keep prices low.⁹ The Excise Duty Act 2014 also specified an excise duty rate of 170.65 percent on snuff and other tobacco [50]. In addition, tobacco (up to one pound) can be imported duty-free and is available for purchase at duty-free shops [52], [53].

Taking an important step forward to strengthen tobacco control, in March 2023 the Parliament of Ghana passed the Excise Duty (Amendment) Bill, 2022 amending the Excise Duty Act 2014. Soon after in April 2023, the bill was signed into law by the President of Ghana becoming the Excise Duty (Amendment) Act, 2023. This new law includes the introduction of a specific excise tax on cigarettes (at a rate of GHC 5.6 per pack) and on other tobacco products. The legislation also includes provision to tax electronic cigarettes and electronic liquids. However, the legislation decreases the ad valorem rate from 175 to 50 percent [54].¹⁰

The *Global Cigarette Tax Scorecard* that assesses countries' cigarette tax policy performance gave Ghana a score of 0.75 out of a maximum score of 5 in 2020. This is significantly lower than the Africa regional average of 1.64 and Ghana's rating has not changed since 2014. Within the Tax Scorecard, Ghana rated lowest on cigarette affordability¹¹ change and tax share components scoring zero for both components in 2020 [56].

The investment case examines the impact of **raising cigarette taxes** to levels considered in the *WHO Report on the Global Tobacco Epidemic, 2021* as a high-level of achievement [4]. It models introducing a specific excise tax beginning in 2025 (in addition to the existing ad valorem tax) to create a mixed tax structure and raising the tax by an average of 0.74 Ghanaian cedi per year—in real terms—until 2038 (see the annex on methodology for detailed information). Further economic gains will be made in Ghana with substantial tax increases on all tobacco products.

2. Create smoke-free public places and workplaces to protect people from the harms of tobacco smoke (WHO FCTC Article 8)

Under the Public Health Act 2012 and the Tobacco Control Regulations 2016, tobacco use is effectively banned on most forms of public transportation [43], [57].

9 The tobacco industry can easily manipulate CIF and declare a lower value as the government cannot ascertain the actual value of the imported product which only the producer or importer know. On the other hand, the declared retail price is easy to check by monitoring the market.

10 The Excise Tax (Amendment) Act, 2023 was passed after the modelling for this investment case was completed and thus is not reflected in the modelling. The baseline tax scenario used in the modelling is from the WHO Report on the Global Tobacco Epidemic, 2021 with no specific excise tax and total taxes representing 32 percent percent of the retail price of the most sold brand of cigarettes [4].

11 Measured as the percentage of a country's GDP per capita needed to buy 100 packs of the most sold brand of cigarettes [55].

However, in all other indoor public places and workplaces, smoking is permitted in designated smoking areas. As defined in the Tobacco Control Regulations 2016, such designated areas can be either an indoor or outdoor public area [22] and means smoking still takes place in indoor public places and workplaces.

The current smoke-free requirements in place are reportedly not fully enforced and violations are common. Researchers investigated compliance by observing indoor smoking before and after enactment of the 2012 Public Health Act. In 2007, before smoke-free requirements were in force, indoor smoking was observed at 86 percent of hospitality venues and only decreased to 56 percent in 2015 after the smoke-free law was implemented, indicating compliance and enforcement need to be reinforced [57].

The investment case examines the impact of **enacting and enforcing comprehensive smoke-free measures for all indoor public places and workplaces.**

3. Require tobacco packaging to carry graphic health warnings describing the harms of tobacco use (WHO FCTC Article 11)

Six rotating **graphic warning labels** are required on cigarette packaging in Ghana. The Public Health Act 2012 mandated that not less than 50 percent of the front and rear principal display areas of cigarette packaging be covered by health warnings [4]. The Tobacco Control Regulations Act 2016 increased the size of coverage on the back to 60 percent [44]. The Public Health Act also states that warnings should describe the harmful effects of tobacco use on health and be written in the principal language(s) of Ghana [4]. For smokeless tobacco products, it is required that health warnings cover 65 percent of the front and back of the product. Misleading packaging and labelling terms such as "light", "ultra-light", "mild" and "low tar", among others, are prohibited [59]. Given that the requirements under WHO FCTC Article 11 obligations are being met and there is a good level of implementation, this intervention has not been modeled in this investment case.

4. Implement plain packaging of tobacco products (WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13)

Ghana currently does not require plain packaging of tobacco products [4]. The investment case examines the impact of implementing and enforcing **plain packaging** requirements.

5. Promote and strengthen public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation (WHO FCTC Article 12)

Ghana has recently aired **mass media information campaigns** on public television and radio that meet WHO's criteria for high-level implementation [4]. Given the existing good level of implementation in Ghana of this policy area, this intervention has not been modeled in the investment case.

6. Enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship (TAPS) (WHO FCTC Article 13)

Ghana has a near total **ban on tobacco advertising, promotion, and sponsorship (TAPS)** and has been recognized as one of the highest achieving countries to enforce bans on tobacco advertising [4]. However, point-of-sale product displays and product placement in television and films are still permitted [4], [59]. In addition, compliance assessments by national experts¹² indicate that TAPS bans were only moderately enforced [4]. The TAPS ban includes direct and indirect forms of advertising, including billboards, wall murals, on public transport and during an activity or event. Any form of tobacco sponsorship is banned, and anyone associated with tobacco is not permitted to organize an activity or financially contribute to an organized activity. It is not permitted to promote tobacco through retail sale and it is not permitted to sell or advertise a non-tobacco product that is often associated with a tobacco product, brand or manufacturer [43]. The National Media Commission's *Guidelines for Broadcasting* discourage smoking-related content where it is not consistent with plot and character development [60]. Cross-border advertising is also banned [61]. The investment case models the impact of closing remaining gaps that permit TAPS and ensuring full compliance with TAPS bans.

12 Five national experts provided assessments of compliance with existing laws for the WHO report on the Global Tobacco Epidemic 2021: addressing new and emerging products [4], including one senior government official in charge of tobacco control, one head of a nongovernmental organization that works on tobacco control, one health professional, one academic, and one tobacco control focal point at the WHO country office.

7. Promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (WHO FCTC Article 14)

While the establishment of smoking **cessation** centres at both regional and district levels is provided for under the Public Health Act 2012, such centres have yet to be established [50]. Smoking cessation support is only available in some hospitals and health offices and is not available in primary care facilities or community centres [4]. Ghana's national health insurance currently does not cover the cost of tobacco cessation services, and there are no other arrangements to absorb costs. There is no national toll-free quit line to help individuals who wish to quit using tobacco [62]. Nicotine replacement therapy (NRT) is difficult to access as it is not readily available in pharmacies or general stores in Ghana and costs are not covered. [4] Between 2002 and 2006, Ghana, with support from WHO's Tobacco-Free Initiative, joined the Quit and Win International Smoking Cessation Program [22], [42].

In 2017, MoH developed the *Smoking Cessation Clinical Guidelines for Ghana* to guide health workers in the provision of tobacco cessation services [63]. However, considering the limited smoking cessation support available, it appears these guidelines are not implemented to the fullest.

The provision of brief advice to tobacco users from health-care professionals whenever they access health-care services especially in the primary care setting is also shown to be effective in supporting successful tobacco cessation [64] and represents a useful early step in rolling out support for tobacco users to quit. The investment case models the impact of training primary care health providers to identify tobacco users and to provide tobacco cessation advice (see the annex on methodology for detailed information). Further gains would be possible with the provision of further support to tobacco users, such as offering specialized tobacco dependence treatment services, a national toll-free quit line and/or internet based quit support and making pharmacotherapies more widely available (free of cost if possible).

Table 1 summarizes the existing state of WHO FCTC demand reduction measures and compares them against a target that would represent a high-level of implementation for each measure. The impact of each policy measure—individually and in combination—is described in **Annex Table A4**.

Table 1: Summary of the current state of WHO FCTC demand reduction measures in Ghana and modeled implementation targets based on the *WHO Report on the Global Tobacco Epidemic, 2021* [4]

Tobacco control policy	Ghana baseline*	Modeled implementation target
Increase tobacco taxation to reduce the affordability of tobacco products (WHO FCTC Article 6)	Tax share equivalent to 32% of the retail price of the most sold cigarette brand.	Introduce a specific excise tax (in addition to the existing ad valorem tax) and increase total tax rates on cigarettes to at least 75% of the retail price. Implement regular tax increases to outpace inflation and income growth.
Create smoke-free public places and workplaces to protect people from the harms of tobacco smoke (WHO FCTC Article 8)	The Public Health Act 2012 bans smoking in enclosed indoor public places and workplaces but designated smoking areas are allowed. Smoking in public transport is effectively prohibited in most cases. The existing smoke-free requirements are not fully enforced.	Remove provision for designated smoking areas to make all indoor work and public places 100% smoke-free.
Implement plain packaging of tobacco products (WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13)	Plain packaging requirements are not currently in place.	Implement and enforce plain packaging of tobacco products.
Enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship (TAPS) (WHO FCTC Article 13)	Most forms of TAPS are banned, except point-of-sale product displays and product placement in television and films. Bans are moderately enforced.	Ban all forms of direct and indirect TAPS, with strengthened enforcement to ensure compliance.
Promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (WHO FCTC Article 14)	Smoking cessation is currently only offered in some hospitals and health offices and is not available in primary care facilities or community centres. Clinical guidelines were developed in 2017 to guide health workers in the provision of tobacco cessation services, but they have not yet been fully implemented. There is no national quit line (or web-based equivalent) to support quitting. Pharmacotherapy is not readily available.	Expand training of primary health care providers to identify tobacco users and to provide tobacco cessation advice; implement the provision of tobacco cessation services at the primary care level.

Source: Information in this table is based on the WHO Report on the Global Tobacco Epidemic, 2021 [4]

2.4 Tobacco use and the COVID-19 pandemic

The global coronavirus disease (COVID-19) pandemic has strained health systems worldwide, and the economic impact of the outbreak has been immense. According to WHO, evidence indicates that smokers are more likely to suffer more severe outcomes of COVID-19, such as admission into intensive care units and death, than never smokers. Furthermore, severe forms of COVID-19 or deaths due to COVID-19 are more frequent in people with comorbidities that are related to tobacco use, including chronic obstructive pulmonary disease, lung cancer and cardiovascular disease [65]. Moreover, tobacco use is also proven to worsen the outcomes of other communicable diseases such as tuberculosis and HIV [66]. In Ghana, the COVID-19 pandemic prompted debate on the need for stronger tobacco control.

2.5 Financing

Ghana does not presently have dedicated funding for tobacco control implementation and enforcement. The benefit package of the National Health Insurance Scheme (NHIS) of Ghana does not include NRT or tobacco cessation services [61]. Public social support systems do not promote cessation, leaving individual tobacco users to pay out-of-pocket (OOP) for such help. The 2010 Ghana WHO FCTC Needs Assessment report identified financing of tobacco control as a key barrier impeding WHO FCTC implementation in Ghana and recommended that “a specific budget line needs to be allocated to support the work of the national coordinating mechanism with dedicated staff in place” [25]. Key stakeholders (from MoH, Ghana FDA, WHO, academia, media, civil society, non-governmental organizations (NGOs) and other institutions) have indicated the need to improve sustainable funding of comprehensive tobacco control programmes in Ghana [31]. In 2022, Ghana shared plans to allocate US\$110 million towards addressing NCDs [67].

2.6 Tobacco industry presence and interference in policymaking

Tobacco use began in Ghana centuries ago and commercialization commenced after the Second World War [41]. British American Tobacco (BAT) established cigarette distribution depots in Ghana in 1948, formed the Gold Coast Tobacco Company in 1951 for network management, and established the Pioneer Tobacco company a year later to cultivate tobacco and manufacture cigarettes [41].

Tobacco manufacturing in Ghana ceased in 2006 after BAT relocated operations to Nigeria for what it claimed to be a more favourable production environment [68]. Ghana has little tobacco cultivation with only a few local farmers informally growing tobacco for local consumption [69]. In 2014, about 2,545 metric tons of tobacco were produced in Ghana with only 0.04 percent of agricultural land devoted to tobacco farming [70]. With the conclusion of tobacco manufacturing in Ghana, importers still bring tobacco products to market [47]. BAT Ghana

and the Target Link Company are the two main importers, with BAT the largest operation responsible for as much as 87 percent of yearly tobacco importation [69].

In Ghana, tobacco industry corporate social responsibility initiatives, collaboration and/or support from the tobacco industry for government activities (i.e., setting and implementing tobacco control policies, attending government meetings on tobacco control, and drafting of legislation) are not permitted. However, some members of the government and officials in Ghana reportedly have worked for the tobacco industry [71].

Ghana recently saw a modest improvement in its *Global Tobacco Industry Interference Index*¹³ score and now ranks 38 out of the 80 countries analysed (moving from a score of 58 in 2020 to 56 in 2021, in a ranking system where a lower score indicates less interference) [72]. Ghana has an opportunity to go further with action to address the tobacco industry's negative influence on health and sustainable development through full implementation of the WHO FCTC.

While the 2016 Tobacco Control Regulations empowered the Minister of Health to issue a code of conduct prescribing standards for public officers, service providers, contractors and consultants involved in setting or implementing public health policies for effective tobacco control, no code has yet been issued.

2.7 Illicit trade in tobacco products

Illicit trade in tobacco products poses a serious threat to public health. Illicit trade increases the accessibility and affordability of tobacco products, thus fuelling the tobacco epidemic and undermining tobacco control policies. It also causes substantial losses in government revenues, and at the same time contributes to the funding of transnational criminal activities [73]. On 22 October 2021, Ghana ratified the Protocol to Eliminate Illicit Trade in Tobacco Products [74] representing a milestone in the country's efforts to eliminate the problem of illicit tobacco. The Protocol supplements the WHO FCTC with a comprehensive tool to counter and eventually eliminate illicit trade in tobacco products and to strengthen legal dimensions for international health cooperation.

Illicit trade in tobacco products is a barrier to successful tobacco control in Ghana, according to interviews with national stakeholders during the development of the investment case. In 2016, the Ghana Customs and Excise Preventive Services reported that about 20 to 30 percent of the tobacco market share was from illicit trade [75]. A 2021 research study on illicit trade of tobacco products in Ghana suggests that one in five cigarettes in Ghana is illicit, and that half of retailers in the study were unaware of illicit tobacco trade and tobacco control laws [76].

¹³ The Global Tobacco Industry Interference Index measures efforts by governments to address tobacco industry interference: It is accessible at <https://globaltobaccoindex.org/>

Ghana has made efforts to combat illicit tobacco trade, including through stationing FDA officials at international borders, requiring registration to manufacture or import tobacco products, and ensuring tobacco packaging has the legally required warnings [77]. It is mandatory for tobacco products for sale in Ghana to have the inscription “For Sale in Ghana Only” [43]. Challenges to effective enforcement include porous borders, individual duty-free allowances (imported tobacco products up to 1 pound (0.5 kg) are not subject to duties and taxes [54]), and limited capacity of officials to identify illicit products. There is also no track and trace system for tobacco products in Ghana [78]. During interviews with national stakeholders while developing the investment case, concern was expressed about seemingly minimal transparency in the system to dispose of all confiscated illicit tobacco products. Some interviewed stakeholders suggested proposals to further combat illicit trade. These included increased resources for border officials to enforce the appropriate penalties when tobacco is illegally brought into Ghana, and rewards for whistle-blowers who give the authorities insight on illegal tobacco products.

2.8 Civil society organizations (CSOs)

Civil society organizations are key tobacco control stakeholders in Ghana. According to WHO FCTC Article 4.7, the participation of civil society is essential in achieving the objective of the Convention and its protocols. Ghana’s 2010 WHO FCTC Needs Assessment report recommended stronger leadership of CSOs in tobacco control advocacy and increased government collaboration with civil society [25]. The Coalition of NGOs in Tobacco Control (CNTC) [79] consists of around 15 organizations, including Vision for Alternative Development (VALD), the Network for Community Planning and Development, Healthy Ghana, the Movement Against Tobacco and Substances of Abuse, the Communication for Development Centre, Healthpage Ghana, the Future Rescue Foundation, and the Integrated Social Development Centre [80].

The CNTC was formed to coordinate Ghanaian civil society’s tobacco control activities and advocate for the passing of tobacco control legislation. However, while individual organizations such as VALD continue to engage in tobacco control advocacy, the coalition has not been particularly active in recent years. The 2021 *VALD Ghana Tobacco Industry Interference Index Report* describes civil society efforts in Ghana as impressive, but it also indicates factors limiting their activities including limited access to information [81].

3. Methodology

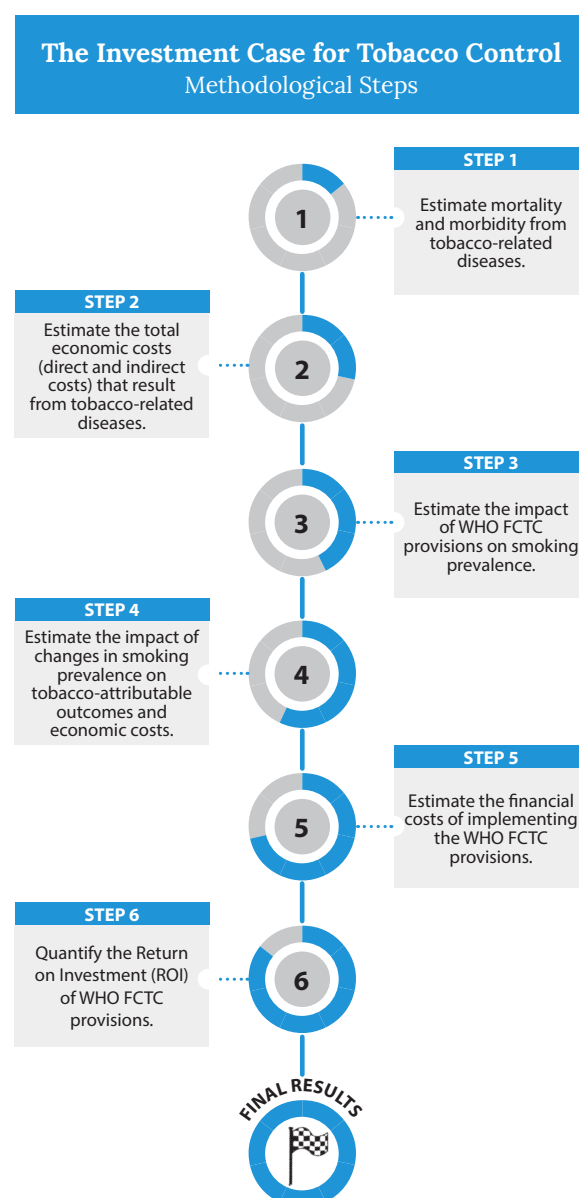
The purpose of the investment case is to quantify the current health and economic burden of tobacco use in Ghana (in the context of WHO FCTC measures that are currently in place), and to estimate the impact that implementing new WHO FCTC measures—or strengthening existing ones—would have on reducing this burden.

A static model was developed to conduct the investment case and to perform the methodological steps in **Figure 3**. This methodology has been used for previous national WHO FCTC investment cases under the FCTC 2030 project.

The tools and methods used to perform these steps are described in this report's annex on methodology. Interested readers are also referred to this report's separate *Technical Appendix*¹⁴ for a more thorough account of the methodology.

The investment case team worked with the MoH and other stakeholders in Ghana 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 WHO, the World Bank database, the Global Burden of Disease study by the the Institute for Health Metrics and Evaluation (IHME), and academic literature. Within the investment case, costs and monetized benefits are reported in constant 2019 Ghanaian cedi (GHC) and discounted at an annual rate of 5 percent.

Fig. 3: Building the investment case



¹⁴ Available upon request.

4. Results

4.1 The current burden of tobacco use: health and economic costs¹⁵

In 2019, tobacco use caused an estimated 6,708 deaths in Ghana, 66 percent of which were premature, i.e. occurred among those under 70 years [82]. These deaths amount to 139,329 years of life lost (YLLs), which are lost productive years in which many of those individuals would have contributed to the workforce [82]. Monetizing YLLs due to tobacco use, the investment case identifies GHC 371 million in losses due to tobacco-attributable mortality.

While the costs of the tobacco-attributable mortality are high, the consequences of tobacco use begin long before death. As individuals suffer from tobacco-attributable diseases (e.g., cardiovascular disease, respiratory conditions, cancers), expensive medical care is required to treat them. Spending on medical treatment for illnesses caused by smoking cost the government GHC 78 million in 2019 and caused Ghanaian citizens to spend GHC 62 million in OOP health-care expenditures. Private insurance and non-profit institutions serving households spent GHC 31 million on treating tobacco-attributable diseases in 2019. In total, health-care expenditures attributable to smoking amounted to GHC 172 million.

In addition to health-care costs, as people become sick, they are more likely to miss days of work (absenteeism) or to be less productive at work (presenteeism). In 2019, the cost of excess absenteeism due to tobacco-related illness was GHC 35 million and the cost of presenteeism due to cigarette smoking was GHC 91 million.

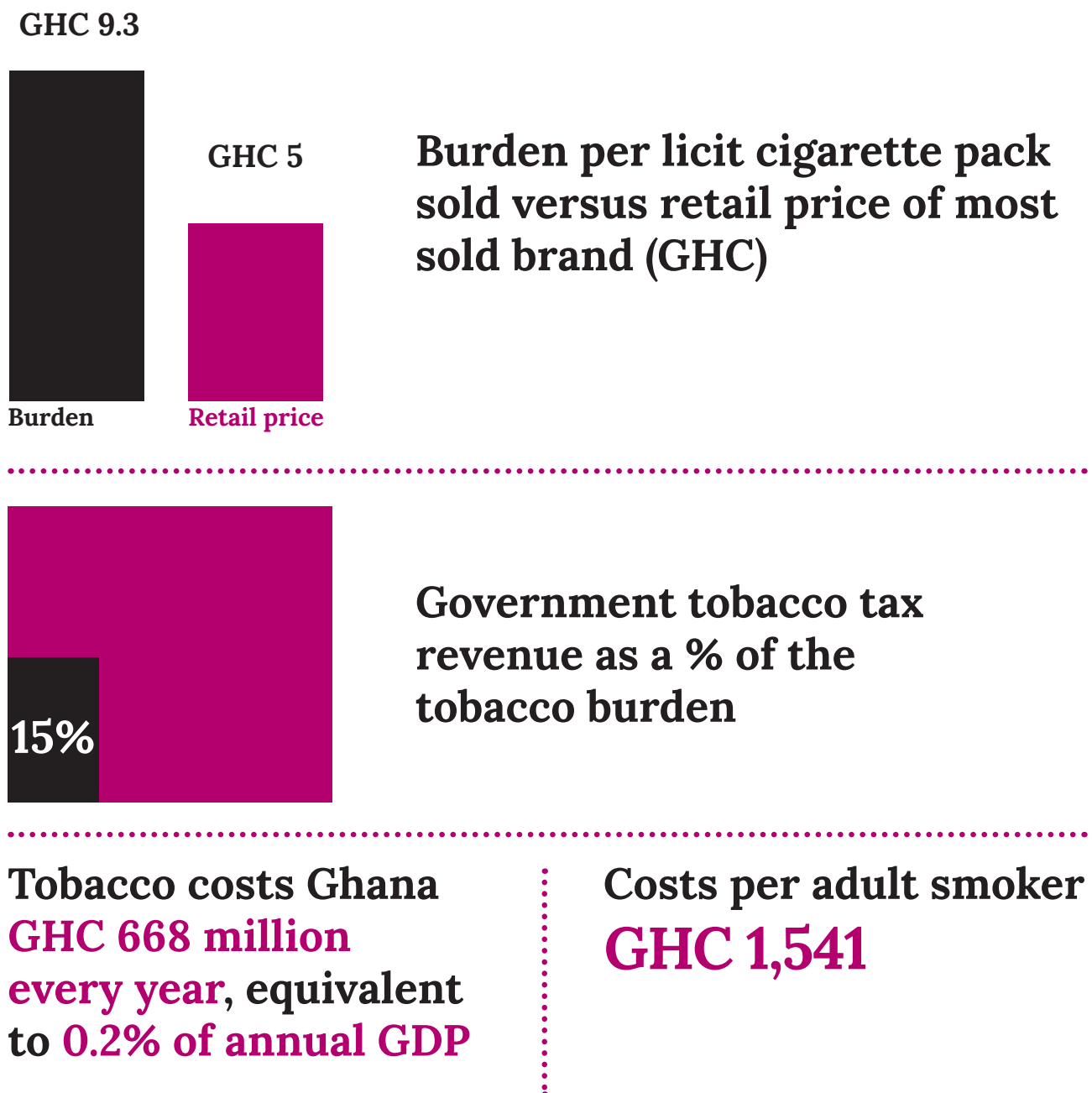
In total, tobacco use caused GHC 668 million in economic losses in 2019, equivalent to about 0.2 percent of Ghana's 2019 GDP. **Figure 4** summarizes the current social and economic burden of tobacco use and contextualizes the losses. This burden of tobacco use in Ghana far exceeds the revenue the government currently collects from taxing tobacco products. Tobacco-attributable social and economic losses are about seven times larger than the collected government revenue. Social and economic losses per *licit* cigarette pack sold equate to about nine dollars per pack, outweighing the financial value—represented by the per pack price—that accrue in the value chain to growers, manufacturers, vendors, other supply chain stakeholders, and the government (through taxation). Given the dominance of multinational corporations in the tobacco trade and the high-profit

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

margins on cigarettes, much of the profit from tobacco sales in Ghana leaves the country and goes into the pockets of international shareholders.

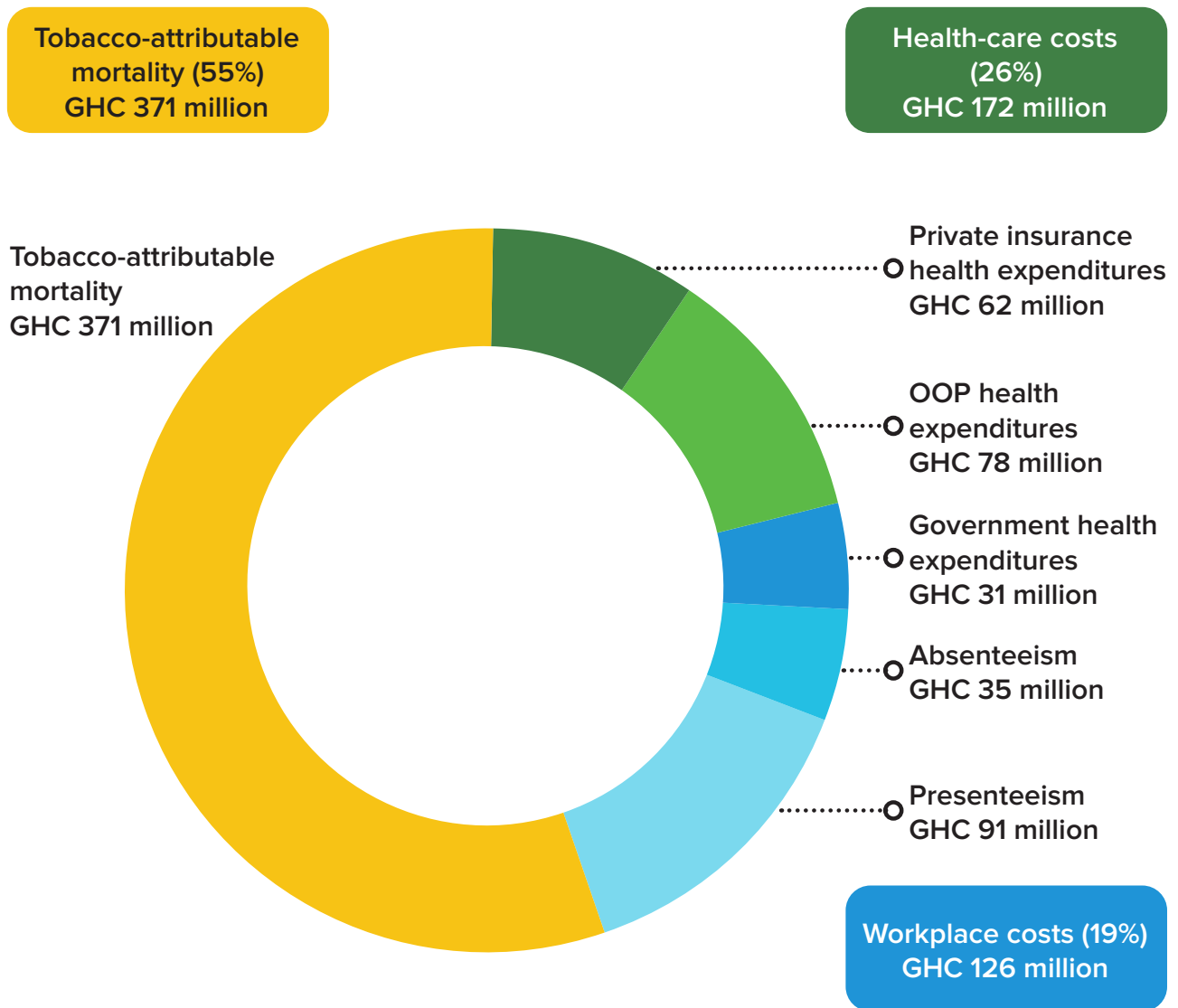
Figure 5 breaks down the share of the economic burden attributable to tobacco-attributable mortality, workplace costs, and health-care costs. **Figure 6** and **Figure 7** illustrate the annual health losses that occur due to tobacco use.

Fig. 4: Contextualizing the burden of tobacco use in Ghana, 2019*

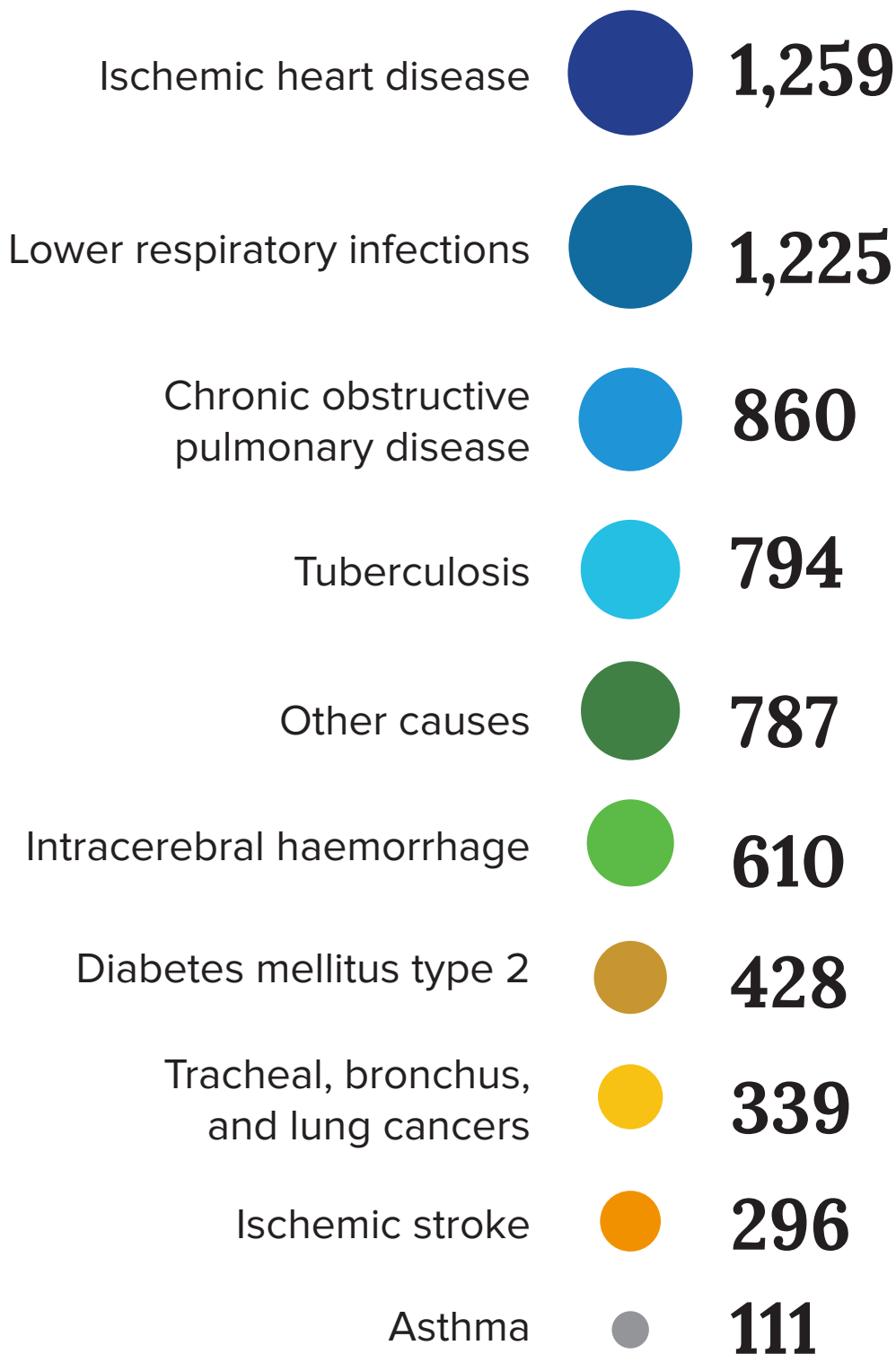


*Figures subject to rounding.

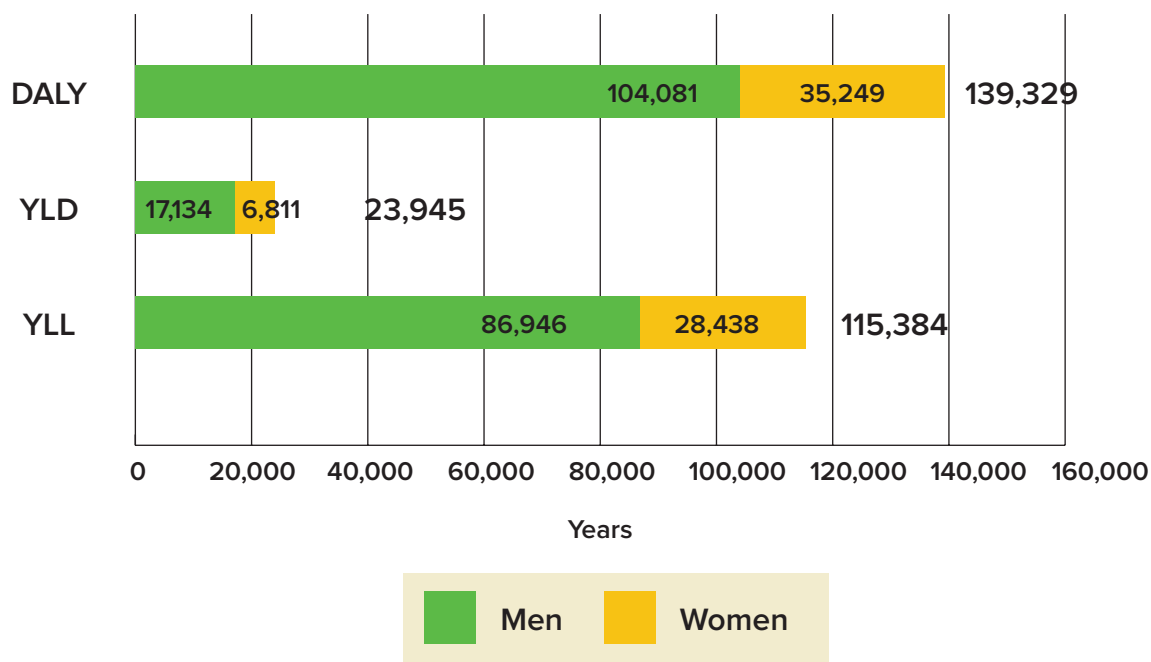
Fig. 5: Breakdown of the share of the economic cost of lost tobacco-attributable mortality, workplace costs, and health-care costs (GHC millions) in 2019*



*Figures subject to rounding.

Fig. 6: Tobacco-attributable deaths by disease in Ghana, 2019

Source: Results are from the IHME Global Burden of Disease Results Tool. Other causes include oesophageal cancer, Alzheimer's disease and other dementias, larynx cancer, cervical cancer, pancreatic cancer, bladder cancer, liver cancer, prostate cancer, breast cancer, colon and rectum cancer, stomach cancer, leukaemia, aortic aneurysm, peptic ulcer disease, subarachnoid haemorrhage, lip and oral cavity cancer, gallbladder and biliary diseases, other pharynx cancer, kidney cancer, atrial fibrillation and flutter, multiple sclerosis, nasopharynx cancer, peripheral artery disease, rheumatoid arthritis, otitis media, and age-related macular degeneration.

Fig. 7: Tobacco-attributable DALYs, YLDs, and YLLs in Ghana, by gender, 2019

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.” Disability-adjusted life years (DALYs) “equal the sum of YLLs and YLDs. One DALY equals one lost year of healthy life.” Source: IHME. (2018). Frequently asked questions. Accessible at <http://www.healthdata.org/gbd/faq#What%20is%20a%20DALY?>

4.2 Implementing policy measures that reduce the burden of tobacco use

The WHO FCTC provides a framework for tobacco control measures to be implemented by Parties at national and international levels to reduce continually and substantially the prevalence of tobacco use and exposure to tobacco smoke. Through the full implementation of the tobacco control measures in the WHO FCTC, Ghana can secure significant health and economic returns, and begin to reduce the GHC 668 million in annual economic losses from tobacco use.

The next two subsections present the health and economic benefits that result from five key WHO FCTC policy actions: 1) to increase tobacco taxation to reduce the affordability of tobacco products; 2) to create smoke-free public places and workplaces to protect people from the harms of tobacco smoke; 3) to implement plain packaging of tobacco products; 4) to enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship (TAPS); and 5) to promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use.

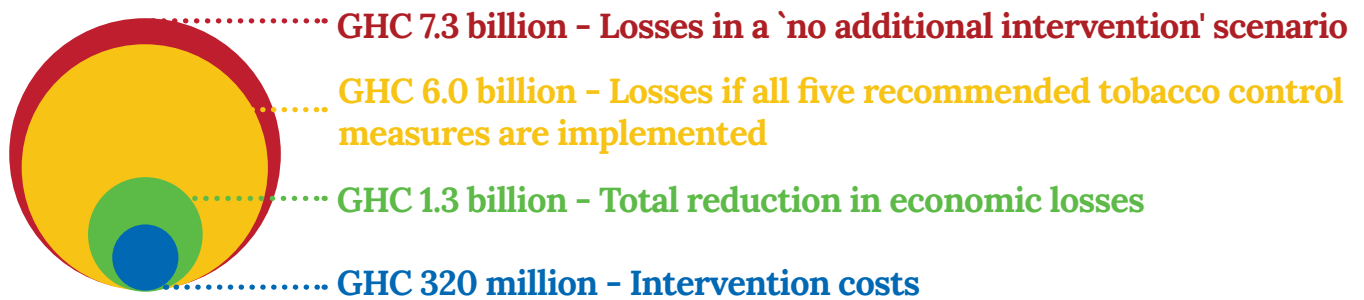
4.2.1 Health benefits – lives saved

The full implementation of the WHO FCTC in Ghana (inclusive of all five of the measures listed above) would lower the prevalence of tobacco use, leading to substantial health gains for the country. Implementing the package of five WHO FCTC policy actions that are the focus of this investment case would reduce the prevalence of cigarette smoking by 33 percent (in relative terms) over 15 years, saving 20,122 lives over 2023-2037, or 1,341 lives annually.

4.2.2 Economic benefits – costs averted

Implementing the package of five key WHO FCTC policy actions would result in Ghana avoiding 18 percent of the economic loss that it is expected to incur from tobacco use over the next 15 years. **Figure 8** illustrates the extent to which Ghana can shrink the economic losses it is expected to incur under the status quo.

Fig. 8: Tobacco-related economic losses over 15 years, 2023-2037

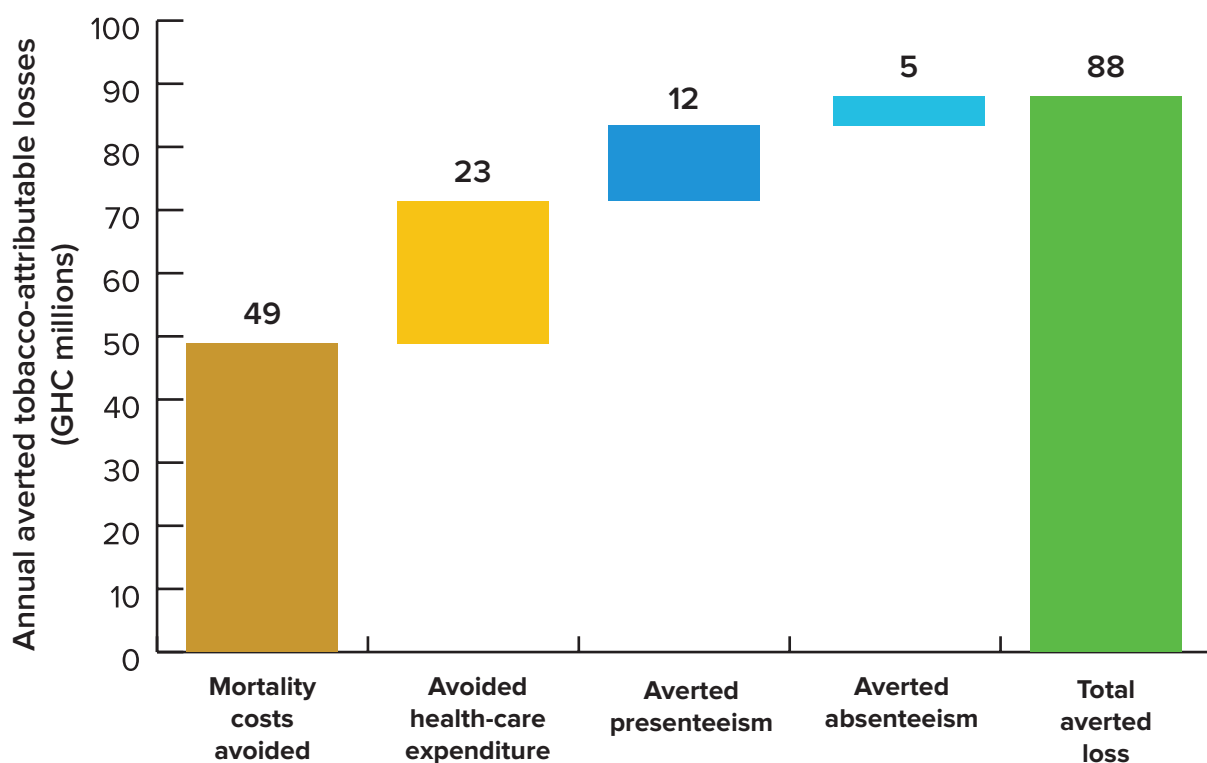


In total, over 15 years Ghana would save about GHC 1.3 billion that would otherwise be lost if the package of five key WHO FCTC policy actions are not implemented. This is equivalent to around GHC 88 million in annual avoided losses.

With better health that would arise from the implementation of the WHO FCTC, fewer individuals would need access to health-care services due to tobacco-related diseases, resulting in direct cost savings to the government and citizens. Better health also leads to increased productivity. Fewer working-age individuals leave the workforce prematurely due to death. Workers miss fewer days of work (absenteeism) and are less hindered by health complications while at work (presenteeism).

Figure 9 breaks down the sources from which *annual* avoided costs accrue from implementation of the package of five WHO FCTC policy actions. The largest annual avoided costs result from averted tobacco-attributable mortality (GHC 49 million). The next highest source is avoided health-care expenditures (GHC 23 million) followed by reduced presenteeism (GHC 12 million) and reduced absenteeism (GHC 4.6 million).

Fig. 9: Sources of annual avoided economic costs as a result of implementing the tobacco control policy package in Ghana*



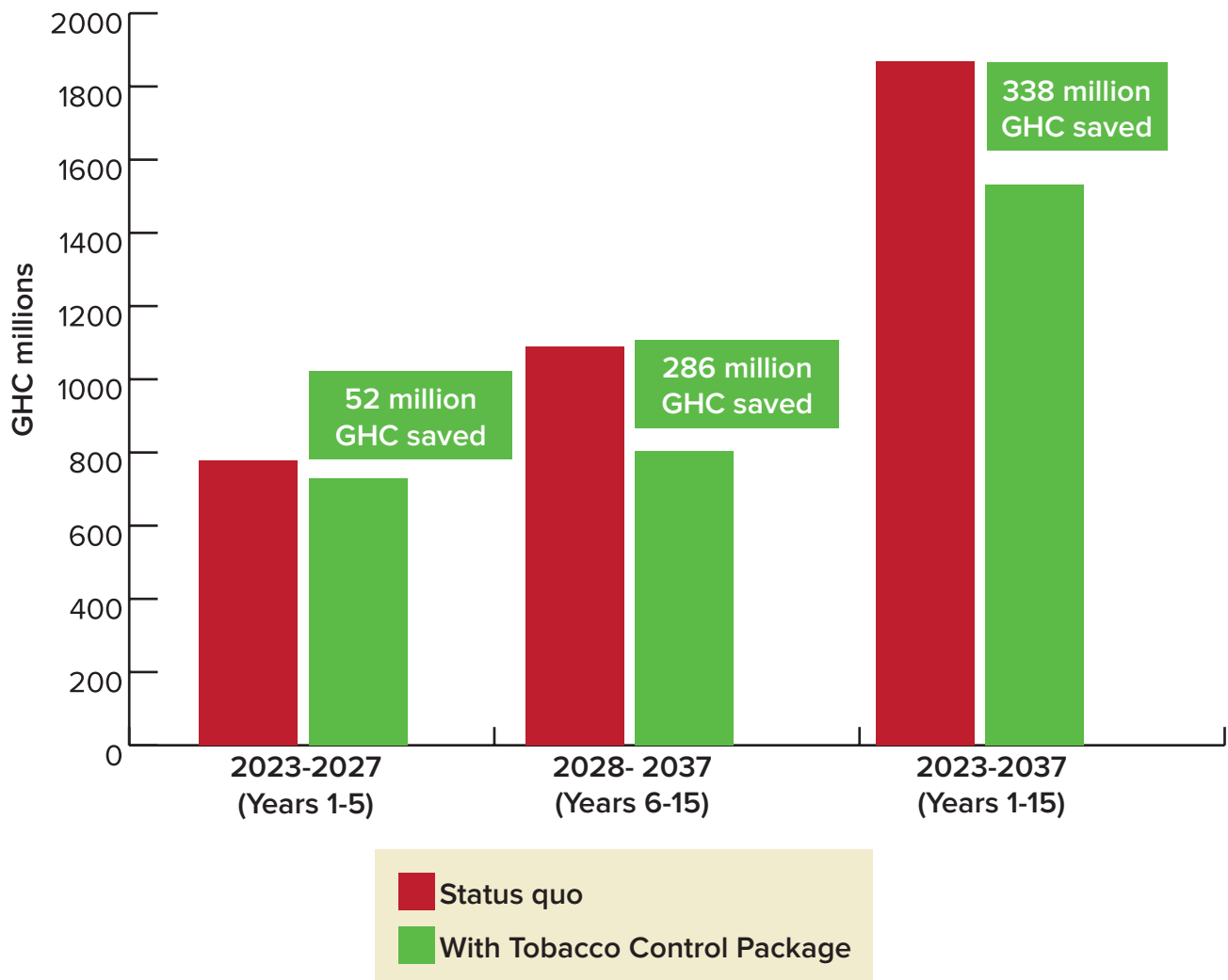
*Figures subject to rounding.

Implementing the package of five WHO FCTC policy actions examined in this investment case will reduce medical expenditures, both for citizens and the government. Presently, total private and public health-care expenditures in Ghana are around 14.3 billion annually [83], and 1.2 percent of this amount is directly related to treating disease and illness due to tobacco use [6] ($\approx$ GHC 172 million).

Year-on-year, the package of interventions would lower tobacco use prevalence, leading to less illness, and consequently less health-care expenditure (see **Figure 10**). Over the 15-year time horizon of the analysis, the package of interventions averts GHC 338 million in health-care expenditures, or GHC 23 million annually. Of these savings, 46 percent would go to the government and 36 percent would go to individual citizens who would have had to make OOP payments for health care. The remainder of savings would go to private insurance and other sources of health-care expenditures. From reduced health-care costs alone, the government would expect to save about GHC 154 million over 15 years.

Simultaneously, the government would successfully reduce the health expenditure burden that tobacco imposes on Ghanaians through out-of-pocket payments, supporting efforts to reduce economic hardship on families. For families with tobacco users who quit, spending that would have been on tobacco products or health care, could instead be invested in nutrition, education, and other productive inputs to secure a better future.

Fig. 10: Private and public health-care costs (and savings) in Ghana, over the 15-year time horizon, 2023-2037



*Figures subject to rounding.

4.2.3 The return on investment

While the health gains from strengthening tobacco control in Ghana are by themselves enough to justify the cost of the interventions, the economic gains that will also accrue make the case for WHO FCTC implementation even stronger.

An investment is considered worthwhile from an economic perspective if the gains from making it 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 tobacco control investments by the costs of the investments.

For this investment case, the ROI for each intervention was evaluated in the short-term (five years), to align with planning and political cycles, and in the medium-term (15 years) to align with the original timeframe allotted for the SDGs. The ROI was also evaluated for the full package of five WHO FCTC policy actions. Total benefits (avoided economic losses due to tobacco-attributable mortality, health-care expenditures, and diminished workplace productivity) 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. With the exception of training health professionals to provide brief advice to quit tobacco use (an individual-level intervention with higher initial personnel costs), all interventions deliver an ROI greater than one within the first five years, meaning that even in the short-term the benefits of implementing the interventions outweigh the costs. Depending on the intervention, over the first five years, the government will gain economic benefits ranging from 0.1 to 11.9 times its investment. Given the long-term nature of many tobacco-related illnesses, with disease often only developing after years of tobacco use, the ROIs for each intervention would continue to grow over time, reflecting the compounding gains from planning and development stages to full implementation.

Table 2: Return on investment, by tobacco control policy/intervention, in Ghana (GHC millions), 2023-2027 and 2023-2037

Return on investment, by tobacco control measure	First 5 years (2023-2027)			All 15 years (2023-2037)		
	Total costs (millions)	Total benefits (millions)	ROI	Total costs (millions)	Total benefits (millions)	ROI
Tobacco control package* (all policies/interventions implemented simultaneously)	130	202	1.6	320	1,319	4.1
Increase tobacco taxation (cigarette taxation modeled)¹⁶ (WHO FCTC Article 6)	8.5	101	11.9	18.7	729	39
Create smoke-free public places and workplaces (WHO FCTC Article 8)	27	43	1.6	55	302	5.5
Implement plain packaging (WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13)	12.3	27	2.2	27	19	7.0
Enact and enforce a comprehensive TAPS bans (WHO FCTC Article 13)	11.9	41	3.4	27	284	10.5
Promote tobacco cessation and treatment for dependence by training health professionals to provide brief advice to quit (WHO FCTC Article 14)	53	4.1	0.1	151	65	0.4

* 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 PR_i and PR_j , $(1-PR_i) \times (1-PR_j)$ [is] applied to the current smoking prevalence [83]. The costs of the tobacco package include the costs of the examined policies, as well as programmatic costs to implement and oversee a comprehensive tobacco control programme.

Over the 15-year period, increasing tobacco taxes on cigarettes is expected to have the highest return on investment (39:1).¹⁷ The return will be even higher with increasing tax on all tobacco products. Enacting and enforcing a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship (TAPS) is expected to have the next highest return on investment (11:1), followed by implementing plain packaging of tobacco products (7:1), creating smoke-free public places and workplaces to protect people from the harms of tobacco smoke (6:1), and finally to promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (0.4:1).

16 Raise taxes to what is considered in the WHO Report on the Global Tobacco Epidemic, 2021 as a high-level of achievement, which is for total taxes to represent at least 75 percent of the retail price [4]. In the scenario modeled, cigarette taxes would meet the 75 percent level by 2032.

17 Rounded to the nearest whole number.

5. Examining additional impacts: government revenue, equity, and the SDGs

The investment case examines how increasing taxes on tobacco would impact government revenue and equity, and the contributions of stronger WHO FCTC implementation towards Ghana's fulfilment of Target 3.4 of the SDGs.

5.1 Tax analysis: the impact of increasing cigarette taxes on government revenue

The Addis Ababa Action Agenda on Financing for Development [87] aligned with the adoption of the Sustainable Development Goals, noting that tobacco price and tax measures “represent a revenue stream for financing for development”.

This section analyses a scenario in which Ghana chooses to increase tobacco taxes towards levels considered in the *WHO Report on the Global Tobacco Epidemic, 2021* as a high-level of achievement [4]. The modelling in this investment case only considers tax on cigarettes and uses a hypothetical scenario in which a specific excise tax is introduced alongside Ghana's current tax structure in 2025 to create a mixed tax structure. In real terms, the introduced specific excise tax increases from around GHC 1 per cigarette pack in 2025 to GHC 2.2 in 2027.¹⁸

Evidence from countries in sub-Saharan Africa shows that on average a 10 percent increase in price results in a 4.9 percent reduction in consumption [88]. Accounting for the rise in demand that results from income increases,¹⁹ under the described tax increase pattern and demand elasticities, licit cigarette consumption in Ghana would drop from the present amount of about 72 million packs annually²⁰ to about 61 million in 2026.

18 The Excise Tax (Amendment) Act, 2023 is not reflected in this section as this law was passed by parliament after the modelling was completed. The act includes a specific excise tax at a rate of 5.6 GHC per pack, which is greater than what is modeled in this hypothetical scenario. However, the act also includes a decrease in ad valorem rate, which is lower than what is modeled. Still, there is potential for further gains than what is estimated in this section.

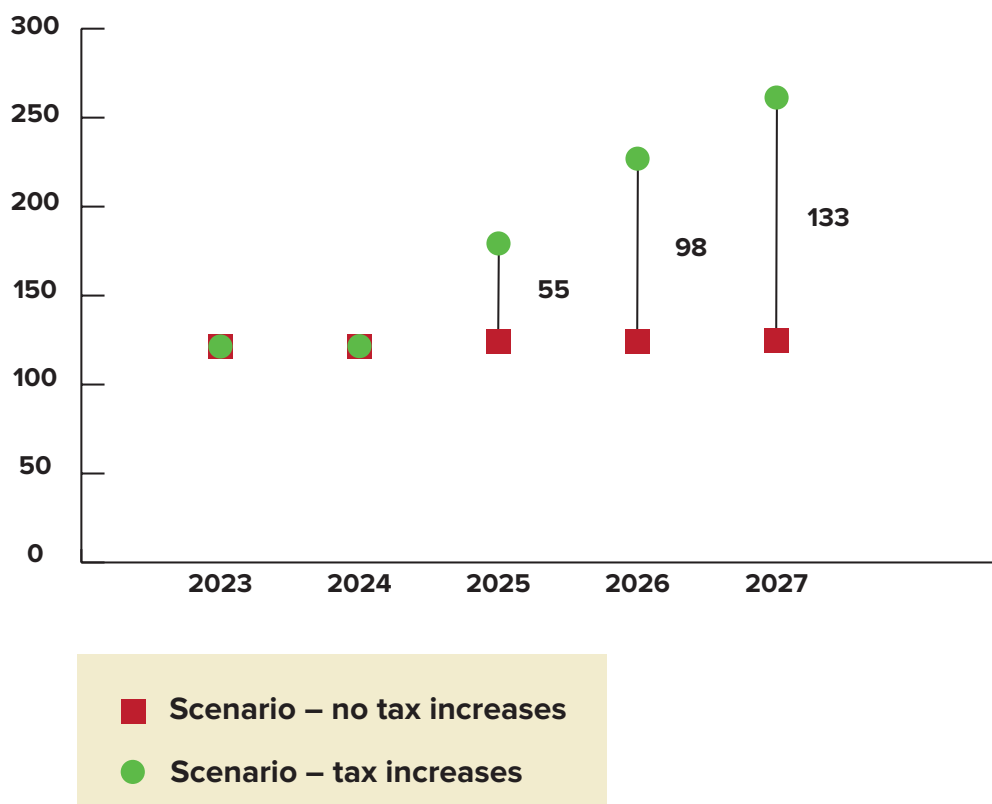
19 Income elasticity of demand [0.319] [89]; income prevalence elasticity of demand – 0.16. Projected income growth over the period from 2023 to 2027 is estimated using real GDP growth projections from the International Monetary Fund as a proxy for income – 5.3 percent [90].

20 The number of estimated licit cigarette packs sold (≈71.5 million) is estimated following methods published by Fenny et al (2020) [83] who use information from GlobalData [84] on 2019 per capita consumption in Ghana (46 cigarettes) to estimate total packs sold ((per capita consumption* Ghanaian population)/20 cigarettes per pack).

Even though there are drops in consumption, revenue gains will still occur. Although reducing the affordability of tobacco products leads people to quit smoking or reduce consumption, many people will continue to smoke, largely because of the addictive nature of tobacco, paying higher taxes to the government each time they purchase cigarettes.

Over a five-year period, **Figure 11** compares annual government cigarette tax revenue (undiscounted) in a hypothetical scenario where Ghana enacts strong specific excise taxes to a scenario in which tobacco prices remain static over time. The figure depicts a growing gap in annual tax collection between the two scenarios. It is assumed that no change occurs during the first two years, allowing time for debate and legislation of the new tax increase. In 2025, large tax increases in an intervention scenario yield an additional GHC 55 million in revenue, growing to GHC 133 million in 2027. **Figure 11** demonstrates that under the hypothetical scenario with tax increases (in green), government revenues will substantially grow even as many tobacco users quit because of the increased cost.

Fig. 11: Additional annual tax revenue (undiscounted) in comparison to the baseline scenario, in Ghana, 2023-2027



5.2 The Sustainable Development Goals and the WHO FCTC

Implementing the package of five WHO FCTC policy actions will support Ghana to meet SDG Target 3.a to strengthen implementation of the WHO FCTC. Moreover, acting now will contribute to Ghana's efforts to meet SDG Target 3.4 to reduce by one third premature mortality from NCDs by 2030. The measures would contribute the equivalent of around 3 percent of the needed reduction in mortality for Ghana to achieve SDG Target 3.4.

The WHO FCTC is an accelerator for sustainable development, and its implementation will benefit the achievement of many SDGs, including those outside of the health and well-being domain [19]. For example, stronger tobacco control will contribute to the reduction of poverty and inequalities (SDGs 1 and 10, respectively) and economic growth (SDG 8).



SDG Target 3.4

By 2030 the WHO FCTC measures would contribute the equivalent of around 3 percent of the needed reduction in mortality for Ghana to achieve SDG Target 3.4.

5.3 Equity analysis: benefits for lower-income populations of increasing cigarette taxes

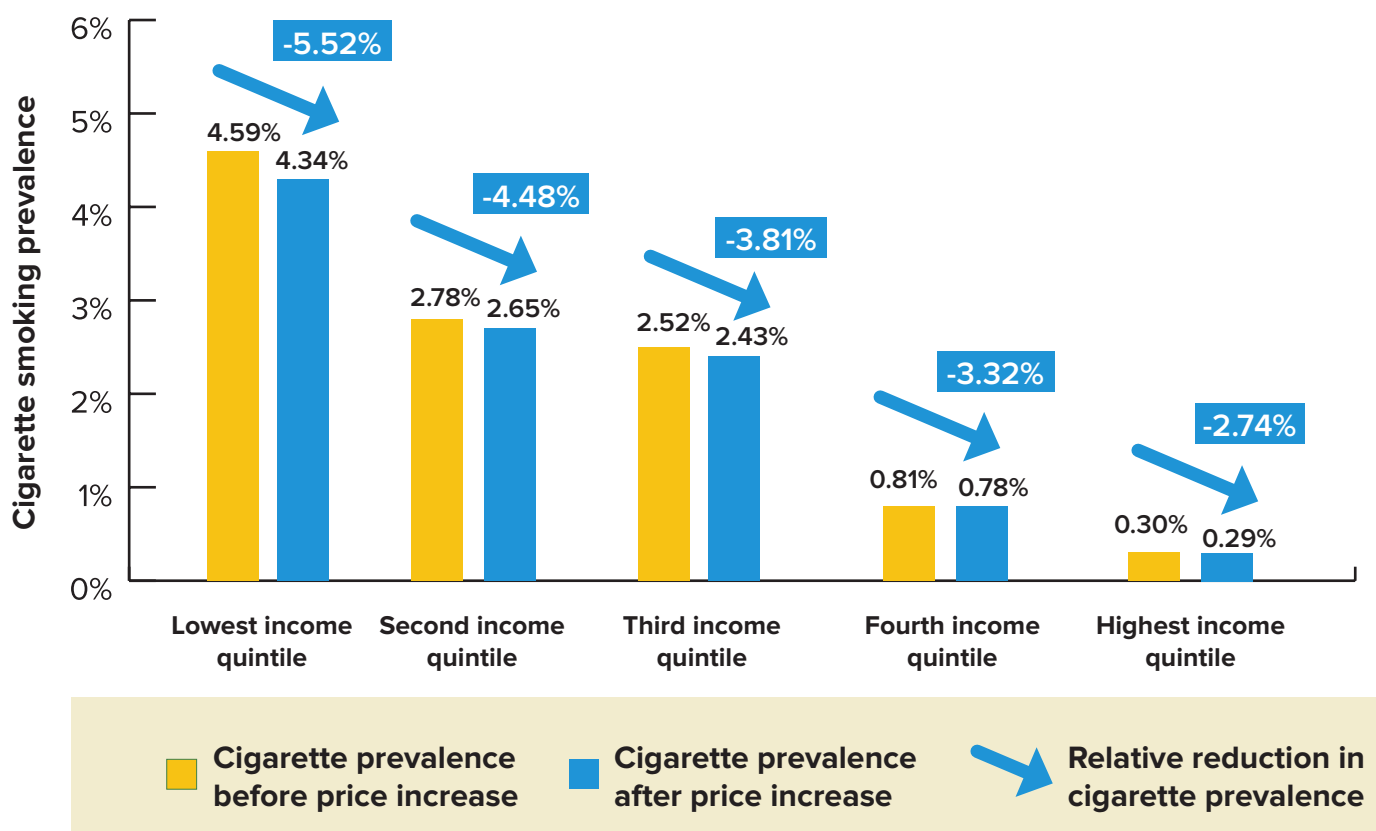
A common misconception is that taxes on tobacco products may disproportionately harm poor tobacco users, since the tax burden represents a higher proportion of their income than that of wealthier tobacco users. However, evidence shows that the poor actually stand to benefit most from raised cigarette taxes [91]. Relative to richer smokers, lower-income smokers are more likely to quit smoking when taxes are increased [32], meaning they benefit from subsequent decreases in tobacco-related health problems, and resulting medical costs which can be financially catastrophic. In Lebanon [92], for example, a 50 percent increase in cigarette prices was projected to prevent 23,000 households from falling into poverty over 50 years, and that same level of increase was found to avert catastrophic health expenditures for 1.83 million individuals in India, 440,000 in Bangladesh, and 350,000 in Viet Nam [93].

To examine the extent to which a cigarette tax increase could be considered pro-poor in Ghana, an equity analysis has been undertaken as part of the investment case. The analysis divides Ghana's population into five equal groups, by income, where quintile 1 is composed of the poorest 20 percent of people, and quintile 5 is composed of the wealthiest 20 percent. Within each income group, the analysis examines the impact of a hypothetical tax increase

that raises the price of the average pack of cigarettes by about 20 percent (GHC 1, or about US\$0.14). This represents only the first year of tax increases that are modeled in the investment case. People at different income levels tend to respond differently to price changes. Average tobacco-income prevalence elasticities of demand from a set of low- and middle-income countries are employed to assess how different economic groups react to changes in price.

In Ghana, the poorest income quintile has the highest smoking prevalence (4.3 percent), meaning they experience the largest share of health and economic impacts resulting from tobacco use [27]. The results from the analysis show that all income quintiles reduce cigarette smoking in response to the tax measures, but because people with lower incomes are more responsive to changes in price, the cigarette tax increase causes the largest drop in prevalence among the poorest income quintiles. **Figure 12** shows the cigarette smoking prevalence in each income quintile before and after the tax increase, as well as the relative change in smoking prevalence.

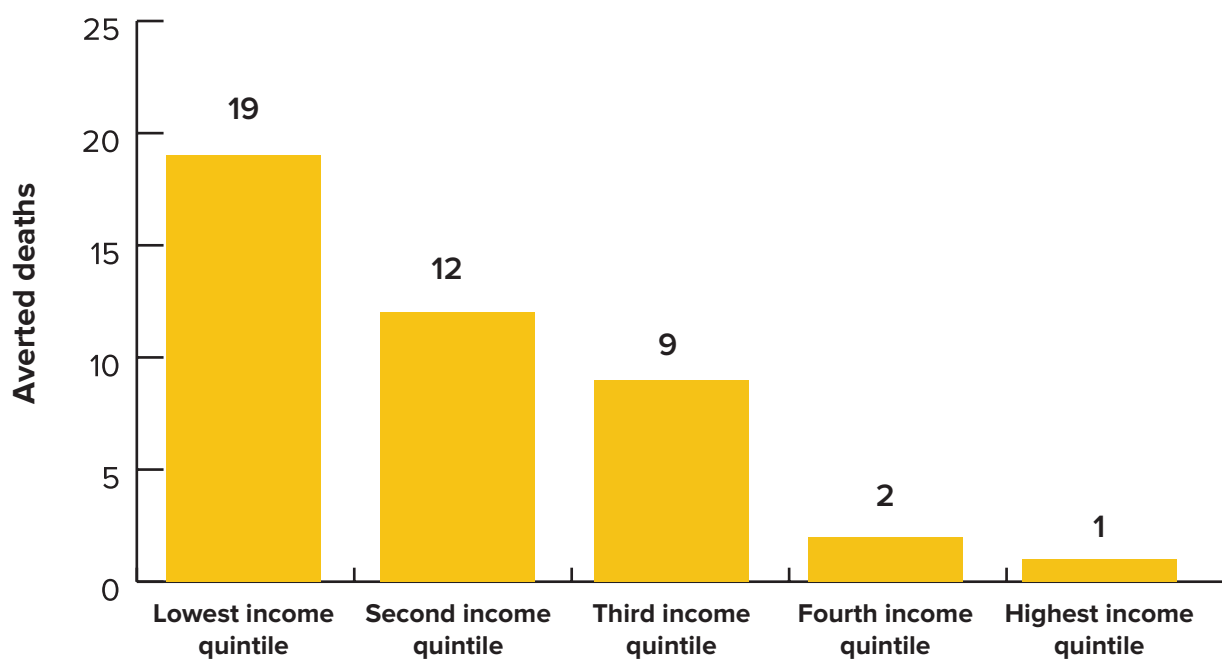
Fig. 12: Relative reduction in cigarette smoking prevalence before and after the cigarette tax increase, by income quintile, during the first year of tax increases that are modeled (2025)*



*Percentages are rounded to the second decimal place.

Lower rates of smoking translate to health gains. Prior to the cigarette tax increase, of the nearly 5,500 smoking-attributable deaths observed in 2019, two-thirds occurred among the poorest 40 percent of the population (quintiles 1 and 2). As cigarette tax increases cause cigarette smoking prevalence to fall the most in the two poorest quintiles, health benefits disproportionately accrue to lower-income Ghanaians. The equity analysis finds that almost three-quarters (72 percent) of the 43 deaths that would be averted during the first year of tax increases modeled in the investment case would be among the poorest 40 percent of the population, as shown in **Figure 13**.

Fig. 13: Deaths averted in Ghana by tax increase, by income quintile during the first year of tax increases that are modeled (2025)



6. Conclusion and recommendations

Each year, tobacco use costs Ghana GHC 668 million in economic losses and causes substantial human development losses. Fortunately, as the investment case shows, there is an opportunity to reduce the health, social and economic burden of tobacco in Ghana. Enacting the five key WHO FCTC policy actions would save 1,341 lives each year and reduce the incidence of tobacco-related disease, leading to savings from averted medical costs and averting productivity losses.

In economic terms, these benefits are substantial, adding up to GHC 1.3 billion over the next 15 years. Importantly, the economic benefits of strengthening tobacco control in Ghana greatly outweigh costs of implementation (GHC 1.3 billion in benefits versus just GHC 320 million in costs).

By investing now in the package of five WHO FCTC policy actions modeled in this investment case, Ghana would not only reduce tobacco consumption, improve health, reduce government health expenditures, and grow the economy, it would also reduce hardships faced by many Ghanaians. The country can also reinvest savings from government health-care expenditures and revenue from increased tobacco taxes into national development priorities such as universal health coverage and other social protection measures, as well as COVID-19 response and recovery efforts.

Based on the findings of this investment case, these key actions for Ghana are recommended to be pursued simultaneously:

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Recommendations

- 1** Commit to fully implement the WHO FCTC in Ghana.
- 2** Strengthen tobacco tax structures and increase tax rates (WHO FCTC Article 6).
- 3** Implement and enforce the other four tobacco control policies studied in this investment case:
 - comprehensive policies to make all public places and workplaces smoke-free (WHO FCTC Article 8);
 - plain packaging of tobacco products (WHO FCTC *Guidelines for implementation of Article 11* and WHO FCTC *Guidelines for implementation of Article 13*);
 - strengthened tobacco advertising, promotion and sponsorship bans that close loopholes (WHO FCTC Article 13); and
 - promote cessation of tobacco use and treatment for tobacco dependence (WHO FCTC Article 14).
- 4** Strengthen multisectoral coordination for tobacco control in Ghana and encourage the participation of civil society in WHO FCTC implementation (WHO FCTC Articles 5.2(a) and 4.7).
- 5** Develop a national tobacco control strategy for Ghana (WHO FCTC Article 5.1).
- 6** Adopt a code of conduct to protect public health policy from tobacco industry interference (WHO FCTC Article 5.3).
- 7** Fully implement the Protocol to Eliminate Illicit Trade in Tobacco Products, including by building capacity to combat illicit trade (Protocol and WHO FCTC Article 15).
- 8** Strictly enforce the prohibition of the sale of tobacco to minors (WHO FCTC Article 16).
- 9** Identify opportunities to link the implementation of the WHO FCTC with wider sustainable development strategies in Ghana.

1

Commit to fully implement the WHO FCTC in Ghana

As a Party to the WHO FCTC, Ghana has undertaken to fully implement the Convention. The WHO FCTC is an evidence-based treaty that sets out a clear blueprint for action to protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke. Ghana is encouraged to commit to fully implementing the treaty, with a focus on the recommendations made for Parties in the *Global Strategy to Accelerate Tobacco Control: Advancing Sustainable Development* through the Implementation of the WHO FCTC 2019–2025, in relevant WHO FCTC implementation guidelines, in WHO FCTC Needs Assessment reports and in this investment case.

Through the FCTC 2030 project, the WHO FCTC Secretariat's flagship development assistance project, Ghana is receiving support to take policy actions towards the full implementation of the treaty. As a FCTC 2030 project country, Ghana is accessing technical and financial resources, including intensive support from the WHO FCTC Secretariat, WHO and UNDP.

2

Given the effectiveness of tobacco taxation, strengthen tobacco tax structures and increase tax rates (WHO FCTC Article 6)

Ghana is encouraged to swiftly implement and enforce the Excise Duty (Amendment) Act, 2023 to introduce a specific excise tax on tobacco products in accordance with recommendations made in the WHO FCTC implementation guidelines for Article 6 [94] and by WHO in the *WHO Technical Manual on Tobacco Tax Policy and Administration* [50]. Ghana is also encouraged to consistently raise the tax share of the retail price of tobacco to eventually meet or exceed 75 percent of the retail price (considered in the *WHO Report on the Global Tobacco Epidemic, 2021* as a high-level of achievement) [4]. Considering Ghana must operate within the bounds of relevant ECOWAS directives, Ghana is encouraged to implement the specific excise tax in the Excise Tax (Amendment) Act, 2023 without delay.

The introduction of a specific tobacco excise tax is recommended because it is more difficult for the tobacco industry to manipulate and easier for authorities to implement [50], [94]. Tobacco taxes should aim to reduce affordability, including by increasing at a rate that outpaces inflation and income growth [95].

A 2014 Ghanaian tax study simulated two separate tax scenarios: 1) increasing the ad valorem excise tax to 300 percent of the CIF and 2) replacing the ad valorem tax with a 1.50 GHC specific excise tax on cigarettes. Results showed that the increased ad valorem tax would generate 40 percent more in overall tobacco-related tax revenue, while changing to a specific excise tax would increase tax revenue by 166 percent [96].

Research has shown that if the 15 countries of ECOWAS fully adopt the relevant directive on tobacco tax, it would improve tax structures (with the specific excise tax compensating for a weak ad valorem tax), in addition to considerably increasing cigarette retail price and tax revenues while simultaneously decreasing sales volumes of tobacco products [24].

It is also recommended to ensure robust tobacco taxation policies are in place for all types of tobacco (including for shisha, smokeless tobacco and novel tobacco products), and consideration is given to removing duty-free allowances for tobacco.

There is clear evidence that raising cigarette prices through increased taxes is a highly effective measure for reducing smoking among youth, young adults, and people from lower socioeconomic communities. Increasing the price of tobacco will have benefit for these vulnerable populations.

3

Take action to strengthen, implement and enforce the other four key WHO FCTC policy actions modeled in this investment case by:

- implementing comprehensive policies to make all public places and workplaces smoke-free by prohibiting indoor designated smoking areas and ensuring robust enforcement (WHO FCTC Article 8).
- considering implementation of plain packaging to reduce the appeal of tobacco packaging and to make health warnings more prominent (*WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13*).
- further strengthening TAPS bans by closing policy loopholes in areas like point-of-sale product displays and product placement in television and ensure robust enforcement (WHO FCTC Article 13).

- promoting cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use, especially in primary care settings. Ghana should move ahead with the full implementation of the *2017 Smoking Cessation Clinical Guidelines for Ghana*. Further gains would be possible with the provision of additional support to tobacco users, such as offering specialized tobacco dependence treatment services, a national toll-free quit line and/or internet based quit support and making pharmacotherapies more widely available (free of cost if possible) (WHO FCTC Article 14).

4

Strengthen multisectoral coordination for tobacco control in Ghana and encourage the participation of civil society in WHO FCTC implementation (WHO FCTC Articles 5.2(a) and 4.7)

Formalizing the mandate of Ghana's Tobacco Control Inter-Agency Coordinating Committee (TC IACC) as the NCM on tobacco control would be an important step in supporting the full implementation of the WHO FCTC and policy coherence on tobacco control. Action to strengthen the TC IACC can be guided by the joint Convention Secretariat-UNDP publication, *National Coordinating Mechanism for Tobacco Control: Toolkit for Parties to Implement Article 5.2(a) of the WHO FCTC* [97].

The work of TC IACC will be enhanced by including media and civil society groups, as appropriate, to support advocacy and compliance building, and encourage positive public opinion for tobacco control measures. In addition, tobacco control, including the activities of the TC IACC, needs to be sustainably resourced into the future [98].

5

Develop a national tobacco control strategy for Ghana (WHO FCTC Article 5.1)

It is recommended to continue efforts to develop, publish and routinely update a national multisectoral tobacco control strategy for Ghana. This will, among other things, serve to guide the work of the TC IACC, as well as set out plans for strengthening tobacco control policies and legislation. The national tobacco control strategy for Ghana should include actions that would:

- Outline a comprehensive workplan and timeline for the full implementation of the WHO FCTC.
- Identify sustainable funding necessary for tobacco control.
- Strengthen capacity for compliance building and enforcement of tobacco control laws.
- Prevent children and young people from taking up tobacco use.
- Ensure gender-sensitive approaches to policy, programmes, and services.
- Prioritize vulnerable groups including, but not limited to, individuals in the northern regions of Ghana, women and girls, those with low-income and youth.
- Encourage and support current tobacco users to quit.
- Protect public health policies from commercial and other vested interests of the tobacco industry.
- Prevent the resurgence of tobacco manufacturing in Ghana.
- Undertake research, surveillance (e.g. on drivers of and disparities in tobacco use), exchange of information and international cooperation to support WHO FCTC implementation.

6

Adopt a code of conduct to protect public health policy from tobacco industry interference (WHO FCTC Article 5.3)

It is recommended to use the powers available to the Minister of Health in the Tobacco Control Regulations 2016 to issue a code of conduct prescribing standards in accordance with WHO FCTC Article 5.3 for public officers, service providers, contractors and consultants involved in setting or implementing public health policies for effective tobacco control. Efforts to raise awareness among public officials of the need to avoid conflicts of interest are also encouraged and can be undertaken in collaboration with tobacco control civil society groups in Ghana.

7

Fully implement the Protocol to Eliminate Illicit Trade in Tobacco Products, including by building capacity to combat illicit trade (Protocol and WHO FCTC Article 15)

It is recommended that Ghana moves forward with the full implementation of the Protocol to Eliminate Illicit Trade in Tobacco Products. Ghana became a Party to the Protocol in 2021. Priorities for implementation should be the establishment of a system for tracking and tracing of tobacco products, capacity building for enforcement officers dealing with illicit tobacco,

increased presence of enforcement at borders where tobacco products are smuggled, and the transparent confiscation and destruction of illicit tobacco that is seized.

8

Strictly enforce the prohibition of the sale of tobacco to minors (WHO FCTC Article 16)

The legal age of sale for tobacco products is 18 years. Nevertheless, fewer than half of current youth cigarette smokers are prevented from purchasing cigarettes based on their age. Robust enforcement action is needed to prevent children and young people from being able to access tobacco, including through retail sale. The government agency that has responsibility for enforcement needs to be clear and have the resources to undertake compliance building and enforcement action, especially with tobacco vendors. The government could publicize enforcement actions to deter others from selling tobacco to people under the legal age of sale.

9

Identify opportunities to link the implementation of the WHO FCTC with wider sustainable development strategies in Ghana

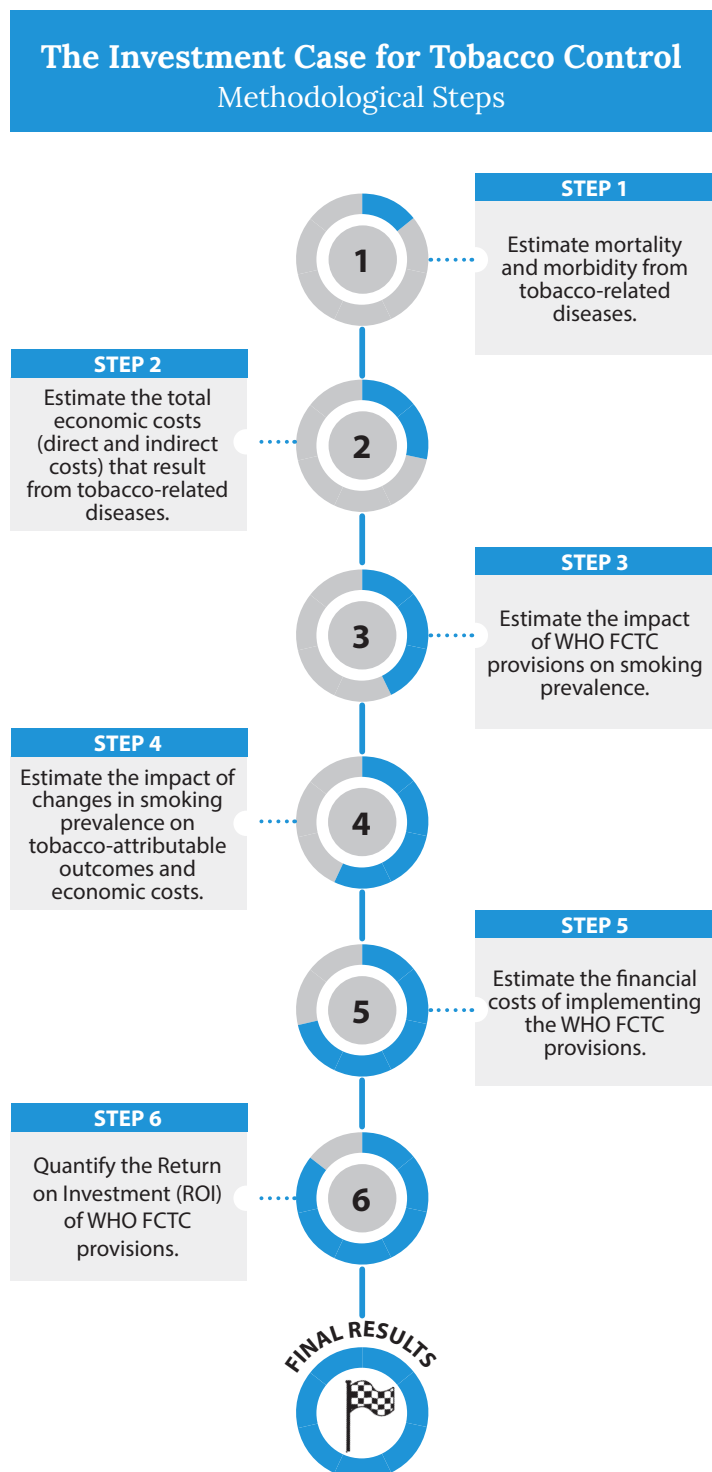
With the vast health, economic, social and environment costs of tobacco, the case is clear: implementing the WHO FCTC is a powerful means for Ghana to improve the lives of citizens, achieve the SDGs, and better the conditions and future of the country. All sectors have a role to play in tackling tobacco use and the benefits of full WHO FCTC implementation will enrich all aspects of life in Ghana. The Government of Ghana should continue to prioritize the implementation of the WHO FCTC in sustainable development strategies, as it has done in the *National Medium-Term Development Policy Framework (2022-2025)* [48].

Annex: Methodology

A1.1 Overview

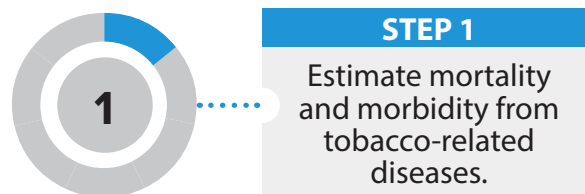
The economic analysis consists of two components: 1) assessing the current burden of tobacco use and 2) examining the extent to which WHO FCTC provisions can reduce the burden. The first two methodological steps depicted in **Figure A1** are employed to assess the current burden of tobacco use, while methodological steps 3-6 assess the impact, costs, and benefits of implementing or intensifying WHO FCTC provisions to reduce the demand for tobacco. The tools and methods used to perform these methodological steps are described in detail below.

Fig. A1: Steps in the investment case

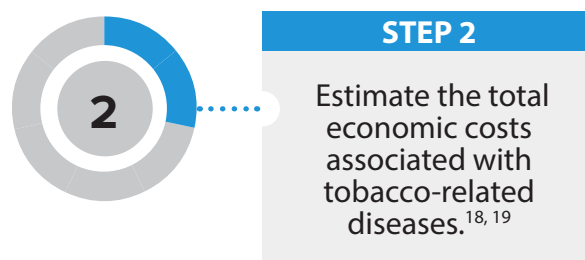


A1.2 Component one: current burden

The current burden model component provides a snapshot of the health and economic burden of tobacco use in Ghana in the most recent year for which data are available.



The investment case model is populated with country-specific data on tobacco-attributable mortality and morbidity from the 2019 Global Burden of Disease Study (GBD) [5], [99]. The study estimates the extent to which smoking and secondhand tobacco smoke exposure contribute to the incidence of 37 diseases, healthy life years lost, and deaths, across 195 countries.



Next, the model estimates the total economic costs of disease and death caused by tobacco use. The total economic costs include tobacco-attributable health-care expenditures, the value of tobacco-attributable mortality, and workplace productivity losses: absenteeism and presenteeism.

Health-care expenditures – Health-care expenditures include smoking-attributable public (government-paid), private (insurance, individual out-of-pocket), and other health-care expenditures. The proportion of health-care costs attributable to smoking was obtained using the formula for estimating smoking attributable fraction (SAF) of health-care expenditures from Goodchild et al. (2018) [6]. The SAF for Ghana is estimated at 1.2 percent. To calculate the share of smoking-attributable health-care expenditures borne by public, non-profit, and

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

22 All diseases are assumed to decrease in proportion to smoking prevalence when the decrease in prevalence occurs. While the model overestimates how quickly health benefits will accrue for some diseases, for example cancers—recent evidence suggests notable declines in the risk of lung cancer incidence begin two to five years after smoking prevalence decreases [98]. On the other hand, the risk of incidence of other diseases, for example cardiovascular disease (CVD), declines significantly in the years immediately following quitting [100].

private entities, it was assumed that each entity incurred smoking-attributable health-care costs in equal proportion to the entity's contribution to total health expenditure. Health-care expenditures were obtained from the *WHO Global Health-care Expenditure Database* (GHED) [83]. The latest year for which data are available in WHO GHED is 2019. To obtain 2020 values, we took the average annual increase in health-care expenditures in Ghana over the past 10 years and applied that increase to the 2019 health-care expenditure values.

Workplace costs and the cost of tobacco-attributable mortality – Workplace costs and the cost of tobacco-attributable mortality represent the monetized value of lost time, productive capacity, or quality of life as a result of tobacco-attributable diseases. The cost of tobacco-attributable mortality accrues when tobacco use causes mortality, eliminating the unique economic and social contributions that an individual would have provided in their remaining years of life. Workplace costs accrue when tobacco use results in productivity losses. Compared to non-tobacco users, individuals who use tobacco are more likely to miss days of work (absenteeism) and to be less productive at work due tobacco-related illnesses (presenteeism).

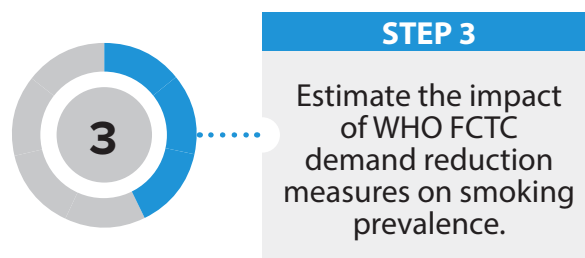
- *The economic cost of tobacco-attributable mortality.* Tobacco-attributable mortality was monetized using a “value of a statistical life” (VSL) measure. VSL is a measure of individuals’ willingness to pay for small changes in the risk of death and it is commonly used in economic evaluations of health programmes and policies to monetize health outcomes [102]. Few studies have assessed VSL in low- and middle-income countries [103]. We extrapolated a country-specific estimate of VSL following guidance from the *Reference Case Guidelines for Benefit-cost analysis in Global Health and Development* [102], estimating the value of one additional year of life for Ghana at GHC 10,861 (value of a statistical life year (VSLY)). 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 future year of life is multiplied by VSLY to calculate the cost of tobacco-attributable mortality.
- *Productivity costs.* Productivity costs consist of costs due to absenteeism and presenteeism, and are counted only among employed cigarette smokers. The model uses estimates from academic literature on the number of extra working days missed due to active smoking (2.9 days per year) [103]. Presenteeism losses are obtained similarly, under research that shows that smokers in China, the United States, and five European countries experience about 22 percent more impairment at work because of health problems compared to never-smokers—losses equivalent to about 7.5 days of work [105]. The number of employed smokers is multiplied by days of work missed due to absenteeism or presenteeism by the average daily country wage to obtain estimates of losses.

A1.3 Component two: policy/intervention scenarios

This component estimates the effects of WHO FCTC measures on mortality and morbidity, as well as on total economic costs (direct and indirect) associated with tobacco use.

A static model using a population attributable fraction (PAF) approach was used to estimate the total impact of the tobacco control measures. In the model, aside from smoking prevalence, variables do not change throughout the 15-year time horizon. The model follows a population that does not vary in size or makeup (age/gender) over time in two scenarios: a status quo scenario in which smoking prevalence remains at present day rates, and an intervention scenario in which smoking prevalence is reduced according to the impact of tobacco control measures that are implemented or intensified. Published studies have used similarly static models to estimate the impact of tobacco control measures on mortality and other outcomes [106], [107].

Within the investment case, mortality and morbidity, as well as economic costs that are computed in the intervention scenario are compared to the status quo scenario to calculate the extent to which tobacco control measures can reduce health and economic costs.



Selection of key WHO FCTC measures modeled within the investment case align with the [Global Strategy to Accelerate Tobacco Control](#) [108] 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, priority is given to enabling action to accelerate WHO FCTC implementation, including effective forms of technical and financial assistance to support Parties in the identified priority action areas. This includes Parties giving priority to, among other things, the implementation of price and tax measures (WHO FCTC Article 6) and time-bound measures of the Convention. The time-bound measures include creating smoke-free public places and workplaces (WHO FCTC Article 8), prominent health warnings on tobacco packaging (WHO FCTC Article 11) and comprehensive bans on tobacco advertising, promotion, and sponsorship (TAPS) (WHO FCTC Article 13).

Effect sizes for the WHO FCTC demand reduction measures are obtained from the literature. The impact of enforcing smoke-free air laws, implementing plain packaging and intensifying advertising bans, are derived from Levy et al. (2018) [85] and Chipty (2016) [109], as adapted

within the Tobacco Use Brief of Appendix 3 of the *WHO Global Action Plan for the Prevention and Control of Non-communicable diseases 2013-2020* [110], and adjusted based on assessments of Ghana's baseline rates of implementation. The impact of basic evidence-based tobacco cessation in the form of brief advice to quit offered to tobacco users by health-care professionals in primary care settings is from Levy et al. 2010 [111].

Except for taxes—the impact of which is dependent on the timing of increases in tax rates (see below)—and the brief cessation advice intervention—the impact of which is guided by rates of training for primary health care providers (see also below)—the full impact of the demand reduction policy measures is phased in over a five-year period. The phase-in period follows WHO assumptions [112] 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.

Tobacco taxes. The impact of cigarette tax increases on revenue and cigarette use prevalence was estimated using an Excel-based tool developed to analyse the impact of tax increases on a fixed population cohort. The tool is populated with data, including on current cigarette smoking prevalence, the tax structure and applied tax rates, cigarette prices, demand elasticities, and inflation and income projections (see **Table A1**).

Table A1: Key parameters used in the tax revenue analysis

Parameter name	Value	Source
Price elasticity of demand	-0.50	Ho et al (2017). The effect of cigarette price increases on cigarette consumption, tax revenue, and smoking-related death in Africa from 1999 to 2013 [88]
Prevalence elasticity of demand	-0.25	Goodchild et al (2016). Modelling the impact of raising tobacco taxes on public health and finance [113] Assumption – half of price elasticity
Income price elasticity of demand	0.32	Nargis et al (2021). Price, Income, and Affordability as the Determinants of Tobacco Consumption: A Practitioner's Guide to Tobacco Taxation [89]
Income prevalence elasticity of demand	0.16	Assumption – half of income price elasticity
Projected real income growth rate*	5.3%	International Monetary Fund (2020). Real GDP Growth - Annual percent change [90]
* Projected real income growth is used as a proxy for wage growth. The International Monetary Fund projects [90] real GDP growth at an average of 5.3 percent annually through 2025.		

The investment case analysis examines a tax increase scenario in which Ghana chooses to enact strong tax increases. In the hypothetical scenario, Ghana's current tax structure and rates stays the same, with the exception that a specific excise tax is introduced in 2025.

In real terms, the specific excise tax increases from around GHC 1 in 2025 to GHC 2.2 in 2027. In the scenario, the price net of taxes remains static (full pass through of the tax increase). **Table A2** breaks down cigarette pack price components from 2023 to 2027 under the described scenario. For the main investment case analysis, additional specific excise taxes triggering real price increases of an average of 7 percent annually are modeled from 2027 to 2037, bringing the total tax share to 81 percent by the end of the analysis and the excise tax share to 60 percent.

Table A2: Projected cigarette pack price in the tax increase scenario, 2023-2027 (GHC, in real terms)

Price component	2023	2024	2025	2026	2027
Price net of taxes	3.32	3.32	3.32	3.32	3.32
Specific excise	0.00	0.00	0.85	1.58	2.20
Ad valorem	0.83	0.83	0.83	0.83	0.83
Value added tax	0.75	0.75	0.89	1.02	1.13
Other taxes	0.11	0.11	0.11	0.11	0.11
Final consumer price *	5.00	5.00	6.00	6.86	7.59

* Figures subject to rounding.

The impact of tax increases on revenue and cigarette use prevalence is dependent on prevailing elasticities: the extent to which individuals change use of a product (e.g., decrease consumption or quit) because of changes in the price of a tobacco product. Changes are calculated following Joosens and colleague's (2009) [114], who use a log-log function to ensure large price increases do not result in implausible reductions in consumption or prevalence. Below, **Equation A1** provides an example of calculations to ascertain the impact of a change in price on smoking prevalence, considering changes in income.

Equation A1: The impact of changes in price on smoking prevalence

$$\Delta SP_i = SP_{i-1} * ((EXP(\epsilon_p * LN(op_{np}))) - 1) - \left[\frac{1 + \epsilon_i \left(\frac{GDP_2 - GDP_1}{GDP_2 + GDP_1} \right)}{1 - \epsilon_i \left(\frac{GDP_2 - GDP_1}{GDP_2 + GDP_1} \right)} \right]$$

Where:

SP = smoking prevalence (# of smokers) in year i

ϵ_p = prevalence elasticity

Op_{np} = the ratio of the old price of a pack of cigarettes to the new price after tax increases

ϵ_i = income elasticity

GDP = Gross domestic product in year

There are several limitations to the tax analysis. First, the tax tool assumes that the price and tax structure of the most sold brand of cigarettes is representative of the market, and it does not incorporate other market segments (high or low-end cigarettes). More detailed models that account for switching between segments or between products (e.g., movement to hand-rolled cigarettes) would capture nuance helpful to framing tobacco tax policy and estimating impact. Second, the analysis assumes a full pass through the tax increases. This assumption reflects a “middle ground” approach, but the tobacco industry may increase or decrease prices in reaction to the price increase. Third, we did not obtain Ghana-specific estimates of price and income elasticities.

Brief advice to quit tobacco. We calculate the effect of scaling up the provision of brief advice to quit tobacco use at the primary care level. First, we calculate the baseline population quit rate (PQR, the percent of smokers who quit annually) drawing on previously published methods by Levy and colleagues (2010) [111]. The PQR is calculated (see **Equation A2**) using three parameters: quit attempts; treatment utilization rates (i.e. counselling, pharmaceutical therapy); and treatment effectiveness.

Equation A2: Calculating Population Quit Rate, from Levy et al (2010) [110]

$$PQR = QA * \sum_{i=1...4} (TxUse_i * TxEff_i)$$

Where:

PQR = Population quit rate

QA = % of smokers who make a quit attempt at least once annually

TxUse = the percent of those who make a quit attempt who use treatment category i

TxEff = The percent of those who use a given treatment who succeed in quitting annually (Treatment efficacy)

i = is one of four treatment categories: 1) no evidence-based treatment; 2) counselling; 3) pharmacological treatment (e.g. nicotine replacement therapy), or 4) both counselling and pharmacological therapy.

Again following Levy et al (2010), “to account for the effect of multiple quit attempts among those who fail at their first attempt, it was assumed that half of those that make at least one quit attempt per year go on to make a second attempt, and half of those [who make a second attempt] make a third, and so on,” and that treatment effectiveness does not change based on whether it is a persons’ first quit attempt or a succeeding one.

After establishing baseline PQR, we calculated how the population quit rate would change if provision of brief advice to quit at the primary care level became more prevalent. In this “intervention scenario”, over the 15-year time horizon of the analysis, half of all primary health care providers are trained to provide brief advice to quit to adult tobacco users—a value selected based on evidence of the current intervention coverage gap; on average, in low-

and middle-income countries less than half (47.8 percent) of adult smokers who visit a health provider are advised to quit.²³ Once trained, it is assumed that the provider administers the brief advice when they encounter a patient who uses tobacco.

Taking into account the number of primary health care providers in the country, the patient panel size per provider, adult smoking rates, and the percent of adult smokers who present within the health system for at least one primary care visit per year, in each year of the analysis we calculate the number of adult tobacco users who would encounter a newly trained health provider and receive the brief intervention—which increases the likelihood that an individual makes a quit attempt by 60 percent over baseline levels [111]. With increases in population quit attempts driven by the provision of brief advice, we recalculate PQR to estimate the number of smokers who quit as a result of the intervention. Data used to inform these calculations are shown in **Table A3**.

Table A3: Provision of brief advice – key parameters to calculate intervention impact

Parameter name	Value	Source
Population quit rate (PQR)		
Annual quit attempt rate (QA)	41%	Average values from the Global Adult Survey (GATS) of low- and middle-income countries (LMICs) conducted between 2009 to 2018*
Increase (%) in QA as a result of receiving brief advice	60%	Levy et al (2010). Modelling the impact of smoking-cessation treatment policies on quit rates [111]
Treatment use (Tx Use)		
No evidence-based treatment	81%	Average values from GATS of LMICs conducted between 2009 to 2018*
Pharmaceutical assistance	7%	Average values from GATS of LMICs conducted between 2009 to 2018*
Counselling	11%	Average values from GATS of LMICs conducted between 2009 to 2018*
Both pharmaceutical assistance and counselling	1%	Average values from GATS of LMICs conducted between 2009 to 2018*
Treatment effectiveness		
No evidence-based treatment	7%	Levy et al (2010). Modelling the impact of smoking-cessation treatment policies on quit rates [111]
Pharmaceutical assistance	15%	Abrams et al (2010). Boosting population quits through evidence-based cessation treatment and policy [115]**
Counselling	12%	Abrams et al (2010). Boosting population quits through evidence-based cessation treatment and policy [115]**

23 Analysts pulled data from GATS surveys conducted between 2009 to 2018 and averaged values from low- and middle-income countries.

Both pharmaceutical assistance and counselling	22%	Abrams et al (2010). Boosting population quits through evidence-based cessation treatment and policy [115]**
% of adult smokers who visit primary care clinic annually	38%	Average values from GATS of LMICs conducted between 2009 to 2018*
% of smokers who relapse after successfully quitting	60%	García-Rodríguez et al (2013). Probability and predictors of relapse to smoking: Results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) [116]
Number of primary care health providers	73,025	WHO (2021). Global Health Observatory [117]***
Annual patient panel size per health provider (# of patients)	550	Altschuler et al (2012). Estimating a Reasonable Patient Panel Size for Primary Care Physicians With Team-Based Task Delegation [118]****

* Analysts pulled data from GATS conducted between 2009 to 2018 and averaged values from low- and middle-income countries.

** Compared to quit attempts that are made with no assistance from any form of evidence-based therapy, pharmaceutical assistance is 100 percent more effective, counselling 60 percent more effective, and combined therapy 200 percent more effective

*** Sum of two indicators in the WHO Global Health Observatory (GHO) for the latest year for which information was available: 1) number of general physicians and 2) number of nursing personnel. Given that specific estimates for primary care nursing personnel are not given from the source, we assume the proportion of primary care nurses is the same as the proportion of generalist doctors to all doctors as given in the GHO.

**** Study results show that a primary care health provider working under a nondelegated model of care can reasonably care for a panel of 983 patients in a year and that in a conservative scenario where non-physician providers assume some responsibility for care patient panel sizes can expand to 1387 patients. In most countries, a nondelegated model of care is the status quo. However, in this analysis, nurses are trained to offer brief advice and assume some responsibility for administering it. Therefore a patient panel size is likely to be somewhere in the range of 983 to 1,387 patients. We assume a panel size of 1,100 and that an individual practitioner on the team covers half of the patients (550) per year.

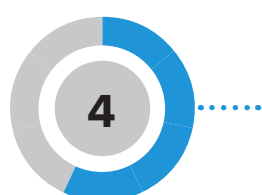
Summary: the impact of tobacco demand reduction measures. The impact sizes of all policy measures examined in the investment case are displayed in **Table A4**. Additional information on their derivation can be found in the *Technical Appendix*.²⁴

24 Available upon request.

Table A4: Impact size: Relative reduction in the prevalence of current smoking by tobacco control policy/intervention, over a period of five (2023-2027) and 15 years (2023-2037)

WHO FCTC policy actions	Relative reduction in the prevalence of current smoking	
	First five years (2023-2027)	Over 15 years (2023-2037)
Tobacco control package* (all policies/interventions implemented simultaneously)	16.9%	31.9%
Increase cigarette taxation (WHO FCTC Article 6)	7.9%	18.1%
Create smoke-free public places and workplaces (WHO FCTC Article 8)	3.8%	6.4%
Implement plain packaging of tobacco products (<i>WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13</i>)	2.4%	4.0%
Enact and enforce a comprehensive TAPS ban (WHO FCTC Article 13)	3.6%	6.0%
Promote tobacco cessation and treatment for dependence by training health professionals to provide brief advice to quit tobacco (WHO FCTC Article 14)	0.2%	1.4%

* 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 PR_i and PR_j, (1-PR_i) x (1-PR_j) [is] applied to the current smoking prevalence" [86].



STEP 4

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

To analyse 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 2037 (end of the analysis), no change occurs from the tobacco control provisions that are currently in place. In the "intervention scenario", Ghana 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 Ghana can achieve by taking targeted actions to reduce tobacco use.

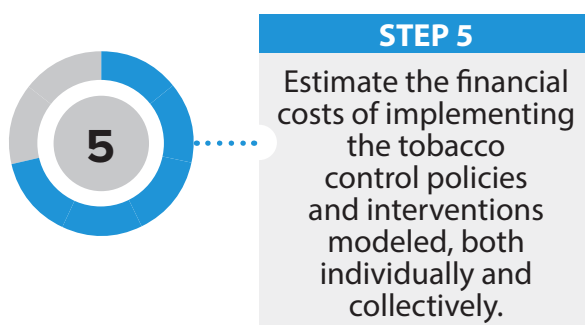
The marginal effects of the policies are calculated using the status quo scenario as the comparison group. To calculate marginal effects, the model subtracts the outcome (risk factor attributable deaths, health-care expenditures, etc.) under the intervention scenario from the

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.

$$\text{Marginal Effects} = \text{Outcome Base Scenario} - \text{Outcome Intervention Scenario}$$

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 health-care 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.



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 [112].

The Costing 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 Costing Tool estimates the cost of surveillance, human resources—for programme management, transportation, advocacy, and enacting and enforcing legislation—trainings and meetings, mass media, supplies and equipment, and other components. Within the Costing Tool, costs accrue differently during four distinct implementation phases: planning

(year 1); development (year 2); partial implementation (years 3-5); and full implementation (years 6 and onward).

Across these categories, the Costing Tool contains default costs from 2011, which are sourced from the WHO CHOICE costing study. Following Shang and colleagues, the Costing Tool is updated to reflect 2020 costs by updating several parameters: the US\$ to local currency unit exchange rate (2020); purchasing power parity (PPP) exchange rate (2020); GDP per capita (US\$, 2020); GDP per capita purchasing power parity (PPP, 2020); population (total, and share of the population age 15+, 2020); labour force participation rate (2020); gas per litre; and government spending on health as a percent of total health spending (2019) [119]. Unless government or other in-country parameters are received, data are from the World Bank database, with the exception of data on the share of government health spending and population figures. 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.

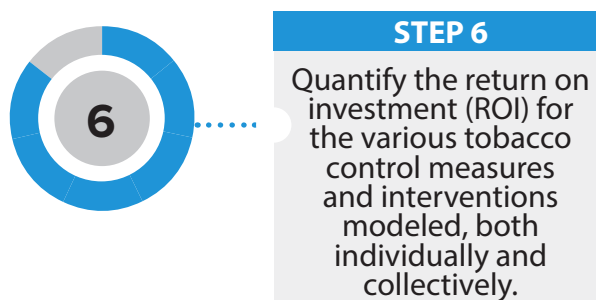
To cost the scale up of the provision of brief advice to quit tobacco use, the analysis adds to the programmatic costs embedded in the WHO Costing Tool by including costs to train health providers and the direct costs of the primary care visits in which the brief advice is administered. Over the 15-year time horizon of the analysis, half of all primary care health providers are trained to administer brief advice to quit tobacco.²⁵ Based on WHO's training package for treating tobacco dependence in primary care [121], we assume that training sessions last 2.5 days, are conducted with a maximum of 30 participants, and are led by a team of two facilitators. We further assume that the training occurs in person in a rented facility space. Costs of training include those to rent the facility,²⁶ pay facilitators, and provide per diems to facilitators and attendees, and we also assume that trainees (doctors and nurses) are compensated for their time at their wage rate.²⁷ Once trained, providers are assumed to provide brief advice if they encounter a patient who smokes. The cost of providing brief advice during primary care visits is based on modeled, country-specific estimates from WHO-CHOICE of the cost of primary care outpatient visits [123]. The derivation of these estimates is detailed elsewhere [124], but in overview, the estimates reflected the "hotel cost" of a 10-minute visit²⁸ to a health facility with beds. We updated the estimates to 2020 local currency units, using 2010 PPP conversion factors and local consumer price indices [125]. For the purposes of the investment case, administration of the 5A's (Ask, Advise, Assess, Assist and Arrange) brief intervention is assumed to take 10 minutes [126]. Following WHO CHOICE methodology, we estimate the cost of those extra 10 minutes as an extra 21 percent of the original cost of the primary care visit.

25 The analysis assumes a 10 percent of health workers turn over annually [120].

26 Rental costs per square foot are obtained from the WHO Costing Tool with the room size estimated is based on square feet per person estimates for collaboration rooms [122].

27 Compensation costs for trainers, per diem estimates, and provider salaries are obtained from the WHO Costing Tool.

28 The analysis assumes that the mean duration of a clinic visit is 10-minutes, following guidance from the WHO NCD Costing Tool.



The ROI analysis measures the efficiency of tobacco control investments by dividing the discounted monetary value of health gains from investments by their discounted respective costs.

ROIs were calculated for each of the five tobacco control policy actions modeled, and for the five interventions together as a package. Estimates from Steps 3, 4 and 5 were used to calculate ROIs at 5- and 15-year intervals.

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

A1.4 Equity analysis

We used elasticity of smoking participation by income group to assess the equity implications of increases in cigarette taxation. No studies were identified that examine the elasticity of smoking participation in Ghana. Instead, we use the average of income-group-specific elasticities in low- and middle-income countries, as compiled in a World Bank policy research working paper [127]. The working paper provides elasticities by deciles. To apply the elasticities to the smoking prevalence data available for Ghana, which are presented as quintiles, we take the average of the first and second decile to obtain the elasticity for the first quintile, and so on. The average elasticity for each quintile from the working paper that are used to calculate reductions in smoking prevalence and smoking attributable mortality are shown in **Table A5** below.

Table A5: Average elasticities used in investment case equity analysis

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Price elasticity	-0.60	-0.49	-0.41	-0.36	-0.30

Source: Average of income-group-specific elasticities in low- and middle-income countries, as compiled in a World Bank policy research working paper (Fuchs et al (2019). Distributional Effects of Tobacco Taxation: A Comparative Analysis. Accessible at <https://openknowledge.worldbank.org/handle/10986/31534>) [127].

The source for smoking prevalence used in the main investment case model (the *WHO Report on the Global Tobacco Epidemic* [4]), does not contain prevalence disaggregated by income quintile. For the equity analysis, we use prevalence by income quintile obtained from the 2014 Demographic and Health Survey (DHS). We adjust the prevalence by income quintile proportionally by the difference between overall prevalence in the DHS and WHO Report.

A1.5 Summary of WHO FCTC demand reduction measure status

Figure 2 in the main text is based on data from the *WHO Report on the Global Tobacco Epidemic, 2021* [4]. In the Figure, the level-of-implementation categories of “no/little implementation”, “partial implementation”, “moderate implementation”, and “high-level implementation” are mapped to the descriptions in **Table A6**, as specified and further detailed in Technical Note I of the WHO report (see page 119).

Investment case analysts assigned scores between 0 to 3 for each demand reduction measure, depending on the level of implementation. For four measures—graphic warning labels, plain packaging, mass media campaigns, and tobacco cessation—we assigned whole number scores (i.e. 0, 1, 2, or 3) that mapped to the four levels of implementation described above and detailed in **Table A5**. For increases in cigarette taxation, smoke-free public places and workplaces, and TAPs bans, we adjusted the level-of-implementation score creating a decimal value as follows:

- For 1) smoke-free public places and workplaces and 2) TAPS bans, we adjusted the score to account for reported levels of compliance in the *WHO Report on the Global Tobacco Epidemic* (Compliance Score). Following previously published assumptions by Levy and colleagues (2013), we assumed that respectively 25 percent and 50 percent of the effect of these measures depends on levels of compliance [128]. Thus, for a country with “moderate implementation” of TAPS bans but a compliance score (as detailed in the GTCR) of 5 out of 10, we calculated the score as follows: $\text{Measure Score} - (0.5 * \text{Compliance Score} / 10) = 2 - (0.5 * (5 / 10)) = 1.75$. For countries that did not report a compliance score we assumed the average of compliance scores worldwide.
- For 3) cigarette taxation, all countries in which the total tax share equalled 75 percent or above received a score of 3. All countries below that mark were assigned a score as follows: $3 * (\text{Total tax share} / 0.75)$. Thus a country with a total tax share of 35 percent received a score of 1.4 ($3 * (.35 / .75)$).

Ultimately, most measures are weighted equally (counting as 3 points if fully implemented) except for plain packaging (counting as 1 point if fully implemented). Analysts selected 1 point for plain packaging because: 1) Unlike for the other measures, plain packaging operates on a 0,1 scale—either the measure is in place or it is not (i.e. there are no gradations of the policy—

there is little benefit to mandating that half of the package is “plain” while the rest is open to colouring or other attributes); 2) In the GTCR plain packaging is scored as a “star” on top of the graphic warning labels acting as a supportive add on to other labelling requirements.

The total score a country can receive for implementation of the key demand reduction measures (i.e. composite tobacco control score) is 19. A country with a composite tobacco control score of 12/19 may be said to have implemented about 63 percent of the WHO FCTC key demand reduction measures agenda.

Table A6: Definition of WHO FCTC implementation status in Figure 2 (main text)

WHO FCTC demand reduction measure	No/little implementation	Partial implementation	Moderate implementation	High-level implementation
Increase cigarette taxation to reduce the affordability of tobacco products (WHO FCTC Article 6)	0% of retail price is tax, or no data is reported.	≥ 25% and <50% of retail price is tax.	≥ 50% and <75% of retail price is tax.	≥ 75% of retail price is tax.
Create smoke-free public places and workplaces to protect people from the harms of tobacco smoke (WHO FCTC Article 8)	Complete absence of ban, or up to two public places completely smoke-free, or no data is reported.	Three to five public places completely smoke-free.	Six to seven public places completely smoke-free.	All public places completely smoke-free (or at least 90% of the population covered by complete subnational smoke-free legislation).
Require tobacco packaging to carry graphic health warnings describing the harmful effects of tobacco use (WHO FCTC Article 11)	No warnings or small warnings, or data not reported.	Medium size warnings missing some appropriate characteristics or large warnings missing many appropriate characteristics.	Medium size warnings with all appropriate characteristics or large warnings missing some appropriate characteristics.	Large warnings with all appropriate characteristics.

WHO FCTC demand reduction measure	No/little implementation	Partial implementation	Moderate implementation	High-level implementation
Implement plain packaging of tobacco products (WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13)	Plain packaging is not mandated.	-	-	Plain packaging is mandated.
Promote and strengthen public awareness about tobacco control issues and the addictive nature and harms of tobacco use through mass media information campaigns (WHO FCTC Article 12)	No national campaign conducted between July 2018 and June 2020 with a duration of at least 3 weeks, or no data is reported.	National campaign conducted with one to four appropriate characteristics.	National campaign conducted with five to six appropriate characteristics.	National campaign conducted with at least seven appropriate characteristics including airing on television and/or radio.
Enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship – TAPS (WHO FCTC Article 13)	Complete absence of ban, or ban that does not cover national television, radio and print media.	Ban on national television, radio and print media only.	Ban on national television, radio and print media as well as on some but not all other forms of direct and/or indirect advertising.	Ban on all forms of direct and indirect advertising (or at least 90% of the population covered by subnational legislation completely banning tobacco advertising, promotion and sponsorship).
Develop infrastructure to support tobacco cessation and treatment of tobacco dependence (WHO FCTC Article 14)	None, or no data are reported.	Nicotine Replacement Therapy (NRT) and/or some cessation services (neither cost-covered).	NRT and/or some cessation services (at least one of which is cost-covered).	National quit line, and both NRT and cessation services routinely cost-covered.

Source: Information in this table is based on the WHO Report on the Tobacco Epidemic, 2021 [4].

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