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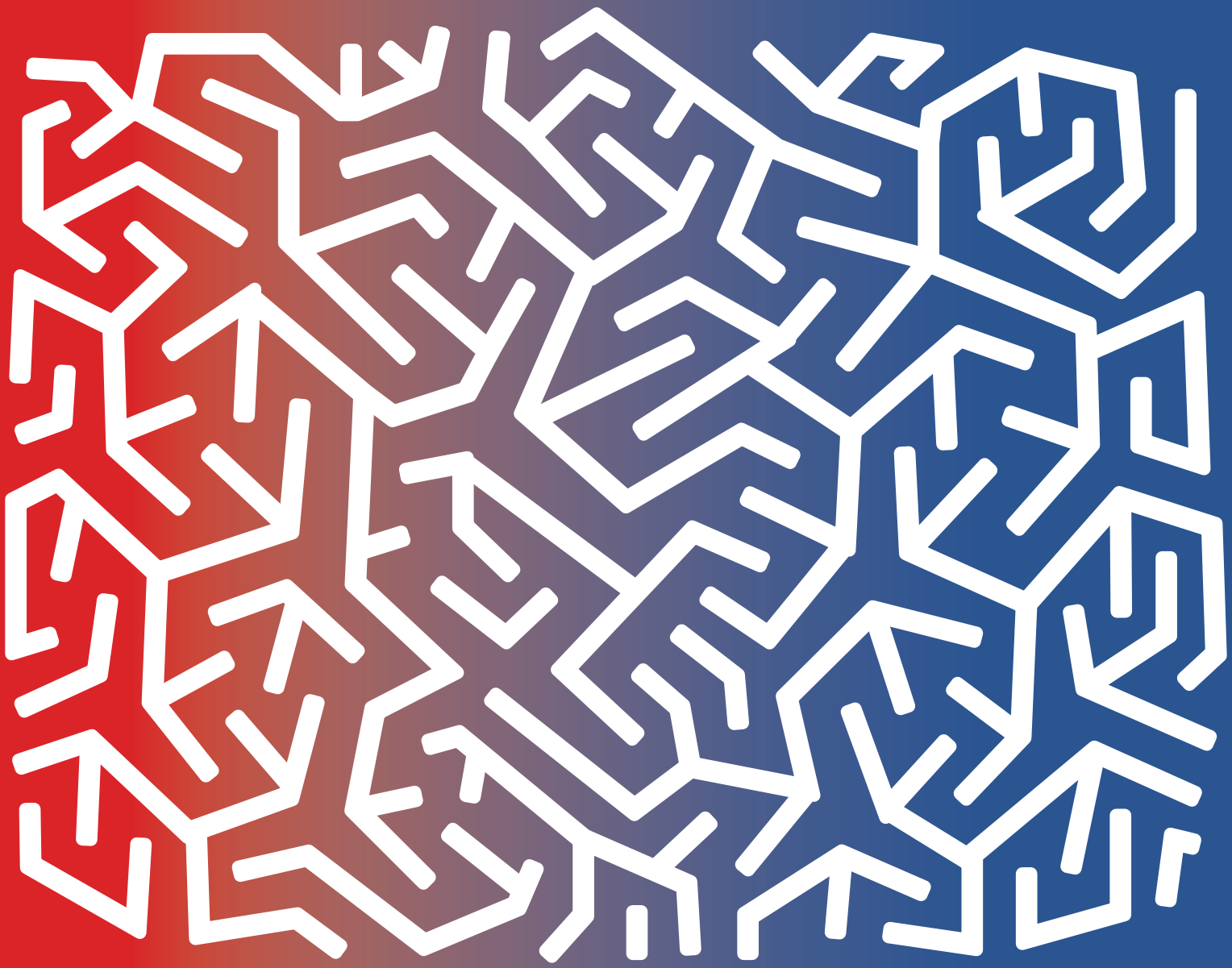
Investment Case for Tobacco Control in PANAMA



Investment Case for Tobacco Control in Panama

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Investment Case for Tobacco Control in

PANAMA

The case for scaling-up WHO FCTC implementation

Investment Case for Tobacco Control in Panama

Nearly

1,400

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

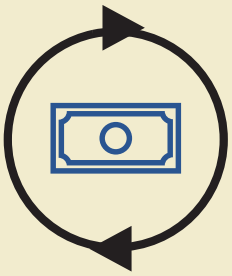
7% **of all deaths in the country.**

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

2,300 deaths

and avert

PAB 464 million

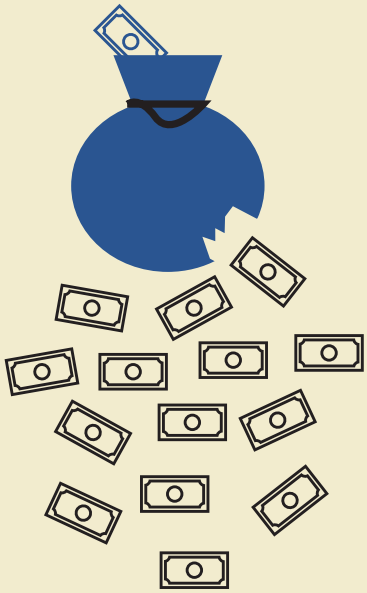


in economic losses by 2037.

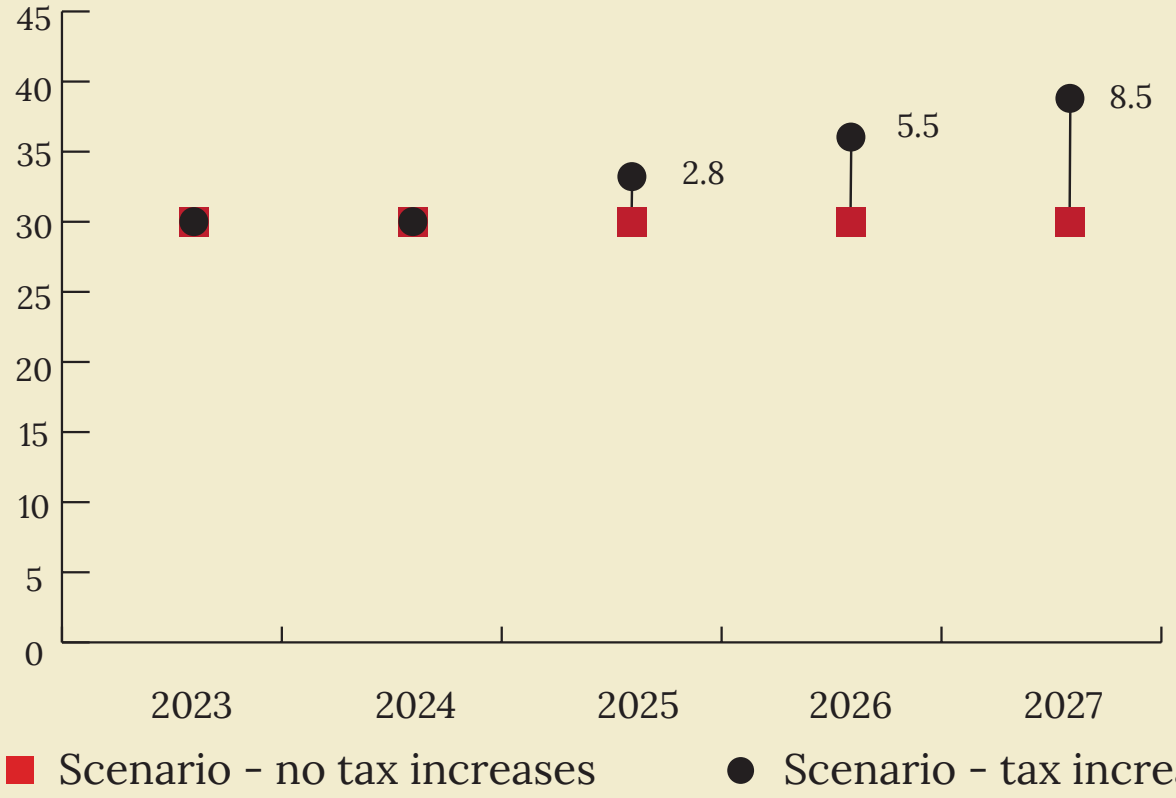
Tobacco-attributable economic losses are about

14 times larger

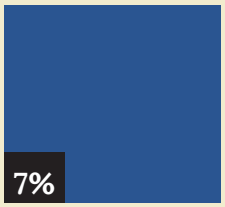
than the collected government revenue.



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



Government tobacco tax revenue as a % of the tobacco burden



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

Tobacco costs Panama PAB 416 million every year, equivalent to 0.6% of annual GDP

Costs per adult smoker PAB 2,632

Figures subject to rounding.

Acknowledgements

This report was completed through collaborative efforts of the Panama Ministry of Health, the United Nations Development Programme (UNDP), the Secretariat of the WHO Framework Convention on Tobacco Control (WHO FCTC), the World Health Organization (WHO), and the Pan American Health Organization (PAHO).

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The economic modelling was performed by Brian Hutchinson and Garrison Spencer. Additional input was provided by Bernardo González, from the National Institute of Statistics and Census. Additional research and drafting was contributed by Sofía Rocha and Katherine Yang. Zsuzsanna Schreck did the graphic design and laid out the report.

Table of Contents

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

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GLOBAL BANK

Executive summary

Overview

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

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

1) **Increasing tobacco taxation to reduce the affordability of tobacco products** *(WHO FCTC Article 6)*.
2) **Implementing plain packaging of tobacco products** *(WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13)*.
3) **Promoting and strengthening public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation** *(WHO FCTC Article 12)*.
4) **Promoting of cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use** *(WHO FCTC Article 14)*.

Main findings of the investment case

In 2019, tobacco use in Panama imposed around 416 million Panamanian balboas (PAB) in economic losses. These losses are equivalent to 0.6 percent of Panama's gross domestic product (GDP). They include a) **PAB 78 million** in direct health-care expenditures to treat tobacco-related illness, b) tobacco-attributable mortality valued at **PAB 309 million**, and c) **PAB 28 million** in reduced workplace productivity from absenteeism and presenteeism. Productivity losses from current tobacco use in Panama, representing **7 percent** of all tobacco-related economic losses, show how tobacco use impedes development in Panama beyond health. Multisectoral engagement is required for effective tobacco control, and other sectors benefit substantially from supporting the implementation of tobacco control measures that create healthier communities and a more productive labor force.

Every year, tobacco use kills nearly 1,400 people in Panama, with **38 percent** of these deaths being premature, among people under the age of 70. About **14 percent** of lives lost from tobacco use are due to exposure to secondhand smoke. Deaths from tobacco are entirely preventable.

By acting now, the Government of Panama can reduce the national burden from tobacco use. The investment case findings demonstrate that implementing and enforcing four key evidence-based WHO FCTC policy actions would, over the next 15 years (2023-2027):

Save more than 2,300 lives and reduce the incidence of disease. The key WHO FCTC measures would contribute to Panama's efforts to achieve SDG Target 3.4 to reduce by one third mortality under age 70 from non-communicable diseases (NCDs) by 2030. Enacting the WHO FCTC measures would prevent **premature deaths** from the four main NCDs – cardiovascular disease (CVD), diabetes, cancer, and chronic respiratory disease – by 2030, in the equivalent of about **2.5 percent** of the needed reduction in premature mortality to achieve SDG Target 3.4.

Avert PAB 464 million in economic losses, coming from:

PAB 32 million due to workplace productivity losses. The tobacco-control actions should stimulate economic growth because fewer people 1) miss days of work due to disability or sickness and 2) work at a reduced capacity due to tobacco-related health issues.

PAB 87 million in savings through avoidance of tobacco-attributable health-care expenditures. Of this, the government would save **PAB 58 million** in health-care expenditures, citizens would save **PAB 24 million** in out-of-pocket health-care costs, with remaining savings accruing to other payers.

PAB 345 million in averted economic costs from tobacco-attributed mortality.

Provide a return on investment (ROI) of 23:11.[1] This means that economic benefits **(PAB 464 million)** significantly outweigh the costs of implementing the four WHO FCTC policy actions **(PAB 20 million)**. For each individual measure, increasing cigarette taxes will have the highest return-on-investment (**68:1**), followed by implementing plain packaging of tobacco products **(64:1)**, promote and strengthen public awareness of tobacco control issues **(50:1)**, and cessation support by training health professionals to provide brief advice to quit tobacco use **(2:1)**.

In addition to these main findings, the investment case separately examined the revenue-generating potential of cigarette tax increases. Under the examined scenario, committing to cigarette tax increases that increase the real price of cigarettes by **21 percent** over the next five years could generate **PAB 16.9 million** in government revenue.

1 For every 1 PAB invested in the four key WHO FCTC policy actions today, Panama will avert PAB 8 in economic losses by 2027 and PAB 23 by 2037.

Recommendations

This report provides comprehensive recommendations that the **Government of Panama** can take to protect public health and realize the benefits of the WHO FCTC as a sustainable development accelerator. The set of recommendations below is not limited to the four WHO FCTC policy actions modeled in this investment case.

Recommendations

1. **Commit to fully implement the WHO FCTC.**
2. **Strengthen tobacco tax structures and increase tax rates (WHO FCTC *Article* 6).**
3. **Implement and enforce the other three tobacco control policies studied in this investment case:**
   - **plain packaging of tobacco products (WHO FCTC *Guidelines for implementation of Article* 11 *and* WHO FCTC *Guidelines for implementation of Article* 13);**
   - **promote and strengthen public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation (WHO FCTC *Article* 12); and**
   - **promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (WHO FCTC *Article* 14).**
4. **Strengthen enforcement compliance with smoke-free laws (WHO FCTC *Article* 8).**
5. **Implement measures to protect public health policies from the commercial and other vested interests of the tobacco industry (WHO FCTC *Article* 5.3).**
6. **Fully implement the Protocol to Eliminate Illicit Trade in Tobacco Products, including by building capacity to combat illicit trade (*Protocol and* WHO FCTC *Article* 15).**
7. **Identify opportunities to link the implementation of the WHO FCTC with wider sustainable development strategies.**

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

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

Every year, tobacco use causes:

- Nearly 1,400 deaths.
- PAB 78 million in health-care expenditures.
- PAB 28 million in workplace productivity losses
- Tobacco-attributable mortality valued at PAB 309 million.
- Total social and economic losses equivalent to 0.6% of GDP.

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

- Prevent more than 2,300 deaths.
- Save PAB 87 million in health-care expenditures.
- Generate economic benefits (PAB 464 million) that significantly outweigh costs (PAB 20 million) of implementation and enforcement – a 23:1 return on investment.
- Prevent PAB 7.8 trillion (US$205 million) in losses due to tobacco-attributable mortality.
- Prevent PAB 32 million in workplace productivity losses.

* Figures subject to rounding.

1. Introduction

The tobacco epidemic is one of the greatest public health threats the world has faced, killing more than 8 million people a year, including some 1.2 million deaths from exposure to secondhand smoke [1]. Tobacco use is a main risk factor for non-communicable diseases (NCDs) including cardiovascular disease (CVD), diabetes, cancer and chronic respiratory disease, as well as a cause of many other diseases [2]. In Panama, around 4.9 percent of adults smoke tobacco, with a higher prevalence among men (8 percent) than among women (1.8 percent) [3]. Tobacco use causes nearly 1,400 deaths every year [4], with about 38 percent of these deaths occurring among those under age 70 [4].

In addition to the cost to health and well-being, tobacco also imposes a heavy economic burden throughout the world. A 2018 study (based on 2012 data) found that the costs of smoking[2] were equivalent to 1.8 percent of the world's annual gross domestic product (GDP). Almost 40 percent of the costs occurred in developing countries, highlighting the substantial burden these countries suffer [5].

Tobacco use reduces productivity by permanently or temporarily removing individuals from the labor market due to poor health [6]. 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) [7], [8]. The labor and health consequences affect not only smokers, but also the people in their households who often need to take time off from work to care for those with tobacco-related diseases.

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

Tobacco production causes environmental damage including soil degradation, water pollution, and deforestation. Tobacco's annual climate change impact is comparable to entire countries' emissions and represents 0.2 percent of the global total. As a result of the shift of tobacco production from richer countries to lower income countries its environmental impacts are now mostly borne by developing regions. By depleting these countries' valuable resources, and polluting and damaging their ecosystems, tobacco puts their livelihoods and development at risk [15]–[17].

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

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

The WHO FCTC was developed in response to the globalization of the tobacco epidemic and is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. The Convention represents a milestone for the promotion of public health and provides new legal dimensions for international health cooperation. Panama is a country that ratified the WHO FCTC at an early stage, and has been a Party since the Convention entered into force in 2005 [18].

Panama also ratified the Protocol to Eliminate Illicit Trade in Tobacco Products in 2016. The Protocol is an international treaty, that entered into force in 2018, that builds upon Article 15 of the WHO FCTC, with the objective of eliminating all forms of illicit trade in tobacco products through a package of measures to be taken by countries acting in cooperation.

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

Box 1. 2030 Agenda for Sustainable Development

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

Since joining the WHO FCTC as a Party in 2005, Panama has made progress in tobacco control and is now considered to have one of the most developed national tobacco control programs in the Americas [22]. Law 13 "Which Adopts Measures to Control Tobacco and its Harmful Effects on Health" is the country's primary legislation on tobacco and includes smoke-free public places and workplaces; regulations on packaging and labeling of tobacco products; and bans on tobacco advertising, promotion, and sponsorship (TAPS); among other measures [22], [23]. After passing of this legislation, Panama continued to strengthen WHO FCTC policy actions, such as health warnings on tobacco products and increasing tobacco taxation.

While Panama has demonstrated leadership in tobacco control, tobacco continues to burden its economy and the health of its population. Existing policies can be strengthened and key demand reduction measures within the WHO FCTC remain to be implemented and or strengthened. Opportunities for Panama to improve implementation of the WHO FCTC include: strengthening tobacco tax structures and increasing tax rates; implementing plain packaging for tobacco products; promoting and strengthening public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation by continuing to implement nationwide anti-tobacco mass media campaigns; strengthening enforcement of smoke-free laws and further expanding cessation services to improve access in indigenous areas and amongst adolescents, ensure access to nicotine replacement therapy in all health facilities and establish a national toll-free quit line. Realizing the full benefits of all of the above measures depends on concerted and coordinated efforts from multiple sectors of government with support from civil society.

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

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

3 The FCTC 2030 project is a global initiative funded by the Governments of Australia, Norway and the United Kingdom to support countries to strengthen WHO FCTC implementation to achieve the SDGs. As of 2022, Panama is one of 33 countries worldwide that have participated in the FCTC 2030 project [24].

1. **Increase tobacco taxation to reduce the affordability of tobacco products** *(WHO FCTC Article 6).*
2. **Implement plain packaging[4] of tobacco products** *(WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13).*
3. **Promote and strengthen public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation** *(WHO FCTC Article 12).*
4. **Promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use** *(WHO FCTC Article 14).*

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

4 Plain (or standardized) packaging is defined as "measures to restrict or prohibit the use of logos, colours, brand images or promotional information on packaging other than brand names and product names displayed in a standard colour and font style". Further information is available at: Guidelines for implementation of Article 11 of the WHO Framework Convention on Tobacco Control (decision FCTC/COP3(10)) November 2008, available at: https://fctc.who.int/publications/m/item/packaging-and-labelling-of-tobacco-products, and Guidelines for implementation of Article 13 of the WHO Framework Convention on Tobacco Control, available at: https://fctc.who.int/who-fctc/overview/treaty-instruments/tobacco-advertising-promotion-and-sponsorship

2. Tobacco control in Panama: status and context

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

Tobacco use prevalence and social norms

The achievements of Panama's tobacco control program have resulted in a significant reduction in tobacco use prevalence over the past decade [25]. In 2007, 9.4 percent of the adult population aged 18 years and older used tobacco [26], while in 2013 6.4 percent of adults aged 15 and older used tobacco [27]. In 2019, 4.9 percent of the adult population aged 15 years and older smoked tobacco [3]. According to PAHO's 2022 Report on Tobacco Control for the Region of the Americas, Panama has the lowest adult tobacco use prevalence of any country in the Americas [28]. Tobacco use remains more common in men than in women in Panama, with 8 percent and 1.8 percent smoking tobacco, respectively. Smoking is the most common form of tobacco use, and in 2019, 4.9 percent of the population currently smoked tobacco, whereas 0.2 percent used smokeless tobacco [3].

Youth tobacco use

According to the most recent Global Youth Tobacco Survey (GYTS) 2017, 7.8 percent of students in Panama (13-15 years old) currently use some form of tobacco product, with a similar prevalence among boys and girls (7.9 percent and 7.4 percent respectively). There is a higher prevalence of current smoked tobacco use among boys (6.2 percent) than girls (5.4 percent), but more girls (2.4 percent) use smokeless tobacco than boys (2.2 percent). According to the 2017 GYTS, 6.4 percent of students are current electronic cigarettes users, making it one of the most used types of tobacco product among youth.[5] More than half (58 percent) of current cigarette smokers were not prevented from buying cigarettes despite their age and 59 percent bought cigarettes as individual sticks [29].

Youth exposure to secondhand smoke is high, and girls are more frequently exposed to secondhand smoke than boys. In 2017, 31 percent of students were exposed to tobacco smoke in an enclosed public place (34 percent of girls compared to 29 percent of boys) and 35 percent at any outdoor public place (37 percent of girls compared to 33 percent of boys) [29]. Most students (58 percent) were taught in school about the danger of tobacco use during the past 12 months, and 86 percent favored prohibiting smoking inside enclosed public places [29].

5 Despite e-cigarettes being banned under Law 315.

Making tobacco products less affordable is one of the best ways to control tobacco use, and young people are particularly sensitive to the price of tobacco [30]. Higher tobacco prices from tax increases can make smoking too costly for young people and reducing the incentive to start or continue to smoke. A 2021 study demonstrated that higher tobacco prices, such as through tax increases, are associated with a decreased risk of smoking initiation among youth and young adults [31].

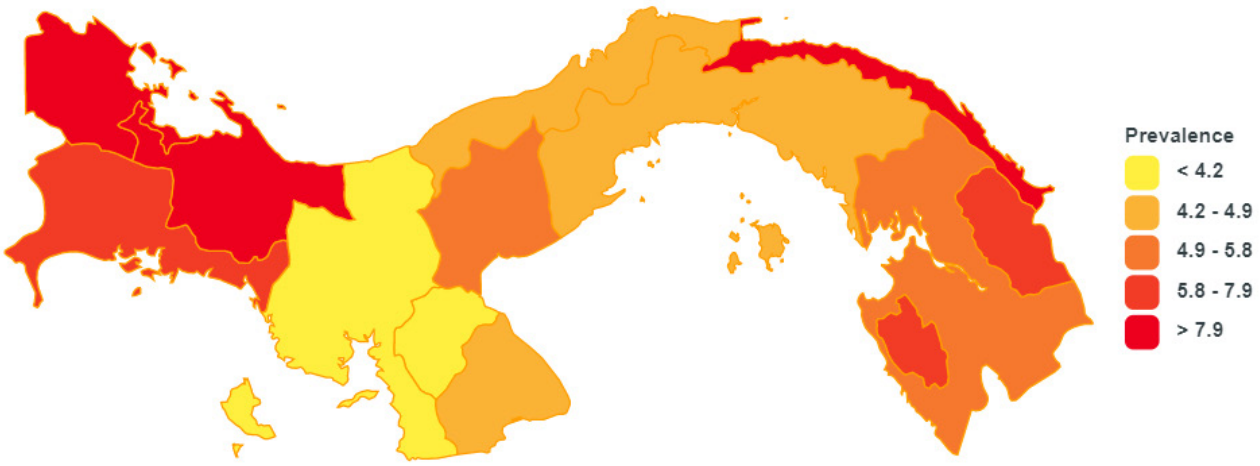
Equality

Despite being an upper-middle-income country with a high ranking on the Human Development Index, income inequality in Panama remains among the highest in the world as indicated by a Gini coefficient[6] of 49.8 percent in 2019 [32], higher than the average of 31.2 percent among all OECD countries, according to the latest data [33]. In 2019, 6.6 percent of the population lived in extreme poverty with large differences between urban and rural areas (1.7 and 18 percent respectively) [34]. Indigenous populations are particularly vulnerable, as 83 percent of ethnic indigenous populations live below the poverty line and 70 percent live in extreme poverty [35]. Higher levels of poverty result in worse access to basic services and infrastructure, higher levels of malnutrition, child mortality, illiteracy, and precarious living conditions [36].

The burden of tobacco use in Panama is higher among these vulnerable groups. According to the 2019 National Health Survey, tobacco use prevalence was comparable in urban and rural areas (4.9 and 4.5 percent respectively), but almost double among the indigenous population (8.4 percent) [3]. **Figure 1** highlights elevated tobacco use prevalence in regions with greater proportions of indigenous people, such as Bocas del Toro and Guna Yala.

6 The Gini coefficient is one of the most frequently used measures of economic inequality. The coefficient can take any values between 0 to 1 (or 0% to 100%). A coefficient of zero indicates a perfectly equal distribution of income or wealth within a population.

Fig. 1: Comparison of tobacco use prevalence, multidimensional poverty and indigenous populations in regions of Panama (expressed as percentage)



Source: Instituto Conmemorativo Gorgas de Estudios de la Salud. Sistema de información de la Encuesta Nacional de Salud de Panamá (ENSPA), (2019) [3]. Smoking prevalence used in models is also drawn from this source.

Box 2. Tobacco and gender

While worldwide women and girls tend to use tobacco at lower rates than men, they can still be subjected to the harms of tobacco use—including exposure to secondhand smoke [37] and the effects of household income diverted to tobacco use. Since tobacco use prevalence is often lower for women than men, the tobacco industry sees this as an opportunity to scale up marketing targeted at women and girls [38]. In Panama, girls are consuming tobacco at a similar rate to boys (7.9 percent and 7.4 percent respectively) and girls are outpacing boys in the consumption of smokeless tobacco (2.4 percent vs 2.2 percent). Moreover, girls are exposed to secondhand smoke at a higher rate than boys in the country [29].

Box 3. Tobacco and pregnancy

Tobacco use during pregnancy imposes significant health risks on the fetus, infant and mother. It increases the likelihood of miscarriages, stillbirths, preterm births, low birth weight, birth defects, and sudden infant death syndrome, among others [39], [40]. Exposure to secondhand smoke during pregnancy also increases the risks of having low birthweight babies, and other health issues for mothers and babies [40]. Mothers face additional health risks as pregnant smokers are more likely to experience heart and lung complications than pregnant nonsmokers [41]. Despite the strong evidence, the tobacco industry continues to aggressively target women and girls [40]. While the current prevalence of smoking during pregnancy in Panama is unknown, it is estimated that the global prevalence is 1.7 percent [42].

2.2 National tobacco control legislation, strategy and coordination

Panama's strong history of tobacco control legislation dates to the 1990's when Law 45 was passed in 1995 establishing an initial tax on cigarettes. Later in 1999, the Executive Decree 86 was passed prohibiting sales to minors, among other measures [43].

Table 1 provides a non-exhaustive summary of key legislation that governs tobacco control in Panama as of 2022. The main law regarding tobacco control in Panama, Law No. 13 "Which Adopts Measures to Control Tobacco and its Harmful Effects on Health" created smoke-free public places and workplaces, established requirements for health warnings, banned TAPS, and prohibited the sale of tobacco to minors, among other tobacco control measures [44].

Table 1: Summary of key tobacco control legislation pertaining to demand reduction measures in Panama (list is not comprehensive)

Law	Date	Summary
Law 13 "Which Adopts Measures to Control Tobacco and its Harmful Effects on Health" (1)	24 January 2008	The main law regarding tobacco control in Panama which implements tobacco control measures including creating smoke-free public places and workplaces, specifications for health warnings, banning TAPS, among others.
Executive Order No. 230 "Which regulates Law 13 of 24 January 2008 and issues other provisions" (2)	6 May 2008	Expands the list of smoke-free places and elaborates on health warning requirements, among others.

Law	Date	Summary
Executive Decree 611 "Which amends Article 18 of Executive Order 230 of 6 May 2008, Which Regulates Law 13 of 24 January 2008" (3)	3 June 2010	Amends Article 18 of Executive Order 230 and imposes a total ban on TAPS including at points of sale. Only a textual list of products and their respective prices are permitted without promotional elements.
Ministry of Health Resolution No. 0554 "That establishes that water pipes, narguiles, hookahs, shishas, cachimbas, or by whatever other name they may be known in the future, are tobacco products, and issues other provisions" (4)	8 March 2018	Defines waterpipes, cachimbas, narguiles, hookahs, shishas or by any other name they may be known in the future, as tobacco products; prohibits all forms of advertising, promotion and sponsorship of these products; requires health warnings on their packaging; and requires importers to request approval from the Directorate General of Public Health for marketing of these products.
Ministry of Health Resolution No. 2569 "That approves the five new pictorial health warnings, which must be printed on the different packages, tobacco product containers, cartons and cigarette packs which are sold in the territory of the Republic of Panama" (5)	4 October 2021	Establishes five new pictorial health warnings to be printed on tobacco product packaging from 1 September 2022 to 30 August 2023.
Law 315 "That prohibits the use, importation and commercialization of electronic nicotine administration systems, electronic cigarettes, vaporizers, tobacco heaters and other similar devices, with or without nicotine, in the Republic of Panama" (6)	30 June 2022	Prohibits the use, import, and sale of e-cigarettes as well as heated tobacco products (6,7).

Sources: (1) Asamblea Nacional de Panamá (2008). Ley No 13. "Que adopta medidas para el control del tabaco y sus efectos nocivos en la salud" [23].
(2) República de Panamá, Ministeria de Salud. 6 Mayo 2008. "Que reglamenta la Ley 13 de 24 de enero de 2008 y dicta otras disposiciones" [45].
(3) República de Panamá, Ministeria de Salud. 3 Julio 2010. "Que modifica el articulo 18 del Decreto Ejecutivo 230 de 6 de mayo de 2008, que reglamenta la Ley 13 de 24 de enero de 2008" [46].
(4) República de Panamá, Ministeria de Salud. 8 Marzo 2018. "Que establece que las pipas de agua, narguiles, hookahs, shisha, cachimbas o de cualquier otra denominación que en el futuro se tenga. Son productos de tabaco y dicta otras disposiciones" [47].
(5) República de Panamá, Ministeria de Salud.4 Octobre 2021. "Que aprueba y adopta los cinco (5) nuevos pictogramas con sus respectivas advertencias sanitarias, que deberán ser impresos en los distintos empaques y envases de productos de tabaco, cartones y cajetillas de cigarrillos, que se comercialicen en el territorio de la República de Panamá; para la vigencia que inicia el 1 de septiembre de 2022 hasta el 30 de agosto de 2023" [48].
(6) República de Panamá Ley 315 de 30 de julio de 2022. "Que prohíbe el uso, importación y comercialización de sistemas electrónicos de administración de nicotina, cigarrillos electrónicos, vaporizadores, calentadores de tabaco y otros dispositivos similares, con o sin nicotina, en la República de Panamá" [49].
(7) Amita Bustamente (2020). "Presidente Cortizo veta parcialmente el proyecto 178 sobre cigarros electrónicos" [50].

There is a national coordinating mechanism for tobacco control in Panama. Established in 2003 under Executive Decree 63, the National Council for Tobacco-Free Health is the designated national coordinating mechanism (NCM) for tobacco control [51]. In 2018 the Council was modified by Executive Decree 178 [52]. The Council acts as an advisory and support body for planning, surveillance, monitoring and evaluation of national policies, plans, programs and projects aimed at controlling consumption and exposure to smoke from tobacco products. It meets periodically and is made up of central and decentralized government entities, including various ministries, representatives of medical and academic associations and foundations.

In addition to the Council, Panama also has the National Control Commission, originally established in 2003 under Resolution 036 of February 6, 2003 (G.O. 24,746 of February 20, 2003) as the National Commission to Study Smoking in Panama. It was modified in 2012 by Resolution 745 and again in 2016 by Resolution 2175, which changed its name to National Tobacco Control Commission.

There is a national tobacco control strategy in effect in Panama. The National Strategic Health Plan includes the Five-Year Tobacco Control Plan 2020-2024, which covers health promotion, including smoking cessation, and training of health-care personnel [53].

There are also programmes specific to tobacco control in Panama. As of 2020, the National Tobacco Control Programme (Programa Nacional de Control del Tabaco) is integrated in the National Plan Against Cancer and NCDs [53]. In addition, the Programme for the Development of the Smoking Cessation Clinics (Programa para el Desarrollo de la Cliníca de Cesacíon de Tabaquismo), housed in the Ministry of Health (MoH) lays out a programme for the establishment of smoking cessation clinics in Panama and establishes guidance for the provision of cessation services in the country [54].

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

2.3 The status of WHO FCTC demand reduction measures

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

While Panama has demonstrated progress to implement key demand reduction measures, 158,000 Panamanians continue to smoke [55]. Implementing additional demand reduction measures or intensifying existing ones can draw Panama into closer alignment with the WHO FCTC and reduce the substantial costs imposed by tobacco use. Below, the status of each

of the demand reduction measures in relation to WHO FCTC recommendations is discussed.

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

In Panama, total taxes comprise around 57 percent of the retail price of the most sold brand of cigarettes [28]. The structure of taxes on tobacco products consists of three taxes including an import tariff of 15 percent (in force since 1998), an import value added tax (VAT) of 15 percent (in force since 2005) based on cost, insurance and freight (CIF), and an ad valorem excise tax at 100 percent of final consumer retail price (modified in 2009) [56]. Since 2009, income growth has increased, making cigarettes more affordable. In fact, economic growth in Panama is expected be around 6.3 and 6.5 percent from 2023 to 2024 [57].[7] As of 2022, there is no specific excise tax on tobacco in Panama.

There is substantial scope for action to reach what is considered in the *WHO Report on the Global Tobacco Epidemic* as a high-level of achievement, which is for total indirect taxes to represent at least 75 percent of the final retail price [58]. On tax design for tobacco products, WHO makes a number of recommendations including that governments should rely on specific tobacco excises to drive price increases or on a mixed system that relies more on the specific component than the ad valorem component; increase tobacco taxes significantly to reduce the affordability of tobacco products (i.e. price increases are greater than income increases)[8] and automatically adjust specific tobacco taxes for inflation and income growth [59], [60].

In 1995, Law 45 established the tax base for the tax on cigarettes to be 32.5 percent of the final retail price [43]. In 2009, via Article 28 of Law 69, the tax on cigarettes was increased from 32.5 percent to 100 percent of the sales price (declared by the national productor or the importer from the Ministry of Economics and Finance), with a minimum of PAB 1.50 per pack and PAB 0.50 for cigars or other tobacco products [61]. Tobacco is also available in duty-free shops in airports [62]. Since this reform in 2009, there have been no additional tobacco tax reforms in Panama.

7 After Law 69 was implemented in 2009 increasing taxes, industry reportedly increased prices, minimizing the total tax as a percent of retail price. As evidence of this, in 2010 total tax was 59 percent of the most sold brand of cigarettes, which decreased to 57 percent by 2012 and has not changed since [58].

8 A common indicator to measure the affordability is the percentage of GDP per capita required to buy 100 packs of 20 cigarettes in a given year [59].

The Global Cigarette Scorecard that assesses countries' cigarette tax policy performance gave Panama a score of 2.13 out of a maximum score of 5 in 2020. This is lower than the global, American region and upper-middle income countries averages. Within the Tax Scorecard, Panama received a zero in the "affordability change" category and the overall score has not improved since 2014 [63].

The investment case examines the impact of raising cigarette taxes to levels considered in the *WHO Report on the Global Tobacco Epidemic, 2021* as a high-level of achievement. It models introducing a specific excise tax in 2025 alongside Panama's current tax structure, and raising the tax rate (see annex on methodology for detailed information). Further economic gains will be made in Panama with substantial tax increases on all tobacco products.

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

Consumption of tobacco and its products is prohibited in the following places: national, provincial, regional and local public and private offices; public transport and in transport terminals (land, sea and air); public closed places; public and private opened and closed places used for sport activities; public and private common areas of buildings for domestic and commercial use; hospitals; closed working places and public and private education and health institutions, as stated in Article 5 of Law 13 of January 2008 [53]. In general, the level of compliance with anti-smoking laws is good, although it could be improved in some pubs, bars and restaurants. Considering the requirements of the obligations under Article 8 of the WHO FCTC are met and are at an acceptable level of implementation, this intervention is not modeled in the investment case.

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

Panama is complying with its obligation under Article 11 of the WHO FCTC regarding health warnings. Health warnings are mandatory for cigarettes and cover 50 percent of the main front and rear display areas. Five health warnings have been approved for circulation that describe the harmful health effects of tobacco, include a photo or graphics in each round, and are available in Spanish, the country's official language [56]. Health warnings are also mandatory on other smoked tobacco products and for smokeless tobacco products and must cover 50 percent of the main exposure areas on the front and back of the package [64]. As the requirements of the obligations under Article 11 of the WHO FCTC are met

and an acceptable level of implementation has been achieved, this intervention was not modeled in the investment case.

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

Although there have been efforts to implement plain packaging of tobacco products, it is not currently mandated in Panama. A bill including plain packaging and increased health warnings size from 50 to 80 percent was proposed but ended up being partially vetoed by the presidency in 2019 [53]. The investment case examines the impact of implementing and enforcing plain packaging requirements.

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

Due partially to the difficulties posed by the coronavirus (COVID-19 pandemic), there were no national anti-tobacco mass media campaigns conducted between 1 July 2018 and 30 June 2020 lasting at least three weeks [65]. However, in 2022 the MoH in Panama informed that their school outreach activities included a focus on new tobacco products. Panama has previously implemented awareness campaigns. In 2013 Panama launched a yearlong public awareness campaign distributed through radio, television and print media. Since 2014, a similar campaign has been considered. There are also orientations for owners of establishments to understand tobacco control regulations [53]. Additionally, there are tobacco control trainings and awareness-raising programs for health workers, community workers, social workers, media professionals, educators, decision makers and administrators among others [53].

As of 2014, the United Nations Population Fund (UNFPA) has been a key ally of MoH and the National Commission Against Tobacco as it relates to awareness campaigns directed at youth and adolescents. Based on this long-standing relation, UNFPA has developed a number of pedagogical resources such as card games, video games, puzzles and flipcharts to help sensitize youth and children against the dangers of tobacco use, and to deter young population from engaging in tobacco use from an early age [66], [67]. In fact, the Friendly Health Services for Adolescents, an institutional offer of MoH for this age group, has a Smoking Prevention Program, since 2018. This intervention is made possible by an agreement between the Comisión Nacional para el Control del Tabaco (National

Commission for Tobacco Control) (CNCT) and the Childhood and Adolescence Program of MoH, with the technical support of UNFPA [67].

The investment case examines the impact of initiating a nationwide antismoking mass media campaign that is researched and tested with a targeted audience and evaluated for impact.

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

Panama has an extensive ban on tobacco advertising, promotion, and sponsorship (TAPS), that bans all forms of direct and indirect advertising, satisfying WHO FCTC criteria. In Panama, tobacco advertising is banned at point of sale, on the internet, on national and international television, radio, magazines, and newspapers, and on billboards and outdoors. This is in addition to bans on indirect tobacco advertising which include free distribution in the mail, promotional discounts, tobacco brands and products in television and films, among other indirect outlets. There is a complete ban on tobacco sponsorship in Panama as well. There are penalties for violation of the bans [58].

Compliance assessments by national experts,[9] indicated that the TAPS ban had high compliance overall, receiving a score of 9 out of 10 [58]. However, the National Tobacco Control Commission identified promotion of tobacco products on social media platforms as a key challenge and has been in contact with the Panama Public Service Authority, which regulates all communication media [53]. Given the requirements for the WHO FCTC Article 13 obligations are being met and there is a good level of implementation, this intervention has not been modeled in the investment case.

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

Partially cost-covered smoking cessation support is available in some primary care facilities and hospitals and additional locations [58]. Tobacco cessation services

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

are also available at the secondary and tertiary health-care level. Altogether, there are 56 tobacco cessation clinics across the country [68], but there is a lack of cessation clinics in indigenous areas like in Guna Yala [69], despite higher tobacco use prevalence there [70]. There are reported disparities in cessation clinic services as government officials have mentioned there is a reduced level of resources available from clinics operated by Social Security (Caja del Seguro social) compared to those operated by MoH. There is no national specific toll-free quit line in Panama and while nicotine replacement therapy (NRT) is on the essential medicines list, it is not available at pharmacies or general stores. Despite MOH's efforts to make the generic product available at cessation clinics, this has not been possible by the time of the publication of this report.

While NRT is not available, there are other cessation medications available with a prescription including bupropion and varenicline, both fully cost covered through the national health insurance [65]. However, varenicline is not currently available on the market due to ongoing global regulatory investigations [71]. Tobacco tax revenues are used to finance cessation clinics as well as medications, although government officials have mentioned it is a challenge to provide resources to Social Security cessation services. Panama has also implemented programs to promote tobacco cessation that incorporate health promotion, training and education of health personnel. However, there is room for improvement with regards to referral, recruitment and participation [53].

The investment case models the impact of training primary care health providers to identify tobacco users and to provide tobacco cessation advice (see the annex on methodology for detailed information). Further gains would be possible with the provision of further support to tobacco users, such as offering specialized tobacco dependence treatment services, a national toll-free quit line and/or internet based quit support and making pharmacotherapies more widely available (free of cost, if possible).

Table 2 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 A4**.

Table 2: Summary of the current state of WHO FCTC demand reduction measures in Panama and modeled implementation targets based on the WHO Report on the Global Tobacco Epidemic, 2021 [58]

Tobacco control policy	Panama baseline	Modeled implementation target
Increase tobacco taxation to reduce the affordability of tobacco products (WHO FCTC Article 6)	Tax share equivalent to 57% of the retail price of the most sold cigarette brand.	Introduce a specific excise tax (in addition to the existing ad valorem tax) and increase total tax rates on cigarettes to at least 75% of the retail price. Implement regular tax increases to outpace inflation and income growth.
Implement plain packaging of tobacco products (WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13)	Plain packaging requirements are not currently in place.	Introduce a specific excise tax (in addition to the existing ad valorem tax) and increase total tax rates on cigarettes to at least 75% of the retail price. Implement regular tax increases to outpace inflation and income growth.
Promote and strengthen public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation (WHO FCTC Article 12)	There was no recent nation-wide mass media campaign	Implement a nationwide antismoking
Promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (WHO FCTC Article 14)	Partially cost-covered smoking cessation support is available in Panama. There is no national specific toll-free quit line and NRT is unavailable.	Increase coverage of services by expanding training of health providers to identify tobacco users and to provide tobacco cessation advice; and by scaling up the provision of tobacco cessation services at the primary care level.

Source: WHO Report on the Global Tobacco Epidemic, 2021 [58]

2.4 Tobacco use and the COVID-19 pandemic

The global COVID-19 pandemic has strained health systems worldwide, and the economic impact of the outbreak has been immense. According to WHO, evidence indicates that smokers are more likely to suffer more severe outcomes of COVID-19, such as admission into intensive care units and death, than never smokers. Furthermore, severe forms of COVID-19 or deaths due to COVID-19 are more frequent in people with comorbidities that are related to tobacco use, including chronic obstructive pulmonary disease, lung cancer and cardiovascular diseases [72]. Moreover, tobacco use is also proven to worsen the outcomes of other communicable diseases such as tuberculosis and HIV [73]. In Panama, the COVID-19 pandemic has triggered some calls for stronger tobacco control. During the pandemic tobacco cessation counselling was offered over the phone [53] and a call center named

ROSA (Sistema de Respuesta Operativa de Salud automática) was established to facilitate the treatment of patients with COVID-19 which also included advice on tobacco cessation and guidance [53].

2.5 Key actors in tobacco control

After discussing with stakeholders during the development of the investment case, many key actors in Panama were identified with important roles in tobacco control. This includes the Ministry of Health in Panama (Ministerio de Salud) (MINSA), which performs tobacco surveillance and control by monitoring the achievement and success of related projects. The Ministry of Economy and Finance shares information with MINSA and related entities regarding the tobacco market and trade, and collates data related to tobacco taxation. The Panama National Customs Authority (Autoridad Nacional de Aduanas) (ANA) is a strategic partner for tobacco control success in Panama. The ANA shares information such as product inspections, seizures, destruction of tobacco products, as well as tobacco legal trade, import and export.

Caja del Seguro Social, the Panamanian Social Security Fund, supplies information related to treatment and rehabilitation for tobacco use through the electronic system, as well as morbidity and mortality associated with tobacco.

The Gorgas Memorial Institute for Health Studies (Instituto Conmemorativo Gorgas de Estudios de la Salud) (ICGES) is a public health scientific research institution with the objective to guide health policies and interventions. ICGES is one of the most prominent entities in Panama addressing tobacco use. The institute oversees the collection and sharing of tobacco-related information, from tobacco use surveys (e.g. GATS, GYTS and national surveys) to research, regulations, warnings, sanctions, advertising, promotions, market and trade [74].

Civil society has supported many of the accomplishments in tobacco control in Latin America and the Caribbean [75]. Formed in 2006, the main civil society organization in Panama is the Panamanian Coalition for Tobacco Control (Coalición Panameña para el Control del Tabaco) (COPACET) which is part of the government-established National Commission for Health without Tobacco [76] and represented by recognized tobacco control professionals in Panama. The organization has an active role in tobacco control in the country and works closely with the government [77].

2.6 Financing

Panama is forecasted to reach a GDP growth rate of 6.5 percent in 2022 and continue to grow at 5 percent in 2023 and 2024, one of the strongest economic growth rates in the Latin American and Caribbean Region [78]. The annual budget for tobacco control reported in 2018 was PAB 13.7 million (US$13.7 million). While this is higher than other upper-middle income

countries in the region, it is lower than Costa Rica with a US$49.7 million budget for tobacco control [58].

Panama uses tobacco taxes to finance tobacco control actions, considering that half of the tobacco tax collection is allocated to the "promotion of public health, prevention, surveillance and control of tobacco", 20 percent. is allocated to the National Cancer Institute, 20 percent to the Ministry of Health and 10 percent to the Customs Authority (to combat smuggling) [25]. According to government officials, in 2018, the total tobacco taxes collected on all tobacco products was around 24.6 million PAB.[10]

2.7 International and illicit trade

Panama is highly involved in international trade and direct foreign investment given its geographic position, the Panama Canal and its free trade zones [79]. It is estimated that the canal contributes 17 percent to government revenue [80] and 6 percent to GDP [81].

Panama has free trade agreements with El Salvador, Singapore, Chile, Costa Rica, Honduras, Guatemala, Nicaragua, Peru, the United States, Canada, Iceland, Norway, Switzerland, Liechtenstein, Mexico, South Korea and Israel [82]. In July 2018, Panama launched negotiations for a bilateral free trade agreement with China [83] and as of 2022, Panama is China's largest trading partner in Central America and China is the second largest user of the Panama Canal [84]. Panama is home to the Colon Free Trade Zone, the principal free trade zone in the Western Hemisphere, which more than 3,000 companies [85]. While the free trade zones offer companies specialized trade services as well as tax incentives [86], they can also be linked to illicit trade [87].

Free trade zones in Panama have been linked with illegal cigarettes sold across Latin America. Large amounts of illegal cigarettes have been confiscated in Colombia, Brazil and other Latin America countries with Panama identified as the main regional hub for illicit trade. In 2020, Panamanian authorities seized 28 containers of illegal cigarettes before they were shipped [88]. The Colon Chamber of Commerce (Cámara de Comercio de Colón) identified weak regulation and enforcement as key enablers allowing companies to abuse the norms of the free trade zone with few repercussions [88].

Illicit trade in tobacco products poses a serious threat to public health. Illicit trade increases the accessibility and affordability of tobacco products, thus fueling the tobacco epidemic and undermining tobacco control policies. It also causes substantial losses in government revenues, and at the same time contributes to the funding of transnational criminal activities [89].

10 From the National Customs Authority. Distribution of the amounts paid of the selective excise tax on imports of tobacco and substitutes according to law 69 of 2009 chapter 24- follow [61]. From January 1 to December 13, 2018.

According to the most recent GATS in Panama, 36 percent of current cigarette smokers purchase illegal cigarettes, and 45 percent of current youth cigarette smokers ages 15 to 19 purchase illegal cigarettes [27]. While illicit tobacco is a key issue in Panama, the tobacco industry exaggerates the extent of the problem in an effort to stop successful tobacco control (e.g. tobacco tax increases) [25]. Despite the tobacco industry's claims, increasing tobacco taxes does not necessarily lead to more tobacco smuggling, as demonstrated by multiple studies, and countries can reduce illicit trade by strengthening tobacco tax administration and enforcement [90].

The Government of Panama has made efforts to combat illicit tobacco trade. Panama ratified the Protocol to Eliminate Illicit Trade in Tobacco Products in 2016 – an international treaty, that entered into force in 2016. The Protocol includes regulations on tobacco trading in free trade zones [89]. Furthermore, Panama has tightened restrictions on illicit trade, considering it as criminal activity [44]. The Protocol was developed in response to the growing illicit trade in tobacco products, often across borders. A 2019 resolution established requirements for obtaining a special permit for companies that trade (import, sale, commercialization, export, and re-export) tobacco and tobacco-derived products in the Colon Free Trade Zone [91].

2.8 Tobacco industry presence and interference in policymaking

The main tobacco companies in Panama are British American Tobacco Caribbean & Central America, with 54 percent of the cigarette market share, and Philip Morris Panama with 23 percent of the market share [92]. In 2014 there were 2,849 metric tons of tobacco produced in Panama. Tobacco growing is only a small fraction of agriculture in Panama, with only 0.07 percent of agricultural land devoted to tobacco cultivation [93].

Panama received a *Global Tobacco Industry Interference Index*[11] score of 46, ranking 17th out of 90 countries [44]. According to the Index, the National Assembly is most vulnerable to tobacco industry interference. The passing of bills without civil society or health authority review have led to accusations of interference through illicit means [92]. The tobacco industry has also been allowed to participate in the discussions of bills as it is permitted by different committees of the National Assembly [92].

The tobacco industry has also conducted corporate social responsibility (CSR) activities, including in schools. Tobacco companies Philip Morris and British American Tobacco participated in the American Chamber of Commerce and Industry (AmCham) of Panama's Leadership Program for School Principals, Recognition Sustainable Leadership and AmCham-AACCLAA Volunteer Day [92]. Moreover, the Electoral Code does not clearly prohibit donations

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

from the tobacco industry in political campaigns. While reforms request the disclosure of donors in campaigns, they do not explicitly prohibit donations coming from the tobacco industry [44].

To protect public health policy in Panama, a number of resolutions have been adopted that limit the interaction of health officials with the tobacco industry. In 2016, Resolution 2175 of 2016 was passed prohibiting members of the National Tobacco Control Commission from engaging with the tobacco industry three years prior and after their appointment and required Committee members to sign a declaration on conflicts of interest. This Resolution included other specific measures as well to regulate Committee interactions with tobacco industry [94]. In 2018, Executive Decree 178 modified provisions regulating interactions of the National Council for Tobacco Free Health with the tobacco industry [52].

In 2019, under Executive Decree 237 the Inter-institutional Commission for the Implementation of the Protocol for the Elimination of Illicit Trade in Tobacco Products was established [95]. It is headed by the General Directorate of Public Health of the MoH and the Customs Authority to coordinate the development of policies and national strategies for the implementation of the Protocol in Panama. Also, as mentioned in interviews during the development of the investment case, the Ministry of Foreign Affairs requires all members of the commission to the Conference of the Parties to the WHO FCTC to sign a declaration of conflict-of-interest document.

Photo: © Flickr.com

3. Methodology

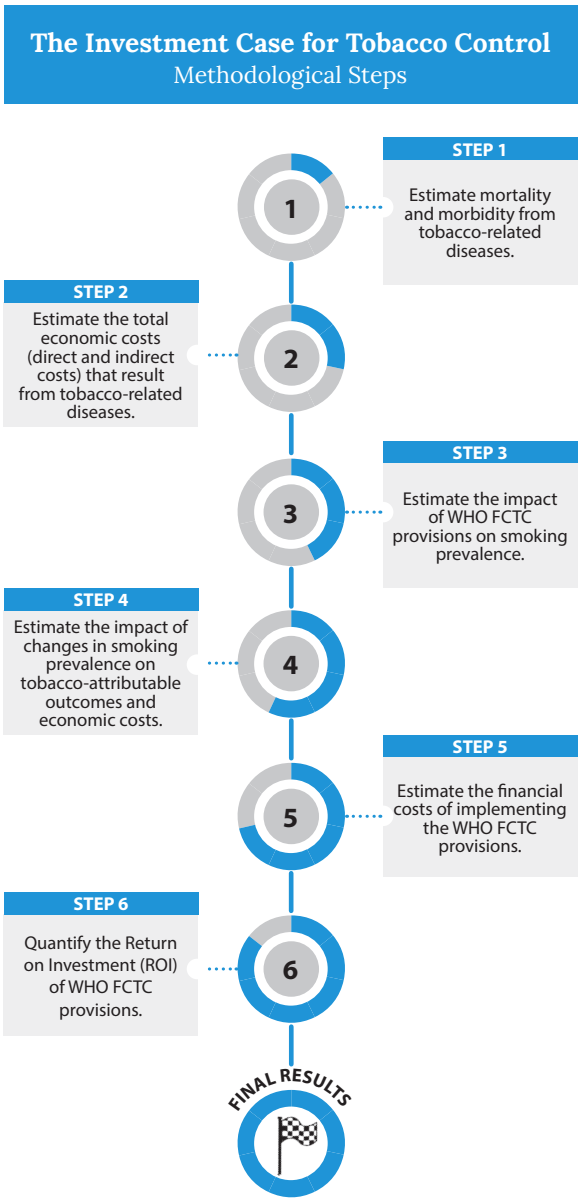
The purpose of the investment case is to quantify the current health and economic burden of tobacco use in Panama (in the context of WHO FCTC measures that are currently in place), and to estimate the impact that implementing new WHO FCTC measures—or strengthening existing ones—would have on reducing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

A static model was developed to conduct the investment case and to perform the methodological steps in **Figure 2**. This methodology has been used for previous national WHO FCTC investment cases under the WHO FCTC 2030 project. The tools and methods used to perform these steps are described in this report's annex on methodology. Interested readers are also referred to this report's separate *Technical Appendix*[12] for a more thorough account of the methodology.

The investment case team worked with the MoH and other stakeholders in Panama to collect national data inputs for the model. Where data was unavailable from government or other in-country sources, the team utilized publicly available national, regional, and global data from sources such as the WHO, the World Bank database, the Global Burden of Disease study by the Institute for Health Metrics and Evaluation (IHME), and academic literature.

Within the investment case, costs and monetized benefits are reported in constant 2020 Panamanian Balboas (PAB) and discounted at an annual rate of 5 percent.

Fig. 2: Building the investment case



12 Available upon request.

4. Results

4.1 The current burden of tobacco use: health and economic costs[13]

In 2019, tobacco use caused an estimated 1,384 deaths in Panama, 38 percent of which were premature, i.e. occurred among those under 70 years [95]. These deaths amount to 24,039 years of life lost (YLLs), which are lost productive years during which many of those individuals would have contributed to the workforce [96]. Monetizing YLLs due to tobacco use by applying an estimate of the value of a statistical life year (VSLY) to each year of life lost, the investment case identifies PAB 309 million in losses due to tobacco-attributable mortality.

While costs of tobacco-attributable mortality are high, the consequences of tobacco use begin long before death. As individuals suffer from tobacco-attributable diseases (e.g., cardiovascular disease, respiratory conditions, diabetes, cancers), expensive medical care is required to treat them. Spending on medical treatment for illnesses caused by smoking cost the government PAB 52 million and caused Panamanian citizens to spend PAB 22 million in out-of-pocket (OOP) health-care expenditures. Private insurance and non-profit institutions serving households spent PAB 4.9 million on treating tobacco-attributable diseases in 2019. In total, health-care expenditures attributable to smoking amounted to PAB 78 million.

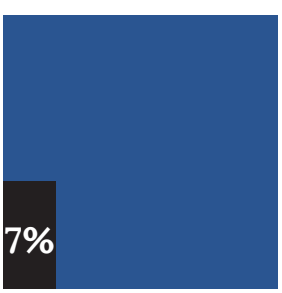
In addition to health-care costs, as people become sick, they are more likely to miss days of work (absenteeism) or to be less productive at work (presenteeism). In 2019, the cost of excess absenteeism due to tobacco-related illness was PAB 7.8 million and the cost of presenteeism due to cigarette smoking was PAB 21 million.

In total, tobacco use caused PAB 416 million in economic losses in 2019, equivalent to about 0.6 percent of Panama's 2019 GDP. **Figure 3** summarizes the current burden of tobacco use and contextualizes the losses. The burden of tobacco use exceeds the revenue the government currently collects from taxing tobacco products. Tobacco-attributable economic losses are about 14 times larger than the collected government revenue from tobacco taxes. Economic losses per licit cigarette pack sold are about PAB 31 per pack, outweighing the financial value—represented by the per pack price—that accrue in the value chain to growers, manufacturers, vendors, other supply chain stakeholders, and the government (through taxation). There are PAB 2,632 in costs per adult smoker.

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

Given the dominance of multinational corporations in the tobacco trade and the high-profit margins on cigarettes, much of the profit from tobacco sales in Panama leaves the country and goes into the pockets of international shareholders.

Fig. 3: Contextualizing the burden of tobacco use in Panama, 2019[14]



Government tobacco tax revenue as a % of the tobacco burden

Costs per adult smoker

PAB 2,632

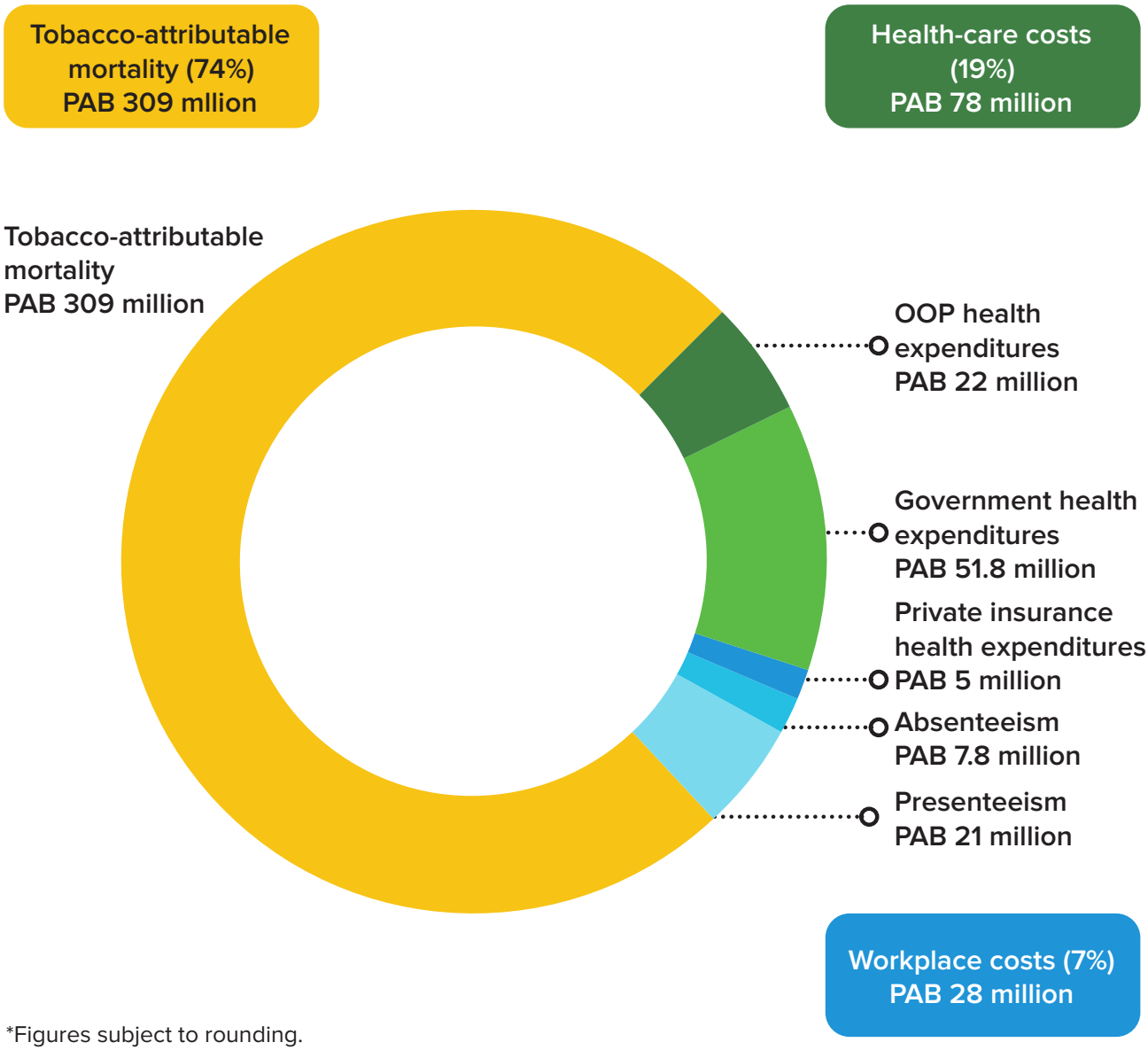
Burden per licit cigarette pack sold versus retail price of most sold brand (PAB)

Tobacco costs Panama PAB 416 million every year, equivalent to 0.6% of annual GDP

14 The tax revenue comparison is provided for context and is not meant to suggest that taxes should be increased to levels that equalize revenue with the tobacco burden. Government tobacco tax revenue (PAB 30.8 billion in 2019) was provided by the MoH during the investment case data collection process. The retail price of the most sold brand is from the WHO Report on the Global Tobacco Epidemic 2021 [58]. The number of licit cigarette packs sold (2.2 million) is estimated by dividing total excise tax revenue by the excise tax per pack of cigarettes, as reported in the WHO 2021 report.

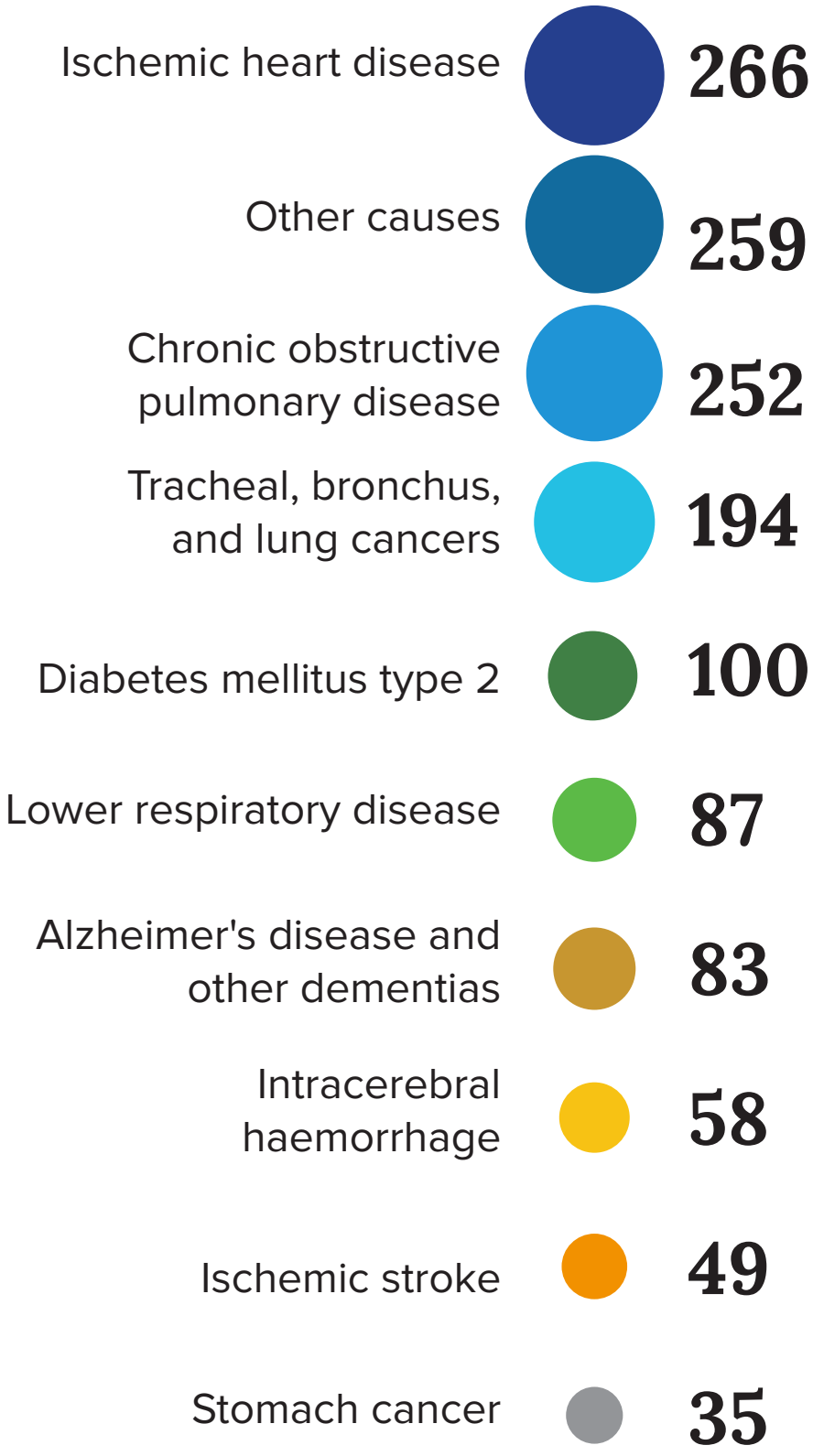
Figure 4 illustrates the share of the burden attributable to tobacco-attributable mortality, workplace costs, and health-care costs. **Figure 5** and **Figure 6** illustrate the annual health losses that occur due to tobacco use.

Fig. 4. Breakdown of the share of the cost of tobacco-attributable mortality, workplace costs, and health-care costs in Panama (PAB), 2019



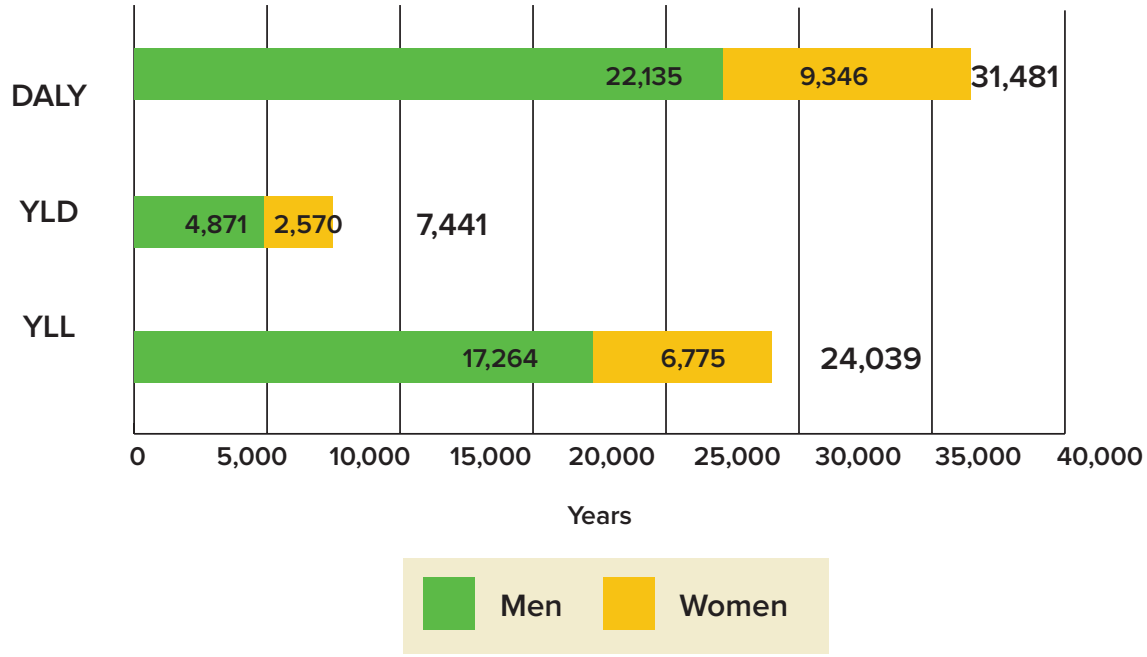
*Figures subject to rounding.

Fig. 5: Tobacco-attributable deaths by disease in Panama, 2019



Source: Results are from the IHME Global Burden of Disease Results Tool. Other causes include colon and rectum cancer, larynx cancer, cervical cancer, pancreatic cancer, aortic aneurysm, tuberculosis, subarachnoid haemorrhage, leukaemia, oesophageal cancer, prostate cancer, liver cancer, bladder cancer, lip and oral cavity cancer, other pharynx cancer, breast cancer, kidney cancer, peripheral artery diseases, peptic ulcer disease, asthma, atrial fibrillation and flutter, nasopharynx cancer, and gallbladder and biliary diseases.

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



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

4.2 Implementing policy measures that reduce the burden of tobacco use

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

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

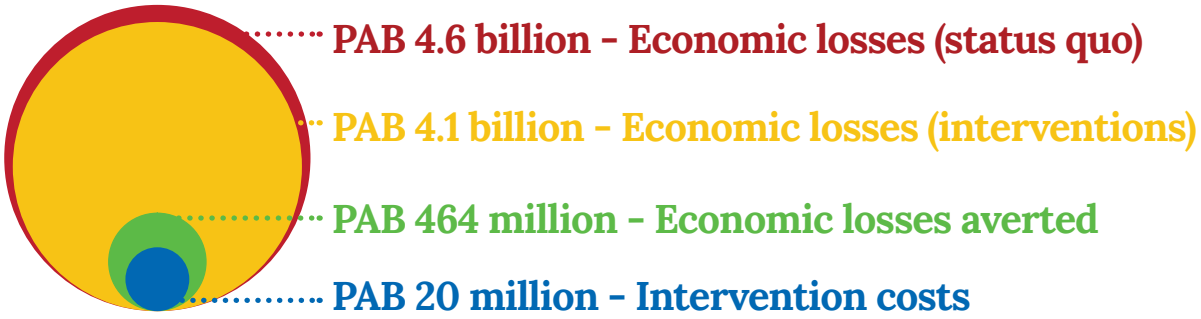
4.2.1 Health benefits—lives saved

La plena aplicación del CMCT de la OMS en Panamá (que incluye las cuatro medidas indicadas anteriormente) reduciría la prevalencia del consumo de tabaco, lo que supondría importantes beneficios sanitarios para el país. La aplicación del paquete de cuatro medidas políticas clave del CMCT de la OMS en las que se centra este caso de inversión reduciría la prevalencia del consumo de cigarrillos un 20% (en términos relativos) a lo largo de 15 años, por lo que se salvarían 2378 vidas entre 2023 y 2037, es decir, unas 159 vidas al año.

4.2.2 Economic benefits—costs averted

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

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

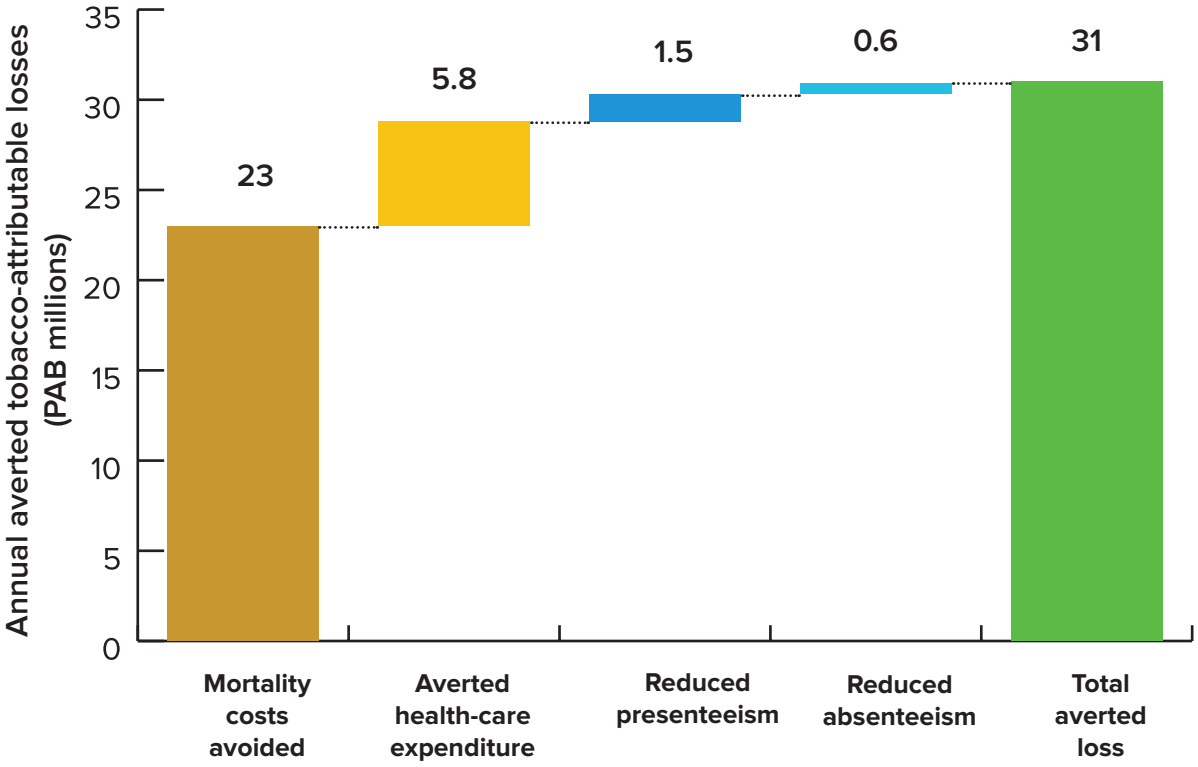


In total, over 15 years Panama would save about PAB 464 million that would otherwise be lost if the package of four key WHO FCTC policy actions are not implemented. This is equivalent to around PAB 31 million in annual avoided losses.

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

Figure 8 breaks down the sources from which annual avoided costs accrue from implementation of the package of four key WHO FCTC policy actions. The largest annual avoided costs result from averted tobacco-attributable mortality (PAB 23 million). The next highest source is avoided health-care expenditures (PAB 5.8 million), averted presenteeism (PAB 1.5 million), and reduced absenteeism (PAB 0.6 million).

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



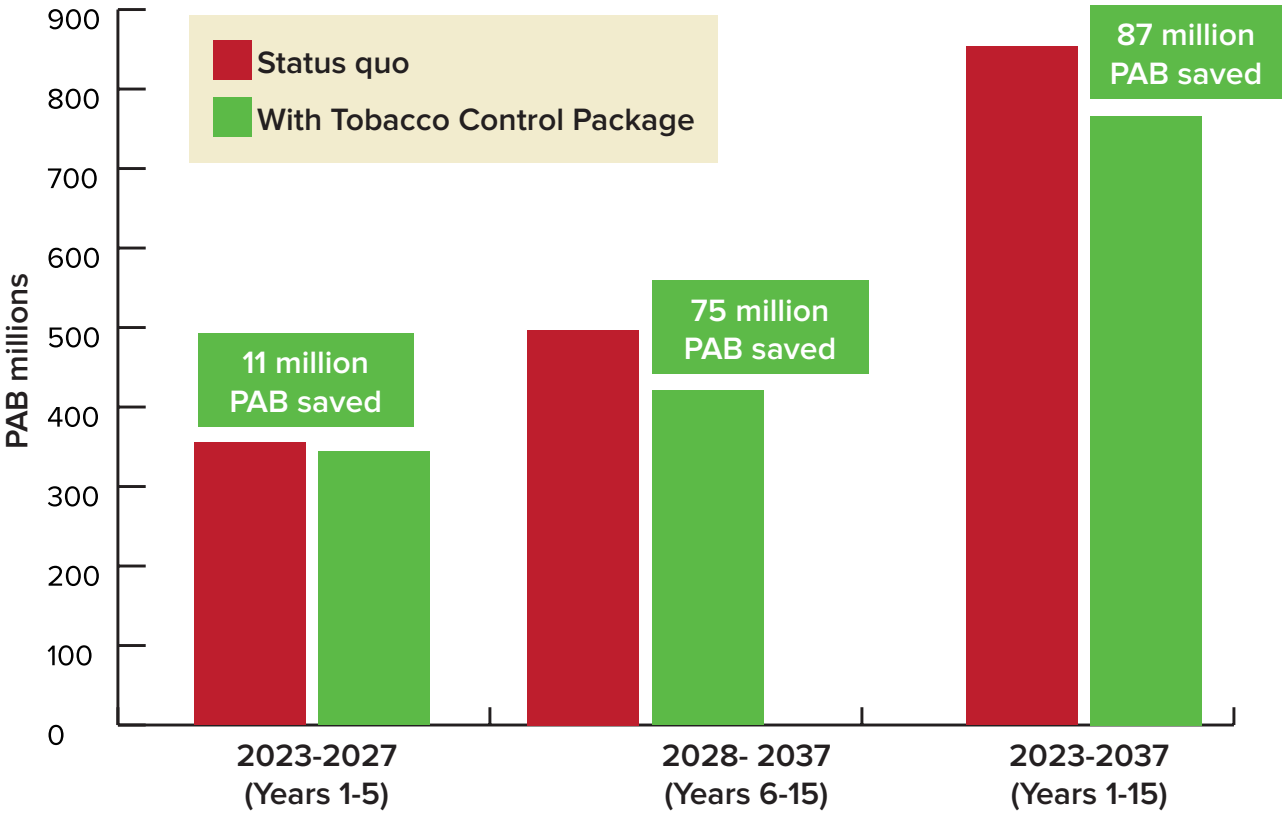
*Figures subject to rounding.

Implementing the package of four WHO FCTC policy actions examined in the investment case will reduce medical expenditure both for citizens and the government. Presently, total private and public health-care expenditures in Panama is about PAB 5.6 billion annually [98], and 1.4 percent of this amount is directly related to treating disease and illness due to tobacco use [5] (≈ PAB 78 million).

Year-on-year, the package of interventions would lower tobacco use prevalence, leading to less illness, and consequently less health-care expenditure (see **Figure 9**). Over the 15-year time horizon of the analysis, the package of interventions averts PAB 87 million in health-care expenditures, or PAB 5.8 million annually. Of these savings, 66 percent of savings would go to the government and 28 percent would go to individual citizens who would have

had to make OOP payments for health care. The remainder of savings would go to private insurance and other sources of health-care expenditures. From reduced health-care costs alone, the government stands to save about PAB 58 million over 15 years. Simultaneously, the government would successfully reduce the health expenditure burden that tobacco imposes on Panamanians through OOP payments, supporting efforts to reduce economic hardship on families. For families with tobacco users who quit, spending that would have been on tobacco products or health care, could instead be invested in nutrition, education, and other productive inputs to secure a better future.

Fig. 9: Private and public health-care costs (and savings) in Panama over the 15-year time horizon, 2023-2037



4.2.3 The return on investment

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

An investment is considered worthwhile from an economic perspective if the gains from making it outweigh the costs. A return on investment (ROI) analysis measures the efficiency of the tobacco investments by dividing the economic benefits that are gained from implementing the WHO FCTC tobacco control investments by the costs of the investments.

For this investment case, the ROI for each intervention was evaluated in the short-term (five years), to align with planning and political cycles, and in the medium-term (15 years) to align with the original timeframe allotted for the SDGs. The ROI was also evaluated for the full package of four WHO FCTC policy actions. Total benefits (avoided economic losses due to tobacco-attributable mortality, health-care expenditures, and diminished workplace productivity) are a measure of which interventions are expected to have the largest impact.

Table 3 displays costs, benefits, and ROIs by intervention, as well as for all interventions combined. With the exception of training health professionals to provide brief advice to quit tobacco use (an individual-level intervention with higher initial personnel costs), interventions deliver a ROI greater than one within the first five years, meaning that even in the short-term the benefits of implementing the interventions outweigh the costs. Depending on the intervention, over the first five years, the government will gain economic benefits ranging from between 0.3 to 19 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. Given the long term nature of many tobacco-related illnesses, with disease often only developing after years of tobacco use, the ROIs for each intervention would continue to grow over time, reflecting the compounding gains from moving as quickly as possible from planning and development stages to full implementation.

Table 3: Return on investment, by tobacco control policy/intervention, in Panama (PAB billions), 2023-2027 and 2023-2037

Return on investment, by tobacco control measure	First 5 years (2023-2027)			All 15 years (2023-2037)		
	Total costs (millions)	Total benefits (millions)	ROI	Total costs (millions)	Total benefits (millions)	ROI
Tobacco control package* *(all policies/interventions implemented simultaneously)*	**8.1**	**61**	**8**	**20**	**464**	**23**
Increase tobacco taxation (cigarette taxation modeled)[15] (WHO FCTC Article 6)	1.2	16	13	2.6	174	68
Implement plain packaging (WHO FCTC Guidelines for Implementation of Article 11 and WHO FCTC Guidelines for Implementation of Article 13)	0.9	17	19	1.8	119	64
Promote and strengthen public awareness of tobacco control issues (WHO FCTC Article 12)	1.7	29	17	4.0	200	50
Promote tobacco cessation and treatment for dependence by training health professionals to provide brief advice to quit (WHO FCTC Article 14)	3.3	1.0	0.3	9.4	16.0	2

* The combined impact of all interventions is not the sum of individual interventions. To assess the combined impact of interventions, following Levy and colleagues' (2018), "effect sizes [are applied] as constant relative reductions; that is, for policy i and j with effect sizes PRi and PRj, (1-PR ii) x (1-PR j) [is] applied to the current smoking prevalence [99]. 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, increasing taxes on cigarette is expected to have the highest return on investment (68:1).[16] The return will be even higher with increasing tax on all tobacco products. Implementing plain packaging has the next highest return on investment (64:1), followed by promoting and strengthening public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation (50:1), and finally to promote cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use (2:1).

15 Raise taxes to what is considered in the WHO Report on the Global Tobacco Epidemic, 2021 as a best practice, which is for total taxes to represent at least 75 percent of the retail price. In the scenario modeled, cigarette taxes would meet the 75 percent level by 2033.

16 Rounded to the nearest whole number.

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

The investment case examines how increasing taxes would impact government revenue and contributions that stronger WHO FCTC implementation would make towards Panama's fulfillment of SDG Target 3.4.

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

The Addis Ababa Action Agenda on Financing for Development [100], the framework endorsed by the UN General Assembly that seeks to align financing flows and policies with the Sustainable Development Goals, notes that tobacco price and tax measures "represent a revenue stream for financing for development".

This section analyses a scenario in which Panama chooses to increase tobacco taxes towards levels considered in the WHO Report on the Global Tobacco Epidemic, 2021. The modelling in this investment case only considers tax on cigarettes and uses a hypothetical scenario in which a specific excise tax is introduced alongside Panama's current tax structure in 2025. In real terms, the introduced specific excise tax increases from around PAB 0.25 per cigarette pack in 2025 to PAB 0.75 in 2027.

Evidence from Panama shows that on average a 10 percent increase in price results in a 4.0 percent reduction in consumption [101]. Accounting for the rise in demand that results from income increases,[17] under the described tax increase pattern and demand elasticities, licit cigarette consumption in Panama would drop from the present amount of about 13.3 million packs annually[18] to about 12.8 million in 2025.

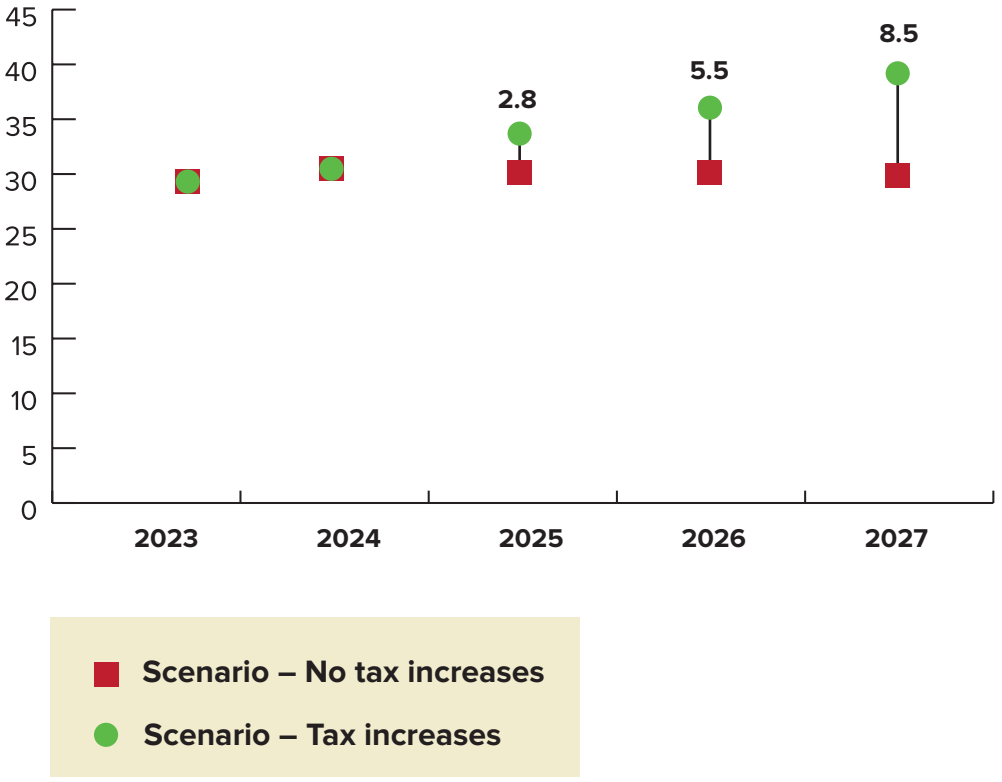
Even though there are drops in consumption, revenue gains will still occur. Although reducing the affordability of tobacco products leads people to quit smoking or reduce consumption, many people will continue to smoke, largely because of the addictive nature of tobacco, paying higher taxes to the government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

17 Income price elasticity of demand – 0.23 [101]; income prevalence elasticity of demand – 0.12. Projected income growth over the period from 2023 to 2027 is estimated using real GDP growth projections from the International Monetary Fund as a proxy for income – 4.7 percent [102].

18 The number of licit cigarette packs sold (2.2 million) is estimated by dividing total excise tax revenue by the excise tax per pack of cigarettes, as reported in the 2020 GTCR.

Over a five-year period, **Figure 10** compares annual government cigarette tax revenue (undiscounted) in a hypothetical scenario where Panama enacts strong specific excise taxes to a scenario in which tobacco prices remain static over time. The figure depicts a growing gap in annual tax collection between the two scenarios. It is assumed that no change occurs during the first two years, allowing time for debate and legislation of the new tax increase. In 2025, tax increases in an intervention scenario yield an additional PAB 2.8 million in revenue, growing to PAB 8.5 million in 2027. **Figure 10** demonstrates that under the hypothetical scenario with tax increases (in blue), government revenues will substantially grow even as many tobacco users quit because of the increased cost.

Fig. 10: Additional annual tax revenue (undiscounted) in comparison to the baseline scenario, in Panama, 2023-2027



5.2 The Sustainable Development Goals and the WHO FCTC

Implementing the package of four key WHO FCTC policy actions will support Panama to meet SDG Target 3.a to strengthen implementation of the WHO FCTC. Moreover, acting now will contribute to Panama's efforts to meet SDG Target 3.4 to reduce by one third premature mortality from NCDs by 2030: the measures would contribute the equivalent of around 2.5 percent of the needed reduction in mortality for Panama to achieve SDG Target 3.4.

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

SDG Target 3.4

By 2030 the WHO FCTC measures would contribute the equivalent of around 2.5 percent of the needed reduction in mortality for Panama to achieve SDG Target 3.4.

Photo: © Flickr.com

6. Conclusion and recommendations

Each year, tobacco use costs Panama PAB 416 million in economic losses and causes substantial human development losses. Fortunately, as the investment case shows, there is an opportunity to reduce the health, social and economic burden of tobacco in Panama. Enacting the four key WHO FCTC policy actions would save 159 lives each year and reduce the incidence of disease, leading to savings from averted medical costs and averting productivity losses.

In economic terms, these benefits are substantial, adding up to PAB 464 million over the next 15 years. Further, the economic benefits of strengthening tobacco control in Panama greatly outweigh the costs of implementation (PAB 464 million in benefits versus just PAB 20 million in costs).

By investing now in the package of four WHO FCTC policy actions modeled in this investment case, Panama would not only reduce tobacco consumption, improve health, reduce government health expenditures, and grow the economy, it would also reduce hardships faced by many Panamanians. Panama can also reinvest savings from government health-care expenditures and revenue from increased tobacco taxes into national development priorities such as the full implementation of the WHO FCTC and the Protocol to Eliminate Illicit Trade in Tobacco Products, including the application of measures aimed at maintaining a sustainable decrease in the use of tobacco products, particularly aimed at preventing the initiation of use of these products by young people, strengthen universal health coverage for the cessation of the use of tobacco products and other social health protection measures, as well as in COVID-19 response and recovery efforts.

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

Recommendations

1. **Commit to fully implement the WHO FCTC in Panama**

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

3. **Take action to strengthen, implement and enforce the other three key WHO FCTC policy actions modeled in this investment case**

4. **Strengthen enforcement compliance with smoke-free laws to ensure all public places and workplaces are smoke-free (WHO FCTC Articles 8)**

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

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

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

1 Commit to fully implement the WHO FCTC in Panama

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

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

2 Given the effectiveness of tobacco taxation, strengthen tax structures for all tobacco products (including novel products) and increase tax rates (WHO FCTC Article 6)

Panama is encouraged to carry out a review of its fiscal policy for tobacco taxation and reform its tobacco taxation structure to introduce a specific excise tax on tobacco products and to substantially raise the tax share of the retail price of tobacco in accordance with recommendations made in the WHO implementation guidelines for Article 6 [60] and by WHO in the *WHO Technical Manual on Tobacco Tax Policy and Administration* [59] . It is also encouraged to substantially raise the total tax share of the retail price of tobacco to meet or exceed 75 percent (considered in the WHO Report on the Global Tobacco Epidemic, 2021 as a high-level of achievement) [58].

The introduction of a specific tobacco excise tax is recommended because it is more difficult for the tobacco industry to manipulate and easier for authorities to implement [103]. Tobacco

taxes should aim to reduce affordability, including by increasing at a rate that outpaces inflation and income growth [103].

It is also recommended to ensure robust tobacco taxation policies are in place for all types of tobacco (including for shisha, smokeless tobacco and novel tobacco products) and consideration is given to removing duty-free allowances for tobacco. There is clear evidence that raising cigarette prices through increased taxes is a highly effective measure for reducing smoking among youth, young adults, and people from lower socioeconomic communities. Increasing the price of tobacco will have benefits for these vulnerable populations.

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

- considering the implementation of plain packaging to reduce the appeal of tobacco packaging and to make sure health warnings remain prominent (WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13).
- promoting and strengthening public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation by instituting anti-tobacco mass media campaigns. Campaigns should continue to specifically target vulnerable populations including indigenous groups and youth given the concerning tobacco use prevalence, increased exposure to secondhand smoke [22], [27] and risk for being targets of tobacco industry advertising among these groups [104], [105]. Panama can also consider using campaigns as an opportunity to share information regarding cessations clinics and how to access them (WHO FCTC Article 12).
- promoting cessation of tobacco use and treatment for tobacco dependence by training health professionals to provide brief advice to quit tobacco use, especially in primary care settings. The country must ensure that it has accessible tobacco cessation services so that everyone residing in Panama (i.e. Panamanians, residents and immigrants) has equal access to quality cessation services, both under the Ministry of Health and Social Security. It is important that smoking cessation services reach those where no smoking cessation clinics are available, including in indigenous areas such as Guna Yala [70]. To address this, expanding well-resourced smoking cessation clinics to these areas is an excellent option. Given that the worrying prevalence of tobacco consumption in youth exceeds the consumption figures in the adult population, Panama must ensure that this population is aware of and has coverage for tobacco cessation services, and that providers are trained to address specific needs of this age group. Additional impacts would be possible with

the implementation of additional services aimed at smokers, such as offering specialized treatments to combat tobacco dependence, a free telephone line with nationwide coverage to support those who want to quit smoking, digital support services to stop smoking, and increase access to pharmacotherapies (free of charge to the user, if possible). Panama should also try to offer Nicotine Substitution Therapy (NST) again, although it is known that the pharmaceutical industry does not market these products in the Panamanian market, neither public nor private, and that smokers do not accept this type of therapy, as well as other medications and cessation resources directly in specialized clinics for this purpose. Additionally, the effectiveness of new initiatives, such as the ROSA call center, established during the COVID-19 pandemic, needs to be evaluated and these services should be expanded when proven effective [53] (WHO FCTC Article 14).

4 Strengthen enforcement of compliance with smoke-free laws to ensure all public places and workplaces are smoke-free (WHO FCTC Articles 8)

Panama is encouraged to allocate sufficient resources to enforce smoke-free legislation in public places and workplaces where the compliance is low including open public spaces such as terraces, balconies, coffees, pubs, bars and restaurants.

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

It is recommended that Panama adopts a code of conduct for all government officials and those acting on behalf of the government, to regulate all interactions with the tobacco industry and ban all public officials and policy makers from accepting any form of support from the industry. Existing codes of conduct for the National Commission for Tobacco Control and the National Council for Tobacco-Free Health should be continued to be strictly enforced. Panama can also consider amending the electoral code to ensure the prohibition of contributions to political campaigns by the tobacco industry and to generate a code of ethics prohibiting interactions with the tobacco industry, warnings against the bribery of public officials and forbidding any cooperation with the tobacco industry [44] income, those with low levels of education and youth.

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

It is recommended to strengthen capacity and transparency of the responsible entities to identify illicit tobacco products and enforce the newly tightened restrictions on illicit trade. The Protocol to Eliminate Illicit Trade in Tobacco Product and particularly measures applicable to free trade zones under its Article 12 should be strictly enforced and monitored, with appropriate penalties for those who violate these regulations. The National Customs Authority would benefit from an integral review of Law No. 30 of 1984, "By which measures are issued against Smuggling and Customs Fraud and other provisions are made", a legislation considered by the government to be obsolete and inefficient when it comes to dealing with illicit trade [106].

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

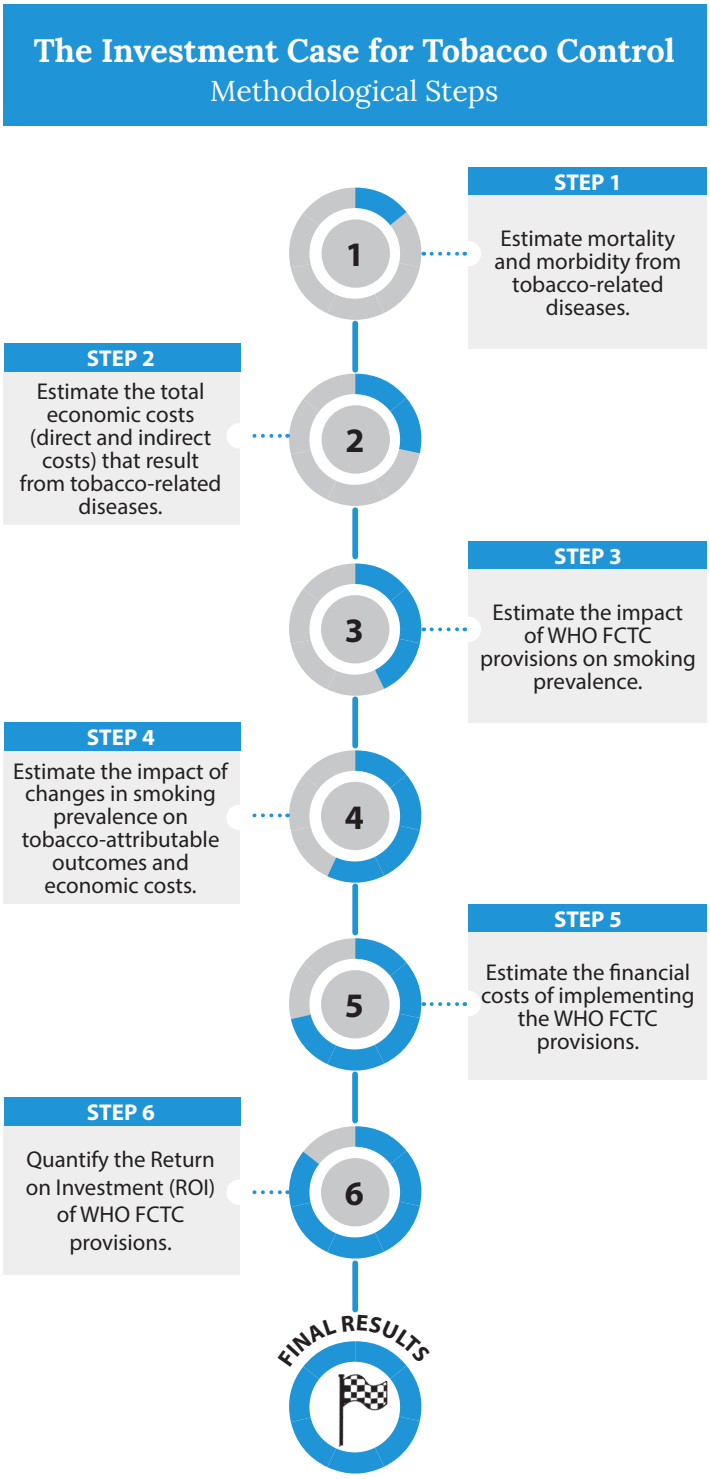
Considering the vast health, economic, social and environmental costs of tobacco, the case is clear: implementing the WHO FCTC is a powerful means for Panama to improve the lives of citizens, achieve the SDGs, and better the conditions and future of the country. All sectors have a role to play in tackling tobacco use, and the benefits of full WHO FCTC implementation will enrich all aspects of life in Panama. The Government of Panama should prioritize the implementation of the WHO FCTC in sustainable development strategies, such as the National Strategic Plan and Vision of the State of Panama 2030 (Plan Estratégico Nacional con Visión de Estado Panamá 2030) [107].

Annex: Methodology

A1.1 Overview

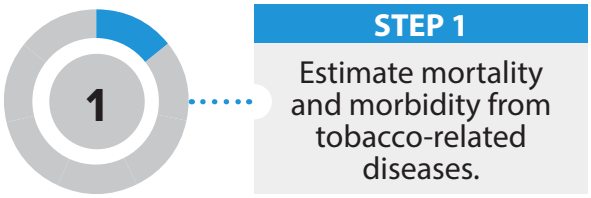
The economic analysis consists of two components: 1) assessing the current burden of tobacco use and 2) examining the extent to which WHO FCTC provisions can reduce the burden. The first two methodological steps depicted in **Figure A1** are employed to assess the current burden of tobacco use, while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

Fig. A1: Steps in the investment case

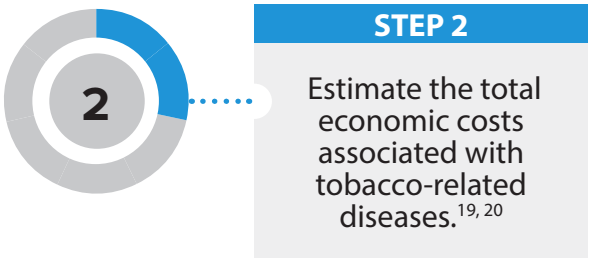


A1.2 Component one: current burden

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



The investment case model is populated with country-specific data on tobacco-attributable mortality and morbidity from the 2019 Global Burden of Disease Study (GBD) [4], [108]. The study estimates the extent to which smoking and secondhand tobacco smoke exposure contribute to the incidence of 37 diseases, healthy life years lost, and deaths, across 195 countries.



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

Health-care expenditures – Health-care expenditures include smoking-attributable public (government-paid), private (insurance, individual out-of-pocket), and other health-care expenditures. The proportion of health-care costs attributable to smoking was obtained using the formula for estimating smoking attributable fraction (SAF) of health-care expenditures from Goodchild et al. (2018) [5]. The SAF for Panama is estimated at 1.4 percent. To calculate the share of smoking-attributable health-care expenditures borne by public, non-profit, and

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

20 All diseases are assumed to decrease in proportion to smoking prevalence when the decrease in prevalence occurs. While the model overestimates how quickly health benefits will accrue for some diseases, for example cancers—recent evidence suggests notable declines in the risk of lung cancer incidence begin two to five years after smoking prevalence decreases [109]. On the other hand, the risk of incidence of other diseases, for example cardiovascular disease (CVD), declines significantly in the years immediately following quitting [110].

private entities, it was assumed that each entity incurred smoking-attributable health-care costs in equal proportion to the entity's contribution to total health expenditure. Health-care expenditures were obtained from the WHO Global Health-care Expenditure Database (GHED) [98]. The latest year for which data are available in WHO GHED is 2019. To obtain 2020 values, we took the average annual increase in health-care expenditures in Panama over the past 10 years and applied that increase to the 2019 health-care expenditure values.

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

- *The economic cost of tobacco-attributable mortality*. Tobacco-attributable mortality was monetized using a "value of a statistical life year" (VSLY) measure. VSL is a measure of individuals' willingness to pay for small changes in the risk of death and it is commonly used in economic evaluations of health programmes and policies to monetize health outcomes [111]. Few studies have assessed VSL in low- and middle-income countries [112]. We extrapolated a country-specific estimate of VSL following guidance from the Reference Case Guidelines for Benefit-cost analysis in Global Health and Development [111], estimating the value of one additional year of life for Panama at PAB 27,885 (value of a statistical life year (VSLY). Using GBD data on the age at which tobacco-attributable deaths occur, the model calculates the total number of years of life lost due to tobacco, across the population. Each future year of life is multiplied by VSLY to calculate the cost of tobacco-attributable mortality.

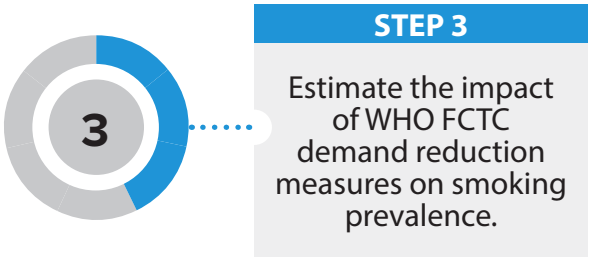
- *Productivity costs.* Productivity costs consist of costs due to absenteeism and presenteeism. The model uses estimates from academic literature on the number of extra working days missed due to active smoking (2.9 days per year) [113]. Presenteeism losses are obtained similarly, under research that shows that smokers in China, the United States, and five European countries experience about 22 percent more impairment at work because of health problems compared to never-smokers—losses equivalent to about 7.5 days of work [114].

A1.3 Component two: policy/intervention scenarios

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

A static model using a population attributable fraction (PAF) approach was used to estimate the total impact of the tobacco control measures. In the model, aside from smoking prevalence, variables do not change throughout the 15-year time horizon. The model follows a population that does not vary in size or makeup (age/gender) over time in two scenarios: a status quo scenario in which smoking prevalence remains at present day rates, and an intervention scenario in which smoking prevalence is reduced according to the impact of tobacco control measures that are implemented or intensified. Published studies have used similarly static models to estimate the impact of tobacco control measures on mortality and other outcomes [115], [116].

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



Selection of key WHO FCTC measures modeled within the investment case align with the *Global Strategy to Accelerate Tobacco Control* [117] developed following a decision at the Seventh session of the Conference of the Parties (COP7) to the WHO FCTC. Under Objective 1.1 of the Strategy, priority is given to enabling action to accelerate WHO FCTC implementation, including effective forms of technical and financial assistance to support Parties in the identified priority action areas. This includes Parties giving priority to, among other things, the implementation of price and tax measures (WHO FCTC Article 6) and time-bound measures of the Convention. The time-bound measures include creating smoke-free public places and workplaces (WHO FCTC Article 8), prominent health warnings on tobacco packaging (WHO FCTC Article 11), and comprehensive bans on tobacco advertising, promotion, and sponsorship (TAPS) (WHO FCTC Article 13).

In addition, given the importance of awareness in behaviour change and shaping cultural norms, the investment cases include promoting and strengthening public awareness of tobacco control issues, including the health risks of tobacco use and tobacco smoke, addiction, and the benefits of cessation (WHO FCTC Article 12). Effect sizes for the WHO FCTC demand reduction measures are obtained from the literature. The impact of enforcing smoke-free air laws, implementing plain packaging and intensifying advertising bans, are derived from Levy et al. (2018) [99] and Chipty (2016) [118], as adapted within the Tobacco Use Brief of Appendix 3 of the WHO Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2020 [119], and adjusted based on assessments of Panama's baseline rates of implementation. The impact of basic evidence-based tobacco cessation in the form of brief advice to quit offered to tobacco users by health-care professions in primary care settings is from Levy et al. 2010 [120].

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

Table A1: Key parameters used in the tax revenue analysis

Parameter name	Value	Source
Price elasticity of demand	-0.40	Hugo et al (2017). Impacto del incremento del impuesto a los productos de tabaco sobre la recaudación y los precios en Panamá [101]
Prevalence elasticity of demand	-0.20	Goodchild et al (2016). Modelling the impact of raising tobacco taxes on public health and finance [122] Assumption – half of price elasticity
Income price elasticity of demand	0.23	Hugo et al (2017). Impacto del incremento del impuesto a los productos de tabaco sobre la recaudación y los precios en Panamá [101]
Income prevalence elasticity of demand	0.12	Assumption – half of income price elasticity
Projected real income growth rate*	4.7%	International Monetary Fund (2020). Real GDP Growth - Annual percent change [102]

* Projected real income growth is used as a proxy for wage growth. The International Monetary Fund projects [102] real GDP growth at an average of 4.7 percent annually through 2026.

The investment case analysis examines a tax increase scenario in which Panama chooses to enact cigarette tax increases. In the hypothetical scenario, a specific excise tax is introduced alongside Panama's current tax structure in 2024. In real terms, the introduced specific excise tax increases from PAB 0.24 in 2025 to PAB 0.74 in 2027.

In the scenario, the price net of taxes remains static (full pass through of the tax increase). **Table A2** breaks down cigarette pack price components from 2023 to 2027 under the described scenario. For the main investment case analysis, additional specific excise taxes triggering real price increases of an average of 6.8 percent annually are modeled from 2027 to 2037, bringing the total tax share to 82 percent by the end of the analysis and the excise tax share to 70 percent. Under this scenario, the specific excise tax rises (in real terms) from to PAB 0 to PAB 5.18 by the end of the analysis.

Table A2: Projected cigarette pack price in the tax increase scenario (PAB, in real terms)[21]

Price component	2023	2024	2025	2026	2027
Price net of taxes	1.74	1.77	1.81	1.84	1.87
Specific excise	0.00	0.00	0.25	0.50	0.80
Ad valorem	1.74	1.77	1.81	1.84	1.87
Value added tax	0.52	0.53	0.58	0.63	0.68
Other taxes	0.00	0.00	0.00	0.00	0.00
Final consumer price *	**4.00**	**4.08**	**4.44**	**4.81**	**5.23**
* Figures subject to rounding.					

The impact of tax increases on revenue and cigarette use prevalence is dependent on prevailing elasticities: the extent to which individuals change use of a product (e.g., decrease consumption or quit) because of changes in the price of a tobacco product. Changes are calculated following Joosens and colleague's (2009) [123], 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.

21 Numbers in Table A2 reflect the prices when modelling was done in 2021. Numbers are not updated per inflation.

Below, **Equation A1** provides an example of calculations to ascertain the impact of a change in price on smoking prevalence, considering changes in income.

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

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

Where:
SP = smoking prevalence (# of smokers) in year i
Ɛp = prevalence elasticity
Op_np = the ratio of the old price of a pack of cigarettes to the new price after tax increases
Ɛi = income elasticity
GDP = Gross domestic product in year

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

Brief advice to quit tobacco. We calculate the effect of scaling up the provision of brief advice to quit tobacco use at the primary care level. First, we calculate the baseline population quit rate (PQR, the percent of smokers who quit annually) drawing on previously published methods by Levy and colleagues (2010) [120]. The PQR is calculated (see **Equation A2**) using three parameters: quit attempts; treatment utilization rates (i.e. counselling, pharmaceutical therapy); and treatment effectiveness.

Equation A2: Calculating Population Quit Rate, from Levy et al (2010) [82]

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

Where:
PQR = Population quit rate
QA = % of smokers who make a quit attempt at least once annually
TxUse = the percent of those who make a quit attempt who use treatment category i
TxEff = The percent of those who use a given treatment who succeed in quitting annually (Treatment efficacy)
i = is one of four treatment categories: 1) no evidence-based treatment; 2) counselling; 3) pharmacological treatment (e.g. nicotine replacement therapy), or 4) both counselling and pharmacological therapy.

Again following Levy et al (2010) [120], "to account for the effect of multiple quit attempts among those who fail at their first attempt, it was assumed that half of those that make at least one quit attempt per year go on to make a second attempt, and half of those [who make a second attempt] make a third, and so on," and that treatment effectiveness does not change based on whether it is a persons' first quit attempt or a succeeding one.

After establishing baseline PQR, we calculated how the population quit rate would change if provision of brief advice to quit at the primary care level became more prevalent. In this "intervention scenario", over the 15-year time horizon of the analysis, half of all primary health-care providers are trained to provide brief advice to quit to adult tobacco users—a value selected based on evidence of the current intervention coverage gap; on average, in low- and middle-income countries less than half (47.8 percent) of adult smokers who visit a health provider are advised to quit. Once trained, it is assumed that the provider administers the brief advice when they encounter a patient who uses tobacco.

Taking into account the number of primary health-care providers in the country, the patient panel size per provider, adult smoking rates, and the percent of adult smokers who present within the health system for at least one primary care visit per year, in each year of the analysis we calculate the number of adult tobacco users who would encounter a newly trained health provider and receive the brief intervention—which increases the likelihood that an individual makes a quit attempt by 60 percent over baseline levels [120]. With increases in population quit attempts driven by the provision of brief advice, we recalculate PQR to estimate the number of smokers who quit as a result of the intervention. Data used to inform these calculations are shown in **Table A3**.

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

Parameter name	Value	Source
Population quit rate (PQR)		
Annual quit attempt rate (QA)	45%	Gorgas Memorial Institute for Health Studies, Ministry of Health Panama (2013). Panama Global Adult Tobacco Survey 2013 [27]
Increase (%) in QA as a result of receiving brief advice	60%	Levy et al (2010). Modelling the impact of smoking-cessation treatment policies on quit rates [120]
Treatment use (Tx Use)		
No evidence-based treatment	82.1%	Gorgas Memorial Institute for Health Studies, Ministry of Health Panama (2013). Panama Global Adult Tobacco Survey 2013 [27]
Pharmaceutical assistance	5.3%	Gorgas Memorial Institute for Health Studies, Ministry of Health Panama (2013). Panama Global Adult Tobacco Survey 2013 [27]

Counselling	11.3%	Gorgas Memorial Institute for Health Studies, Ministry of Health Panama (2013). Panama Global Adult Tobacco Survey 2013 [27]
Both pharmaceutical assistance and counselling	1.3%	Gorgas Memorial Institute for Health Studies, Ministry of Health Panama (2013). Panama Global Adult Tobacco Survey 2013 [27]
Treatment effectiveness		
No evidence-based treatment	7%	Levy et al (2010). Modelling the impact of smoking-cessation treatment policies on quit rates [120]
Pharmaceutical assistance	15%	Abrams et al (2010). Boosting population quits through evidence-based cessation treatment and policy [124]*
Counselling	12%	Abrams et al (2010). Boosting population quits through evidence-based cessation treatment and policy [124]*
Both pharmaceutical assistance and counselling	22%	Abrams et al (2010). Boosting population quits through evidence-based cessation treatment and policy [124]*
% of adult smokers who visit primary care clinic annually	37%	Gorgas Memorial Institute for Health Studies, Ministry of Health Panama (2013). Panama Global Adult Tobacco Survey 2013 [27]
% of smokers who relapse after successfully quitting	60%	García-Rodríguez et al (2013). Probability and predictors of relapse to smoking: Results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) [125]
Number of primary care health providers	34,374	WHO (2021). Global Health Observatory [126]**
Annual patient panel size per health provider (# of patients)	550	Altschuler et al (2012). Estimating a Reasonable Patient Panel Size for Primary Care Physicians With Team-Based Task Delegation [127]***

* Compared to quit attempts that are made with no assistance from any form of evidence-based therapy, pharmaceutical assistance is 100 percent more effective, counselling 60 percent more effective, and combined therapy 200 percent more effective.
** Sum of two indicators in the WHO Global Health Observatory (GHO) for the latest year for which information was available: 1) number of general physicians and 2) number of nursing personnel. Given that specific estimates for primary care nursing personnel are not given from the source, we assume the proportion of primary care nurses is the same as the proportion of generalist doctors to all doctors as given in the GHO.
*** Study results show that a primary care health provider working under a nondelegated model of care can reasonably care for a panel of 983 patients in a year and that in a conservative scenario where non-physician providers assume some responsibility for care patient panel sizes can expand to 1387 patients. In most countries, a nondelegated model of care is the status quo. However, in this analysis, nurses are trained to offer brief advice and assume some responsibility for administering it. Therefore, a patient panel size is likely to be somewhere in the range of 983 to 1,387 patients. We assume a panel size of 1,100 and that an individual practitioner on the team covers half of the patients (550) per year.

A1.4 Summary: the impact of tobacco demand reduction measures

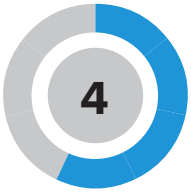
The impact sizes of all policy measures examined in the investment case are displayed in **Table A4**. Additional information on their derivation can be found in the *Technical Appendix*.[22]

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

WHO FCTC policy actions	Relative reduction in the prevalence of current smoking	
	First five years (2023–2027)	Over 15 years (2023–2037)
Tobacco control package* (all policies/interventions implemented simultaneously)	**8.7%**	**20.2%**
Increase cigarette taxation *(WHO FCTC Article 6)*	2.3%	9.8%
Implement plain packaging of tobacco products *(WHO FCTC Guidelines for implementation of Article 11 and WHO FCTC Guidelines for implementation of Article 13)*	2.4%	4.0%
Promote and strengthen public awareness about tobacco control issues with a mass media campaign *(WHO FCTC Article12)*	4.1%	6.8%
Promote tobacco cessation and treatment for dependence *(WHO FCTC Article 14)*	0.2%	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 PRi and PRj, (1-PR ii) x (1-PR j) [is] applied to the current smoking prevalence" [99].

22 Available upon request.



STEP 4

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

To analyse the impact of policy measures on reducing the health and economic burden of smoking, the investment case calculates and compares two scenarios. In the "status quo scenario", current efforts are "frozen", meaning that, through the year 2037 (end of the analysis), no change occurs from the tobacco control provisions that are currently in place. In the "intervention scenario", Panama 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 Panama can achieve by taking targeted actions to reduce tobacco use.

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

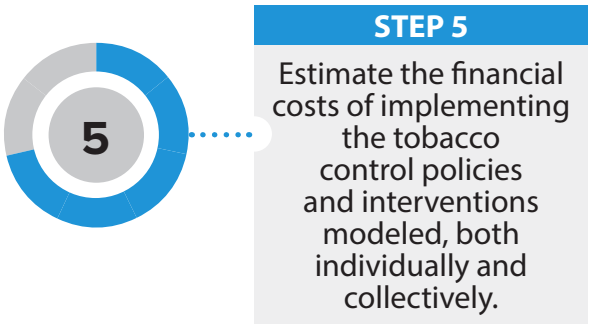
Marginal Effects = Outcome Base Scenario — Outcome Intervention Scenario

Marginal effects are calculated as follows for each outcome:

- **Health outcomes:** To calculate the reductions in mortality and morbidity due to implementation of the policy measures, forecasted changes in smoking prevalence are applied directly to the GBD risk factor attributable outcomes from the status quo scenario. This means that the model adjusts the risk factor attributable outcomes for mortality and morbidity as reported by GBD based on year-over-year relative changes in smoking prevalence for each outcome.

- **For health-care expenditures**, the model applies forecasted annual relative changes in smoking prevalence for each intervention scenario to the SAFs. SAFs are adjusted in proportions equal to the relative change in smoking prevalence for each intervention scenario.

- **Workplace smoking outcomes** are recalculated substituting actual (status quo) smoking prevalence for estimated annual smoking prevalence for each of the intervention scenarios that are modeled.



The financial costs to the government of implementing new measures—or of intensifying or enforcing existing ones—is estimated using the WHO NCD Costing Tool. Full explanations of the costs and assumptions embedded in the WHO NCD Costing tool are available [121].

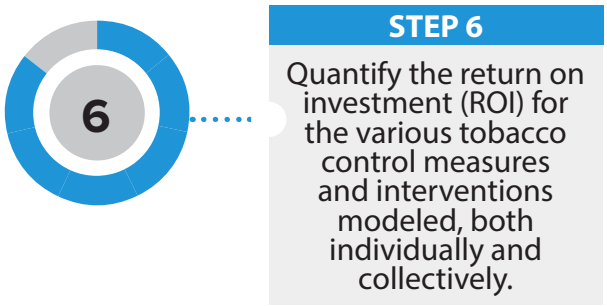
The Costing Tool uses a "bottom up" or "ingredients-based" approach. In this method, each resource that is required to implement the tobacco control measure is identified, quantified, and valued. The Costing Tool estimates the cost of surveillance, human resources—for programme management, transportation,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

Across these categories, the Costing Tool contains default costs from 2011, which are sourced from the WHO CHOICE costing study. Following Shang and colleagues, the Costing Tool is updated to reflect 2020 costs by updating several parameters: the US$ to local currency unit exchange rate (2020); purchasing power parity (PPP) exchange rate (2020); GDP per capita (US$, 2020); GDP per capita purchasing power parity (PPP, 2020); population (total, and share of the population age 15+, 2020); labour force participation rate (2020); gas per liter, and government spending on health as a percent of total health spending (2019) [128]. Unless government or other in-country parameters are received, data are from the World Bank database, with the exception of data on the share of government health spending and population figures. The share of government spending on health as a percent of total health spending is derived from the WHO Health Expenditures database, and population figures are from the UN Population Prospects.

To cost the scale up of the provision of brief advice to quit tobacco use, the analysis adds to the programmatic costs embedded in the WHO Costing Tool by including costs to train health providers and the direct costs of the primary care visits in which the brief advice is administered. Over the 15-year time horizon of the analysis, half of all primary care health providers are trained to administer brief advice to quit tobacco.[23] Based on WHO's training package for treating tobacco dependence in primary care [130], we assume that training

23 The analysis assumes a 10 percent of health workers turn over annually [129].

sessions last 2.5 days, are conducted with a maximum of 30 participants, and are led by a team of two facilitators. We further assume that the training occurs in person in a rented facility space. Costs of training include those to rent the facility,[24] pay facilitators, and provide per diems to facilitators and attendees, and we also assume that trainees (doctors and nurses) are compensated for their time at their wage rate.[25] Once trained, providers are assumed to provide brief advice if they encounter a patient who smokes. The cost of providing brief advice during primary care visits is based off on modeled, country-specific estimates from WHO-CHOICE of the cost or primary care outpatient visits [132]. The derivation of these estimates is detailed elsewhere [133], but in overview, the estimates reflected the "hotel cost" of a 10-minute[26] visit to a health facility with beds. We updated the estimates to 2020 local currency units, using 2010 PPP conversion factors and local consumer price indices [134]. For the purposes of the investment case, administration of the 5As (Ask, Advise, Assess, Assist and Arrange) brief intervention is assumed to take 10 minutes [135]. Following WHO CHOICE methodology, we estimate the cost of those extra 10 minutes as an extra 21 percent of the original cost of the primary care visit.



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

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

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

24 Rental costs per square foot are obtained from the WHO Costing Tool with the room size estimated is based on square feet per person estimates for collaboration rooms [131].

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

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

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