



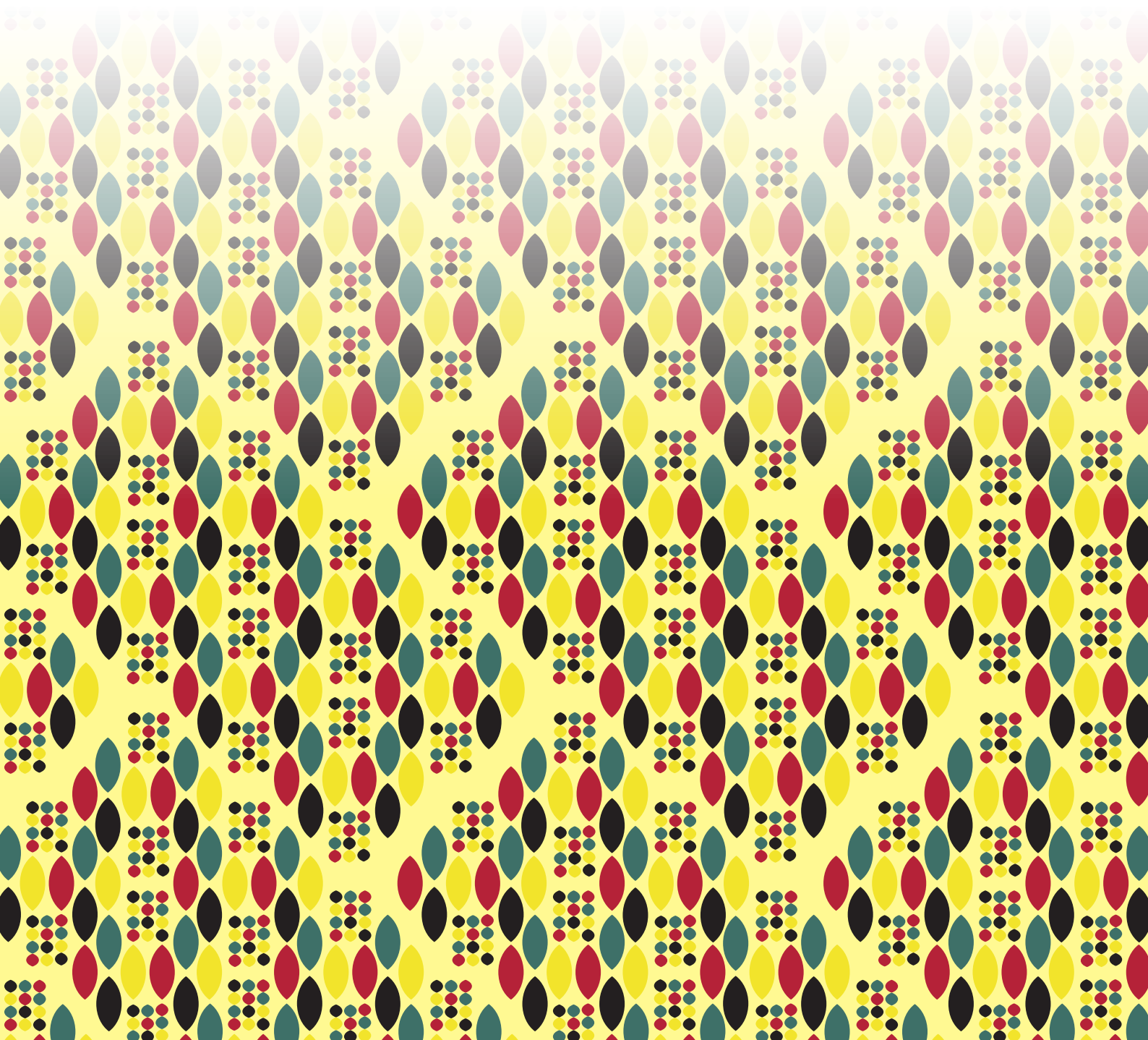
REPÚBLICA DE MOÇAMBIQUE  
MINISTÉRIO DA SAÚDE

O Nosso Maior Valor é a Vida



## Investment Case for Tobacco Control in

# MOZAMBIQUE



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# The case for scaling up WHO FCTC implementation in Mozambique



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More than

**9,300** Mozambicans die every year

due to tobacco-related illness, accounting for nearly

**3.5%** of all deaths in the country.

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Tobacco costs Mozambique

**MZN 11.7 billion**

every year, equivalent to

**1.3% of annual  
GDP.**

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Investing now in seven proven tobacco control measures will prevent

**53,400 deaths**

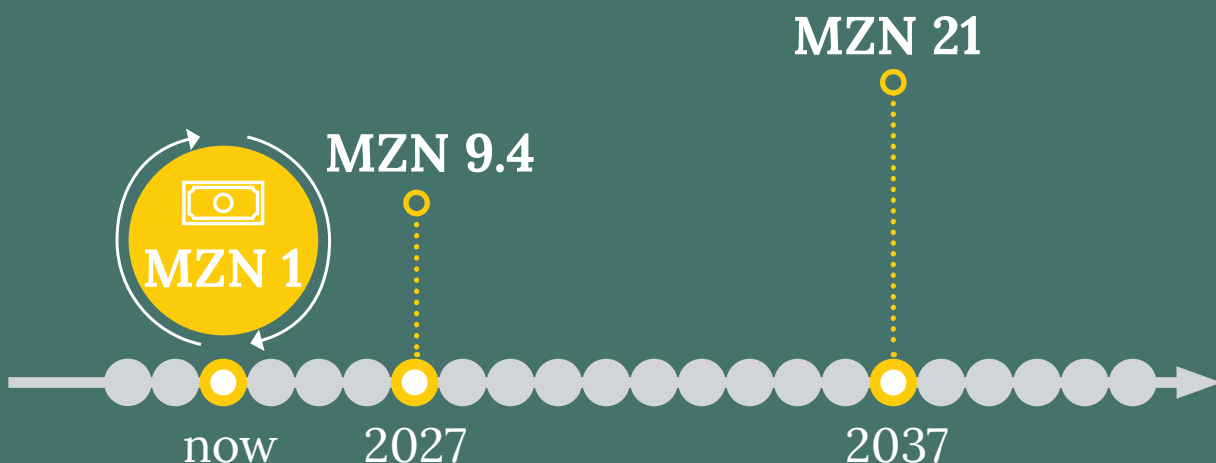
and avert

**MZN 45 billion**

in health costs and economic losses by 2037.



For every **Mozambican metical** invested in the seven key WHO FCTC policy actions today, Mozambique will avert **MZN 9.4** in economic losses by 2027 and **MZN 21** by 2037.



## Acknowledgements

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This tobacco control investment case highlights the enormous costs of tobacco in Mozambique 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 Mozambique.







# 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 presents the findings of the case for investing in tobacco control in Mozambique, a stated priority of the Government of Mozambique. In line with the [WHO Framework Convention on Tobacco Control \(WHO FCTC\) Global Strategy to Accelerate Tobacco Control](#), it measures the costs and benefits – in health and economic terms – of implementing seven key WHO FCTC policy actions that focus on demand reduction. The seven actions are: 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) require graphic health warnings on tobacco product packaging that describes the harms of tobacco use (*WHO FCTC Article 11*); 4) implement plain packaging of tobacco products (*WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13*); 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*); 6) enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship (*WHO FCTC Article 13*); and 7) scale up of brief advice to quit for tobacco users in primary care clinics (*WHO FCTC Article 14*).

## Main findings

**In 2019, tobacco use resulted in MZN 11.7 billion in economic losses. These losses are equivalent to 1.3 percent of Mozambique's GDP.** They include a) MZN 931 million in healthcare expenditures, and b) nearly MZN 10.8 billion in indirect losses due to tobacco-attributable mortality and ill-health, and reduced workplace productivity from absenteeism and presenteeism. The indirect economic losses from current tobacco use in Mozambique – 92 percent of all tobacco-related costs – indicate that tobacco use impedes development in Mozambique beyond health. Multisectoral engagement is required for effective tobacco control, with other sectors benefitting 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 9,300 people in Mozambique;** with 73 percent of these deaths being premature, among people under the age of 70. About 14 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 Mozambique can reduce the national burden from tobacco use. The investment case findings demonstrate that enacting and enforcing seven proven WHO FCTC policy actions would, over the next 15 years (2023–2037):

**Avert MZN 45 billion in economic losses.** Of this total, MZN 41 billion is from averted tobacco-attributable mortality and ill health. The tobacco control measures stimulate economic growth by ensuring that fewer people 1) die due to tobacco-attributable diseases, 2) miss days of work due to disability or sickness, and 3) work at a reduced capacity due to smoking breaks or tobacco-related health issues.

**Lead to MZN 3.5 billion in savings through avoidance of tobacco-attributable healthcare expenditures.** Of this, the government would save MZN 2.1 billion in healthcare expenditures, citizens would save MZN 0.3 billion in out-of-pocket health-care costs, and MZN 1.1 billion would be saved from other sources of healthcare expenditures.

**Save about 53,400 lives and reduce the incidence of disease.** More than 20,000 lives saved would be from avoided tobacco-attributable tuberculosis deaths alone. The recommended WHO FCTC policy actions also contribute to Mozambique's efforts to achieve SDG Target 3.4 to reduce by one-third premature mortality from non-communicable diseases (NCDs) by 2030.

**Provide economic benefits (MZN 45 billion) that significantly outweigh the costs of implementing the seven WHO FCTC policy actions (MZN 2.1 billion).** Increasing cigarette taxes has the highest return-on-investment (146:1), followed by enacting and enforcing bans on tobacco advertising, promotion, and sponsorship (122:1), implementing graphic health warning labels (70:1), public awareness of tobacco control issues (38:1), enforcing bans on smoking in public places (33:1), implementing plain packaging of tobacco products (24:1), and cessation by training health professionals to provide brief advice to quit tobacco use (0.6:1). While the ROI for the 'brief advice to quit tobacco use' intervention is lower than for other WHO FCTC policy actions, the intervention lays a strong foundation for future cessation infrastructure. This infrastructure – e.g., increasing access and affordability of nicotine replacement therapy – can be implemented later and it would amplify the impact of existing cessation services. Providing assistance to those who would like to quit, but cannot do so on their own, is an important service: especially given that implementing other demand reduction policy measures will provide a conducive environment and motivate more tobacco users to quit. Since tuberculosis is the leading cause of tobacco-attributable deaths in Mozambique, there may be efficiency-building opportunities to integrate tobacco cessation into existing infectious disease infrastructure, in line with available guidance [1].

This report recommends actionable steps, in addition to the modeled WHO FCTC provisions, that the Government of Mozambique can take to strengthen a whole-of-government approach to tobacco and its development consequences. Through the FCTC 2030 Project, the Secretariat of the WHO FCTC, UNDP and WHO stand ready to support the Government of Mozambique to reduce the tobacco-induced social, economic, and environmental burdens that tobacco continues to place on its country.

## Recommendations

- 1 Commit to fully implement the WHO FCTC in Mozambique**
- 2 Strengthen tobacco tax structures and increase tax rates** (*WHO FCTC Article 6*)
- 3 Take action to strengthen, implement and enforce the other six key WHO FCTC policy actions modeled in this investment:**
  - Create smoke-free public places and workplaces to protect people from the harms of tobacco smoke. (*WHO FCTC Article 8*)
  - Require graphic health warnings on tobacco product packaging that describes the harms of tobacco use. (*WHO FCTC Article 11*)
  - Implement plain packaging of tobacco products. (*WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13*)
  - 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*)
  - Enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship. (*WHO FCTC Article 13*)
  - Scale up of brief advice to quit for tobacco users in primary care clinics. (*WHO FCTC Article 14*)
- 4 Develop a national, multisectoral tobacco control strategy** (*WHO FCTC Article 5.1*) **and strengthen multisectoral coordination for tobacco control along with the participation of civil society in WHO FCTC implementation** (*WHO FCTC Article 5.2a and 4.7*)
- 5 Implement measures to protect public health policies from the commercial and other vested interests of the tobacco industry** (*WHO FCTC Article 5.3*)
- 6 Become a Party to and 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*)
- 7 Support tobacco farmers to engage in alternative economic activities or crops**
- 8 Identify opportunities to link the implementation of the WHO FCTC with wider sustainable development strategies in Mozambique**

**Table ES1. Summary of the main results of the investment case for tobacco control in Mozambique 2023–2037\***

Every year, tobacco use causes...	Implementing the modeled WHO FCTC policy actions now would, over the next 15 years:
More than 9,300 deaths each year	Prevent about 53,400 deaths
MZN 900 million in health care expenditures	Save MZN 3.5 billion in healthcare expenditures
Tobacco-attributable mortality valued at MZN 10.8 billion	Prevent MZN 45 billion in losses due to tobacco-attributable mortality
Total social and economic losses equivalent to 1.3 percent of GDP	Generate economic benefits (MZN 45 billion) that significantly outweigh the cost (MZN 2.1 billion) of implementation and enforcement – a 21:1 return on investment

\* Figures are subject to rounding.



Photo: © World Bank via Flickr

## 2. Introduction

Tobacco use is one of the world's leading health threats, and a main risk factor for NCDs including cancer, heart disease, chronic respiratory disease and diabetes, as well as a cause of many other diseases [2]. In Mozambique, around 13.7 percent of the adult population currently use some form of tobacco product, with a higher prevalence among men (23 percent) than women (7.3 percent) [3]. Tobacco use causes an estimated 9,300 deaths every year [4]. Around 73 percent of them are premature, occurring among those under the age of 70 [4].

In addition to the cost to health and wellbeing, tobacco imposes a substantial economic burden throughout the world. A 2018 study (based on 2012 data) found that the costs of smoking<sup>1</sup> 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 [5]. Further, tobacco use can reduce productivity by permanently or temporarily removing individuals from the labour market due to poor health [6]. 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) [7], [8].

Tobacco use may displace household expenditure that would otherwise go to fulfilling basic needs, including food and education [9]–[11], and it contributes to hunger and impoverishment among families [12], [13]. Tobacco use imposes health and socio-economic challenges on vulnerable populations including the poor, women, and young people [14].

Tobacco production causes environmental damage including soil degradation, water pollution and deforestation [15]–[17]. 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 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. Given the far-reaching development impacts of tobacco, and the multisectoral nature of the interventions required, effective tobacco control requires the engagement of non-health sectors in support of a whole-of-government and whole-of-society approach to policy making and implementation of the WHO FCTC.

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

Current tobacco use trends in Mozambique and around the world are incompatible with sustainable development. Through SDG Target 3.4, the 2030 Agenda for Sustainable Development commits Member States, including Mozambique, to achieve a one-third reduction in premature mortality from NCDs (i.e. deaths between ages 30 and 70) by 2030. Accelerating progress on NCDs requires strengthened implementation of the WHO FCTC; SDG Target 3.a. Tobacco control is not just a primary means to improve population health, but also a proven approach to reduce poverty and inequalities, grow the economy and advance sustainable development. Tobacco control is an SDG accelerator as it can contribute to many goals simultaneously across the economic, social, and environmental spheres. However, more work must be done to reverse the tobacco epidemic including by accelerating the implementation of the WHO FCTC. 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 [18].

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.

Mozambique signed the WHO FCTC in 2003, and ratified on July 14, 2017 [19]. In 2007, Mozambique approved Decree No. 11/2007: The Regulation of Consumption and Marketing of Tobacco, which included many important policy actions contained in the WHO FCTC, such as smoke-free public places and workplaces, restrictions on tobacco advertising, and health warning labels [20]. However, additional policy measures to reduce demand for tobacco have not been implemented since that time and existing measures fall short of WHO FCTC obligations. Strengthening existing measures and implementing new ones can reduce tobacco use prevalence and generate health and economic benefits. For example, there are opportunities to expand bans on smoke-free public spaces, which currently allow for designated smoking areas, and to increase enforcement; health warning labels do not require graphic images and have size requirements smaller than those obligated under the WHO FCTC; and advertising bans can be expanded to include online, point-of-sale, and other types of direct and indirect advertising. Realizing the full benefits of such measures depends on concerted and coordinated efforts from multiple sectors of government, as well as high level leadership and an informed public.



An investment case for tobacco control analyses 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 Mozambique (the return on investment; ROI). In consultation with the Government of Mozambique, the investment case models the impact of implementing the following seven key WHO FCTC provisions:

- 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 **Require graphic health warnings on tobacco product packaging that describes the harms of tobacco use.** (WHO FCTC Article 11)
- 4 **Implement plain packaging<sup>2</sup> of tobacco products.** (WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13);
- 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)
- 6 **Enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship.** (WHO FCTC Article 13)
- 7 **Scale up of brief advice to quit for tobacco users in primary care clinics.** (WHO FCTC Article 14)

**Chapter 2** of this report provides an overview of tobacco control in Mozambique, including tobacco use prevalence as well as challenges and opportunities. **Chapter 3** summarizes the methodology of the investment case (for more detail see Section 7: Methodology Annex, and the separate Technical Appendix [available upon request]). **Chapter 4** reports the main findings of the economic analysis. **Chapter 5** examines the impact increasing taxes has on low-income smokers. The report concludes under **Chapter 6** with recommendations.

2 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>

## 3. Tobacco control in Mozambique: status and context

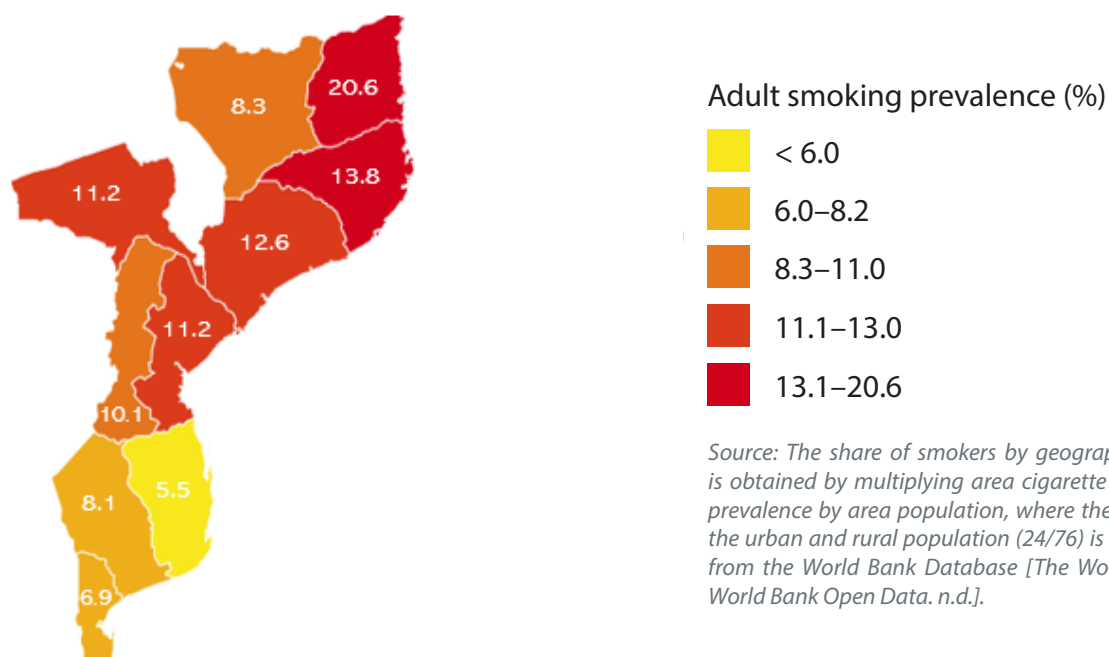
### 3.1 Tobacco use prevalence, social norms, and awareness-raising

In Mozambique, 13.7 percent of the adult population consumes tobacco products, with a higher prevalence among men (23 percent) compared to women (7.3 percent) [3]. Cigarettes (both manufactured and hand-rolled) are the most common type of tobacco used, with 23 percent of men and 3.2 percent of women being current cigarette smokers. Although smoking prevalence is seven times lower among women than it is among men, more women smoke in Mozambique, on average, compared to other countries that score “low” on the Human Development Index (HDI) [21]. Moreover, women are nearly five times more likely than men to consume smokeless tobacco products in Mozambique (4.6 percent compared to 1.1 percent) [3].

Smoking prevalence also varies widely by province, ranging from 21 percent of the adult population in Cabo Delgado to 5.2 percent in Maputo City (**Figure 1**). Smoking prevalence is higher in the country’s northern provinces, with regional differences more pronounced for hand-rolled cigarette consumption (ranging from 0 percent in Maputo City to 8.1 percent in Cabo Delgado) and smokeless tobacco consumption (ranging from 0.3 percent in Maputo City to 9.1 percent in Cabo Delgado).

**Fig. 1: Current adult tobacco smoking prevalence by province, Mozambique 2014-2015**

(Source: Mozambique NCD Risk Factors STEPS Report, 2014-2015)



Smoking prevalence increases with age in Mozambique. Adults aged 15-24 have an overall smoking prevalence of 2.8 percent compared to 16.1 percent among those aged 45-64. Lower consumption of hand-rolled cigarettes and smokeless tobacco is associated with higher levels of education whereas consumption of manufactured cigarettes varies less with education [3]. Approximately one-third of current smokers report that they attempted to quit at least once in the last 12 months [3].

Among young adults, exposure to secondhand smoke is common. According to the 2015 Mozambique Global School-based Student Health Survey (GSHS), more than half of students aged 13-17 reported exposure to secondhand smoke [22]. Some 2.3 percent of children (aged 13-17) are current smokers and 5.2 percent are users of any tobacco product [22]. Three-quarters of students reported being taught about the dangers of smoking [23].

### **3.2 The status of WHO FCTC tobacco control demand reduction measures**

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

While Mozambique has demonstrated progress to implement key demand reduction measures, more than 9,300 people in Mozambique continue to die from tobacco use each year. Implementing additional measures or intensifying existing ones can draw Mozambique into closer alignment with the WHO FCTC and reduce the substantial costs imposed by tobacco use. This section summarizes the current state of WHO FCTC demand reduction measures and the target level advocated for and analyzed within the investment case (**Table 1**).



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

In Mozambique, taxes comprise 29 percent of the retail price of the most sold brand of cigarettes [19], with the specific excise tax component forming 14 percent of the retail price. There is substantial scope 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 price. 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.

The [Global Cigarette Tax Scorecard](#) that assesses countries' cigarette tax policy performance gave Mozambique a score of 2.5 out of a maximum score of 5 in 2020. This score is higher than the African regional average of 1.64. Within the Tax Scorecard, Mozambique scores well on cigarette affordability change but scores poorly in cigarette price and tax share [24].

The investment case examines the impact of raising cigarette taxes to levels considered in the WHO Report on the Global Tobacco Epidemic as a high level of achievement [25]. It models a specific excise tax increase (in real terms) from MZN 7 to MZN 47 in 2027, while the VAT tax rate stays the same (17 percent). In this scenario, the price net of taxes remains static (full pass through of the tax increase). Additional specific excise taxes triggering real price increases of an average of 9 percent annually are modeled from 2028 to 2037, bringing the total tax to 75 percent at the end of the analysis (see methodology annex for detailed information). Further economic gains will be made in Mozambique with substantial tax increases on all tobacco products.



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

Mozambique's Decree No. 11/2007 restricts smoking in many public places, such as workplaces, public transportation, government buildings, and restaurants, but designated smoking areas are allowed. There are no funds dedicated to enforcement of smoke-free policies, nor is there a system to field and investigate complaints [19]. Media reports highlight that existing restrictions are not enforced in many establishments [27]. Permitting smoking in designated areas does not protect individuals – including workers in the hospitality industry – from secondhand smoke exposure. Moreover, permitting smoking in designated areas signals the acceptability of smoking as a social norm [27]. The investment case examines the impact of enacting and enforcing comprehensive smoke-free measures for all indoor public and work places.



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

Mozambique's Decree No. 11/2007 stipulates that tobacco products come with “ample, clear, visible and legible” warnings against tobacco use on their packaging, covering at least 30 percent of the front and 25 percent of the back (28 percent of the principal display areas combined). The Decree does not specify whether the mandatory warning should contain graphic components nor what these should look like. It is also not required that health warnings rotate, allowing for the possibility that warnings may lose their potency over time. The investment case examines the impact of mandating that at least 50 percent of the principal display areas of all tobacco packages are covered with graphic warning labels that are rotated on a regular basis.



### **Implement plain packaging of tobacco products** (WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13)

Mozambique currently does not require plain packaging of tobacco products. The investment case models the impact of implementing and enforcing plain packaging requirements.



**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)**

Mozambique has not recently implemented an anti-tobacco national mass-media campaign featuring components recommended by the WHO FCTC, such as target audience research, testing of materials, and evaluating the impact of the campaign. Launching a best-practice mass media campaign (examined in the investment case) would further promote and strengthen public awareness about tobacco control issues and the harms of tobacco use.



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

Mozambique bans direct tobacco advertising through national and international television and radio, print magazines and newspapers, and billboards and outdoor advertising [19]. While compliance with existing bans is high, other forms of advertising such as point of sale displays, internet advertising, and most forms of promotion and sponsorship are not regulated. The investment case models the impact of implementing and enforcing a comprehensive ban on tobacco advertising, promotion, and sponsorship (TAPS).



**Scale up of brief advice to quit for tobacco users in primary care clinics (WHO FCTC Article 14)**

Smoking cessation support is available in some hospitals, healthcare offices, and community centers, but is not known to be available in clinics or primary care facilities. Approximately one in ten Mozambicans aged 15-64 has been advised to stop smoking (or not to start smoking) by a health professional in the past three years [3]. Supportive cessation advice from trained providers can motivate and assist individuals to quit or increase quit attempts. The investment case examines the impact of expanding training for health providers to offer smoking cessation advice in primary care settings.

**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. Reaching target goals can further reduce tobacco consumption. The impact of each policy measure – individually and in combination – is described in Annex Table A3.

**Table 1: Summary of the current state of WHO FCTC demand reduction measures in Mozambique and target goals**

<b>Tobacco Control Policy</b>	<b>Mozambique Baseline*</b>	<b>Modeled Implementation Target</b>
<b>Increase tobacco taxation to reduce the affordability of tobacco products</b> ( <i>WHO FCTC Article 6</i> )	Tax share equivalent to 29 percent of the retail price of the most sold cigarette brand (specific excise taxes comprise 14 percent of the price).	Increase taxes on cigarettes to at least 75 percent of the retail price. Implement regular tax increases to outpace inflation and income growth.
<b>Create smokefree public and work places to protect people from the harms of tobacco smoke</b> ( <i>WHO FCTC Article 8</i> )	Smoking is restricted in many public places. However, designated smoking areas are allowed and enforcement of existing restrictions is weak.	Enact and enforce comprehensive smoke-free requirements for indoor public places and workplaces.
<b>Require graphic health warnings on tobacco product packaging that describes the harms of tobacco use</b> ( <i>WHO FCTC Article 11</i> )	Textual health warnings are required to cover at least 28 percent of cigarette packages and there are no requirements for graphic health warning labels.	Mandate that graphic health warning labels cover at least 50 percent of the principal display area of all tobacco packages, and that labels regularly rotate to ensure continued impact.
<b>Implement plain packaging of tobacco products</b> ( <i>WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13</i> )	Plain packaging is currently not mandated.	Implement and enforce plain packaging of tobacco products.
<b>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</b> ( <i>WHO FCTC Article 12</i> )	No national-level, anti-tobacco mass media campaigns reflecting WHO best practices have recently aired in Mozambique.	Implement a nationwide anti-tobacco mass media campaign that is researched and tested with a targeted audience, and evaluated for impact.
<b>Enact and enforce a comprehensive ban on all forms of tobacco advertising sponsorship and promotion (TAPS)</b> ( <i>WHO FCTC Article 13</i> )	Most forms of domestic and international tobacco advertising are banned (e.g. television, radio, billboards, print). However, other forms of tobacco advertising such as point-of-sale display and internet advertising are not banned.	Ban all forms of direct and indirect TAPS, with strengthened enforcement to ensure compliance.
<b>PScale up of brief advice to quit for tobacco users in primary care clinics<sup>3</sup></b> ( <i>WHO FCTC Article 14</i> )	Smoking cessation support is available in some healthcare facilities and hospitals. There is no national Quitline.	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.

\*WHO Report on the Global Tobacco Epidemic, 2019: Mozambique country profile

3 The costs include: those to train health providers, the cost to health systems to deliver the brief interventions (inclusive of human resource time, facility overheads, etc.), and some programmatic costs

### 3.3 Tobacco use and the COVID-19 pandemic

The global 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 diseases [28]. Moreover, tobacco use is also proven to worsen the outcomes of other communicable diseases such as tuberculosis and HIV [29].

### 3.4 National tobacco control legislation, strategy and coordination

Decree No. 11/2007 on the Regulation of Consumption and Marketing of Tobacco is the primary tobacco-control legislation in Mozambique. In addition to this Decree, the Law No. 17 of 2017 establishes the current Excise Code of Mozambique and regulates excise duties on tobacco products [26]. The Constitution of Mozambique contains several provisions on the right to health that are relevant for tobacco control [30]. For example, Article 92 establishes the right of consumers to “protection of their health” and to “education and information” related to products they consume. Article 116(3) establishes the responsibility of government to “encourage citizens and institutions to participate in raising the standard of health in the community.” These provisions are an important foundation for warning people about the harms of tobacco and supporting cessation, in accordance with the WHO FCTC, which Mozambique ratified in 2017.

As a founding member of the Southern African Development Community (SADC), Mozambique is encouraged to implement various WHO FCTC articles, such as WHO FCTC Article 6 and WHO FCTC Article 15 [31]. The SADC also provides guidelines for cooperation on excise taxes among member countries [32].

Whilst there is currently no national strategy for tobacco control in Mozambique, tobacco control targets are included in the Strategic Plan for the Health Sector (2014-2019) [33] and the National Strategic Plan for the Prevention and Control of NCDs (2008-2014) [34]. The latter plan included prevention and health education including raising awareness on the harms of tobacco consumption. The National Plan for Cancer Control (2019-2029) [35] includes awareness-raising activities in relation to tobacco-related harms, and the Mental Health Action Plan and Strategy (2007-2015) emphasizes health literacy for disease prevention [36]. Further, the 2018-2022 WHO-Mozambique Cooperation Plan includes a point of action on strengthening national capacity for



preventing NCD risk factors, including tobacco. A new strategic plan for the health sector is in formation. It will be important to ensure this plan incorporates strong action on implementing WHO FCTC measures in line with national priorities.

The Ministry of Health leads national efforts on tobacco control. Under the auspices of the Ministry of Health, Mozambique has formed a multi-sector working group on tobacco control consisting of representatives from different ministries, civil society, relevant regulatory authorities, and development partners including UN agencies. This working group played an instrumental role in drafting Decree No. 11 of 2007 on the Regulation of Consumption and Marketing of Tobacco, and continues to work with stakeholders to improve compliance with WHO FCTC in the country [37]. The Ministry of Health collaborates with the National Inspectorate of Economic Activities (INAE) under the Ministry of Industry and Commerce on supervising tobacco retailers and ensuring national regulations on tobacco consumption and commercialization are followed [37]. It further collaborates with the Ministry of Finance on tobacco taxes and with civil society and academia on tobacco control advocacy.

In the absence of a national tobacco control strategy, the roles and responsibilities of key stakeholders are ill-defined. Decree No. 11/2007 outlines the contributions of some ministries (Health, Industry and Commerce, and Finance) to tobacco regulation but does not provide a framework for a whole-of-government response. There are no targeted measures to promote the engagement of the Ministry of Education and Human Development, Ministry of Labour, and the Ministry of Gender, Children, and Social Action (MGCAS), for example. These institutions have an important role to play in promoting and enforcing tobacco control measures, including in ensuring smoke-free schools and workplaces, addressing tobacco industry targeting of these settings to promote their products, and raising awareness and providing information.

### **3.5 Health system capacity**

Mozambique has made strides in strengthening its health system. For example, it has made notable progress over the past decade in reducing under-5 mortality [39]. Nonetheless, the availability and accessibility of health services remain limited [39]. The 2017 World Social Protection Report estimated that 93 percent of the population experienced a deficit in health protection coverage due to a shortage of healthcare personnel, and 87 percent due to a shortage of financial resources [40]. Primary and secondary care is offered by the District Health, Women's and Social Action Services (Serviços Distritais de Saúde Mulher e Acção Social, SDSMSA). Higher-level care is provided at major hospitals which are usually directly managed by the Ministry of Health. The geographic distribution of healthcare facilities is uneven, with rural communities facing significantly lower provision of health services.

The share of total government spending allocated to health has fluctuated between 4 and 6 percent over the 2010-2018 period [41]. In 2018, nearly 63 percent of all health expenditure was financed through external aid [41]. The national healthcare response has focused on HIV/AIDS, tuberculosis, malaria and reproductive health, given the country remains heavily affected by these diseases. However, the burden of NCDs has been rising due to shifting behavioural partners, demographic changes and urbanization. Between 2010 and 2016, mortality from NCDs increased from 23 to 27 percent [39].

Considering the currently limited capacity of the health system to respond to the needs of people with NCDs, amidst other health and development challenges, preventing NCDs through stronger tobacco control is even more critical. WHO FCTC implementation is a powerful means of reducing human and financial strains on the health system. Tobacco taxation, in addition to saving lives and averting health and economic costs, can provide revenue to finance stronger and more resilient health systems on the path to universal health coverage.

### **3.6 Tobacco industry presence and interference in policymaking**

In Mozambique, stronger multi-stakeholder commitment and action on tobacco control is especially needed in the context of the prominent economic footprint the tobacco industry has in the country. Mozambique tobacco exports account for more than a quarter of the total value of agricultural commodities exported [37]. Boosting agricultural exports – including tobacco – was prioritized in the national Five Year Development Programme (2015-2019) [38]. The Ministry of Finance and Ministry of Agriculture are therefore inclined to support tobacco farmers. In addition, Mozambique Leaf Tobacco Ltd. – the largest domestic tobacco company – is an important supplier of jobs and revenue which gives it leverage when engaging different political forces in the country [42]. The absence of a national multisectoral tobacco control strategy also creates space for tobacco industry interference. In Mozambique tobacco companies leverage their economic and labour market footprint to influence social and political norms as well as interfere with policy framing, often using indirect representation and third-party actors [42].

Mozambique recently saw a decline in its [Global Tobacco Industry Interference Index score](#) and now ranks 52 out of the 80 countries analysed (moving from a score of 61 in 2020 to 64 in 2021, in a ranking system where a lower score indicates less interference) [42]. Mozambique 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.

### 3.7 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 [43]. Mozambique has yet to ratify the Protocol to Eliminate Illicit Trade in 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 Mozambique. There are known transit routes for illicit tobacco coming from Zimbabwe and the Middle East, and reports of illegal cigarettes being seized in Mozambique [44].

To address illicit trade of tobacco products, Mozambique has implemented a range of provisions. These include: marking to determine the origin and if it is legally sold, a track and tracing system, monitoring and evaluating tobacco trade data, communication across the relevant authorities, legislation on penalties for violations of licit trade, destroying of illicit tobacco products and regulation of production and distribution [45].

## 4. Methodology

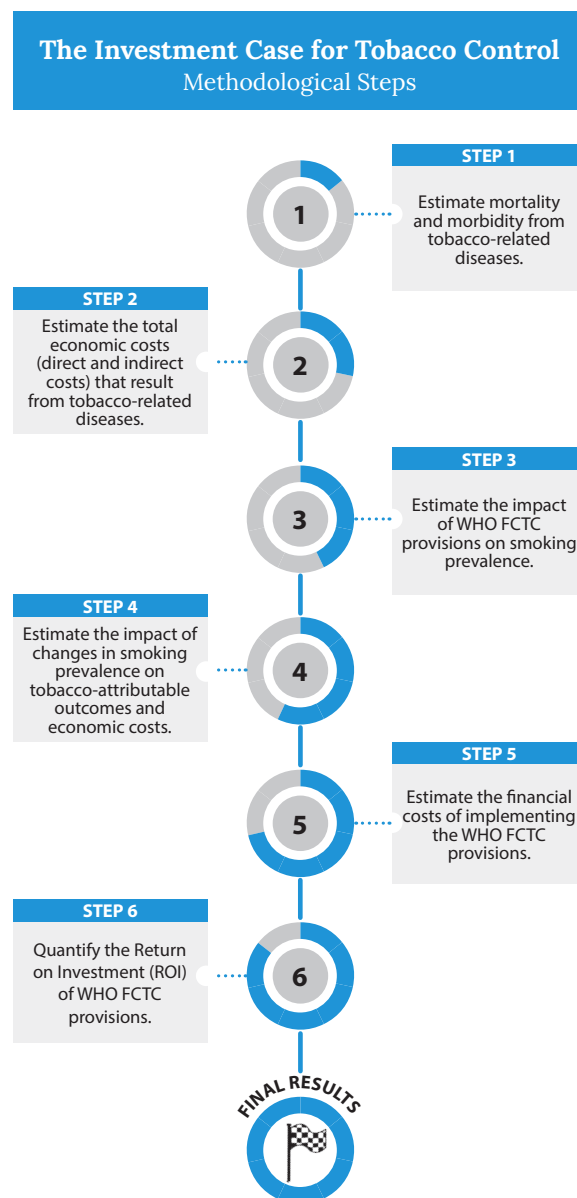
The purpose of the investment case is to quantify the current health and economic burden of tobacco use in Mozambique (in the context of tobacco control measures that are currently in place), and to estimate the impact that implementing new WHO FCTC measures – or strengthening existing ones – would have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

A static model was developed to conduct the investment case and to perform the methodological steps in **Figure 2**. 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. Interested readers are also referred to this report's separate *Technical Appendix*<sup>4</sup> for a more thorough account of the methodology.

The investment case team worked with stakeholders in Mozambique to collect national data inputs for the model. Where data was unavailable from government or other in-country sources, the team utilized publicly available national, regional, and global data from sources such as the World Health Organization (WHO), the World Bank database, the Institute for Health Metrics and Evaluation's (IHME) Global Burden of Disease (GBD) study, and academic literature. Within the investment case, costs and monetized benefits are reported in constant 2019 Mozambican meticaís (MZN) and discounted at an annual rate of 5 percent.

**Fig. 2: Building the investment case**



<sup>4</sup> Available upon request.



Photo: © World Bank via Flickr

## 5. Results

### 5.1 The current burden of tobacco use: health and economic costs<sup>5</sup>

Tobacco use undermines economic growth. In 2019, tobacco use caused an estimated 9,300 deaths in Mozambique, 73 percent of which were premature, i.e. occurred among those under 70 years old [4]. These deaths amount to 158,800 years of life lost (YLLs), which are lost productive years in which many of those individuals would have contributed to the workforce. The economic losses in 2019 in Mozambique due to tobacco-related mortality are estimated at MZN 3.8 billion.

While the costs of tobacco-attributable mortality are high, the consequences of tobacco use begin long before death. As individuals suffer from tobacco-attributable diseases (e.g. cardiovascular diseases, respiratory conditions, cancers), expensive medical care is required to treat them. Spending on medical treatment for illnesses caused by smoking cost the government MZN 549 million in 2019 and caused Mozambican citizens to spend MZN 90 million in out-of-pocket (OOP) healthcare expenditures. Private insurance and non-profit institutions serving households spent MZN 292 million on treating tobacco-attributable diseases in 2019. In total, healthcare expenditures attributable to smoking amounted to MZN 931 million.

In addition to healthcare 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 MZN 1.2 billion and the cost of presenteeism due to cigarette smoking was MZN 3.4 billion.

Finally, even in their healthy years, workers who smoke are more likely to incur productivity loss than workers who do not smoke. Smokers take an estimated ten additional minutes per day in breaks than non-smoking employees [46]. If ten minutes of time is valued at the average worker's salary, the compounding impact of 1.5 million employed smokers taking ten minutes per day for smoke breaks is equivalent to losing MZN 2.4 billion in productive output annually.

In total, tobacco use caused MZN 11.7 billion<sup>6</sup> in economic losses in 2019, equivalent to about 1.3 percent of Mozambique's 2019 GDP. **Figure 3** breaks down direct and indirect costs. **Figure 4, 5** and **6** illustrate the annual health losses that occur due to tobacco use.

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5 In assessing the current burden of tobacco use, the economic costs of tobacco-attributable mortality include the cost of mortality 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 healthcare 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.

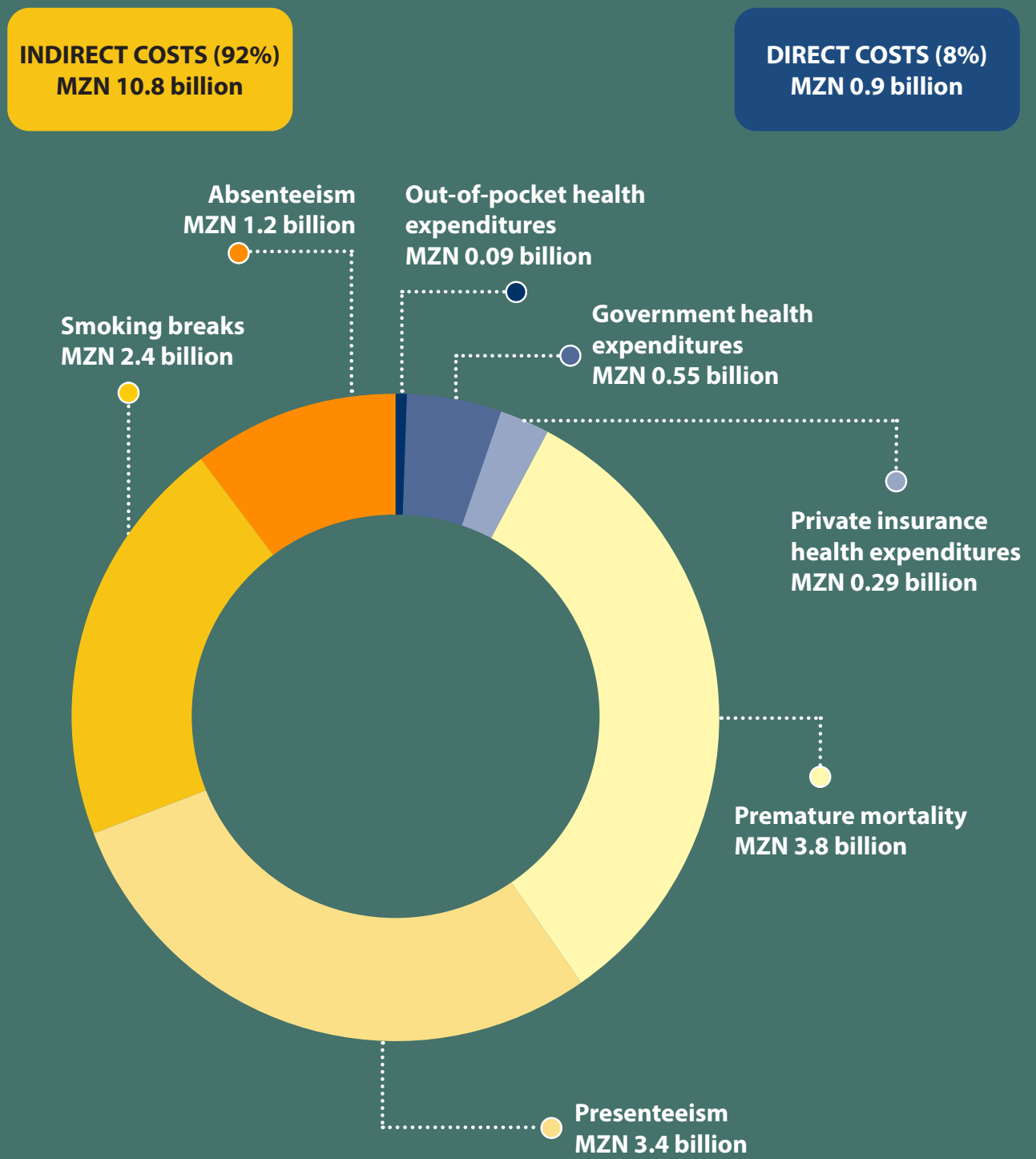
6 Component parts may not add to MZN 11.7 billion exactly due to rounding.



Photo: © World Bank via Flickr

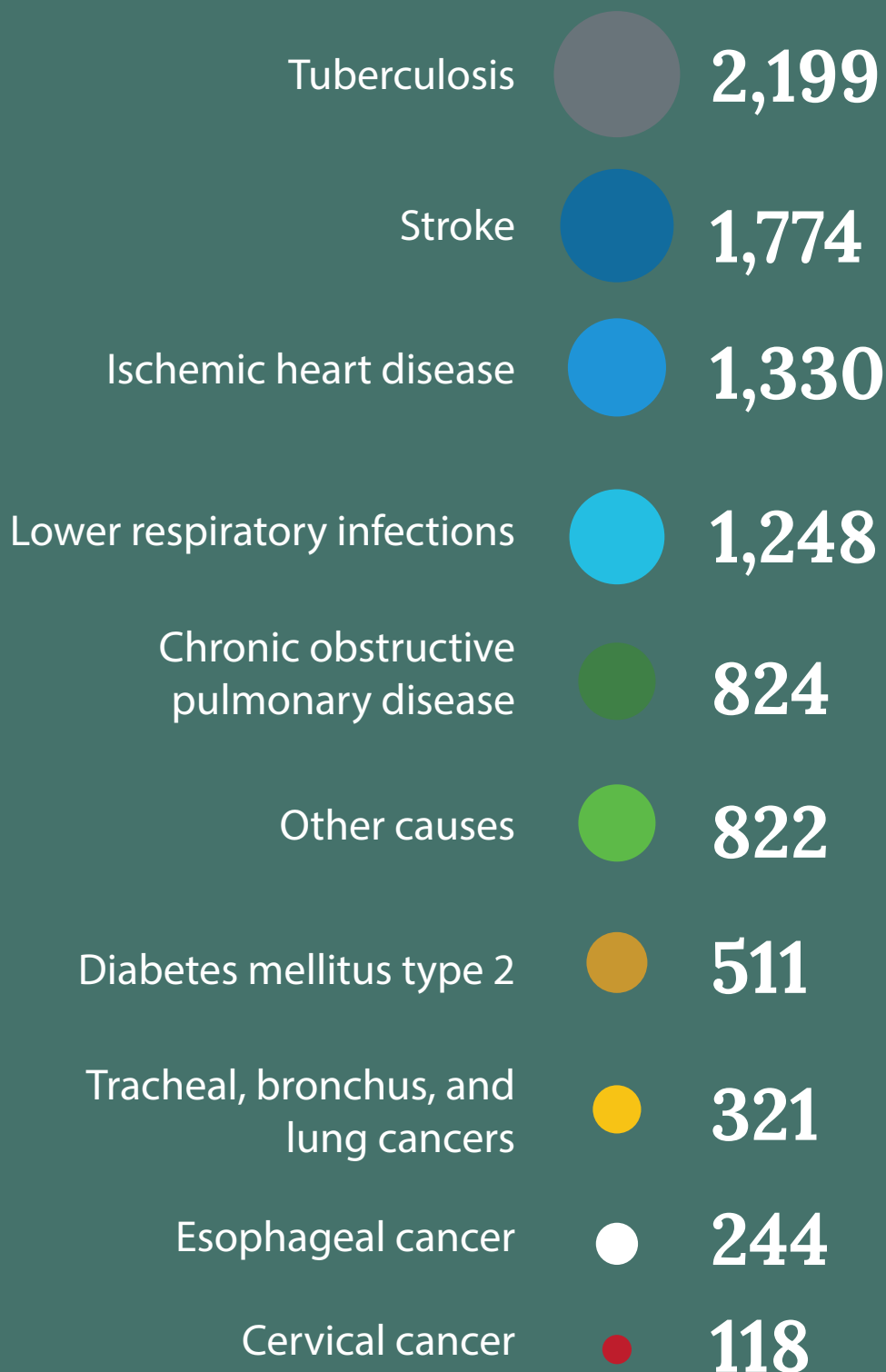
# The current burden of tobacco use

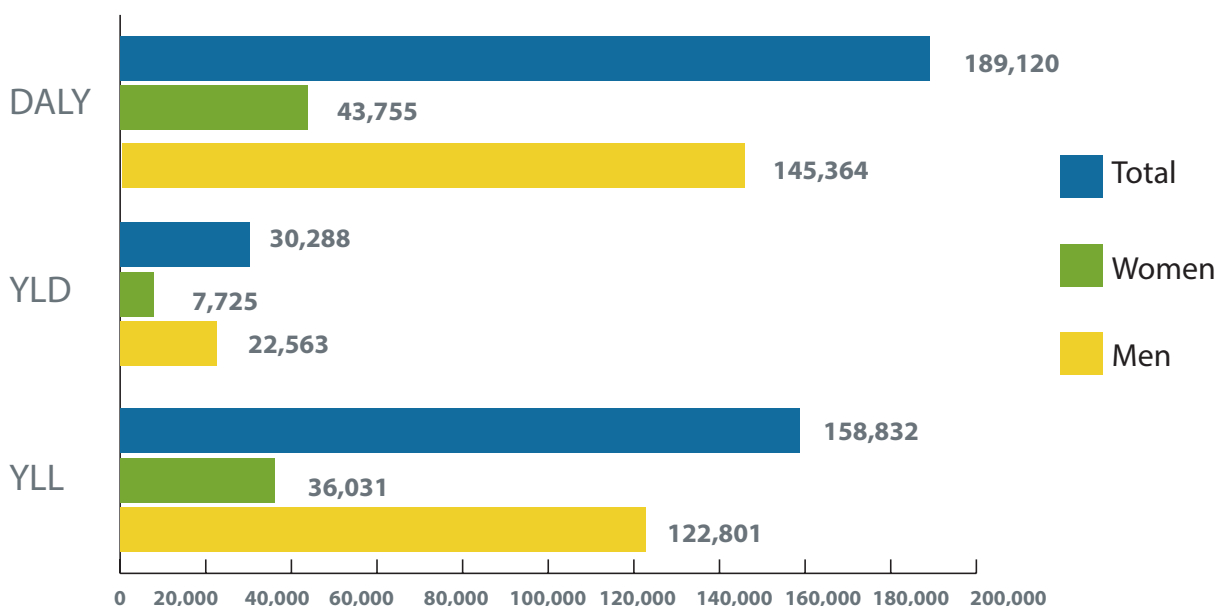
Fig. 3: Breakdown of the share of direct and indirect economic costs (MZN billions) in 2019





**Fig. 4: Tobacco-attributable deaths by disease in Mozambique, 2019** (Source: Results are from the IHME Global Burden of Disease Results Tool. Other causes include asthma, larynx cancer, Alzheimer's disease and other dementias, peptic ulcer disease, aortic aneurysm, bladder cancer, lip and oral cavity cancer, stomach cancer, colon and rectum cancer, leukemia, breast cancer, pancreatic cancer, liver cancer, peripheral artery disease, other pharynx cancer, gallbladder and biliary diseases, prostate cancer, atrial fibrillation and flutter, kidney cancer, rheumatoid arthritis, nasopharynx cancer, otitis media, and multiple sclerosis.)



**Fig. 5: Tobacco-attributable DALYs, YLDs, and YLLs in Mozambique, by sex,<sup>7</sup> 2019**

## 5.2 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, Mozambique can secure significant health and economic returns, and begin to reduce the MZN 11.7 billion in annual economic losses from tobacco use.

The next two subsections present the health and economic benefits that result from seven WHO FCTC policy actions to: 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) require graphic health warnings on tobacco product packaging that describes the harms of tobacco use (*WHO FCTC Article 11*); 4) implement plain packaging of tobacco products (*WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13*); 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*); 6) enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion, and sponsorship (*WHO FCTC Article 13*); and 7) scale up of brief advice to quit for tobacco users in primary care clinics (*WHO FCTC Article 14*).

<sup>7</sup> YLDs are “years lived in less than ideal health...[YLDs are] measured by taking the prevalence of a [disease] condition multiplied by the disability weight for that condition. Disability weights reflect the severity of different conditions.” YLLs are “calculated by subtracting the age at death from the longest possible life expectancy for a person at that age.” DALYs “equal the sum of YLLs and YLDs. One DALY equals one lost year of healthy life.” Source: IHME. (2018). Frequently asked questions. Retrieved from <<http://www.healthdata.org/gbd/faq#What%20is%20a%20DALY?>>

### 5.3 Health benefits – lives saved

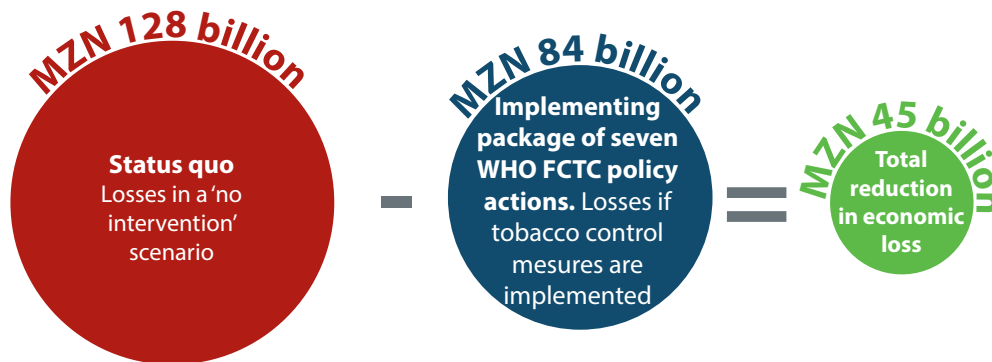
The full implementation of the WHO FCTC in Mozambique (inclusive of all seven of the measures listed above) would lower the prevalence of tobacco use, leading to substantial health gains for the country. Implementing the package of seven WHO FCTC policy actions that are the focus of this investment case would reduce the prevalence of cigarette smoking by 64 percent (in relative terms) over 15 years, saving around 53,400 lives from 2023-2037, or 3,600 lives annually.

### 5.4 Economic benefits – costs averted

Implementing the tobacco control policy package would result in Mozambique avoiding 35 percent of the economic loss that it is expected to incur from tobacco use over the next 15 years.

**Figure 6** illustrates the extent to which Mozambique can shrink the economic losses it is expected to incur under the status quo.

**Fig. 6: Tobacco-related economic losses over 15 years, 2023-2037**

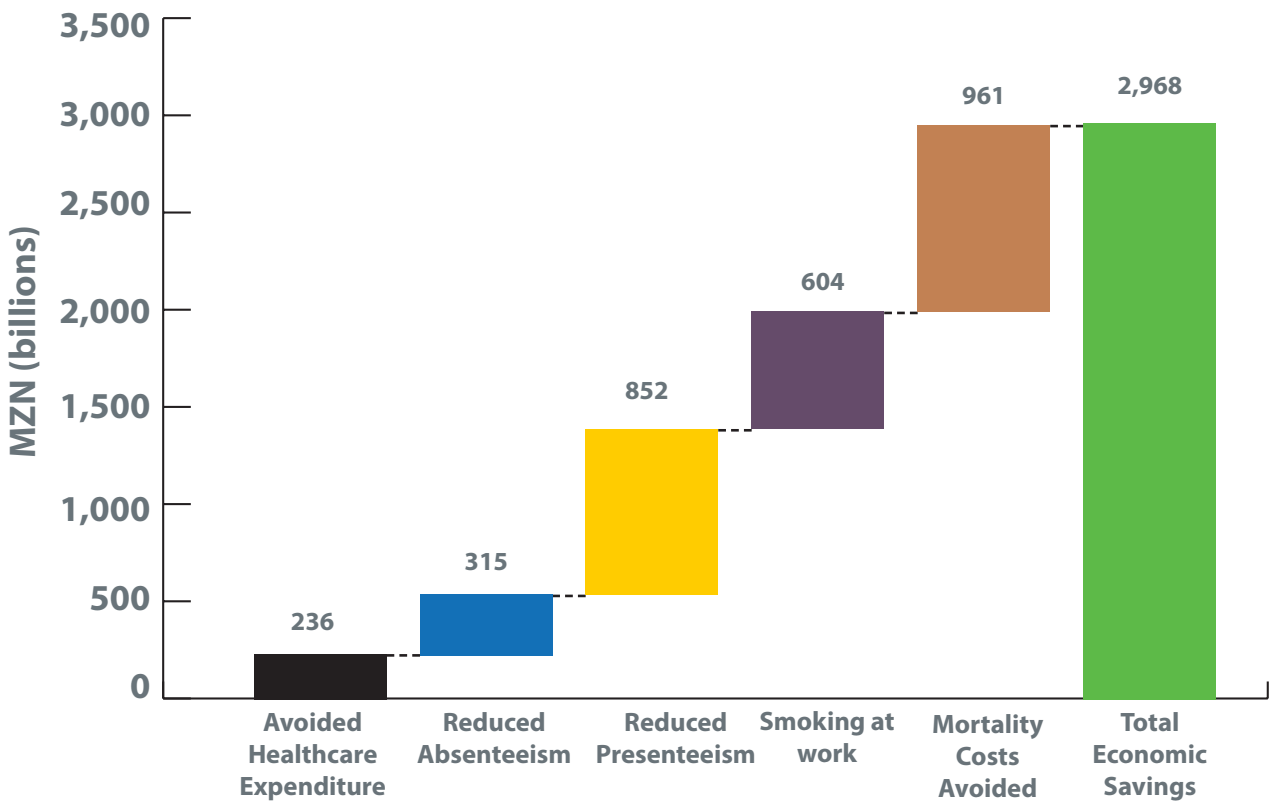


In total, over 15 years Mozambique would save about MZN 45 billion that would otherwise be lost if the package of seven key WHO FCTC policy actions were not implemented. This is equivalent to around MZN 3 billion in annual avoided losses.

With better health that would arise from implementation of the WHO FCTC, fewer individuals would need access to healthcare 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). Finally, because the prevalence of smoking declines, fewer unsanctioned smoke breaks are taken in the workplace and less productivity is lost.

**Figure 7** breaks down the sources from which annual avoided costs accrue from implementation of the package of seven WHO FCTC policy actions. The largest annual avoided costs result from averted tobacco-attributable mortality (MZN 961 million). The next highest source is reduced presenteeism (MZN 852 million), followed by reduced numbers of smoking breaks (MZN 604 million), reduced absenteeism (MZN 315 million), and avoided healthcare expenditures (MZN 236 million).

**Fig. 7: Sources of annual avoided economic costs because of implementing the tobacco control policy package\***



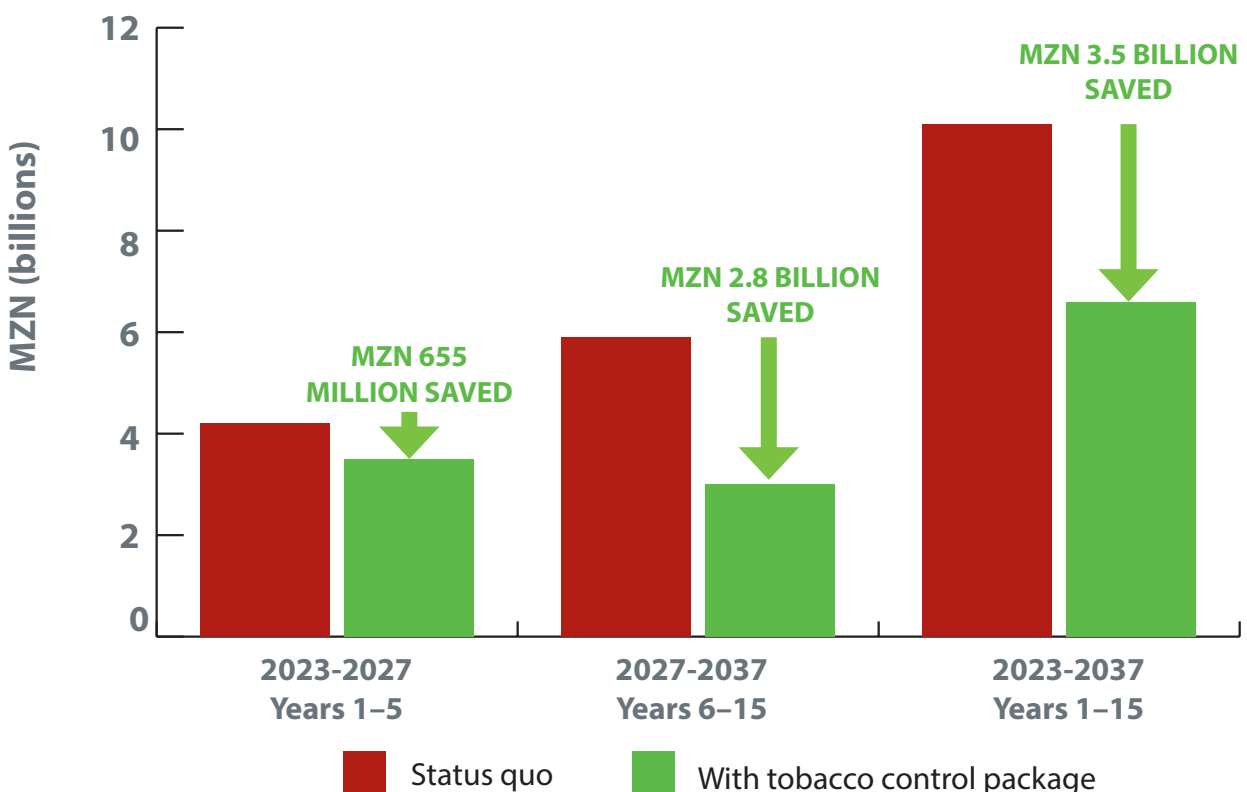
\*Figures subject to rounding.

Implementing the package of seven WHO FCTC policy actions examined in this investment case will reduce medical expenditures, both for citizens and the government. Presently, total private and public annual health care expenditures in Mozambique is about MZN 72 billion [41], 1.3 percent of which (~ MZN 931 million) is directly related to treating disease and illness due to tobacco use [5].

**Figure 8** compares the level of private and public healthcare costs that would be spent if the WHO FCTC policy actions are implemented and under a status quo scenario. Over the 15-year time horizon of the analysis, the package of interventions averts MZN 3.5 billion in healthcare expenditures, or MZN 236 million annually. Of this, 59 percent of savings accrue to the government and 10 percent accrue to individual citizens who would have had to make out-of-pocket payments for healthcare. The remainder of the saving goes to private insurance and other sources of healthcare expenditures. Thus, from reduced healthcare costs alone, the government stands to save about MZN 2.1 billion over 15 years.

Simultaneously, the government would successfully reduce the health expenditure burden that tobacco imposes on Mozambicans through out-of-pocket payments, supporting efforts to reduce economic hardship on families. Rather than spending on tobacco products or healthcare treatment for tobacco-related diseases, these families would be able to invest more in nutrition, education, and other productive inputs to secure a better future.

**Fig. 8: Private and public healthcare costs (and savings) over the 15-year time horizon, 2023-2037**



## 5.5 The return on investment

While the health gains from strengthening tobacco control in Mozambique 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 investments by dividing the economic benefits that are gained from implementing the WHO FCTC policy actions by the costs of the investments. For the Mozambique investment case, the ROI for each intervention was evaluated in the short-term (period of five years), to align with planning and political cycles, and in the medium-term (period of 15 years) to align with the SDGs. The ROI shows the return on investment for each intervention, and for the full package of WHO FCTC policy actions. Total benefits (avoided economic losses due to tobacco-attributable mortality, healthcare 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 smoking (an individual-level intervention with higher initial personnel costs), 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 of Mozambique will gain economic benefits ranging from 0.1 to 46 times its investment. Given the long-wave nature of many tobacco-related illnesses, the ROIs for each intervention would continue to grow over time, reflecting the compounding gains from planning and development stages to full implementation. The ROIs for each intervention continue to grow over time, reflective of the increasing effectiveness of policy measures as they move from planning and development stages to full implementation.

**Table 2: Return on investment, by tobacco control policy/intervention (MZN billions)<sup>8</sup> over five (2023-2027) and 15 (2023-2037) years**

Return on investment, by tobacco control policy	First 5 years (2023-2027)			All 15 years (2023-2037)		
	Total costs (billions)	Total benefits (billions)	ROI	Total costs (billions)	Total benefits (billions)	ROI
<b>Tobacco control package*</b> <i>(all policies/interventions implemented simultaneously)</i>	0.88	8.3	<b>9.4</b>	2.1	45	<b>21</b>
<b>Raise Cigarette Taxes<sup>9</sup></b> <i>(WHO FCTC Art. 6)</i>	0.06	2.6	<b>46</b>	0.12	17.9	<b>146</b>
<b>Protect People from Tobacco Smoke</b> <i>(WHO FCTC Art. 8)</i>	0.15	1.4	<b>9.7</b>	0.30	9.7	<b>33</b>
<b>Graphic Health Warnings</b> <i>(WHO FCTC Art. 11)</i>	0.07	1.4	<b>21</b>	0.14	9.7	<b>70</b>
<b>Plain Packaging</b> <i>(WHO FCTC Guidelines for implementation of Articles 11 and 13)</i>	0.07	0.48	<b>7</b>	0.14	3.3	<b>24</b>
<b>Public Awareness of Tobacco Control Issues</b> <i>(WHO FCTC Art. 12)</i>	0.13	1.8	<b>13.2</b>	0.32	12.2	<b>38</b>
<b>Bans on Tobacco Advertising, Promotion, and Sponsorship</b> <i>(WHO FCTC Art. 13)</i>	0.07	2.7	<b>39</b>	0.15	17.9	<b>122</b>
<b>Cessation: Brief Advice to Quit</b> <i>(WHO FCTC Art. 14)</i>	0.25	0.02	<b>0.1</b>	0.74	0.50	<b>0.60</b>
* 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 <sub>i</sub> and PR <sub>j</sub> , (1-PR <sub>i</sub> ) × (1-PR <sub>j</sub> ) [is] applied to the current smoking prevalence [47]. 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, raising taxes are expected to have the highest return on investment (146:1).<sup>10</sup> Enacting and enforcing a comprehensive ban on all forms of tobacco advertising, promotion and sponsorship is expected to have the next highest return on investment (122:1), followed by requiring graphic health warnings on tobacco product packaging that describes the harms of tobacco use (70:1), promoting and strengthening public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation (38:1), creating smoke-free public places and workplaces (33:1), implementing plain packaging of tobacco products (24:1), and scaling up of brief advice to quit for tobacco users in primary care clinics (0.6:1).

8 Rounded to the nearest whole number.

9 Raise taxes to what is considered in the WHO Report on the Global Tobacco Epidemic, 2019 as a high level of achievement, which is for total taxes to represent at least 75 percent of the retail price [25]. In the scenario modeled, cigarette taxes would meet the 75 percent level by 2032.

10 Rounded to the nearest whole number.

## 6. Examining additional impacts: equity and the SDGs

The investment case undertakes an equity analysis to examine the extent to which a cigarette tax increase could be considered pro-poor in Mozambique. It also examines the contributions of stronger WHO FCTC implementation towards Mozambique's fulfilment of Target 3.4 of the Sustainable Development Goals.

### 6.1 Equity analysis: benefits to low-income populations from increasing cigarette taxes

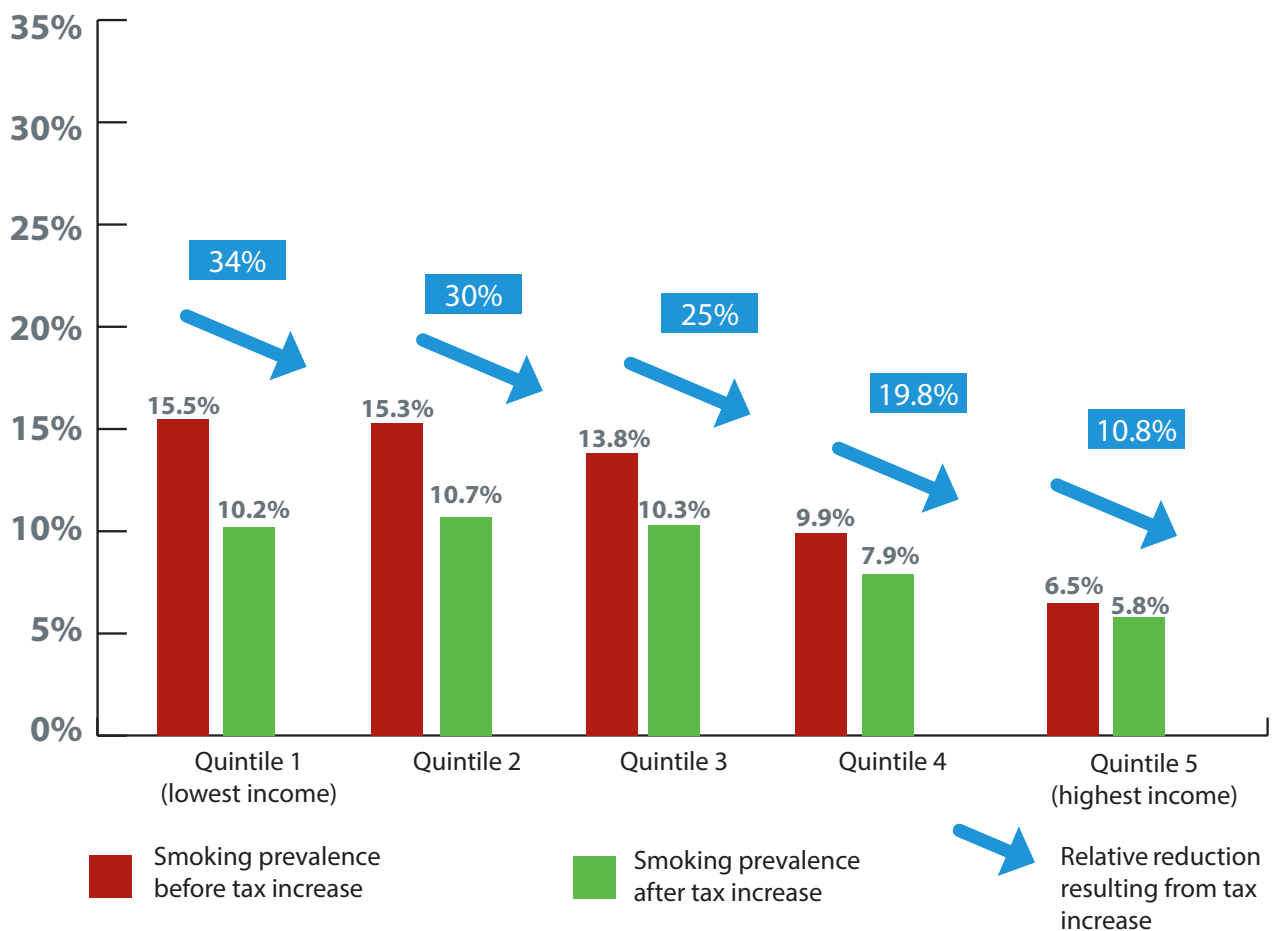
A common misconception is that taxes on tobacco products may disproportionately harm poor tobacco users, since the tax burden represents a higher proportion of their income than that of wealthier tobacco users. However, evidence shows that the poor actually stand to benefit most from raised cigarette taxes [48]. Relative to richer smokers, lower-income smokers are more likely to quit smoking when taxes are increased [49], meaning they benefit from subsequent decreases in tobacco-related health problems, and resulting medical costs which can be financially catastrophic. In Lebanon [50], 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 [51].

To examine the extent to which a cigarette tax increase could be considered pro-poor in Mozambique, the investment case undertakes an equity analysis. The analysis divides Mozambique'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 95 percent (MZN 47, or about US\$0.65). This represents only the first three years 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 changes in price from a set of low- and middle-income countries are used to assess how different economic groups react to changes in price.



The results from the analysis show that all income quintiles reduce smoking in response to the cigarette tax measures but, because people with lower incomes are more responsive to changes in price, the tax increase causes the largest drop in smoking prevalence among the poorest income quintiles. **Figure 9** shows the smoking prevalence in each income quintile before and after the tax increase, as well as the relative change in smoking prevalence.

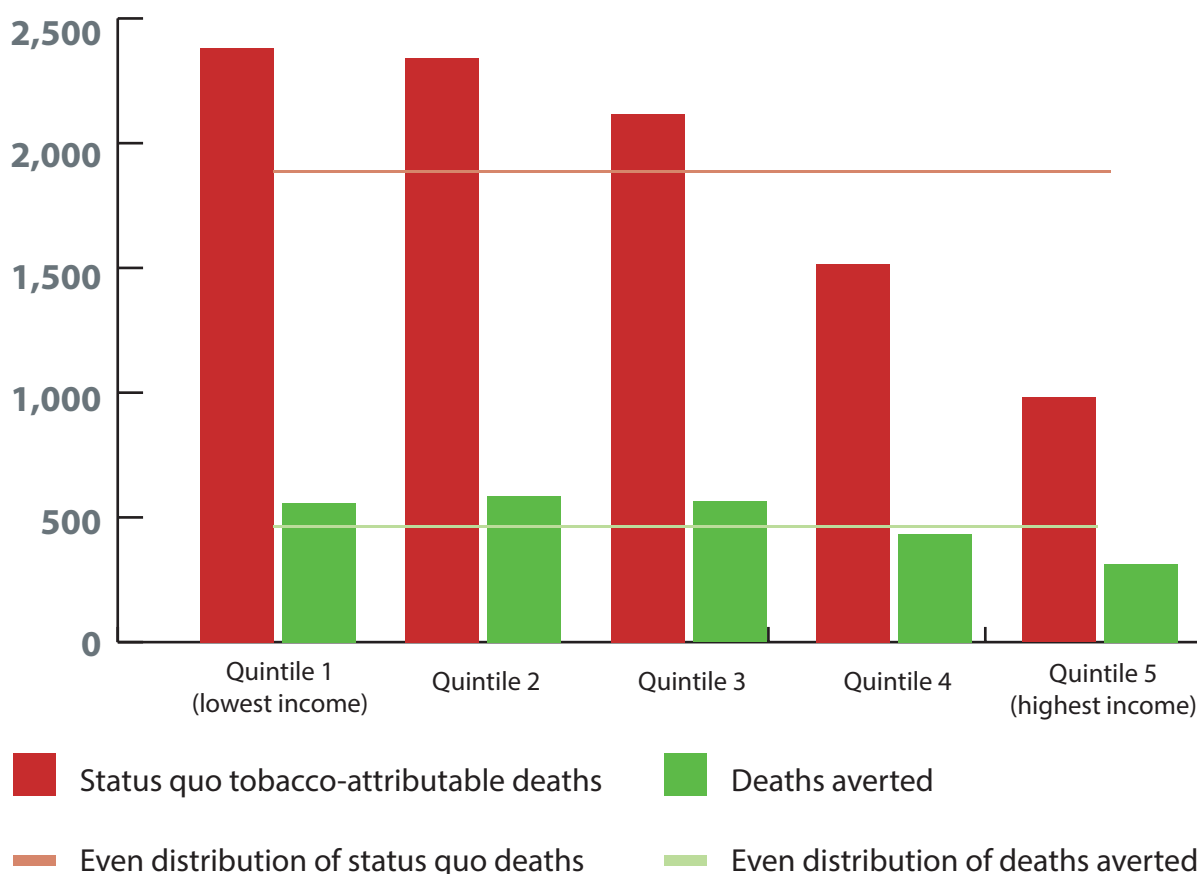
**Fig. 9: Relative reduction in smoking prevalence before and after the cigarette tax in Mozambique increase, by income quintile during the first year of tax increases that are modeled (2025)\***



\*Percentages are rounded to the second decimal place.

In Mozambique, the poorest income quintiles suffer disproportionately from the current burden of tobacco-attributable deaths due to their higher smoking prevalence. Of the more than 9,300 annual tobacco-attributable deaths expected if taxes were to stay the same, 51 percent would occur among the poorest 40 percent of the population (quintiles 1 and 2). However, because the tax increase causes smoking prevalence to fall the most in the two poorest quintiles, health benefits disproportionately accrue to the poor. The equity analysis finds that almost half (47 percent) of the more than 2,400 deaths that would be averted during the first three years of tax increases modeled in the investment case would be among the poorest 40 percent of the population, as shown in **Figure 10**.<sup>11</sup>

**Fig. 10: Status quo deaths and deaths averted by tax increase, by income quintile**



11 The light red horizontal line shows what the number of status quo deaths would be if they were evenly distributed among the quintiles, and the light green line demonstrates the number of averted deaths if they were distributed evenly among quintiles.

## 6.2 The Sustainable Development Goals and the WHO FCTC

Implementing the package of seven WHO FCTC policy actions will support Mozambique to meet SDG Target 3.a to strengthen the implementation of the WHO FCTC. Moreover, acting now will contribute to Mozambique's efforts to meet SDG Target 3.4 to reduce by one-third premature mortality from NCDs by 2030.

In Mozambique in 2019, over 31,300 premature deaths between the ages of 30 and 70 were caused by the four main NCDs (cardiovascular disease, diabetes, cancer, and chronic respiratory disease) [52]. Around twelve percent of these premature deaths occurred due to tobacco use [52]. Implementing the package of seven WHO FCTC policy actions would reduce tobacco use prevalence – a key risk factor driving NCD incidence – preventing 11,575 premature deaths from the four main NCDs over the next 10 years. 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 [60]. For example, stronger tobacco control will contribute to the reduction of poverty and inequalities (SDGs 1 and 10, respectively) and economic growth (SDG 8).

**By 2030 the WHO FCTC measures would:**



**SDG Target 3.4**

**Lower the prevalence of tobacco use by 62 percent from present levels.**

**Reduce economic costs** due to tobacco use by MZN 20 billion, including saving MZN 0.9 billion in healthcare expenditures.

**Lead to savings** (MZN 20 billion) that significantly outweigh the costs (MZN 1.4 billion) of implementation and enforcement, with an overall return on investment of 15:1.

## 7. Conclusion and recommendations

Each year, tobacco use costs MZN 11.7 billion in economic losses (equivalent to 1.3 percent of 2019 GDP) and causes substantial human development losses. Fortunately, the investment case shows that there is an opportunity to reduce the health, social and economic burden of tobacco in Mozambique. Enacting the seven key WHO FCTC policy actions would save 3,600 lives each year and reduce the incidence of disease, leading to savings from averted medical costs and averted productivity losses. In economic terms, these benefits are substantial, adding to MZN 45 billion over 15 years. Further, the economic benefits of strengthening tobacco control in Mozambique greatly outweigh the costs of implementation (MZN 45 billion in benefits versus just MZN 2.1 billion in costs at a 21:1 return on investment).<sup>12</sup>

By investing now in the package of seven WHO FCTC policy actions modeled in this investment case, Mozambique would not only reduce tobacco consumption, improve health, reduce government health expenditures, and grow the economy, it would also reduce hardships among Mozambicans, particularly among low-income populations. Many countries reinvest savings from averted healthcare expenditures and revenue from increased tobacco taxes into national development priorities such as social protection including 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 Mozambique are recommended to be pursued simultaneously:

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<sup>12</sup> Figures subject to rounding.

## 1

## Commit to fully implement the WHO FCTC and invest in strengthening the WHO FCTC policy actions modeled in this investment case.

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



## 2

**Strengthen tobacco tax structures and increase tax rates. (WHO FCTC Article 6)**

Mozambique is encouraged to substantially raise the tax share of retail price of tobacco in accordance with recommendations made in the WHO implementation guidelines for Article 6 and by WHO in the WHO Technical Manual on Tobacco Tax Administration. In particular, the WHO recommends substantially raising the total tax share of retail price of tobacco to meet or exceed 75 percent of the retail price (considered in the WHO Report on the Global Tobacco Epidemic as a high level of achievement [25]). The investment case demonstrated that in the short-term, by year 5, Mozambique can expect a 46:1 return on investment from the modeled cigarette tax increase, with this already substantial return growing to 146:1 by year 15. This is the highest return on investment of all measures analysed. In addition to saving lives and avoiding substantial healthcare costs and productivity losses, increasing cigarette taxes to 75 percent of retail price could generate significant additional government revenue. This would enable Mozambique to strengthen universal health coverage, other social protection measures as well as broader investments in health and development, particularly in the context of COVID-19 response and recovery. The investment case further demonstrates that it is in fact poorer Mozambicans who would benefit most from increases in cigarette taxes. In line with the commitment to leave no one behind, the equity analysis finds that almost half (47 percent) of the more than 2,400 deaths that would be averted during the first three years of tax increases modeled in the investment case would be among the poorest 40 percent of the population.

The investment case modeled only the potential gains from increasing taxes on cigarettes, not all tobacco products, meaning that if Mozambique were to take an even more comprehensive approach to taxation, there would be even greater health and economic benefits. It is recommended that Mozambique take immediate steps to strengthen taxes on all tobacco products (including shisha, smokeless tobacco and novel and emerging tobacco products) in line with WHO FCTC Article 6 and its guidelines, and the WHO Technical Manual on Tobacco Tax Policy Administration [55]. Mozambique should convey the multidimensional benefits of tobacco taxation to all stakeholders, support tobacco farmers to engage in alternative economic activities or crops, and ensure a robust system to eliminate the illicit trade of tobacco products in line with the Protocol. Guidance and support are available on governance frameworks, tax structures, monitoring, administration and complementary measures [55].

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 six key WHO FCTC policy actions modeled in this investment case.**

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The investment case has shown the health and economic benefits of strengthening implementation of the modeled WHO FCTC measures. Thus in addition to increasing tobacco taxes, Mozambique is recommended to take immediate action to implement the following:

- make all public places and workplaces smoke-free by removing exemptions and ending the use of indoor designated smoking areas, in line with WHO FCTC Article 8 and its guidelines for implementation;
- consider implementing plain packaging to reduce the attractiveness of tobacco products and make health warnings more prominent, in line with WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13;
- comprehensively ban all forms of tobacco advertising, promotion and sponsorship, aligning fully with the WHO FCTC and the WHO FCTC Guidelines for implementation of Article 13;
- scale up of brief advice to quit for tobacco users in primary care clinics, in line with WHO FCTC Article 14 and its guidelines for implementation;
- 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 in line with WHO FCTC Article 12; and
- require graphic health warnings on tobacco product packaging that describe the harms of tobacco use, in line with WHO FCTC Article 11.

4

**Develop a national, multisectoral tobacco control strategy (WHO FCTC Article 5.1) and strengthen multisectoral coordination for tobacco control along with the participation of civil society in WHO FCTC implementation. (WHO FCTC Article 5.2a and 4.7)**

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The social and economic benefits from stronger tobacco control demonstrated in the investment case, including benefits to the economy and advancements towards the SDGs, make clear that a multisectoral tobacco control strategy is in the national interest and that multiple sectors, not just health, would benefit.

The major actors in Mozambique with respect to tobacco control, production, and regulation, including the five ministries designated in Decree No. 11/ 2007 (Health, Industry and Commerce, Agriculture, Finance and Interior), could form a core team to advance tobacco control strategy drafting, ensuring high level support and bringing in other stakeholders in line with available guidance [53]. The investment case could inform the rationale and vision of the strategy, and the priorities modeled in the case could be a foundation for the strategy's action plan.

Additionally, a national multisectoral tobacco control strategy could outline the alignment of tobacco control efforts with other health and development plans, including sector-specific strategies and national development planning. Mozambique should include concrete tobacco control objectives in the new five-year Strategic Plan for the Health Sector, for example, and explore similar opportunities across ministries (e.g. with the Ministry of Education and Human Development as well as the Ministry of Gender, Children, and Social Welfare). Civil society organizations are also key tobacco control stakeholders in Mozambique. According to WHO FCTC Article 4.7, the participation of civil society is essential in achieving the objective of the Convention and its protocols. Civil society groups in Mozambique could support advocacy and compliance building and encourage positive public opinion for tobacco control measures.

The adoption of a national tobacco control strategy would also help formalize the engagement of all relevant stakeholders and provide clarity on their roles and responsibilities. It would facilitate the activity of the multisectoral working group under the Ministry of Health by strengthening its mandate and coordinating capacity. Mozambique should consider reinforcing and ensuring the effective and sustainable functioning of a national coordinating mechanism for tobacco control in line with available guidance, building upon its existing task force and taking into account the multisectoral benefits outlined in this investment case [54].



In Mozambique, the number one cause of tobacco-attributable death is not an NCD but tuberculosis, an infectious disease. There are therefore opportunities to strengthen efficiencies between tobacco control and infectious disease responses. In advancing WHO FCTC implementation, Mozambique is encouraged to consider the impact this could have on national TB burdens, as well as interactions with HIV, and to consult UNDP and the Secretariat of the WHO FCTC, for guidance for policymakers and programmes managers on integrating tobacco control, including cessation support, into policies and programmes to address infectious diseases. For example, there are likely cost efficiencies in integrating the tobacco cessation services modeled in this investment case into existing infectious disease service delivery infrastructure, in line with available guidance [1].

**5****Implement measures to protect public health policies from the commercial and other vested interests of the tobacco industry. (WHO FCTC Article 5.3)**

It is recommended that Mozambique take action to protect the country's public health policies from the commercial and other vested interests of the tobacco industry. A resolution made by the World Health Assembly in 2001, citing the findings of the Committee of Experts on Tobacco Industry Documents, states that "the tobacco industry has operated for years with the express intention of subverting the role of governments and of WHO in implementing public health policies to combat the tobacco epidemic" [56].

The Preamble of the WHO FCTC recognizes that Parties "need to be alert to any efforts by the tobacco industry to undermine or subvert tobacco control efforts and the need to be informed of activities of the tobacco industry that have a negative impact on tobacco control efforts". The WHO FCTC includes a specific obligation that "in setting and implementing their public health policies with respect to tobacco control, Parties shall act to protect these policies from commercial and other vested interests of the tobacco industry in accordance with national law". The 2021 global progress report on implementation of the WHO Framework Convention on Tobacco Control reported that the most frequently mentioned barrier to the implementation of the Convention by Parties is the interference by the tobacco industry, including the industries producing novel and emerging tobacco products and nicotine products [57].

Mozambique is encouraged to review current policies and legislation in light of the Implementation Guidelines for WHO FCTC Article 5.3 [58], and then address outstanding gaps by implementing the recommendations made in those guidelines. Attention should also be given to ensuring policy coherence across government policy-making to prioritise public health and WHO FCTC implementation.

6

**Become a Party to and 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)*

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While illicit trade is a significant challenge in Mozambique, the country is not yet a Party to the Protocol to Eliminate Illicit Trade in Tobacco Products. Mozambique would benefit from acceding to the Protocol, which would represent a key step in the country's efforts to eliminate the problem of illicit tobacco. Key provisions that Mozambique would benefit from include:

- requiring tobacco products to include a statement to indicate the final destination of the product, like "sales only allowed in Mozambique";
- allowing for the confiscation of proceeds that are from sales of illicit tobacco products; and
- reporting of findings from monitoring and evaluation data on illicit trade of tobacco products in Mozambique and sharing with regional countries.

7

**Support tobacco farmers to engage in alternative economic activities or crops.**  
*(WHO FCTC Articles 17 and 18)*

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This investment case focused on tobacco consumption but tobacco production remains an issue in Mozambique and around the world, particularly for tobacco farmers who often become ill from handling tobacco leaves (i.e. 'Green Tobacco Sickness') and suffer from exploitative contracts with the tobacco industry. Moreover, tobacco production inflicts a range of environmental harms including land degradation as well as water and soil pollution [59], [60].

Tobacco growth in Mozambique is profitable and many households engaged in farming choose to grow tobacco instead of other crops, which allows the tobacco industry to maintain a larger footprint in the national economy and labour market. Most medium and small farms that produce tobacco sell close to 100 percent of their crop [37]. Such a high sales rate is due to strong market demand and a superior logistical/supply chain cultivated by the tobacco industry.

In order to support tobacco farmers in exploring alternative livelihoods, Mozambique, led by its Ministries of Agriculture and Health, could for example increase tobacco farmers' awareness of

other profitable cash crops being grown in their respective regions, ensure access to financial aid, including access to small loans, provide tailored training and sensitization to farmers and their families, leveraging available international support, and strengthen supply and value chains for alternative crops. Through targeted investments in non-tobacco crop markets to improve commercial and supply chain infrastructure, Mozambique could create equally favorable conditions for production and sales of non-tobacco crops, thereby creating incentives for tobacco farmers to switch to healthier, more lucrative and more environmentally sustainable crops. The Ministry of Agriculture, together with other relevant ministries and organizations, could explore scaling-up tested programmes, such as the Seed Multiplication project to Empower Small Commercial Farmers (SM4ESCF) that was implemented in Zambézia Province between March 2016 and January 2019.

**8**

## **Identify opportunities to link the implementation of the WHO FCTC with wider sustainable development strategies in Mozambique.**

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With the vast health, economic, social and environmental costs of tobacco, the case is clear: implementing the WHO FCTC is a powerful means for Mozambique to improve the lives of all citizens, achieve the SDGs, and better the conditions and future of the country.

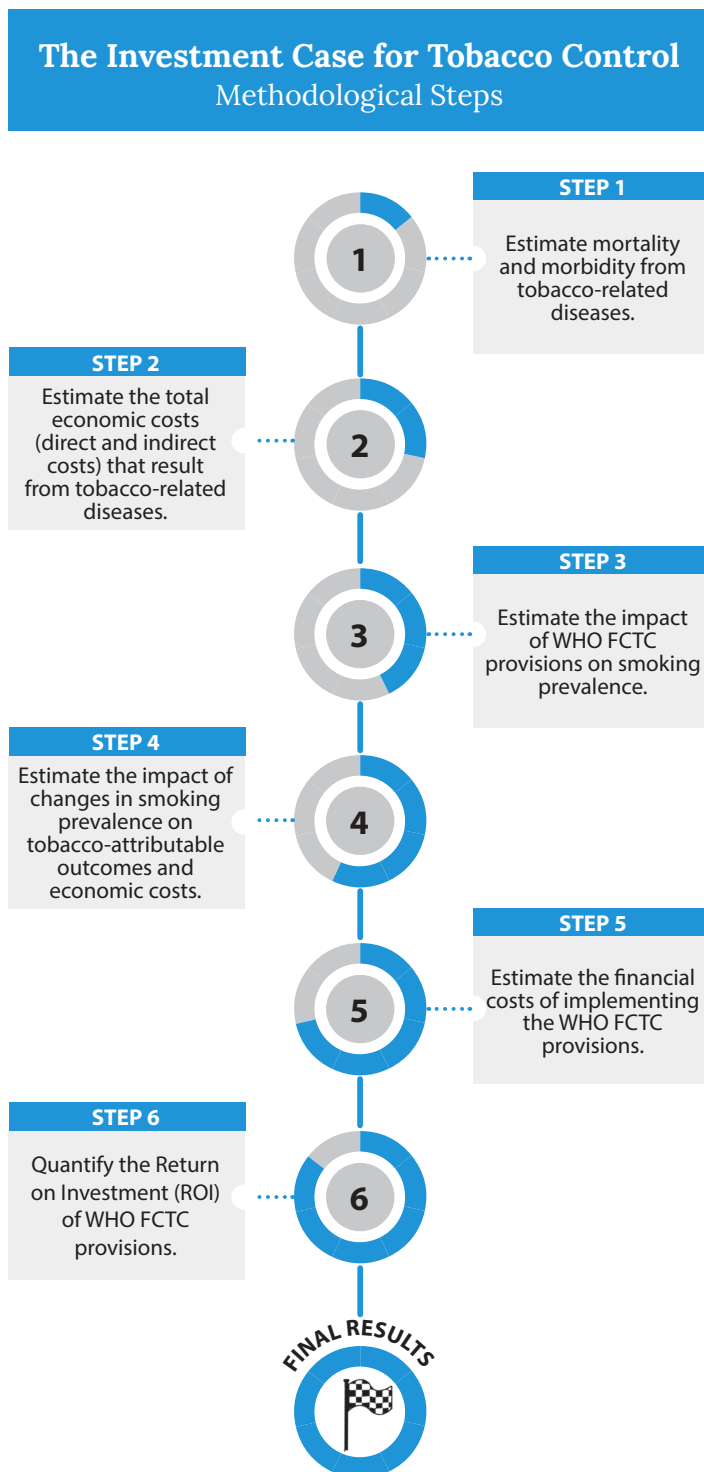
All sectors have a role to play in tackling tobacco use and the benefits of full WHO FCTC implementation will enrich all aspects of life in Mozambique. The government of Mozambique should prioritize the implementation of the WHO FCTC in sustainable development strategies. With the vast health, economic, social and environmental costs of tobacco, the case is clear: implementing the WHO FCTC is a powerful means for Mozambique to improve the lives of all citizens, achieve the SDGs, and better the conditions and future of the country.

# Methodology annex

## 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 current health and economic burden of tobacco use in Mozambique.



### STEP 1

Estimate mortality and morbidity from tobacco-related diseases.

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) [4], [61]. 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.



### STEP 2

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

Next, the model estimates the total economic costs of disease<sup>13</sup> and death caused by tobacco use, including both direct and indirect costs. Direct refers to tobacco-attributable healthcare expenditures. Indirect refers to the value of lives lost due to tobacco-attributable premature mortality, and workplace productivity losses: absenteeism, presenteeism, and excess breaks due to smoking.

**Direct costs** — Direct costs include tobacco-attributable public (government-paid), private (insurance, individual out-of-pocket), and other healthcare expenditures. The proportion of healthcare costs attributable to smoking was obtained using the formula for estimating smoking attributable fraction (SAF) of healthcare expenditures from Goodchild et al. (2018) [5]. The investment case utilizes the average smoking attributable fraction of healthcare expenditures of low-income African countries for which estimates are available in the Goodchild paper; this comes out to 1.3 percent. To calculate the share of smoking-attributable healthcare expenditures borne by public, non-profit, and private entities, it was assumed that each entity incurred smoking-

<sup>13</sup> 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 of smoking, secondhand smoke exposure, and the use of other types of tobacco products). Only smoking-attributable (not tobacco-attributable) costs are calculated for healthcare expenditures, absenteeism, presenteeism, and smoking breaks. While other forms of tobacco may also cause losses in these categories, no data is available to pinpoint those losses.

attributable healthcare costs in equal proportion to its contribution to total health expenditure. Healthcare expenditures were obtained from the WHO Global Healthcare Expenditure Database (GHED) [41].

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

- *The economic cost of tobacco-attributable to tobacco use* — Tobacco-attributable mortality is valued using the human capital approach, which places an economic value on each year of life lost. Using GBD data on the age at which tobacco-attributable deaths occur, the model calculates the total number of years of life lost due to tobacco, across the population. Each year of life is valued at 1.4 times GDP per capita, following the “full income approach” employed by Jamison et al (2013) [62].
- *Productivity costs* — Productivity costs consist of costs due to absenteeism, presenteeism, and excess work breaks due to smoking. The model incorporates estimates from academic literature on the number of extra working days missed due to active smoking (2.9 days per year) [63]. Presenteeism losses are obtained similarly, under research that shows that smokers in China, the US, and five European countries experience about 22 percent more impairment at work because of health problems compared to never-smokers [64]. Lost productivity due to smoking breaks is valued under the conservative assumption that working smokers take ten minutes of extra breaks per day [46].

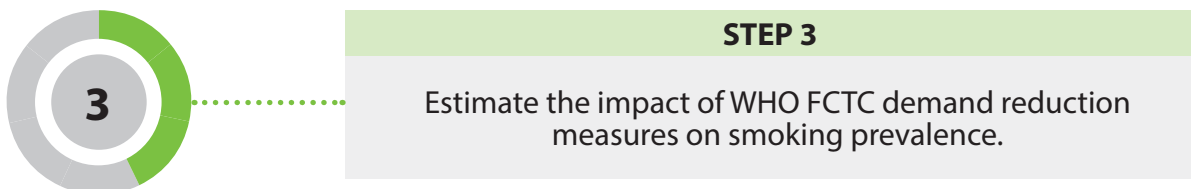
### A1.3 COMPONENT TWO: POLICY/INTERVENTION SCENARIOS

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

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This component estimates the effects of WHO FCTC tobacco control measures on mortality and morbidity, as well as on total economic costs (direct and indirect) associated with tobacco use. The investment case employs a static model to estimate the total impact of the tobacco control measures, meaning that aside from smoking prevalence, variables do not change throughout the time horizon of the analysis. 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 [65], [66].

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



The selection of priority WHO FCTC measures modeled within the investment case align with the [Global Strategy to Accelerate Tobacco Control](#) 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, inter alia, the implementation of price and tax measures (WHO FCTC Article 6) and time-bound measures of the Convention. The time-bound measures are for creating smoke-free public places and workplaces (WHO FCTC Article 8), prominent health warnings on tobacco packaging (WHO FCTC Article 11) and plain packaging (WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13), and comprehensive bans on tobacco advertising, promotion and sponsorship (TAPS) (WHO FCTC Article 13). The impacts of implementing the WHO FCTC provisions

are obtained from the literature. The impact of enforcing smoke-free air laws, implementing plain packaging, intensifying advertising bans and conducting mass media campaigns are derived from Levy et al. (2018) [47] and Chipty (2016) [67], as adapted within the Tobacco Use Brief of Appendix 3 of the WHO Global NCD Action Plan 2013-2020 [68], and adjusted based on assessments of Mozambique's baseline rates of implementation.

Except for taxes – the impact of which is dependent on the timing of increases in tax rates (described below) – the full impact of the measures is phased in over a five-year period. The phase-in period follows WHO assumptions [69] 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	[54]
Prevalence elasticity of demand	-0.25	Assumption – half of price elasticity [70]
Income elasticity of demand	0.32	[71]
Income prevalence elasticity of demand	0.16	Assumption – half of income elasticity
Projected real income growth rate*	4.8%	[72]

\* Projected real income growth is used as a proxy for wage growth. The International Monetary Fund projects [72] real GDP growth at an average of 4.8 percent annually through 2025.

The investment case analysis examines a tax increase scenario in which Mozambique chooses to enact strong tax increases. In the hypothetical scenario, the VAT tax rate stays the same (17 percent), while the specific excise tax rises (in real terms) from MZN 7 to MZN 47 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 specific excise tax increases. Additional specific excise taxes triggering real price increases of an average of 9 percent annually are modeled from 2028 to 2037, bringing the total tax to 75 percent at the end of the analysis.



**Table A2: Projected cigarette pack price in the tax increase scenario (MZN)**

	2023	2024	2025	2026	2027
Price net of taxes	36	36	36	36	36
Specific excise	7.0	7.0	13.8	29	47
Value added tax	7.2	7.2	9.6	13.4	18.2
<b>Final Consumer Price</b>	50	50	58	76	97

\*Component parts may not sum to final consumer price due to underlying rounding.

The impact of these 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) [73], 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.

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

Where:

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

$\epsilon_p$  = prevalence elasticity

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

$\epsilon_i$  = 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, in reality, the tobacco industry may increase or decrease prices in reaction to the price increase. Third, we did not obtain Mozambique-specific estimates of price and income elasticities.

The impact sizes of all policy measures examined in the investment case are displayed in **Table A3**. Additional information on their derivation can be found in the *Technical Appendix*.<sup>14</sup>

**Table A3: Impact size: Relative reduction in the prevalence of current smoking by tobacco control policy/intervention of five (2023-2027) and 15 years (2023-2037)**

WHO FCTC Policy Actions	Relative reduction in the prevalence of current smoking	
	First 5 years (2023–2027)	Over 15 years (2023–2037)
<b>Tobacco Control Package (all policies/interventions implemented simultaneously)</b>	<b>44%</b>	<b>65%</b>
<b>Increase taxes on cigarettes</b> ( <i>WHO FCTC Article 6</i> )	14.4%	26%
<b>Create smoke-free indoor public places and workplaces</b> ( <i>WHO FCTC Article 8</i> )	7.2%	12%
<b>Require graphic health warnings on tobacco product packaging that describes the harms of tobacco use</b> ( <i>WHO FCTC Article 11</i> )	7%	12%
<b>Implement plain packaging of tobacco products</b> ( <i>WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13</i> )	2.4%	4.0%
<b>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</b> ( <i>WHO FCTC Article 12</i> )	9%	15%
<b>Enact comprehensive bans on tobacco advertising, promotion and sponsorship</b> ( <i>WHO FCTC Article 13</i> )	13.8%	23%
<b>Scale up of brief advice to quit for tobacco users in primary care clinics</b> ( <i>WHO FCTC Article 14</i> )	0.1%	1.0%

\* 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  $PR_j$ ,  $(1-PR_i) \times (1-PR_j)$  [is] applied to the current smoking prevalence” [47].



#### 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, Mozambique 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 Mozambique can achieve by taking targeted actions to reduce tobacco use.

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

Marginal effects are calculated as follows for each outcome:

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

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



**STEP 5**

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

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The financial costs to the government of implementing new measures – or of intensifying or enforcing existing ones – are estimated using the WHO NCD Costing Tool. Full explanations of the costs and assumptions embedded in the WHO NCD Costing tool are available [69].

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

Across these categories, the Tool contains default costs from 2011, which are sourced from the WHO CHOICE costing study. Following Shang and colleagues, the Tool is updated to reflect 2019 costs by updating several parameters: the US\$ to local currency unit exchange rate (2019), purchasing power parity (PPP) exchange rate (2019), GDP per capita (US\$, 2019), GDP per capita (PPP, 2019), population (total, and share of the population age 15+, 2019), labour force participation rate (2019), gas per liter, and government spending on health as a percent of total health spending (2018) [74]. Unless government or other in-country parameters are received, data is from the World Bank database [70], 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.

**STEP 6**

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

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The return on investment (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 four tobacco control policies modeled, and for the four interventions together as a package. Estimates from Steps 3 and 4 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

To assess how increased taxation affects different income groups, different income groups' responses to changes in price were estimated, i.e. their elasticity of smoking participation. No studies were identified that examine the elasticity of smoking participation in Mozambique. Instead, an average from low- and middle-income countries identified by the International Agency for Research on Cancer's Handbook of Cancer Prevention Volume 14: Effectiveness of Tax and Price Policies for Tobacco Control [49]. Most studies on the effect of price increases on smoking prevalence divide the population into income quintiles, that is five even groups each containing 20 percent of the population, by income level. In the case of some studies reported by income tertiles (three groups), tertile 1 was assigned to quintile 1, tertile 2 to quintile 3, and tertile 3 to quintile 5. Then, quintile 2 was given as the average of tertiles 1 and 2, and quintile 4 was given as the average of tertiles 2 and 3. The overall average elasticity is -0.27, meaning that if prices increase by 100 percent smoking prevalence is expected to decrease by 27 percent. The prevalence elasticity of demand used in the investment case is -0.25, as shown in Table A1. The quintile-specific elasticities were adjusted slightly and proportionately so that the average would match that used in the investment case. The average elasticity for each quintile from the IARC Handbook and the adjusted elasticities are shown in **Table A4** below.

**Table A4: Average elasticities used in investment case equity analysis**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Average elasticity of studies identified in IARC Handbook	-0.38	-0.33	-0.28	-0.22	-0.12
Adjusted elasticity	-0.36	-0.31	-0.26	-0.21	-0.11

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