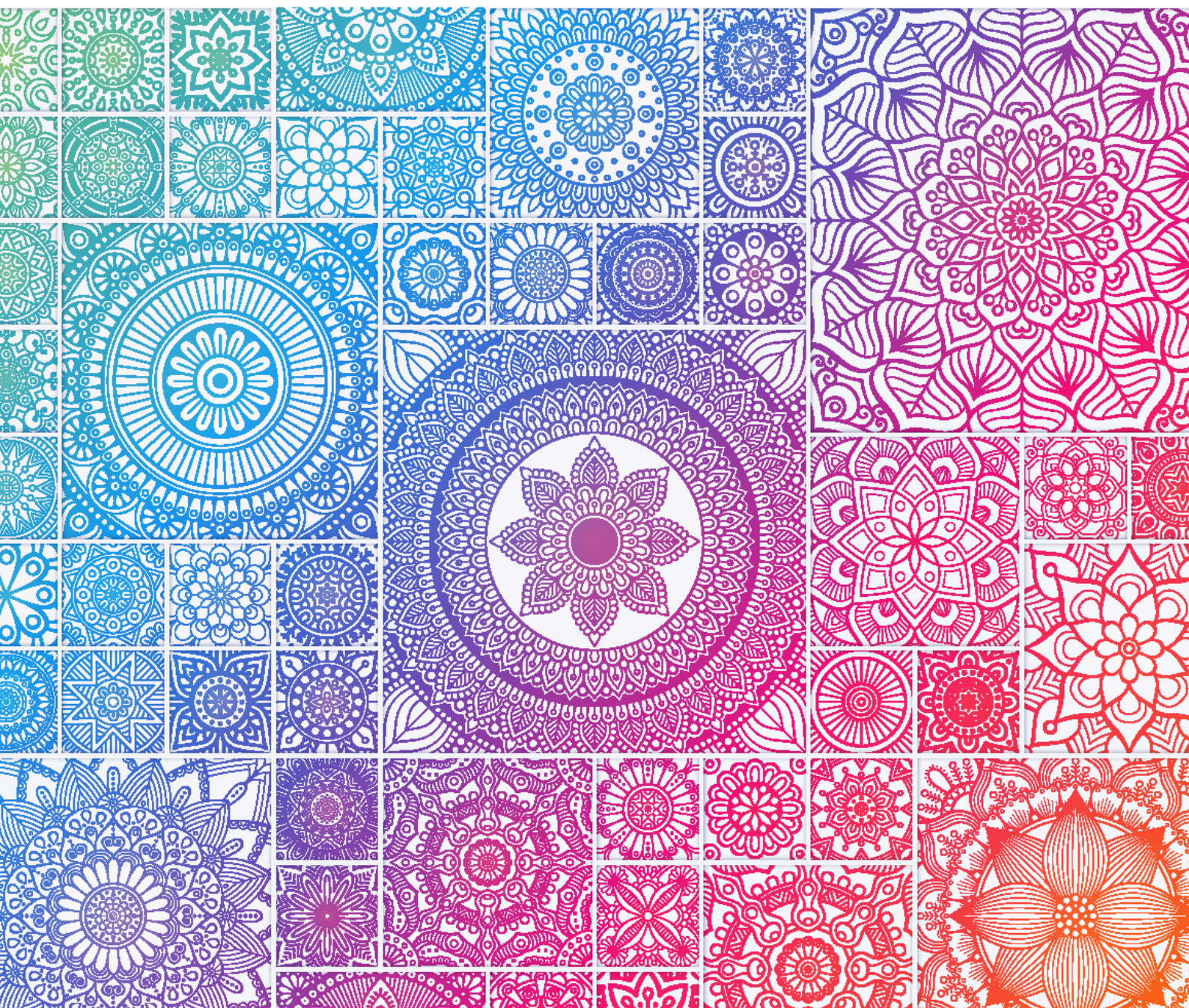


Investment Case for Tobacco Control in **TUNISIA**

The case for scaling up WHO FCTC implementation





The Case for Investing in WHO FCTC Implementation in Tunisia

Prepared by
Ministry of Health Tunisia
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December 2021



More than **13,200** Tunisians die every year due to tobacco-related illness, accounting for nearly **20%** of all deaths in the country.

Tobacco-related illnesses cost Tunisia

TND 2 billion

every year, equivalent to

1.8% of its GDP

in 2019.



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

55,500 deaths

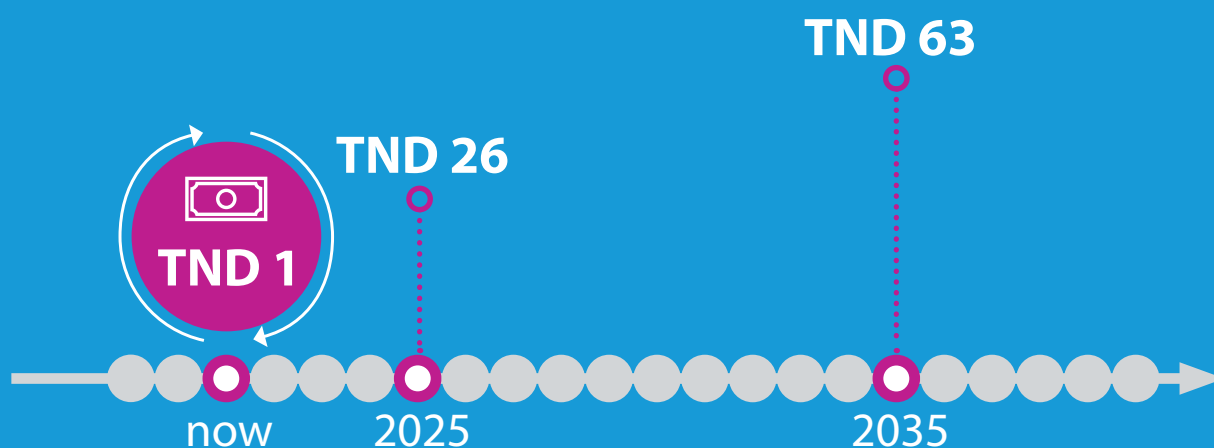
and avert

TND 5.7 billion

in health costs and economic losses by 2035.



For every **Tunisian dinar** invested in the seven tobacco control measures today, Tunisia will achieve **TND 26** in averted costs and economic losses by 2025 and **TND 63** by 2035.



Acknowledgements

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





1. Executive summary

Overview

Tobacco is a health and sustainable development issue. Tobacco consumption and production causes early death and disease, results in high health costs and economic losses, widens socioeconomic inequalities, and impedes progress across the Sustainable Development Goals. This report presents the findings of the case for investing in tobacco control in Tunisia, a stated priority of the Government of Tunisia. 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 priority tobacco control measures. The seven measures are 1) increase cigarette taxation to reduce the affordability of tobacco products (*WHO FCTC Article 6*), 2) implement bans on smoking in public places to protect people from tobacco smoke (*WHO FCTC Article 8*), 3) implement rotating graphic health warnings that cover 50 percent of product packaging (*WHO FCTC Article 11*), 4) implement plain packaging (*WHO FCTC Article 11 Guidelines and Article 13*), 5) institute mass media campaigns against tobacco use (*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) support reducing tobacco dependence and encourage cessation by training health professionals to provide brief advice to quit smoking (*WHO FCTC Article 14*).

Main findings

In 2019, tobacco use caused TND 2 billion in economic losses. These losses are equivalent to 1.8 percent of Tunisia's GDP. They include a) TND 146 million in healthcare expenditures and b) TND 1.9 billion in indirect economic losses due to premature mortality and ill-health as well as workplace smoking breaks. The indirect economic losses from current tobacco use in Tunisia – 93 percent of all tobacco-related costs – indicate that tobacco use impedes development in Tunisia beyond health; multisectoral engagement is required for effective tobacco control, and other sectors benefit substantially from supporting tobacco control investments through a healthier and more productive labor force.

Every year, tobacco use kills more than 13,200 people in Tunisia, with 49 percent of these deaths among individuals under age 70 (i.e. premature death). Eighteen percent of lives lost from tobacco use are due to exposure to secondhand smoke.

By acting now, the Government of Tunisia can reduce the national burden from tobacco use. The investment case findings demonstrate that enacting and enforcing seven proven WHO FCTC tobacco control measures would, over the next 15 years:

Avert TND 5.7 billion in economic losses. Of this total, TND 5.3 billion is attributable to indirect economic losses due to premature mortality and ill-health. The tobacco control measures stimulate economic growth by ensuring that fewer people 1) die prematurely 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 an additional TND 405 million in savings through avoidance of tobacco-attributable healthcare expenditures. Of this, the Government would save TND 234 million in healthcare expenditures, citizens would save TND 157 million in out-of-pocket healthcare costs, and TND 13.6 million would be saved from other sources of healthcare expenditures.

Save 55,500 lives and reduce the incidence of disease. The recommended WHO FCTC tobacco control measures would contribute to Tunisia's efforts to achieve SDG Target 3.4 to reduce by one-third premature mortality (under age 70) from the four main NCDs – cardiovascular diseases (CVD), diabetes, cancers and chronic obstructive pulmonary disease (COPD) – by 2030. Enacting the WHO FCTC measures would prevent over 13,700 premature deaths from the four main NCDs by 2030, the equivalent of about 22 percent of the needed reduction in premature mortality to achieve SDG Target 3.4.

Provide economic benefits (TND 5.7 billion) that significantly outweigh the costs of implementing the seven WHO FCTC measures (TND 90 million). Increasing cigarette taxes has the highest return on investment (499:1), followed by enacting and enforcing bans on tobacco advertising, promotion, and sponsorship (178:1), implementing graphic health warning labels (163:1), enforcing bans on smoking in public places (109:1), mass media campaigns (58:1), implementing plain packaging of tobacco products (55:1), and cessation by training health professionals to provide brief advice to quit smoking (3:1).

Increasing cigarette taxes in Tunisia will confer social benefits to all, particularly those on lower incomes. These individuals are more likely to quit smoking when cigarette prices are increased, helping them to avoid illness and catastrophic healthcare expenditures. During the first year of the modeled tax increase, over half (53 percent) of the deaths averted from increasing cigarette taxes will be among the poorest 40 percent of the population. Cigarette tax increases would further benefit lower-income Tunisians if the resulting Government tax revenue were reinvested in national development priorities such as universal health coverage including tobacco cessation support, in the context of an equitable COVID-19 response and recovery.

This report recommends actionable steps, in addition to the modeled WHO FCTC provisions, that the Government of Tunisia can take to strengthen a whole-of-government and whole-of-society 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 Tunisia to reduce the social, economic, and environmental burdens that tobacco continues to place on the country.

Recommendations

- 1 Strengthen multisectoral planning and coordination for tobacco control.**
- 2 Update and strengthen tobacco control laws and ensure they are enforced.**
- 3 Increase excise taxes on tobacco products to avert economic losses and raise revenue for development.**
- 4 Take action to prevent interference from industry in policymaking and implementation.**
- 5 Raise awareness among the public and government of the true costs of tobacco and the enormous development benefits of tobacco control.**

Table ES1. Summary of the main results of the investment case for tobacco control in Tunisia

Every year, tobacco use causes...	Over 15 years, implementing new tobacco control measures or intensifying existing ones would...
More than 13,200 deaths	Prevent more than 55,500 deaths
TND 146 million in healthcare expenditures	Save TND 405 million in healthcare expenditures
TND 1.9 billion in indirect economic losses	Prevent TND 5.3 billion in economic productivity losses
Total economic losses equivalent to 1.8% of GDP	Generate economic benefits (TND 5.7 billion) that greatly outweigh the costs of implementation and enforcement of the recommended interventions (TND 90 million) – a 63:1 return on investment

2. Introduction

Tobacco is one of the world's greatest health threats and a main risk factor for non-communicable diseases (NCDs) including cancers, diabetes, chronic respiratory disease and cardiovascular disease. In Tunisia, around 25 percent of the adult population currently uses some form of tobacco product [1], leading to more than 13,200 deaths every year [2]. About 49 percent of those deaths occur among those under age 70 [2].

Alongside the cost to health, tobacco imposes a substantial economic burden. In 2012, worldwide healthcare expenditures to treat diseases and injuries caused by tobacco use totaled nearly six percent of global health expenditure [3]. Further, tobacco use can reduce productivity by permanently or temporarily removing individuals from the labor market due to poor health [4]. When individuals die prematurely, the labor output that they would have produced in their remaining years is lost. In addition, individuals with poor health are more likely to miss days of work (absenteeism) or to work at a reduced capacity while at work (presenteeism) [5], [6].

Tobacco use may displace household expenditure that would otherwise go to fulfilling basic needs, including food and education [7]–[9], and it contributes to hunger and impoverishment among families [10], [11]. It imposes health and socio-economic challenges on the poor, women, youth and other vulnerable populations [12]. Tobacco production causes environmental damage including soil degradation, water pollution and deforestation [13]–[15]. 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 within the context of a whole-of-government and whole-of-society approach.

Current tobacco use prevalence in Tunisia and around the world is incompatible with sustainable development. Through Sustainable Development Goal (SDG) Target 3.4, the 2030 Agenda for Sustainable Development commits Member States 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 Framework Convention on Tobacco Control (WHO FCTC; SDG Target 3.a). Tobacco control is not just a primary means to improve population health, but also a proven approach to reduce poverty and inequalities, grow the economy and advance sustainable development broadly. 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 implementation of the WHO FCTC.

Tunisia ratified the WHO FCTC in 2010 [16]. Tunisia's recognition of the importance of tobacco control predates its signature of the WHO FCTC, having implemented its first tobacco control regulations on advertising and smoking in public places over two decades ago in 1998 [17]. Subsequent legislation and regulations have built on the 1998 law, the most recent being a 2014 order from the Minister of Health mandating warning labels take up at least 30 percent of tobacco product packaging [17]. Additional policy measures can be implemented to reduce demand for tobacco, and existing measures can be strengthened to comply with WHO FCTC obligations.

Intensifying 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 smoking in public spaces, which currently allow for designated smoking areas, and to increase enforcement; health warning labels currently 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.

In 2020, the Convention Secretariat, UNDP and WHO undertook a virtual joint mission to Tunisia to initiate an investment case as part of the FCTC 2030 Project. The FCTC 2030 Project is a global initiative funded by the governments of the UK, Norway, and Australia to support 24 countries to strengthen WHO FCTC implementation to achieve the SDGs. Tunisia is one of these 24 countries receiving dedicated support.

An investment case analyzes the health and economic costs of tobacco use as well as the potential gains from scaled-up implementation of WHO FCTC measures. It identifies which WHO FCTC demand-reduction measures will produce the largest health and economic returns for Tunisia (the return on investment, or ROI). In consultation with the Government of Tunisia, the investment case for Tunisia models the impact of the following seven key WHO FCTC measures:

-  **1 Cigarette taxation to reduce the affordability of tobacco products**
(WHO FCTC Article 6)
-  **2 Bans on smoking in all public places to protect people from tobacco smoke**
(WHO FCTC Article 8)
-  **3 Graphic health warning labels to warn of the dangers of tobacco use**
(WHO FCTC Article 11)
-  **4 Plain packaging¹ of tobacco products**
(WHO FCTC Article 11: Guidelines for implementation and Article 13)
-  **5 Mass media campaigns against tobacco use**
(WHO FCTC Article 12)
-  **6 Bans on tobacco advertising, promotion and sponsorship**
(WHO FCTC Article 13)
-  **7 Reducing tobacco dependence and cessation by training health professionals to provide brief advice to quit smoking** (WHO FCTC Article 14)

Section 3 of this report provides an overview of tobacco control in Tunisia, including tobacco use prevalence as well as challenges and opportunities. **Section 4** summarizes the methodology of the investment case (see Section 8: Methodology Annex and the separate Technical Appendix, available upon request, for more detail). **Section 5** reports the main findings of the economic analysis. **Section 6** details sub-analyses examining equity dimensions of increasing cigarette taxes and the contribution of tobacco control measures to meeting Sustainable Development Goal Target 3.4. The report concludes under **Section 7** with recommendations.

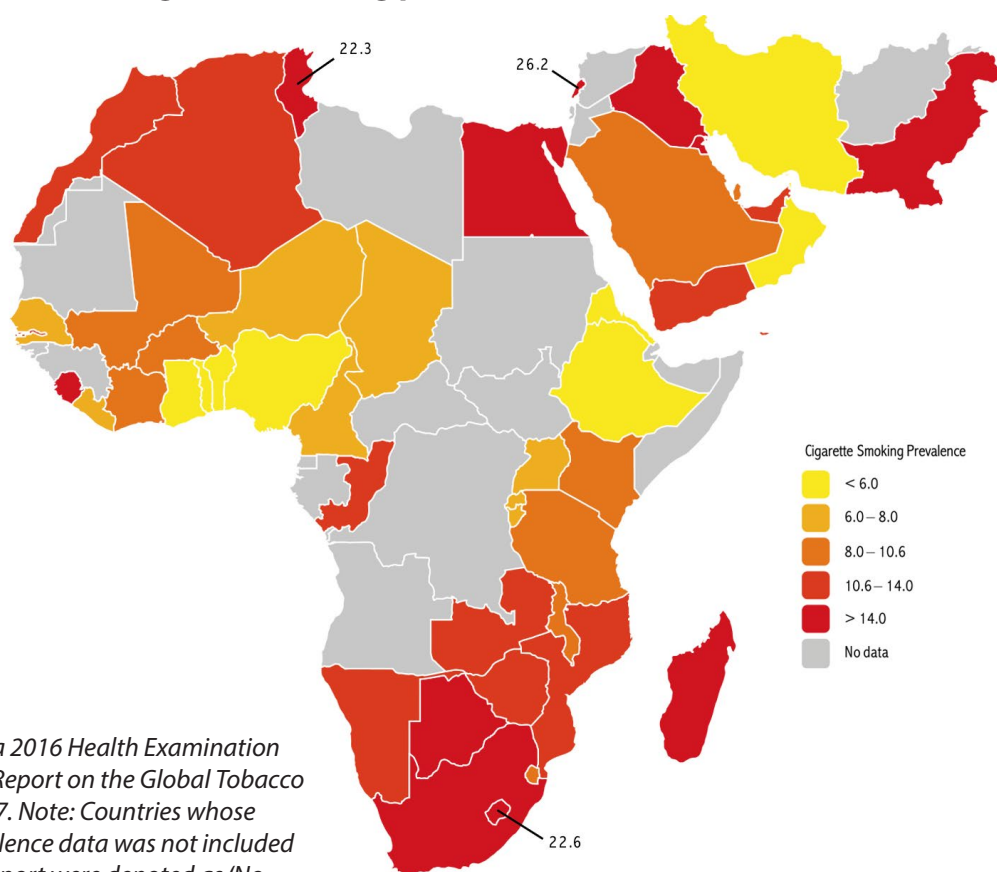
1 Plain (or neutral) packaging requirements prohibit the use of logos, colors, brand images, or promotional information on packaging other than brand names and product names displayed in a standard color and font style.

3. Tobacco control in Tunisia: status and context

3.1 Tobacco use prevalence, social norms and awareness-raising

Efforts to mitigate tobacco as a public health concern have been ongoing in Tunisia for decades, with the first Tunisian tobacco control framework, Law No. 98-17, introduced in 1998 [17]. Despite this, the 2016 Tunisian Health Examination Survey found that 22.3 percent of adults aged 15 and older were current cigarette smokers [1] and that on average smokers consume nearly a pack of cigarettes per day. Cigarette smoking prevalence in Tunisia is significantly higher than almost all other countries in the Eastern Mediterranean and African regions for which comparable estimates are available from the 2019 WHO Report on the Global Tobacco Epidemic, with only Lebanon and Lesotho having a higher prevalence (**Figure 1**) [1], [18]. Tunisian male cigarette smoking prevalence is significantly higher than female prevalence (43.3 and 2 percent, respectively), placing it in the top 10 percent of countries with the highest male smoking prevalence globally [1], [18]. The premature tobacco-attributable mortality rate among Tunisian men has been particularly concerning, as it has increased by about 20 percent since 2010 [19].

Fig. 1: Current adult cigarette smoking prevalence, Africa and Eastern Mediterranean regions



Source: Tunisia 2016 Health Examination Survey; WHO Report on the Global Tobacco Epidemic, 2017. Note: Countries whose tobacco prevalence data was not included in the WHO Report were denoted as 'No data'.

Fewer than 2 percent of Tunisians use either hookah or smokeless tobacco [1]. Consumption of smokeless tobacco is correlated with socioeconomic status and level of education – smokeless tobacco prevalence was found to be nonexistent in the wealthiest households, and less than one percent for those with higher levels of education, compared to 6.5 percent of those with no education [1].

The 2017 Global Youth Tobacco Survey (GYTS) demonstrates the need for increased tobacco control measures targeting Tunisian youth. According to the 2017 Global Youth Tobacco Survey (GYTS) in Tunisia, 1 in 10 students aged 13-15 years old currently smoke tobacco, and among students 13-15 years old who smoke cigarettes, 76.1 percent reported that they were able to purchase cigarettes – despite their age – within the past 30 days. Tunisian youth are also passively exposed to tobacco smoke. Nearly half of the students in the 2017 GYTS reported being exposed to secondhand smoke at home, and 3 in 5 students were exposed in enclosed public places [20]. One-quarter of students believed that smoking is not harmful, pointing to a need for increased awareness among Tunisian youth [20].

Tunisian smokers have significantly poorer health-related quality of life than their non-smoking counterparts across indicators such as frequency of binge drinking, anxiety and depression, and level of physical activity [21]. They are also more likely to engage in risky health behaviors, and likely to underestimate their relative risk of developing cancer, or engaging in ‘risk denial’ [21]. However, the majority of adult and youth smokers express a desire to quit. More than half of adult smokers have made at least one quit attempt, while about seven in ten youth smokers attempted to quit in the past year [1], [20]. This suggests that a supportive cessation environment alongside stronger tobacco control measures may assist users in fulfilling their goals.

3.2 The status of FCTC tobacco control demand-reduction measures

Strong fiscal and regulatory measures powerfully influence societal norms by signaling to the population that tobacco use is harmful, not just for users but also for the people around them—including family, colleagues and workers. While Tunisia has implemented some tobacco control measures, nearly 2 million people continue to use tobacco [1].

The first legal framework for tobacco control in Tunisia was outlined in Law No. 98-17 in 1998, which contains provisions regulating direct advertisements and smoking in public places [21]. This was supplemented by Decree No. 98-2248 of the same year, which expanded smoke-free public places [23], and by Decree No. 2009-2611 in 2009, which further regulated smoking in restaurants and tourism establishments [24].

While Tunisia is fulfilling some obligations under the WHO FCTC, implementing additional measures – or intensifying existing ones – can draw Tunisia into closer alignment with treaty requirements and contribute to ending the epidemic of tobacco use. The section below summarizes the status of existing tobacco control measures in Tunisia and the WHO FCTC target advocated for – and analyzed within – the investment case.



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

Cigarettes in Tunisia are more affordable than in 60 percent of countries worldwide [18]. As of 2018, excise taxes (ad valorem and specific) comprised about 43 percent of the retail price of the most sold brand of cigarettes [16]. Additional taxes (value added tax [VAT] and an employment fund tax) layered so that together taxes comprised 72 percent of the retail price [16]. After consecutive years of stable cigarette prices, in March 2020 the Ministry of Finance announced about a 10 percent increase in prices of cigarettes [25]. The WHO recommends that taxes represent at least 75 percent tax of the retail price of tobacco products, with at least 70 percent of the retail price comprised of the specific excise tax. To meet – and exceed – these goals, the investment case examines the impact of continued tax increases that generate real increases averaging about 10 percent annually through 2035.



Implement and enforce bans on smoking in all public places to protect people from tobacco smoke (WHO FCTC Article 8)

Tunisia's Decree No. 98-2248 restricts smoking in many public places, such as schools, healthcare facilities, religious establishments, and government buildings [17]. However, designated smoking areas are allowed. While there is a system to field and investigate complaints related to smoke-free laws, there are no government funds dedicated to the enforcement of these policies [16]. Permitting smoking in designated areas does not protect individuals—including workers in the hospitality industry—from passive smoke exposure. Moreover, permitting smoking in designated areas signals the acceptability of smoking as a social norm [23]. The investment case examines the impact of enacting a complete ban on smoking in all public places, with high levels of enforcement.



Mandate that tobacco products and packaging carry large graphic health warnings describing the harmful effects of tobacco use (WHO FCTC Article 11)

Tunisian law mandates that cigarette packages must contain a clear, legible warning that covers 30 percent of the principal display area [17]. The composition of tobacco products, including nicotine and tar contents, must also be mentioned in the packaging in both Arabic and another language [17]. However, the law does not mandate graphic warnings (only requiring one textual health warning) and health warnings are not required to be rotated, allowing for the possibility that warnings may lose their saliency over time [16]. The investment case examines the impact of mandating that at least 50 percent of all tobacco packages are covered with graphic warning labels that are rotated on a regular basis.



Mandate plain packaging of all tobacco products (WHO FCTC Guidelines for Articles 11 and 13)

Plain packaging – neutral colors, without branding and logos – is not included in Tunisia’s existing tobacco control legislation. The investment case models the impact of implementing and enforcing plain packaging requirements.



Promote and strengthen public awareness about tobacco control issues and the harms of tobacco use through mass media information campaigns (WHO FCTC Article 12)

Public information campaigns can increase awareness of the harms of tobacco use. Although Tunisia recently ran a national anti-tobacco mass media campaign, it did not include all of the components recommended by WHO, such as including pre-testing of materials, researching the target audience, and evaluating the impact of the campaign [26]. Launching – and sustaining – best-practice mass media campaigns (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, promotion, and sponsorship (WHO FCTC Article 13)

Tunisia bans tobacco advertising on national and international TV and radio, local publications, and billboard and outdoor advertising [16], [26]. Bans on indirect tobacco advertising through product placement in TV and films, promotional discounts, and free distribution also exist, with varying levels of enforcement [16]. Other forms of advertising and promotion – such as point of sale displays, internet advertising, and most forms of sponsorship – are not regulated. The investment case models the impact of implementing and enforcing a comprehensive ban on tobacco advertising, promotion, and sponsorship (TAPS).



Provide support for reducing tobacco dependence and cessation: Offer brief advice to quit at the primary care level (WHO FCTC Article 14)

Smoking cessation support is available in most health clinics, primary care facilities and hospitals [16]. However, among healthcare professionals there are lingering misperceptions that lower tar and nicotine cigarettes are less harmful and about the strength of the evidence of the link between tobacco and cancer [17], which may affect their willingness and ability to provide smoking cessation advice and recommend nicotine replacement therapy (NRT). Indeed, nearly 95 percent of smokers attempt to quit without supportive services [1]. Cessation advice from trained providers can motivate individuals to quit or increase quit attempts. The investment case examines the impact of expanding training for health providers to offer cessation advice in primary care settings.

Table 1 summarizes the existing state of WHO FCTC demand-reduction measures and compares them against the WHO FCTC target for each measure. Reaching the WHO FCTC targets can further reduce tobacco consumption and its development impacts. 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 Tunisia and modeled WHO FCTC targets

Tobacco Control Policy	Tunisia Baseline*	Modeled WHO FCTC Target
Increase tobacco taxation to reduce the affordability of tobacco products (WHO FCTC Article 6)	As of 2018, tax share equivalent to 72 percent of the retail price of the most sold cigarette brand (ad valorem and specific excise taxes comprise about 43 percent of the price).	Increase taxes on cigarettes to at least 75 percent of the retail price and the excise tax share to at least 70 percent by 2035. Implement regular tax increases to outpace inflation and income growth.
Implement and enforce bans on smoking in all public places to protect people from tobacco smoke (WHO FCTC Article 8)	Smoking is <i>restricted</i> in many public places, but designated smoking areas are allowed. No complete bans on smoking in public places exist.	Implement legislation banning smoking in all public places, with high levels of enforcement to drive compliance.
Mandate that tobacco products and packaging carry large graphic health warnings describing the harmful effects of tobacco use (WHO FCTC Article 11)	Textual health warnings are required to cover at least 30 percent of cigarette packages.	Mandate that graphic health warning labels cover at least 50 percent of tobacco packaging and that labels regularly rotate to ensure continued impact.
Mandate plain packaging of all tobacco products (WHO FCTC Article 11: Guidelines and Article 13)	Plain packaging is currently not mandated.	Implement and enforce plain packaging of tobacco products.
Promote and strengthen public awareness about tobacco control issues and the harms of tobacco use through mass media information campaigns (WHO FCTC Article 12)	A national anti-tobacco media campaign recently aired in Tunisia; however, it did not include all WHO-recommended “best-practice” components.	Sustained national anti-tobacco mass media campaigns that are researched and tested with a targeted audience and evaluated for impact.
Enact and enforce a comprehensive ban on all forms of tobacco advertising sponsorship and promotion (WHO FCTC Article 13)	Most forms of domestic and international tobacco advertising are banned (e.g. TV, radio, billboards, print). However, other forms of tobacco advertising, promotion and sponsorship—such as point-of-sale displays and internet advertising—are not banned.	Enact and enforce a comprehensive ban on all forms of tobacco advertising, promotion and sponsorship.
Provide support for reducing tobacco dependence and cessation: Offer brief advice to quit at the primary care level (WHO FCTC Article 14)	Smoking cessation support is available in some healthcare facilities and hospitals.	Expand training of health providers to identify tobacco users and to provide tobacco cessation advice; scale up the provision of tobacco cessation services at the primary care level.
* Information in this column is taken from the Tunisia WHO Tobacco Country Profile [16].		

3.3 Tobacco use and the COVID-19 pandemic

The global COVID-19 pandemic is straining health systems worldwide, and the economic impact of the outbreak is immense. People living with pre-existing NCDs, including those caused by tobacco use, are likely more vulnerable to becoming severely ill with COVID-19 [27]. According to WHO, smokers have up to a 50 percent increased risk of developing severe disease or dying from COVID-19. However, more research needs to be conducted. Well-designed population-based studies are, however, necessary to address questions about hospitalization, COVID-19 severity and the risk of infection by SARS-CoV-2 among smokers [28].

3.4 The tobacco industry in Tunisia

Tobacco industry interference in policymaking is a leading threat to tobacco control worldwide. In Tunisia, the state-owned company Régie Nationale des Tabacs et des Allumettes (RNTA) has a monopoly of the tobacco sector. RNTA manufactures its own products, owns the exclusive right to import and resell international tobacco products and has monopoly on the wholesale market of tobacco products. At the time of writing, around 90 percent of tobacco products consumed in Tunisia are of domestic origin and 10 percent are imported [29]. RNTA may also import and distribute vaping devices and e-cigarettes [30]. According to 2021 data, the company owns two production sites and employs 2,000 employees in total [29]. RNTA employees are unionized and have shown readiness to strike if they consider a proposed policy position detrimental. For example, there was a strike when privatization of the company and tobacco price increases were discussed in 2017 [31]. By contrast, the international tobacco industry appears to have relatively little power in Tunisia, given RNTA's monopoly. British American Tobacco (BAT), Philip Morris International (PMI), and Japan Tobacco International occupy just small physical premises in country [32], [33].

It is entirely possible to make powerful progress in WHO FCTC implementation in contexts with a large state-owned tobacco industry presence. For example, Ethiopia has a state-owned National Tobacco Enterprise (of which Japan Tobacco International now owns a majority stake), but in 2019, it passed one of the strongest tobacco control legislations in Africa [34]. Effective leadership and governance are key in such circumstances to firmly direct national discussions towards a strong health position and to ensure that formal discussions take place within a dedicated national coordinating mechanism so as to achieve full transparency [35]. In addition to requirements covering core WHO FCTC demand-reduction measures, Ethiopia's new law regulates interactions of government officials with the tobacco industry following the recommendations of the Guidelines for implementation of Article 5.3 of the Convention [34].

3.5 Illicit trade

Illicit trade poses a serious threat to tobacco tax revenue. In 2013, the World Bank found that informal cigarette trade for Tunisia likely occurs at the border with Algeria and not Libya [36]. The Bank's report found that in one border region with Algeria about 7 percent of all vehicles traffic cigarettes, and that international brand cigarettes are priced five times higher in Tunisia than in Algeria. In the study, a trade union leader of RNTA states that about 40 percent of revenue collected from cigarettes, or 500 million TND, are lost due to informal trade [36]. Illicit trade reduces the benefits of tobacco tax increases because it enables tobacco consumers to switch to more inexpensive products readily available on the market. Tobacco taxation can be optimized to reduce the risks of illicit trade and consumers substituting products, for example through uniform specific excise taxes alongside strong customs and excise tax administration, steps to address tobacco industry interference, high-level commitment, and strong tobacco control governance generally. The adoption and implementation of the Protocol to Eliminate Illicit Trade in Tobacco Products are particularly important steps to take. Tunisia signed the protocol in 2013 but has yet to ratify it [37].

3.6 National multisectoral tobacco control planning and coordination

Effective multisectoral planning and coordination for tobacco control, in line with WHO FCTC Article 5, are critical to virtually all WHO FCTC obligations including those modeled in the investment case. They are particularly important in contexts where the tobacco industry is government-owned. In Tunisia, the Ministry of Health (MoH) has led efforts to reduce tobacco consumption [38]. The MoH funds and oversees the national tobacco control programme which is integrated into its National Multisectoral Strategy for Prevention and Control of NCDs 2018-2025. A national multisectoral committee for tobacco control has been created under the coordination of MoH, in partnership with the Ministry of Finance (MoF), Ministry of Commerce, Ministry of Interior (MoI), Ministry of Education (MoE) and civil society organizations. The MoI and MoH are responsible for enforcing existing tobacco control laws and rules. The Ministry of Finance (MoF) is responsible for setting prices, taxes, and import duties for tobacco products; as a result, it can impact the volume of imported goods and competitiveness of locally-produced tobacco products. MoF holds two seats on the governing board of RNTA. Various non-profit organisations have supported Tunisia's tobacco-related interventions through educational actions and campaigns in the general population [39]. These include La Société Tunisienne de Pneumologie, La Ligue Nationale de Lutte contre la Tuberculose et les Maladies Respiratoires, l'Association Tunisienne de Lutte contre le Cancer (ATCC), and the Direction des Soins de Santé de Base (DSSB). Direction de la Médecine Scolaire et Universitaire (DMSU) has supported tobacco interventions in schools [16].

4. Methodology

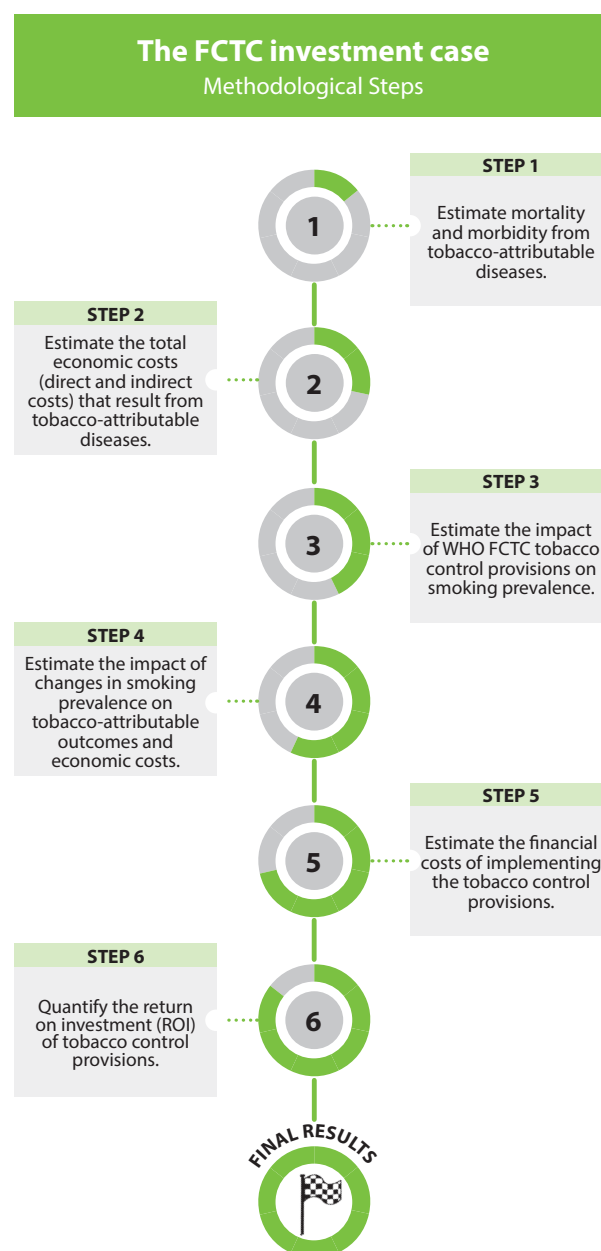
The purpose of the investment case is to quantify the current health and economic burden of tobacco use in Tunisia (in the context of tobacco control measures that are currently in place) and to estimate the impact that implementing new tobacco control measures – or intensifying existing ones – would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

RTI International developed a static model 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*² for a more thorough account of the methodology. The investment case team worked with stakeholders in Tunisia to collect national data inputs for the model. Where data was unavailable from government or other in-country sources, the team utilized publicly available national, regional, and global data from sources such as the WHO, the World Bank database, the 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 Tunisian dinars (TND) and discounted at an annual rate of 5 percent.

Fig. 2: Building the FCTC investment case



5. Results

5.1 The current burden of tobacco use: health and economic costs³

Tobacco use undermines economic growth. In 2019, tobacco use caused more than 13,200 deaths in Tunisia, 49 percent of which occurred among those under 70 years. These deaths amount to 217,600 years of life lost, which are lost years in which many of those individuals would have contributed to the workforce. The economic losses in 2019 due to tobacco-related premature mortality are estimated at TND 1.6 billion.

While the costs of premature mortality are high, the consequences of tobacco use begin long before death. As individuals suffer from tobacco-attributable diseases (e.g. heart disease, strokes, cancers), expensive medical care is required to treat them. Spending on medical treatment for illnesses caused by smoking cost the Government TND 84.5 million in 2019 and caused Tunisian citizens to spend TND 56.9 million in out-of-pocket (OOP) healthcare expenditures. Private insurance and non-profit institutions serving households spent TND 4.9 million on treating tobacco-attributable diseases in 2019. In total, healthcare expenditures attributable to smoking amounted to TND 146.3 million.

In addition to healthcare costs, as individuals 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 TND 51.6 million and the cost of presenteeism due to cigarette smoking was TND 139.4 million.

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 [40]. If ten minutes of time is valued at the average statutory minimum wage, the compounding impact of 1.2 million employed smokers taking ten minutes per day for smoke breaks is equivalent to losing TND 98.7 million in productive output annually. In total, tobacco use caused TND 2 billion⁴ in economic losses in 2019, equivalent to about 1.8 percent of Tunisia's 2019 GDP. **Figure 3** breaks down direct and indirect costs. **Figure 4**, **Figure 5** and **Figure 6** illustrate the annual health losses that occur due to tobacco use.

³ In assessing the current burden of tobacco use, the economic costs of premature mortality include the cost of premature deaths due to any form of exposure to tobacco (including smoking, second-hand smoke, and the use of other types of tobacco products). Only smoking-attributable (not tobacco-attributable) costs are calculated for healthcare expenditures, absenteeism, presenteeism, and smoking breaks. While other forms of tobacco may also cause losses in these categories, no data is available to precisely ascertain those losses.

⁴ Component parts may not add to TND 2 billion exactly due to rounding.



The current burden of tobacco use

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

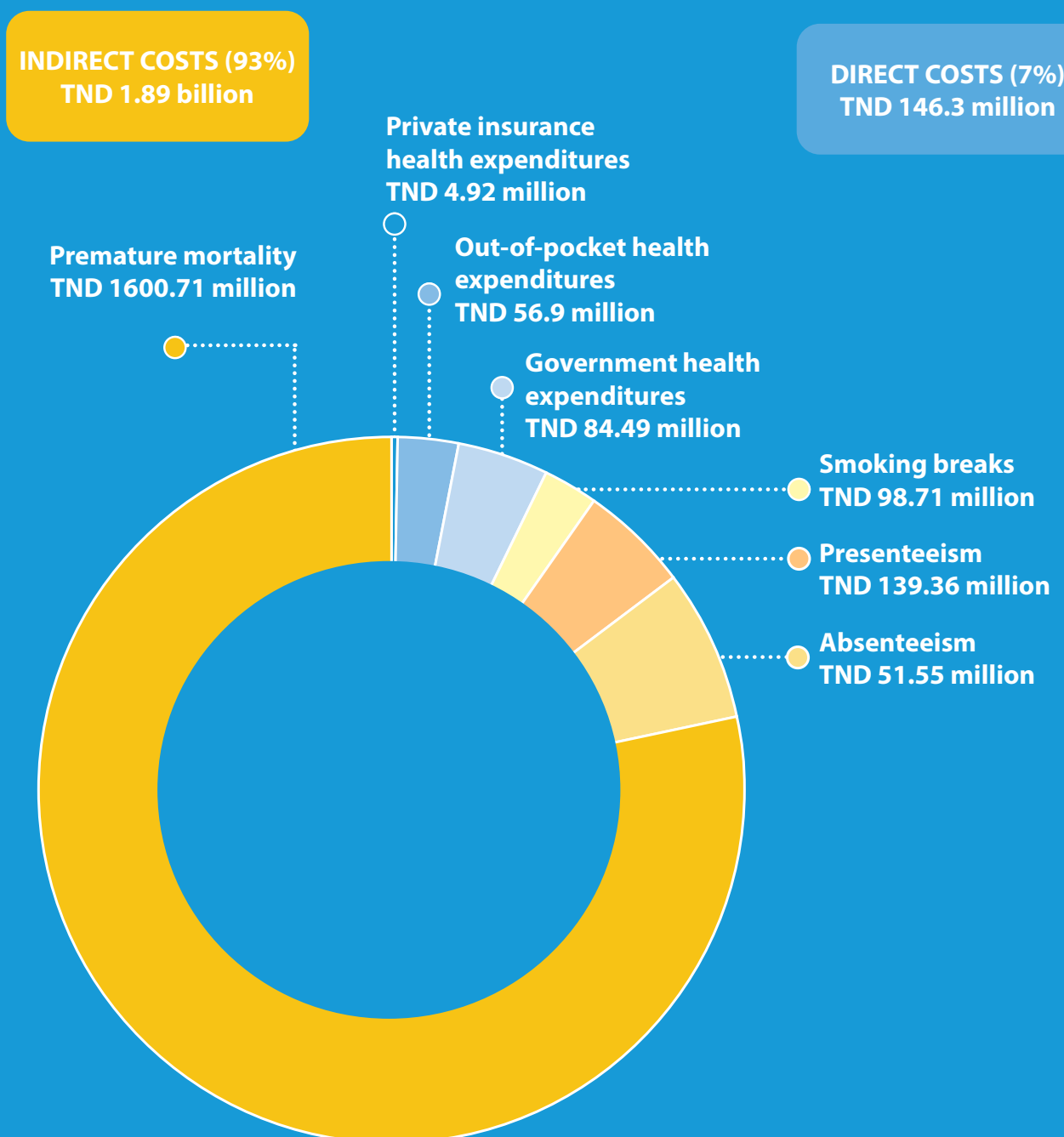


Fig. 4: Tobacco-attributable deaths by disease in Tunisia, 2019 (Results are from the IHME Global Burden of Disease Results Tool. Other causes include colon and rectum cancer, stomach cancer, asthma, pancreatic cancer, lip and oral cavity cancer, leukemia, nasopharynx cancer, esophageal cancer, peptic ulcer disease, aortic aneurysm, breast cancer, liver cancer, prostate cancer, kidney cancer, tuberculosis, other pharynx cancer, atrial fibrillation and flutter, cervical cancer, gallbladder and biliary diseases, peripheral artery disease, and multiple sclerosis).

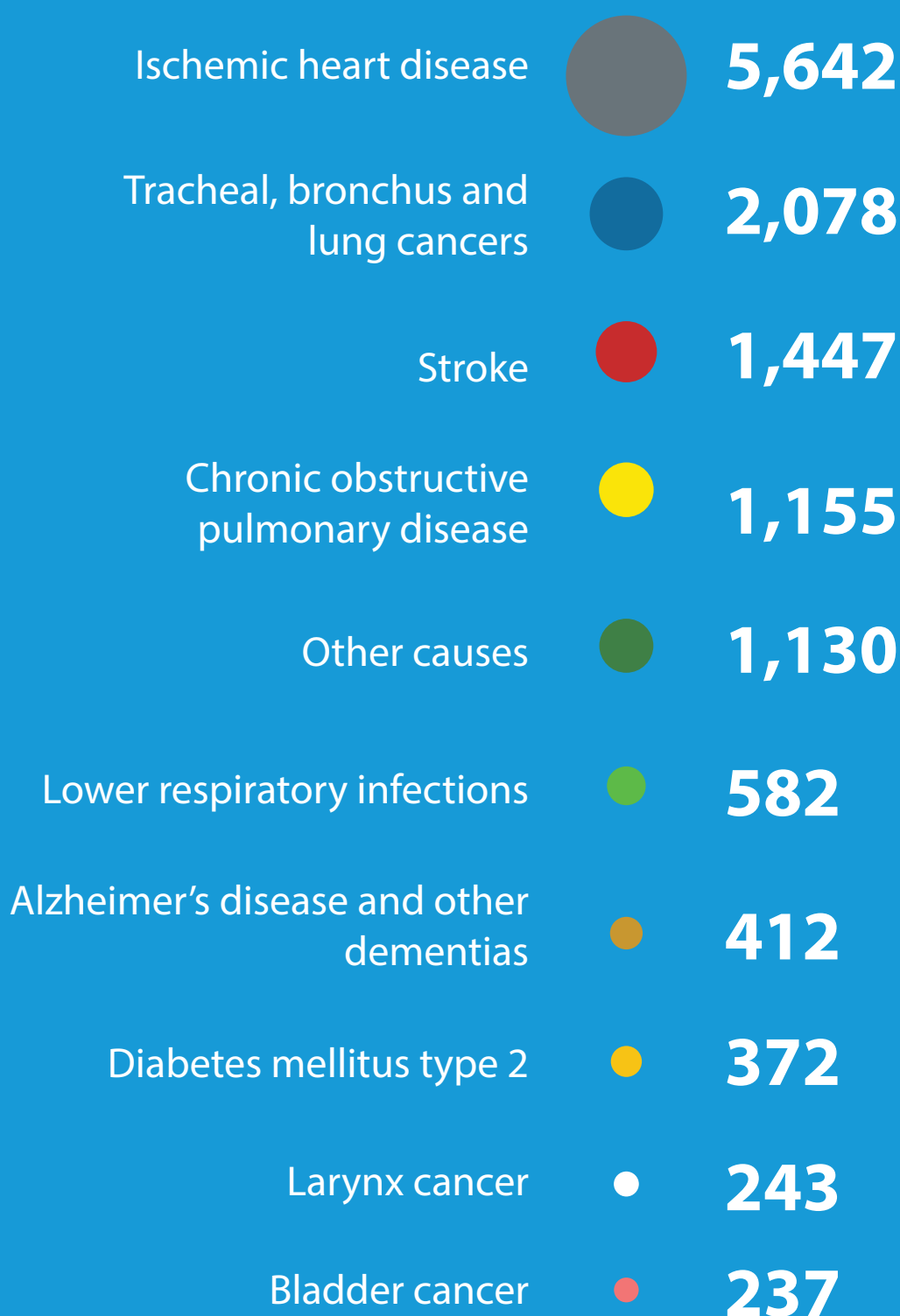
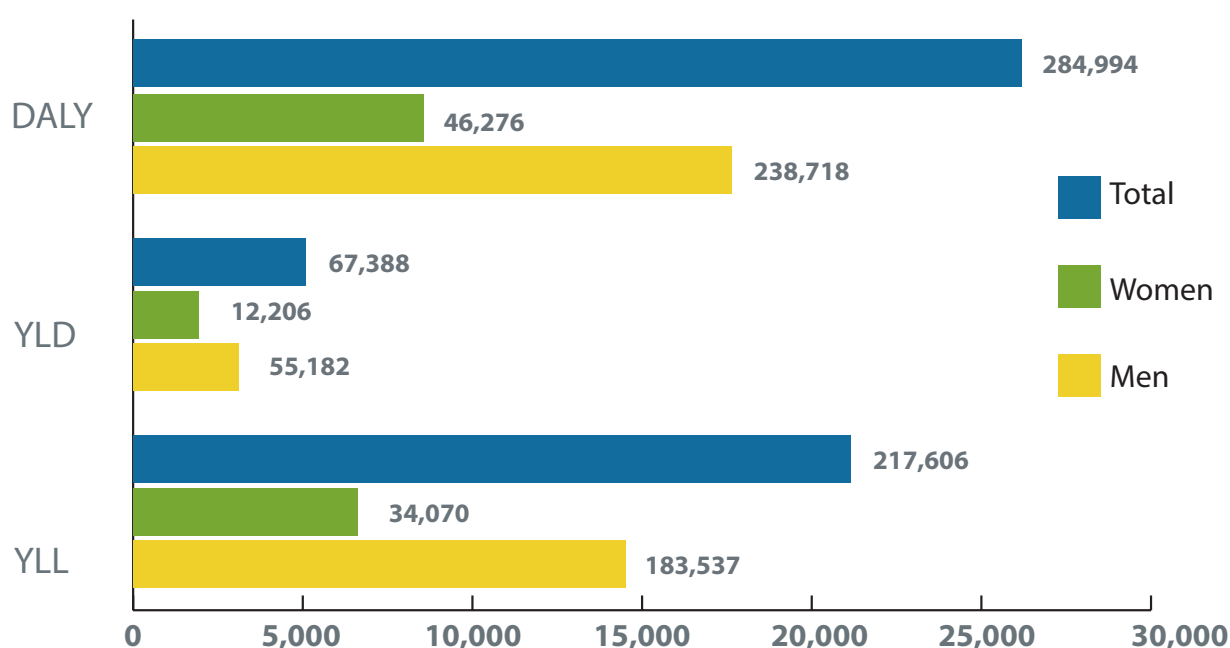
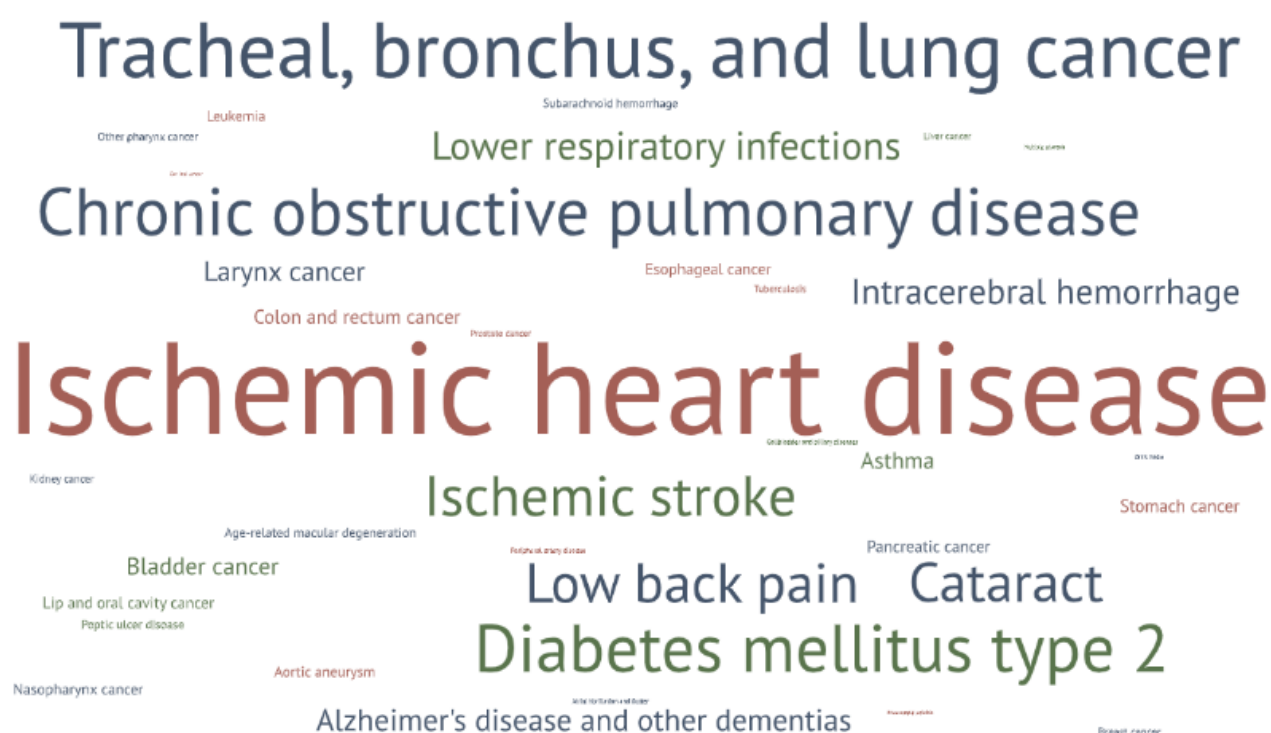


Fig. 5: Tobacco-attributable DALYs, YLDs and YLLs in Tunisia, by sex,⁵ 2019**Fig. 6: Tobacco-attributable disability-adjusted life years (DALYs) in Tunisia, by cause (word sizes relative to their burden)⁶**

5 DALY refers to 'disability-adjusted life year', YLD refers to 'years lived with disability' and YLL refers to 'years of life lost'. 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/fdq#What%20is%20a%20DALY?>>

6 Size of words representative of the number of DALYs resulting from that disease.

5.2 Implementing policy measures that reduce the burden of tobacco use

Implementing new tobacco control measures – or intensifying and better enforcing existing ones – can reduce the national burden from tobacco use. Through these actions, Tunisia can secure significant health and economic returns, and begin to reduce the TND 2 billion in annual direct and indirect 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 cigarette taxation to reduce the affordability of tobacco products; 2) implement bans on smoking in public spaces; 3) implement graphic warning labels; 4) implement plain packaging of tobacco products; 5) strengthen mass media campaigns against tobacco use to ensure they meet WHO “best practice” criteria and sustain campaigns over time; 6) expand and enforce bans on tobacco advertising, promotion and sponsorship; and 7) support reducing tobacco dependence and cessation by training 50 percent of primary care health professionals to provide brief advice to quit smoking.

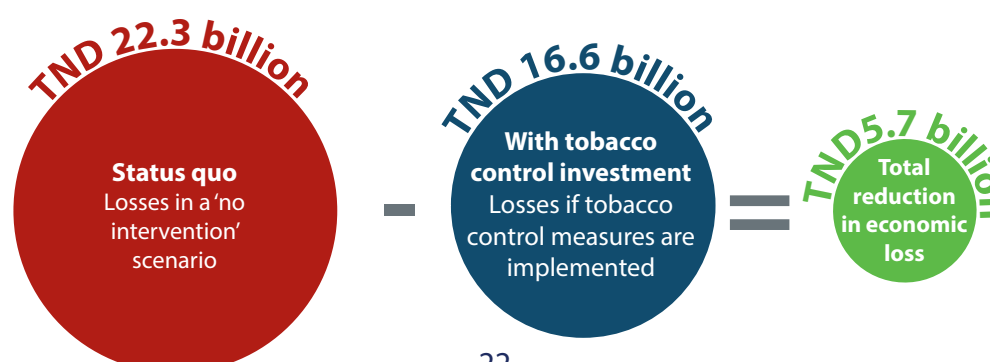
5.3 Health benefits—lives saved

Putting in place the full package of tobacco control measures (inclusive of all seven of the measures listed above) would lower the prevalence of tobacco use, leading to substantial health gains now and into the future. Specifically, enacting the package would reduce the prevalence of cigarette smoking by 46 percent (in relative terms) over 15 years, saving 55,500 lives from 2021-2035, or 3,700 lives annually.

5.4 Economic benefits—costs averted

Implementing the tobacco control policy package would result in Tunisia avoiding 25 percent of the economic loss that it is expected to incur from tobacco use over the next 15 years. **Figure 7** illustrates the extent to which Tunisia can shrink the economic losses it is expected to incur under the status quo.

Fig. 7: Tobacco-related economic losses over 15 years: What happens if Tunisia does nothing else versus if the Government strengthens tobacco control measures to reduce demand for smoking?

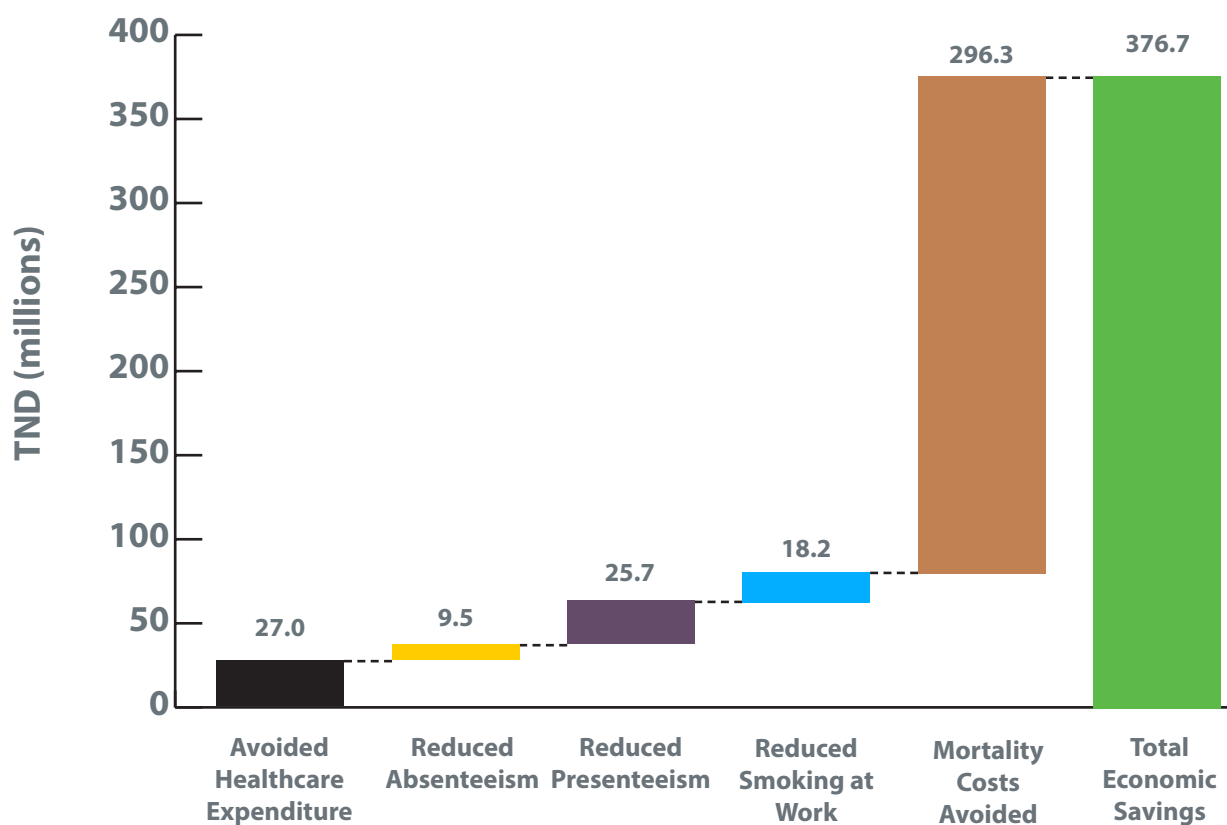


In total, over 15 years Tunisia would save about TND 5.7 billion that would otherwise be lost if it does not implement the recommended package of tobacco control measures. These avoided costs are equivalent to about TND 376.7 million in annual avoided economic losses.

With better health, fewer individuals need to be treated for complications from disease, 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. Laborers 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 smoke breaks are taken in the workplace.

Figure 8 breaks down the sources from which annual avoided costs accrue because of implementing the tobacco control policy package. The largest annual avoided costs result from averted premature mortality (TND 296.3 million). The next highest source comes from avoided healthcare expenditures (TND 27 million), followed by reduced presenteeism (TND 25.7 million), reduced numbers of smoking breaks (TND 18.2 million), and reduced absenteeism (TND 9.5 million).

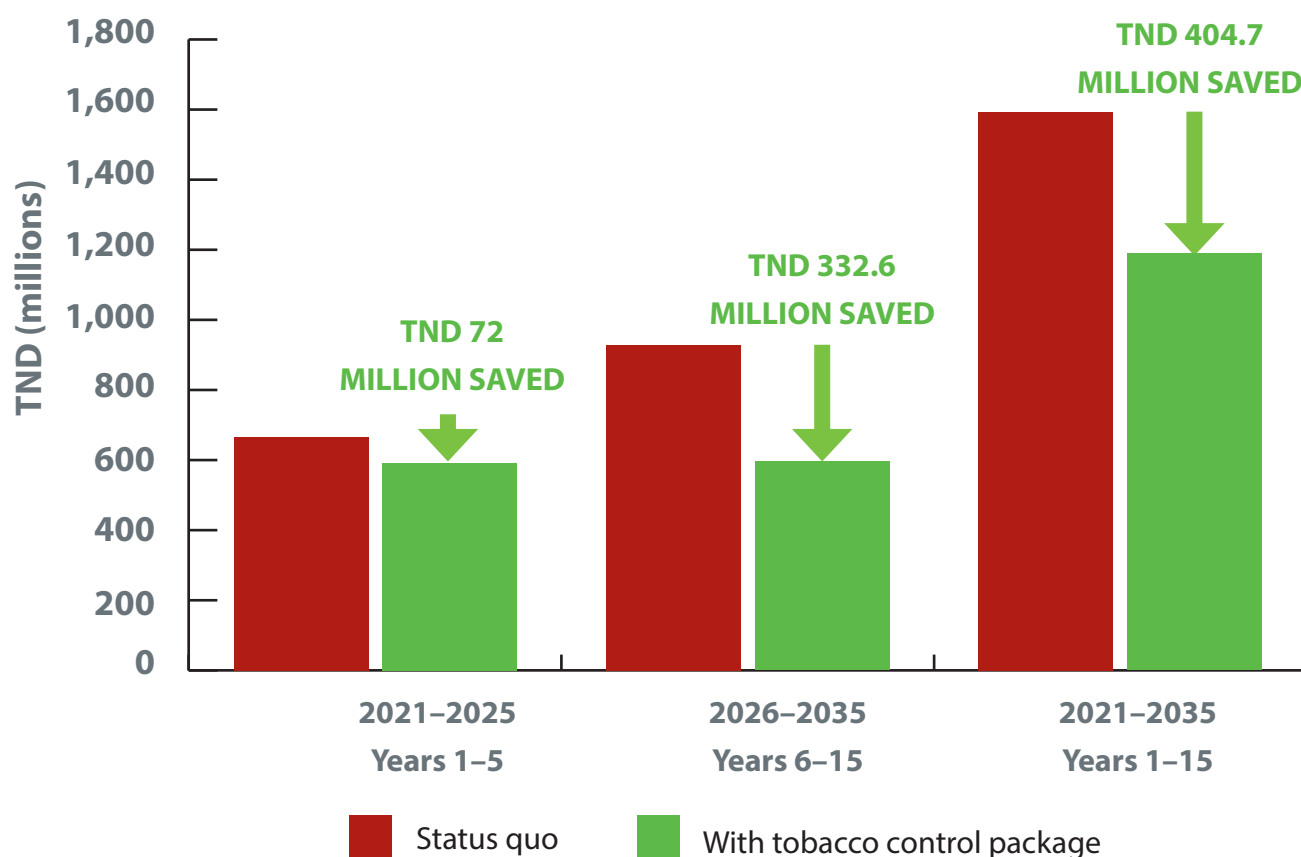
Fig. 8: Sources of annual avoided economic costs as a result of implementing the tobacco control policy package



Implementing the package of tobacco control measures reduces medical expenditure for citizens and the Government. Presently, total private and public annual healthcare expenditures in Tunisia is about TND 7.7 billion [41], 1.9 percent of which is directly related to treating disease and illness due to tobacco use ($\approx$ TND 146.3 million) [3].

Year-on-year, the package of interventions lowers tobacco use prevalence, which leads to less illness, and consequently less healthcare expenditure (see **Figure 9**). Over the 15-year time horizon of the analysis, the package of interventions averts TND 404.7 million in healthcare expenditures, or TND 27 million annually. Of this, 58 percent of savings accrue to the Government and 39 percent accrue to individual citizens who would have had to make out-of-pocket payments for healthcare. The remainder of savings goes to private insurance and other sources of healthcare expenditure. Thus, from reduced healthcare costs alone, the Government stands to save about TND 233.7 million over 15 years. Simultaneously, the Government would successfully reduce the health expenditure burden that tobacco imposes on Tunisia's citizens, supporting efforts to reduce economic hardship on families. Rather than spending on treating avoidable diseases and routinely spending on tobacco products, these families would be able to invest more in nutrition, education and other productive inputs to secure a better future.

Fig. 9: Private and public healthcare costs (and savings) over the 15-year time horizon



5.5 The return on investment

An investment is considered worthwhile from an economic perspective if the gains from making it outweigh the costs. A return on investment (ROI) analysis measures the efficiency of the tobacco control investments by dividing the economic benefits that are gained from implementing the WHO FCTC tobacco control investments by the costs of the investments. For the Tunisia 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 and beyond the SDGs. The ROI shows the return on investment for each intervention, and for the full package of measures. Total benefits are a measure of which interventions are expected to have the largest impact.

Table 2 displays costs, benefits, and ROIs by intervention, as well as for all interventions combined. 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 will gain economic benefits anywhere from 0.6 to 179 times its investment. 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 (TND billions)

Return on investment, by tobacco control measure	First 5 years (2021–2025)			All 15 years (2021–2035)		
	Total Costs (billions)	Net Benefits (billions)	ROI	Total Costs (billions)	Net Benefits (billions)	ROI
Tobacco control package* (all policies/interventions implemented simultaneously)	38.4	1,006.6	26	89.7	5,650.7	63
Raise cigarette taxes (WHO FCTC Art. 6)	2.9	516.5	179	6.1	3,036.8	500
Protect people from tobacco smoke (WHO FCTC Art. 8)	5.9	190.3	32	12.1	1,318.1	109
Graphic warning labels (WHO FCTC Art. 11)	2.8	143.1	51	6.1	996.6	163
Plain packaging (WHO FCTC Art. 11 & 13)	2.8	48.0	17	6.1	337.7	55
Mass media campaigns (WHO FCTC Art. 12)	4.1	81.2	20	9.9	569.2	58
Bans on advertising, promotion, and sponsorship (WHO FCTC Art. 13)	2.8	158.0	57	6.2	1,098.2	178
Cessation: brief advice to quit (WHO FCTC Art. 14)	13.2	7.4	0.6	34.4	95.4	3

* The combined impact of all interventions is not the sum of individual interventions. To assess the combined impact of interventions, following Levy and colleagues' (2018), "effect sizes [are applied] as constant relative reductions; that is, for policy i and j with effect sizes PR_i and PR_j, (1-PR_i) x (1-PR_j) [is] applied to the current smoking prevalence" [42]. 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 program.

Over the 15-year period, raising cigarette taxes is expected to have the highest return on investment (500:1).⁷ Enacting and enforcing bans on tobacco advertising, promotion and sponsorship is expected to have the next highest return on investment (178:1), followed by graphic warning labels (163:1), bans on smoking in public places (109:1), anti-tobacco mass media campaigns (58:1), implementing plain packaging of tobacco products (55:1), and cessation by training health professionals to provide brief advice to quit smoking (3:1). Return on investment (ROI) results represent an amalgamation of local factors that affect the costs and benefits of a given intervention or package of interventions. These include a country's existing service package and policies as well as its plans for expansion of services. The results of the investment case analysis in Tunisia show a high ROI relative to many other countries. There are several reasons for this, including an initially high smoking prevalence that leaves room for high gains to be achieved and relatively high overall healthcare expenditures that lead to higher tobacco-attributable healthcare costs.

7 Rounded to the nearest whole number.

6. Examining additional impacts: Equity and the SDGs

The investment case examines how increasing cigarette taxes would benefit lower-income smokers in Tunisia, driving equity, and contributions that stronger WHO FCTC implementation (SDG Target 3.a) would make toward Tunisia's fulfillment of the SDGs more broadly including Target 3.4 on reducing premature mortality from NCDs by one-third by 2030.

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

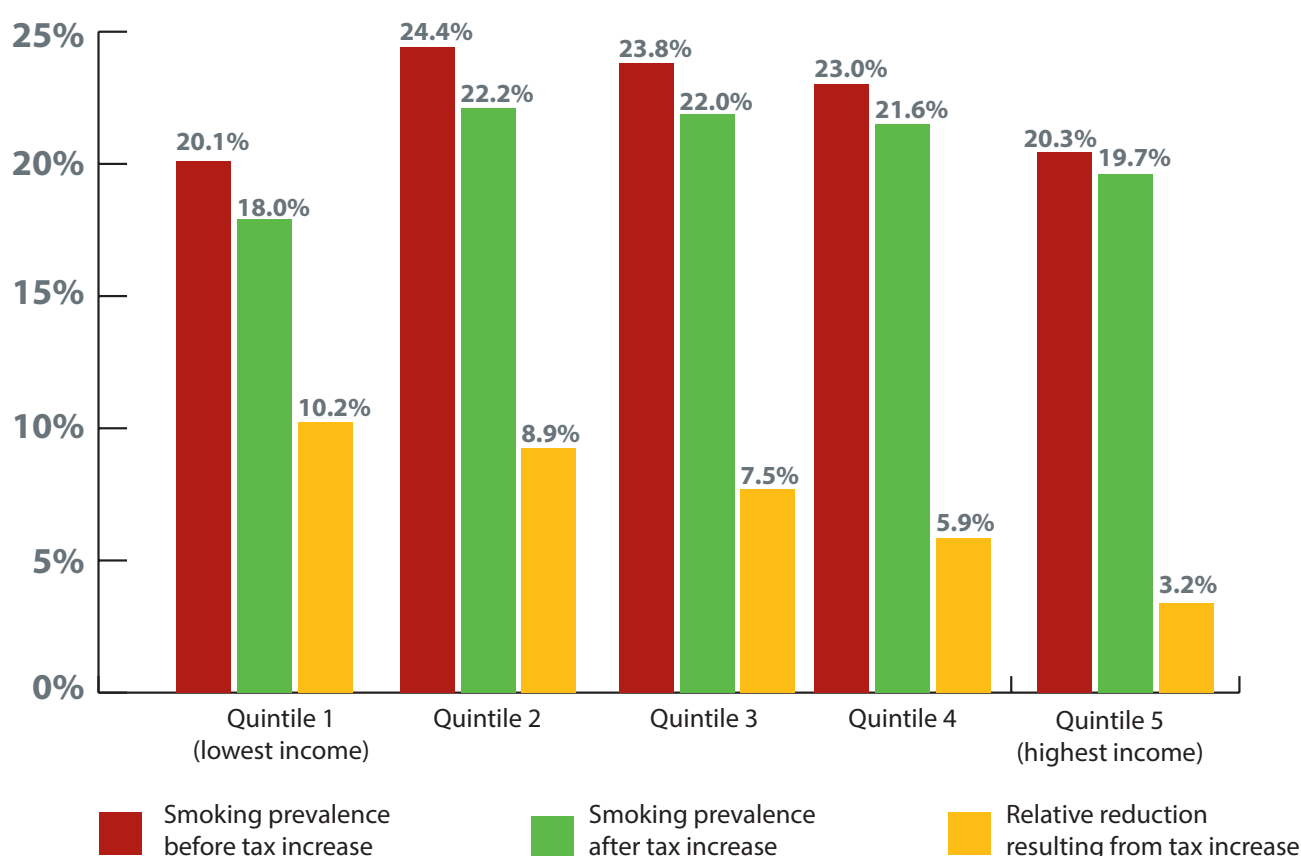
A common misperception is that taxes on tobacco products may disproportionately harm poor tobacco users, since the tax burden represents a higher proportion of their income than that of wealthier tobacco users. However, evidence shows that the poor actually stand to benefit most from raised cigarette taxes [43]. Relative to richer smokers, poorer smokers are more likely to quit smoking when taxes are increased [44], meaning they benefit from subsequent decreases in tobacco-related health problems, and resulting medical costs which can be financially catastrophic. In Lebanon [45], for example, a 50 percent increase in cigarette prices was projected to prevent 23,000 new cases of poverty over 50 years, and that same level of increase was found to avert 2.1 million catastrophic health expenditures in India, 440,000 in Bangladesh, and 250,000 in Vietnam [46].

To examine the extent to which a cigarette tax increase could be considered pro-poor in Tunisia, the investment case undertakes an equity analysis. The analysis divides Tunisia'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 29 percent (TND 0.8, or about US\$ 0.30). This is representative of the first year of tax increases that are modeled in the investment case. Average tobacco-income prevalence elasticities of demand from a set of low- and middle-income countries are employed to assess how different economic groups react to changes in price.

In Tunisia, there are not large differences in cigarette smoking prevalence between income quintiles, though those in the second poorest income quintile smoke at the highest rate (24.4 percent) [1].⁸ The results from the analysis show that all income quintiles reduce smoking in response to the tax measures, but because people with lower incomes are more responsive to changes in price, the cigarette tax increase causes the largest drop in prevalence among the poorest income quintiles.

Figure 10 shows the smoking prevalence in each income quintile before and after the tax increase, as well as the relative change in smoking prevalence.

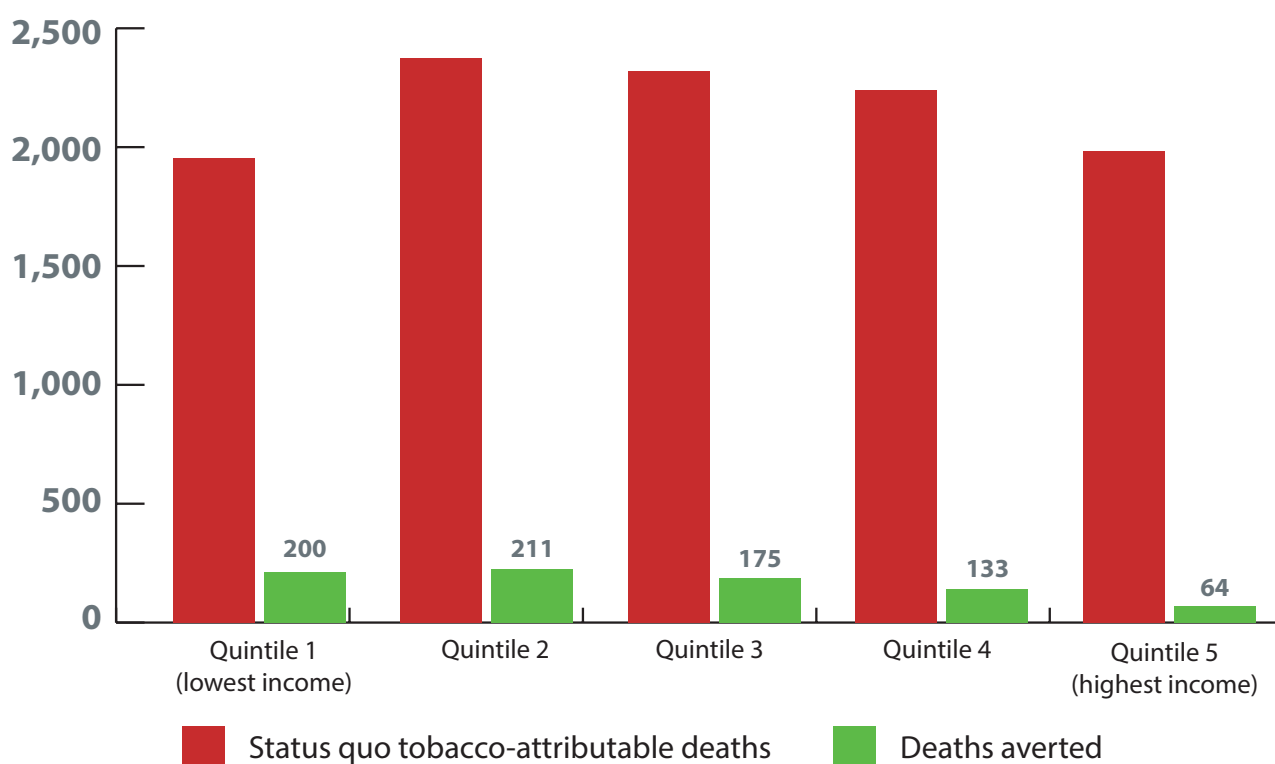
Fig. 10: Smoking prevalence before and after the cigarette tax increase, by income quintile



⁸ Only overall smoking prevalence (including cigarette and hookah smoking) was available by income quintile in the Tunisia Health Examination Survey. To estimate cigarette smoking prevalence by income quintile, overall smoking prevalence by quintile was adjusted using a scaling factor of cigarette prevalence divided by overall smoking prevalence.

Lower rates of smoking translate to health gains. Prior to the cigarette tax increase, of the nearly 10,900 smoking-attributable deaths observed in 2019, 40 percent occurred among the poorest 40 percent of the population (quintiles 1 and 2). However, because the cigarette tax increase causes smoking prevalence to fall the most in the two poorest quintiles, health benefits disproportionately accrue to lower-income Tunisians. The equity analysis finds that over half (53 percent) of the over 800 deaths that would be averted during the first year of tax increases modeled in the investment case would be among the poorest 40 percent of the population, as shown in **Figure 11**.

Fig. 11: Status quo deaths and deaths averted by cigarette tax increase, by income quintile



6.2 The Sustainable Development Goals and the WHO FCTC

Enacting and strengthening seven measures designed to reduce demand for tobacco will support Tunisia in fulfilling SDG Target 3.a to strengthen implementation of the WHO FCTC. Moreover, acting now will contribute to Tunisia's efforts to meet SDG Target 3.4 to reduce by one-third premature mortality from NCDs by 2030. These health gains will support development more broadly, including reduction of poverty and inequalities (SDGs 1 and 10, respectively) and increased economic growth (SDG 8).

In Tunisia in 2019, over 17,000 premature deaths between the ages of 30 to 70 were caused by the four main NCDs (CVD, diabetes, cancer, and COPD) [47]. Almost a third (31 percent) of these premature deaths occurred due to tobacco use [47]. Enacting the WHO FCTC measures identified in the investment case would reduce tobacco use prevalence – a key risk factor driving NCD incidence – preventing 13,774 premature deaths from the four main NCDs over the next 10 years (2021 to 2030). Preventing those deaths contributes the equivalent of about 22 percent of the needed reduction in premature mortality for Tunisia to achieve SDG Target 3.4.



Achieving SDG Target 3.4 by 2030

By 2030 the FCTC measures would...



Lower the prevalence of tobacco use by 43 percent from present day levels.

Reduce economic costs due to tobacco use by TND 3.5 billion, including saving TND 251.8 million in healthcare expenditures.

Lead to avoided economic costs (TND 3.5 billion) that significantly outweigh the costs of implementation and enforcement of the interventions (TND 67.4 million), with an overall return on investment of 52:1.

7. Conclusion and recommendations

Each year, tobacco use costs Tunisia TND 2 billion in economic losses and causes substantial human development losses. Fortunately, the investment case shows that there is an opportunity to reduce the social and economic burden of tobacco use in Tunisia. Enacting the recommended multisectoral tobacco control provisions would save 3,700 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 TND 5.7 billion over the next 15 years. Further, the economic benefits of strengthening tobacco control in Tunisia greatly outweigh costs of implementation (TND 5.7 billion in benefits versus just TND 89.7 million in costs).

By investing now in the seven proven WHO FCTC measures modeled under this investment case, Tunisia would not only reduce tobacco consumption, improve health, reduce government health expenditures and grow the economy, it would also reduce hardships among Tunisians. Many countries reinvest savings from government healthcare expenditures and revenue from increased tobacco taxes into national development priorities such as universal health coverage, which the Tunisian government is committed to achieve. Increased revenue from tobacco taxes is also an innovative source of financing in the context of the COVID-19 response and recovery.

The investment case identified several strong tobacco control investments that Tunisia can make. It offers compelling economic and social arguments to implement core WHO FCTC measures. Sharing this report widely – with political leaders and parliamentarians, government sectors, civil society organizations and private companies, academic institutions, development partners and the public – can strengthen whole-of-government and whole-of-society tobacco control efforts. In addition to the seven tobacco control measures examined, the full benefits of the investment case are more likely to be realized if the following actions are pursued:



Strengthen multisectoral planning and coordination for tobacco control

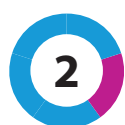
Stronger multisectoral planning and coordination in line with WHO FCTC Article 5 are critical to take the investment case recommendations forward and advance WHO FCTC implementation in Tunisia, particularly given the government-owned tobacco industry.

Tunisia has a strong foundation on which to build. It has a national tobacco control programme which is integrated into its National Multisectoral Strategy for Prevention and Control of NCDs 2018-2025. It could use FCTC investment case findings to strengthen this programme and reinvigorate

its implementation, communication and monitoring, while also engaging other sectors to integrate the WHO FCTC into relevant development planning instruments, including sector-specific plans, SDG planning and financing frameworks, and COVID-19 response and recovery plans.

Tunisia's multisectoral committee on tobacco control could also be strengthened in line with available Article 5.2a guidance and best practices, including but not limited to ensuring high-level political leadership, that committee representatives hold senior level positions in their respective institutions, and broad representation and consultation across government sectors and stakeholders [48]. Tunisia's history of civil society engagement in tobacco control is an asset to leverage. Given the government-owned tobacco industry, it is especially critical to use the multisectoral tobacco control committee as a forum to have official communications with full transparency. Tunisia would benefit from developing an explicit code of conduct for all current and future committee members in how they interact and engage with the tobacco sector.

COVID-19 response and recovery is an impetus to bring sectors together and engage national leadership on advancing a healthier, more resilient population through stronger WHO FCTC implementation. Optimized taxes on tobacco not only improve health but also raise important revenue for mitigating the impacts of COVID-19 and building back better.



Update and strengthen tobacco control laws and ensure they are enforced

Tunisia was selected for the FCTC 2030 Project because of its stated commitment to strengthen its tobacco control legislation and bring it into further alignment with the Convention, with particular focus on implementation and enforcement of measures to protect the public from tobacco smoke and to warn of the dangers of tobacco-related harms. The FCTC investment case findings make clear that the health and economic benefits of delivering these legislative changes are massive. After raising cigarette taxes, the modeled policies with the highest return on investment are bans on tobacco advertising, promotion and sponsorship (178:1), graphic warning labels (163:1), and protecting people from exposure to tobacco smoke (109:1). These measures are also likely to have a significant impact in protecting youth from tobacco use. It is recommended that the Ministry of Health lead the process of reviewing and amending the current legal, policy and regulatory framework for tobacco control in Tunisia to realize the full benefits modeled in the investment case. Tunisia should strongly consider ratification of the Protocol to Eliminate Illicit Trade in Tobacco Product, to ensure it has full access to international cooperation between Parties to the Protocol as well as exchange of best practices and technologies. Enforcement challenges require specific attention, investment and action. This is one area where the multisectoral tobacco control committee could focus, considering for example how best to sensitize the public and businesses, build the capacity of law enforcement, and ensure strict penalties to deter non-compliance.



Increase excise taxes on tobacco products to avert economic losses and raise revenue for development

Price is one of the strongest factors affecting consumption of tobacco products. The investment case demonstrates that raising cigarette taxes in line with WHO recommendations – at least 75 percent of the retail price of tobacco products, with at least 70 percent comprised of a specific excise tax – would yield the highest return on investment over both the next five years (179:1) and the next fifteen (500:1). Lower-income Tunisians would benefit most – the equity analysis finds that over half (53 percent) of the over 800 deaths that would be averted during the first year of tax increases modeled in the investment case would be among the poorest 40 percent of the population. When tobacco taxes are increased, revenue increases because the reduction in sales is less than proportionate to the price increase, and many continue to purchase tobacco products. Uniform specific excise taxes are considered a best practice as they are easiest and least costly to administer and bring about the best health and fiscal outcomes. Tunisia should strongly consider available guidance for optimizing tobacco taxes [49]–[51].

The revenue gains and avoided healthcare spending from raised and optimized tobacco taxes can be used to help finance health and development in Tunisia, including in the context of achieving universal health coverage and supporting the COVID-19 response and recovery. Some countries reinvest the additional revenue from raised tobacco taxes into WHO FCTC implementation including supporting alternative economic livelihoods for tobacco growers. To complement the tax increases, Tunisia would benefit from investing in combatting illicit trade of tobacco products, including strengthening tracking and tracing systems such as digital tax stamps. This is another area that a reliably-resourced multisectoral tobacco control committee could advance.



Take action to prevent interference from industry in policymaking and implementation

The tobacco industry remains one of the biggest challenges to full implementation of the WHO FCTC globally. Tunisia faces an added layer of difficulty in having a government-owned tobacco industry. However, these associated challenges can be overcome to protect the health and economy of Tunisia from tobacco-related harms. It is entirely possible to make powerful progress in WHO FCTC implementation in a context with a large state-owned tobacco industry presence, such as in the case of Ethiopia [34]. Partnerships between the Ministry of Industry and the Ministry

of Commerce alongside the Ministry of Health and the Ministry of Finance are essential. Especially key in such circumstances are effective leadership and governance to direct national discussions firmly towards a strong health position, and ensuring that formal discussions take place within the dedicated national tobacco control coordinating mechanism to ensure full transparency [35].

The WHO FCTC Article 5.3 is critical in protecting the health and economy of Tunisia from tobacco industry interference. This Article, which Tunisia is legally obliged to implement as a Party to the WHO FCTC, states that “[i]n setting and implementing public health policies with respect to tobacco control, Parties shall act to protect these policies from the commercial and other vested interests of the tobacco industry in accordance with national law.” The Guidelines recommend that “[p]arties with a State-owned tobacco industry should ensure that any investment in the tobacco industry does not prevent them from fully implementing the WHO Framework Convention on Tobacco Control.” The Guidelines are clear that state-owned tobacco industries should be treated as any other tobacco industry in respect of setting and implementing tobacco control policies, and that these efforts should be separated from overseeing or managing the tobacco industry [52]. It is therefore recommended that Tunisia:

- ban the industry and front groups from all committees that decide or discuss public health related topics, including tobacco control policies;
- put in place laws that regulate the interaction between the government and the industry and their front groups;
- mandate disclosure of all interactions made with public officials;
- ban all forms of corporate social responsibility and sponsorship by the industry, and;
- support FCTC Article 5.3 education and training among governmental employees at all levels.

The Convention Secretariat and UNDP Toolkit for Parties to implement Article 5.2(a) of the WHO FCTC includes guidance, best practices and templates to support national tobacco control coordinating mechanisms in countering tobacco industry interference in policymaking and implementation [48].



Raise awareness among the public and government of the true costs of tobacco and the enormous development benefits of tobacco control

The investment case makes clear that public health and economic prosperity are two sides of the same coin, and that stronger tobacco control would deliver enormous economic benefits to Tunisia through improved health and well-being. Better informing the public and all branches of government of not only the threat of tobacco but also the socio-economic benefits of tobacco control can strengthen enforcement of existing regulations and increase acceptance of stronger legislation in line with Tunisia's stated commitment. While the projected return on investment in nationwide anti-tobacco awareness raising campaigns modeled in the investment case is lower than the ROIs for other interventions, it is still high, delivering TND 20 by year five for every TND invested now, and TND 58 by year 15.

Building on the investment case findings, it is recommended that the Ministry of Health develop a communications plan that includes a sustained, national-scale mass media campaign. The communications plan should be developed in collaboration with relevant sectors of government and civil society to sensitize key messengers such as teachers, health professionals, law enforcement, as well as youth advocates. Engagement with prominent public figures, such as politicians, celebrities, athletes, social-media influencers, could be an effective strategy to conveying important messages on tobacco control. In order to reach specific populations who have high rates of tobacco consumption or who may be greater risk for starting tobacco use, tailored campaigns could be initiated.

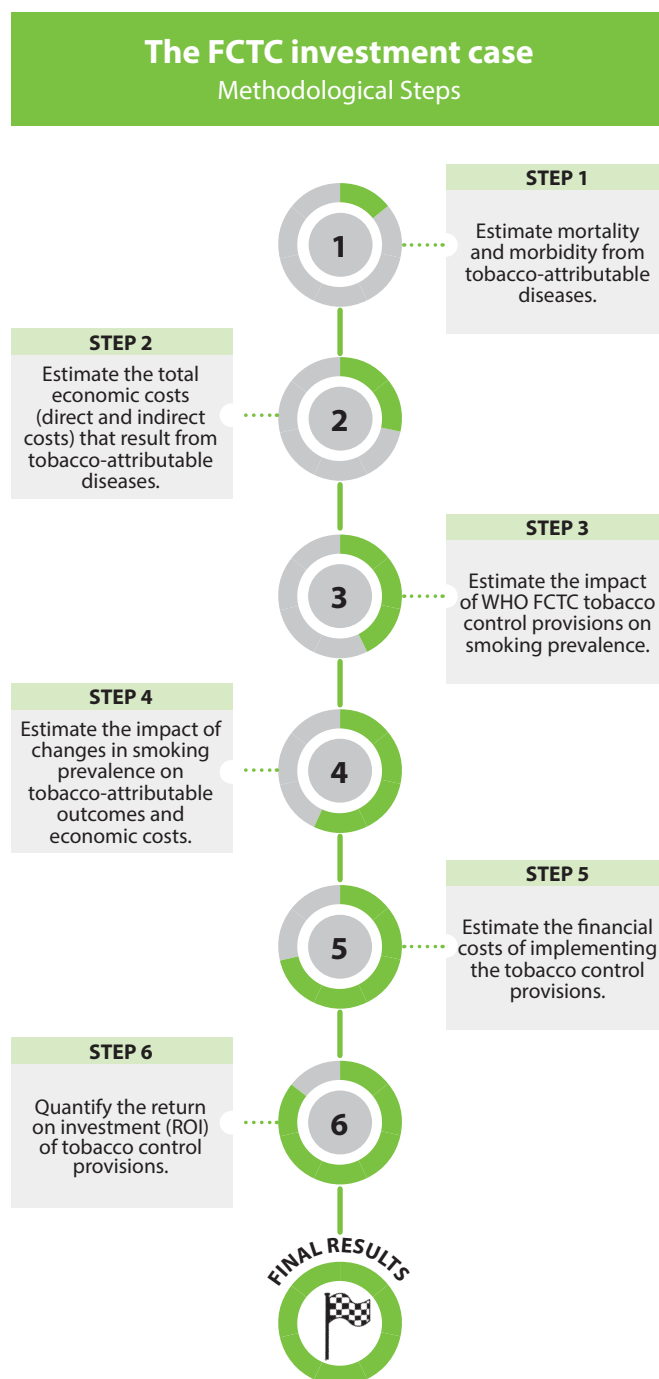
Complementary to awareness-raising on the harms of tobacco use and the benefits of stronger tobacco control are effective graphic health warnings and plain packaging as well as improved availability, accessibility and affordability of tobacco cessation services, which have all modeled in this investment case. The context of COVID-19 and the links between tobacco use, NCDs and worse COVID-19 outcomes – for individuals and health system capacities writ large – offer an entry point to redouble tobacco control communications efforts.

8. Methodology annex

8.1 Overview

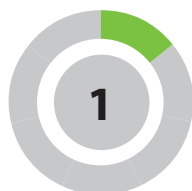
The economic analysis consists of two components: 1) assessing the current burden of tobacco use and 2) examining the extent to which WHO FCTC provisions can reduce the burden. The first two methodological steps depicted in **Figure A1** are employed to assess the current burden of tobacco use, while 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 FCTC investment case



8.2 COMPONENT ONE: CURRENT BURDEN

The current burden model component provides a snapshot of the current health and economic burden of tobacco use in Tunisia.



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) [2], [53]. 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.⁹

Next, the model estimates the total economic costs of tobacco attributable morbidity and mortality, 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 labor force 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 from Goodchild et al. (2018), who estimate the smoking attributable fraction (SAF) of healthcare expenditures for most countries, including Tunisia [3]. The SAF for Tunisia provided by Goodchild et al. (2018) is 1.9 percent [3]. 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-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].

⁹ In assessing the current burden of tobacco use, the economic costs of premature mortality include the cost of premature deaths due to any form of exposure to tobacco (including 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 precisely ascertain those losses.

Indirect costs — Indirect costs represent the monetized value of lost time, productive capacity, or quality of life as a result of tobacco-related diseases. Indirect costs accrue when tobacco use causes premature death, eliminating the unique economic and social contributions that an individual would have 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.

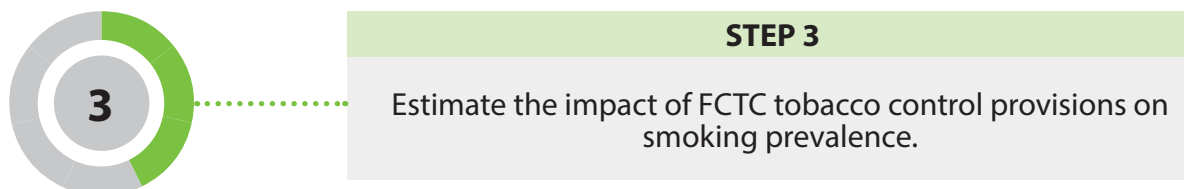
- *The economic cost of premature mortality due to tobacco use* — Premature mortality is valued using the human capital approach, which places an economic value on each year of life lost. Using data from the Global Burden of Disease (GBD) database on the age at which tobacco-attributable deaths occur, 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) [54].
- *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) [55]. 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 [56]. Lost productivity due to smoking breaks is valued under the conservative assumption that working smokers take ten minutes of extra breaks per day [40].

8.3 COMPONENT TWO: POLICY/INTERVENTION SCENARIOS

This component estimates the effects of 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 [59], [60], finding results similar to those found using dynamic models that incorporate future demographic changes and more detailed cycles of initiation, cessation, and relapse.

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.



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, Parties seek to accelerate WHO FCTC implementation by setting clear priorities where they will be likely to have the greatest impact in reducing tobacco use. This includes priority implementation of price and tax measures (WHO FCTC Article 6) and time-bound measures of the Convention, including bans on smoking in all public places (WHO FCTC Article 8), graphic health warnings and plain tobacco packaging (WHO FCTC Article 11 guidelines and WHO FCTC Article 13), and comprehensive bans on tobacco advertising, promotion and sponsorship (WHO FCTC Article 13). In addition, given the importance of awareness in behavior change and shaping cultural norms, the investment cases include instituting mass media campaigns against tobacco use (WHO FCTC Article 12). 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) [42] and Chipty (2016) [59], as adapted within the Tobacco Use Brief of Appendix 3 of the WHO Global NCD Action Plan 2013-2020 [60], and adjusted based on assessments of Tunisia's baseline rates of implementation. Brief advice to quit from primary care health professionals is assumed to increase baseline quit rates by 60 percent [61] from baseline rates (assumption: 43 percent of adults make at least one quit attempt annually [average from lower and upper middle-income countries [62]]) for individuals who receive the advice.

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 [63] 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 cigarette use prevalence was estimated using an Excel-based tool developed to analyze 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	-0.5	[44]
Prevalence elasticity of demand	-0.25	Assumption – half of price elasticity [65]
Income price elasticity of demand	0.32	[66]
Income prevalence elasticity of demand	0.16	Assumption – half of income price elasticity
Projected real income growth rate*	3.2%	[67]
* Projected real income growth is used as a proxy for wage growth. The International Monetary Fund projects [67] real GDP growth at an average of 3.2 percent annually through 2025.		
Definitions: Price elasticity of demand – change in amount of total demand resulting from change in price. Prevalence elasticity of demand – change in amount of demand resulting from change in price due to individuals quitting smoking or not beginning to smoke (does not include reductions in demand due to reduced consumption). Income price elasticity of demand – change in total demand resulting from changes in income. Income prevalence elasticity of demand – change in amount of demand resulting from change in income due to individuals starting to smoke (does not include increases in demand due to increased consumption).		

The investment case analysis examines a tax increase scenario in which Tunisia chooses to enact strong tax increases. In the hypothetical scenario, the tax increases generate real increases in the price of cigarettes that average about 10 percent annually from 2023 to 2035.

The impact of these increases on 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 colleagues (2009) [68], 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

ϵ_p = prevalence elasticity

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

ϵ_i = income elasticity

GDP = Gross domestic product in year

There are several limitations to the tax analysis. First, the tax tool assumes that the price and tax structure of the most sold brand of cigarettes is representative of the market, and it does not incorporate other market segments (high or low-end cigarettes). More detailed models that account for switching between segments or between products (e.g., movement to hand-rolled cigarettes) would capture nuance helpful to framing tobacco tax policy and estimating impact. Second, the analysis assumes a full pass through of 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 Tunisia-specific estimates of price and income elasticities.

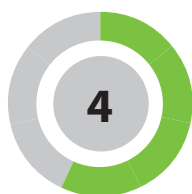
The impact sizes of all policy measures examined in the investment case are displayed in **Table A2**. Additional information on their derivation can be found in the *Technical Appendix*.¹⁰

Table A2. Impact size: relative reduction in the prevalence of current smoking by tobacco control policy/intervention, over a period of 15 years

WHO FCTC Measure	Relative reduction in the prevalence of current smoking	
	First 5 Years (2021–2025)	Over 15 Years (2021–2035)
Tobacco Control Package (all policies)	28.8%	45.9%
Increase taxes on cigarettes (WHO FCTC Art. 6)	13.9%	24.9%
Implement and enforce bans on smoking in public places and workplaces (WHO FCTC Art. 8)	5.5%	9.2%
Mandate that tobacco product packages carry large graphic health warnings (WHO FCTC Art. 11)	4.2%	6.9%
Plain packaging of tobacco products (WHO FCTC Art. 11 – Guidelines and Art. 13)	1.4%	2.3%
Mass media campaigns to promote awareness about tobacco control (WHO FCTC Art.12)	2.3%	3.9%
Enact comprehensive bans on advertising, promotion and sponsorship (WHO FCTC Art. 13)	4.6%	7.7%
Cessation: Brief advice to quit tobacco use (WHO FCTC Art. 14)	0.3%	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) x (1-PR_j) [is] applied to the current smoking prevalence” [42].

10 Available upon request.

**STEP 4**

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

To analyze the impact of policy measures on reducing the health and economic burden of smoking, the investment case calculates and compares two scenarios. In the status quo scenario, current efforts are 'frozen', meaning that, through the year 2035 (end of the analysis), no change occurs from the tobacco control provisions that are currently in place. In the intervention scenario, Tunisia 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 Tunisia 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.

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

- **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 smoking-attributable fraction (SAF) of healthcare expenditures. 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.

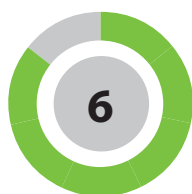
**STEP 5**

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

The financial costs to the government of implementing new measures – or of intensifying or enforcing existing ones – is estimated using the WHO NCD Costing Tool. Full explanations of the costs and assumptions embedded in the WHO NCD Costing tool are available [63].

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), labor force participation rate (2019), gas per liter, and government spending on health as a percent of total health spending (2018) [69]. Unless government or other in-country parameters are received, data is from the World Bank database, with the exception of data on the share of government health spending and population figures. The share of government spending on health as a percentage 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.

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 seven tobacco control policies modeled and for the seven interventions together as a package. Estimates from Steps 3 and 4 were used to calculate ROIs at 5- and 15-year intervals.

$$\text{Return on investment (ROI)} = \frac{\text{Benefits of intervention/policy}}{\text{Costs of implementing intervention/policy}}$$

8.4 Equity analysis

To assess how increased cigarette 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 Tunisia. 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 was used [44]. 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 which 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 then smoking prevalence is expected to decrease by 27 percent. The average elasticity for each quintile from the IARC Handbook and the adjusted elasticities are shown in **Table A3** below.

Table A3: 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

9. References

- [1] "Tunisian Health Examination Survey, 2016." Government of Tunisia, 2019, Accessed: Feb. 10, 2021. [Online]. Available: <http://www.santetunisie.rns.tn/images/rapport-final-enquete2020.pdf>.
- [2] C. J. L. Murray et al., "Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019," *The Lancet*, vol. 396, no. 10258, pp. 1223–1249, Oct. 2020, doi: 10.1016/S0140-6736(20)30752-2.
- [3] M. Goodchild, N. Nargis, and E. Tursan d'Espaignet, "Global economic cost of smoking-attributable diseases," *Tob Control*, vol. 27, no. 1, pp. 58–64, Jan. 2017, doi: 10.1136/tobaccocontrol-2016-053305.
- [4] L. Chaker et al., "The global impact of non-communicable diseases on macro-economic productivity: a systematic review," *Eur J Epidemiol*, vol. 30, no. 5, pp. 357–95, May 2015, doi: 10.1007/s10654-015-0026-5.
- [5] A. Anesetti-Rothermel and U. Sambamoorthi, "Physical and Mental Illness Burden: Disability Days among Working Adults," *Population Health Management*, vol. 14, no. 5, pp. 223–230, Apr. 2011, doi: 10.1089/pop.2010.0049.
- [6] P. S. Wang et al., "Chronic medical conditions and work performance in the health and work performance questionnaire calibration surveys," *J. Occup. Environ. Med.*, vol. 45, no. 12, pp. 1303–1311, Dec. 2003, doi: 10.1097/01.jom.0000100200.90573.df.
- [7] M. J. Husain, B. K. Datta, M. K. Virk-Baker, M. Parascandola, and B. H. Khondker, "The crowding-out effect of tobacco expenditure on household spending patterns in Bangladesh," *PLoS ONE*, vol. 13, no. 10, p. e0205120, Oct. 2018, doi: 10.1371/journal.pone.0205120.
- [8] R. M. John, "Crowding out effect of tobacco expenditure and its implications on household resource allocation in India," *Soc Sci Med*, vol. 66, no. 6, pp. 1356–1367, Mar. 2008, doi: 10.1016/j.socscimed.2007.11.020.
- [9] G. Paraje and D. Araya, "Relationship between smoking and health and education spending in Chile," *Tob Control*, vol. 27, no. 5, pp. 560–567, Sep. 2018, doi: 10.1136/tobaccocontrol-2017-053857.
- [10] J. de Beyer, C. Lovelace, and A. Yürekli, "Poverty and tobacco," *Tob Control*, vol. 10, no. 3, pp. 210–211, Sep. 2001, doi: 10.1136/tc.10.3.210.
- [11] D. Efroymson et al., "Hungry for tobacco: an analysis of the economic impact of tobacco consumption on the poor in Bangladesh," *Tob Control*, vol. 10, no. 3, pp. 212–217, Sep. 2001, doi: 10.1136/tc.10.3.212.
- [12] L. Greaves et al., "What Are the Effects of Tobacco Policies on Vulnerable Populations?," *Can J Public Health*, vol. 97, no. 4, pp. 310–315, Jul. 2006, doi: 10.1007/BF03405610.

- [13] World Health Organization, Tobacco and its environmental impact: an overview. 2017.
- [14] M. Zafeiridou, N. S. Hopkinson, and N. Voulvoulis, "Cigarette Smoking: An Assessment of Tobacco's Global Environmental Footprint Across Its Entire Supply Chain," *Environ Sci Technol*, vol. 52, no. 15, pp. 8087–8094, 07 2018, doi: 10.1021/acs.est.8b01533.
- [15] "The Environmental Burden of Cigarette Butts," *Tobacco Control*, vol. 20, no. Suppl 1, May 2011, Accessed: Oct. 22, 2020. [Online]. Available: https://tobaccocontrol.bmj.com/content/20/Suppl_1.
- [16] "WHO Report on the Global Tobacco Epidemic, 2019: Tunisia." World Health Organization, Accessed: Feb. 11, 2021. [Online]. Available: https://www.who.int/tobacco/surveillance/policy/country_profile/tun.pdf.
- [17] C. Harizi, F. El-Awa, H. Ghedira, C. Audera-Lopez, and R. Fakhfakh, "Implementation of the WHO Framework Convention on Tobacco Control in Tunisia: Progress and challenges," *Tob. Prev. Cessation*, vol. 6, no. December, pp. 1–8, Dec. 2020, doi: 10.18332/tpc/130476.
- [18] World Health Organization, "WHO report on the global tobacco epidemic, 2019," Geneva, Switzerland, 2019. [Online]. Available: <http://www.who.int/tobacco/>.
- [19] Global Burden of Disease Collaborative Network, "Global Burden of Disease Study 2019 (GBD 2019) Results," Institute for Health Metrics and Evaluation, Seattle, United States, 2021. Accessed: Apr. 17, 2020. [Online]. Available: <http://ghdx.healthdata.org/gbd-results-tool>.
- [20] "Tunisia Factsheet - Global Youth Tobacco Survey (GYTS), 2017." Tunisia Ministry of Public Health, WHO, CDC, 2017, Accessed: Feb. 10, 2021. [Online]. Available: <https://extranet.who.int/ncdsmicrodata/index.php/catalog/355>.
- [21] J. Maatoug, "Clustering of Risk Factors With Smoking Habits Among Adults, Sousse, Tunisia," *Prev Chronic Dis*, vol. 10, 2013, doi: 10.5888/pcd10.130075.
- [22] "Law No. 98-17 on Prevention of Harmful Effects of Smoking." Government of Tunisia, Accessed: Feb. 14, 2021. [Online]. Available: <https://www.tobaccocontrollaws.org/files/live/Tunisia/Tunisia%20-%20Smoke-Free%20Public%20Transportation.pdf>.
- [23] "Decree No. 98-2248: Identifying Smoke-Free Public Places." Government of Tunisia, Nov. 16, 1998, [Online]. Available: <https://www.tobaccocontrollaws.org/files/live/Tunisia/Tunisia%20-%20Identifying%20Smoke-Free%20Public%20Places.pdf>.
- [24] "Decree No. 2009-2611: Fixing the Places Assigned to Collective Use in which Smoking is Prohibited." Tunisia Ministry of Public Health, Sep. 14, 2009, Accessed: Feb. 14, 2021. [Online]. Available: <https://www.tobaccocontrollaws.org/files/live/Tunisia/Tunisia%20-%20Decree%20No.%202009-2611%20-%20national.pdf>.
- [25] "Cigarettes : Augmentation des prix de vente au public," *La Presse de Tunisie*, Mar. 16, 2020. <https://lapresse.tn/53172/cigarettes-augmentation-des-prix-de-vente-au-public/> (accessed Apr. 13, 2021).

- [26] “Tunisia Country Profile | The Tobacco Atlas,” Tobacco Atlas. <https://tobaccoatlas.org/country/tunisia/> (accessed Feb. 10, 2021).
- [27] World Health Organization, “Information note on COVID-19 and NCDs,” World Health Organization, Mar. 23, 2020, Accessed: Mar. 14, 2021. [Online]. Available: <https://www.who.int/publications/m/item/covid-19-and-ncds>.
- [28] WHO. (2021). WHO supports people quitting tobacco to reduce their risk of severe COVID-19. Available at <https://www.who.int/news/item/28-05-2021-who-supports-people-quitting-tobacco-to-reduce-their-risk-of-severe-covid-19>
- [29] “La régie Nationale des Tabac et des Allumettes - RNTA.” <http://www.rnta.tn/> (accessed Apr. 19, 2021).
- [30] “TUNISIE : Le monopole de la RNTA sur l’e-cigarette est une catastrophe,” [Vapoteurs.net](http://www.vapoteurs.net/tunisie-le-monopole-de-la-rnta-sur-le-cigarette-est-une-catastrophe/), Oct. 16, 2018. <http://www.vapoteurs.net/tunisie-le-monopole-de-la-rnta-sur-le-cigarette-est-une-catastrophe/> (accessed Apr. 19, 2021).
- [31] “Tunisie : les employés de la Régie nationale des tabacs et des allumettes dans la rue – Jeune Afrique,” [JeuneAfrique.com](https://www.jeuneafrique.com/463398/economie/tunisie-les-employes-de-la-regie-nationale-des-tabacs-et-des-allumettes-dans-la-rue/), Aug. 03, 2017. <https://www.jeuneafrique.com/463398/economie/tunisie-les-employes-de-la-regie-nationale-des-tabacs-et-des-allumettes-dans-la-rue/> (accessed Apr. 19, 2021).
- [32] “Tunisia - EN.” <https://www.pmi.com/markets/tunisia/en> (accessed Apr. 19, 2021).
- [33] “British American Tobacco - Tunisia.” https://www.bat.com/group/sites/UK_9D9KCY.nsf/vwPagesWebLive/DO9FCMUP (accessed Apr. 19, 2021).
- [34] UN Tobacco Control, “Ethiopia: parliament passing one of the strongest tobacco control legislations in Africa.” <https://untobaccocontrol.org/impldb/ethiopia-parliament-passing-one-of-the-strongest-tobacco-control-legislations-in-africa/> (accessed Apr. 19, 2021).
- [35] “WHO | New joint report about Tobacco Control Governance in sub-Saharan Africa,” WHO. <http://www.who.int/fctc/mediacentre/news/2016/Tobacco-Control-Governance-in-sub-Saharan-Africa/en/> (accessed Apr. 19, 2021).
- [36] L. Ayadi, N. Benjamin, S. Bensassi, and G. Raballand, Estimating Informal Trade across Tunisia’s Land Borders. The World Bank, 2013.
- [37] “United Nations Treaty Collection.” https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IX-4-a&chapter=9&clang=en (accessed Apr. 19, 2021).
- [38] “Ministère de la santé publique - Ministère de la santé publique.” http://www.santetunisie.rns.tn/fr/?option=com_content&view=article&id=28 (accessed Apr. 19, 2021).
- [39] R. Fakhfakh, M. Hsairi, and N. Achour, “Epidemiology and prevention of tobacco use in Tunisia: a review,” Preventive Medicine, vol. 40, no. 6, pp. 652–657, Jun. 2005, doi: 10.1016/j.ypmed.2004.09.002.
- [40] M. Berman, R. Crane, E. Seiber, and M. Munur, “Estimating the cost of a smoking employee,” Tob Control, vol. 23, no. 5, pp. 428–433, Sep. 2014, doi: 10.1136/tobaccocontrol-2012-050888.

- [41] World Health Organization, "Global Health Expenditures Database." online, 2020, [Online]. Available: <http://www.who.int/health-accounts/ghed/en/>.
- [42] D. T. Levy, J. Tam, C. Kuo, G. T. Fong, and F. Chaloupka, "The Impact of Implementing Tobacco Control Policies: The 2017 Tobacco Control Policy Scorecard," *J Public Health Manag Pract*, vol. 24, no. 5, pp. 448–457, Oct. 2018, doi: 10.1097/PHH.0000000000000780.
- [43] A. Fuchs, P. Marquez, S. Dutta, and F. Gonzalez Icaza, "Is Tobacco Taxation Regressive? Evidence on Public Health, Domestic Resource Mobilization, and Equity Improvements," The World Bank Group, Washington, DC, 2019. [Online]. Available: <https://openknowledge.worldbank.org/handle/10986/31575>.
- [44] International Agency for Research on Cancer, Ed., *IARC handbooks of cancer prevention, tobacco control, volume 14, Effectiveness of Tax and Price Policies for Tobacco Control*. Lyon: IARC, 2011.
- [45] N. Salti, E. Brouwer, and S. Verguet, "The health, financial and distributional consequences of increases in the tobacco excise tax among smokers in Lebanon," *Soc Sci Med*, vol. 170, pp. 161–169, 12, doi: 10.1016/j.socscimed.2016.10.020.
- [46] Global Tobacco Economics Consortium, "The health, poverty, and financial consequences of a cigarette price increase among 500 million male smokers in 13 middle income countries: compartmental model study," *BMJ*, vol. 361, p. k1162, Apr. 2018.
- [47] Institute for Health Metrics and Evaluation (IHME), "The Global Burden of Disease Results Tool." University of Washington, Seattle, WA, 2019, [Online]. Available: <http://ghdx.healthdata.org/gbd-results-tool>.
- [48] "WHO | Toolkit for Parties to implement Article 5.2 (a) of the WHO FCTC," WHO. <http://www.who.int/fctc/implementation/cooperation/5-2-toolkit/en/> (accessed Mar. 30, 2021).
- [49] "WHO | WHO technical manual on tobacco tax administration," WHO. https://www.who.int/tobacco/publications/tax_administration/en/ (accessed Apr. 19, 2021).
- [50] "Taxes on tobacco." <https://www.sdfinance.undp.org/content/sdfinance/en/home/solutions/taxes-on-tobacco.html> (accessed Apr. 19, 2021).
- [51] "Guidelines for Implementation of Article 6 of the WHO FCTC."
- [52] World Health Organization, "Guidelines for implementation of Article 5.3 of the WHO Framework Convention on Tobacco Control." [Online]. Available: http://www.who.int/fctc/guidelines/article_5_3.pdf.
- [53] T. Vos et al., "Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019," *The Lancet*, vol. 396, no. 10258, pp. 1204–1222, Oct. 2020, doi: 10.1016/S0140-6736(20)30925-9.
- [54] D. T. Jamison et al., "Global health 2035: a world converging within a generation," *The Lancet*, vol. 382, no. 9908, pp. 1898–1955, Dec. 2013, doi: 10.1016/S0140-6736(13)62105-4.

- [55] S. A. Troelstra, P. Coenen, C. R. Boot, J. Harting, A. E. Kunst, and A. J. van der Beek, "Smoking and sickness absence: a systematic review and meta-analysis," *Scand J Work Environ Health*, vol. 46, no. 1, pp. 5–18, 1, doi: 10.5271/sjweh.3848.
- [56] C. L. Baker, N. M. Flores, K. H. Zou, M. Bruno, and V. J. Harrison, "Benefits of quitting smoking on work productivity and activity impairment in the United States, the European Union and China," *Int J Clin Pract*, vol. 71, no. 1, Jan. 2017, doi: 10.1111/ijcp.12900.
- [57] D. Levy, D. B. Abrams, J. Levy, and L. Rosen, "Complying with the framework convention for tobacco control: an application of the Abridged SimSmoke model to Israel," *Isr J Health Policy Res*, vol. 5, Sep. 2016, doi: 10.1186/s13584-016-0101-8.
- [58] D. T. Levy, H. Fouad, J. Levy, A. D. Dragomir, and F. El Awa, "Application of the Abridged SimSmoke model to four Eastern Mediterranean countries," *Tob Control*, vol. 25, no. 4, pp. 413–421, 2016, doi: 10.1136/tobaccocontrol-2015-052334.
- [59] T. Chipty, "Study of the Impact of the Tobacco Plain Packaging Measure on Smoking Prevalence in Australia," Analysis Group, Inc., 2016. [Online]. Available: [http://www.health.gov.au/internet/main/publishing.nsf/content/491CE0444F7B0A76CA257FBE00195BF3/\\$File/PIR%20of%20Tobacco%20Plain%20Packaging%20-%20with%20Addendum.docx](http://www.health.gov.au/internet/main/publishing.nsf/content/491CE0444F7B0A76CA257FBE00195BF3/$File/PIR%20of%20Tobacco%20Plain%20Packaging%20-%20with%20Addendum.docx).
- [60] "Tobacco Interventions for the Appendix 3 of the Global Action Plan for Non Communicable Disease." World Health Organization, 2017, [Online]. Available: https://www.who.int/ncds/governance/tobacco_use.pdf?ua=1.
- [61] D. T. Levy, A. L. Graham, P. L. Mabry, D. B. Abrams, and C. T. Orleans, "Modeling the impact of smoking-cessation treatment policies on quit rates," *Am J Prev Med*, vol. 38, no. 3 Suppl, pp. S364–372, Mar. 2010, doi: 10.1016/j.amepre.2009.11.016.
- [62] American Cancer Society Inc and Vital Strategies, "Solution: Quitting," 2020. <https://tobaccoatlas.org/topic/quitting/#>.
- [63] D. Chisholm, D. Abegunde, S. Mendis, and World Health Organization, *Scaling up action against noncommunicable diseases: how much will it cost?*. Geneva, Switzerland: World Health Organization, 2011.
- [64] U.S. National Cancer Institute and World Health Organization, "The Economics of Tobacco and Tobacco Control. National Cancer Institute Tobacco Control Monograph 21.," U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, and World Health Organization, Bethesda, MD and Geneva, NIH Publication No. 16-CA-8029A, 2016. Accessed: Oct. 22, 2020. [Online]. Available: <https://cancercontrol.cancer.gov/brp/tcrb/monographs/monograph-21>.
- [65] M. Goodchild, A. M. Perucic, and N. Nargis, "Modelling the impact of raising tobacco taxes on public health and finance," in *Bull World Health Organ*, vol. 94, 2016, pp. 250–7.
- [66] N. Nargis, M. Stoklosa, C. Shang, and J. Drope, "Price, Income, and Affordability as the Determinants of Tobacco Consumption: A Practitioner's Guide to Tobacco Taxation," *Nicotine Tob Res*, vol. 23, no. 1, pp. 40–47, Jan. 2021, doi: 10.1093/ntr/ntaa134.

- [67] International Monetary Fund, "Real GDP Growth - Annual percent change," World Economic Outlook Dataset. https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD (accessed Dec. 17, 2020).
- [68] L. Joossens and International Union against Tuberculosis and Lung Disease, How eliminating the global illicit cigarette trade would increase tax revenue and save lives. Paris, France: International Union Against Tuberculosis and Lung Disease, 2009.
- [69] C. Shang et al., "Country-specific costs of implementing the WHO FCTC tobacco control policies and potential financing sources," PLoS One, vol. 13, no. 10, Oct. 2018, doi: 10.1371/journal.pone.0204903.

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