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Investment Case for Tobacco Control in Colombia

The case for scaling-up
WHO FCTC implementation



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November 2019

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Pan American
Health
Organization



The Case for Investing in WHO FCTC Implementation in Colombia

Prepared by

RTI International
United Nations Development Programme
WHO FCTC Secretariat
Pan American Health Organization

November 2019



Funded by
UK Government



More than

34,800 Colombians die
every year due to tobacco-related
illness.

Tobacco costs Colombia

COP 17 trillion

every year, equivalent to

1.8% of its GDP

in 2017.



Investing now in four tobacco control measures would save

154,450 lives

and avert

COP 58 trillion

in health costs and economic losses by 2033.



By investing in four tobacco control interventions, Colombia will receive a return on investment of **133:1** in averted costs and economic losses by 2023, **277:1** by 2030, and **305:1** by 2033.

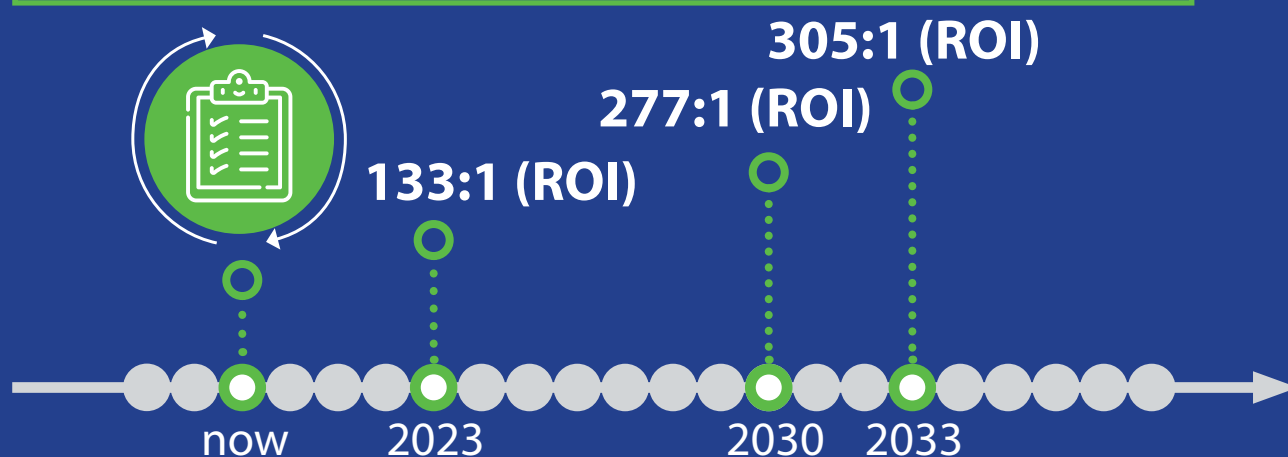


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The report recommends actionable steps, in addition to the modeled WHO FCTC provisions, that the Government of Colombia can take to strengthen a whole-of-government approach to tobacco control and its development consequences. Through the FCTC 2030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





1. Executive summary

Overview

Tobacco is a health and sustainable development issue. Tobacco consumption and exposure to tobacco smoke cause early death and disease, result in high health costs and economic losses, widen socioeconomic inequalities, and contribute to environmental degradation.

This report presents the findings of the case for investing in tobacco control in Colombia. In line with the WHO Framework Convention on Tobacco Control (FCTC) Global Strategy to Accelerate Tobacco Control, the Strategy, and Plan of Action to Strengthen Tobacco Control in the Region of the Americas 2018–2022 and according to the stated priorities of the Ministry of Health and Social Protection, the investment case measures the costs and benefits—in health and economic terms—of implementing four priority tobacco control measures. The four measures are:

- 1 **Increase tobacco taxation to reduce the affordability of cigarettes.**
(FCTC Article 6)
- 2 **Enforce bans on smoking in public places to protect people from tobacco smoke.**
(FCTC Article 8)
- 3 **Mandate that tobacco products carry health warnings that cover at least 50 percent of packaging.** (FCTC Article 11)
- 4 **Implement plain packaging.** (FCTC Article 11 and 13 Guidelines)

Main findings

In 2017, tobacco cost the Colombia economy 17 trillion Colombian pesos (COP), equivalent to 1.8 percent of its GDP. These costs include a) COP 6.5 trillion in annual healthcare expenditures, and b) COP 10.6 trillion in annual lost productive capacities due to premature mortality, disability, and workplace smoking. The indirect economic losses from current tobacco use in Colombia—62 percent of all tobacco-related costs—indicate that tobacco use causes problems far beyond the health sector. Multisectoral engagement is required for effective tobacco control; businesses and other sectors benefit substantially from supporting tobacco control investments.

Every year, tobacco use kills an estimated 34,809 Colombians, with 44 percent of these deaths among people under age 70. More than 6,300 of these lives lost are due to secondhand exposure to tobacco smoke, and 154 (2.4 percent) of those deaths are among children younger than 15.

By acting now, the Government of Colombia can curb the burden of tobacco use. The investment case findings demonstrate that implementing or intensifying four WHO FCTC tobacco-control measures would, over the next 15 years:

Avert COP 58 trillion in economic losses. This would include COP 35.7 trillion in economic output losses averted. The tobacco-control measures stimulate economic growth by ensuring that fewer Colombians 1) drop out of the workforce due to premature mortality, 2) miss days of work due to disability or sickness, and 3) work at a reduced capacity due to smoking.

Lead to COP 22.3 trillion in savings through avoidance of tobacco-attributable healthcare expenditures. Of this, the Government would save COP 14.6 trillion in healthcare expenditure, and the population would save COP 4.5 trillion in out-of-pocket health-care costs.

Save 154,450 lives and reduce the incidence of disease. The recommended WHO FCTC tobacco control measures will contribute to Colombia's efforts to achieve SDG Target 3.4 to reduce by one-third premature mortality (between ages 30 to 70) from NCDs by 2030. Enacting the WHO FCTC measures would prevent 42,800 premature deaths from the four main NCDs by 2030, the equivalent of about 13 percent of the needed reduction in premature mortality to fulfill SDG Target 3.4.

Provide economic benefits (COP 58 trillion) that significantly outweigh the costs (COP 0.19 trillion). Each of the WHO FCTC provisions is highly cost-effective. Increasing cigarette taxes and enacting larger graphic warning labels has the highest ROI (659:1), followed by increasing cigarette taxes (658:1), implementing plain packaging (444:1), and enforcing bans on smoking in public places (258:1).

Effect of exposure to second hand smoke on children

Enacting tobacco control measures will also improve the health of as many as two million children and adolescents under 18 who are exposed to tobacco smoke within their homes, and of many

more adolescents exposed to tobacco smoke in public places. Exposure to tobacco smoke is responsible for more 6,000 deaths in Colombia annually, with 154 of those deaths occurring among children and adolescents younger than 15 years old. In addition, pre- and post-natal exposure to tobacco smoke negatively affects children's physical health, mental health, and education, and children who are exposed to tobacco smoke are more likely to utilize healthcare services, meaning higher costs for families and to healthcare systems.

Conclusive evidence already exists that well-enforced population-level policies that ban smoking in indoor workplaces and public places reduce secondhand smoke exposure, and do not negatively impact businesses. Colombia should continue to direct resources toward increasing compliance with its existing smoke-free legislation. Colombia can also consider the benefits of banning smoking in private vehicles which has been legislated in various forms (i.e. bans sometimes exist only when children are present) in places such as Australia, Bahrain, Canada, Chile, Germany, Kuwait, Mauritius, South Africa the United Kingdom. Finally, strengthening implementation of the core WHO FCTC demand-reduction measures will reduce the prevalence of smoking and exposure to tobacco smoke.

Recommendations

The investment case results for Colombia show that there is an evidence-based opportunity to reduce the health, economic, social and other development burdens caused by tobacco through preventative actions that target tobacco use. By investing now in tobacco control measures, Colombia can accelerate its efforts towards achieving the Sustainable Development Goals, which call for a one-third reduction in premature mortality and morbidity due to NCDs by 2030.

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

- 1 Increase taxes on tobacco products, improve efficiency and transparency in the current tax administration system, and reduce illicit trade.**
- 2 Strengthen and enforce the tobacco control law.**
- 3 Strengthen multisectoral engagement in tobacco control and establish a multisectoral national tobacco control strategy.**
- 4 Take policy measures to counter tobacco industry interference.**

2. Introduction

Tobacco is one of the world's leading health threats, and a main risk factor for non-communicable diseases (NCDs) including: cardiovascular disease, cancers, diabetes and chronic respiratory disease. Around 3 million Colombians use some form of tobacco [2], killing an estimated 34,800 people per year [1].¹

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

Tobacco use may displace household expenditure on basic needs, including food and education [7–9], contributing to pushing families into poverty and hunger [10, 11]. It imposes disproportionate health and socio-economic costs on the poor, women, young people and other vulnerable populations [12]. Meanwhile, tobacco production causes environmental damage including soil degradation, water pollution and deforestation [13–15]. Given the far-reaching development challenges imposed by tobacco, effective tobacco control requires the engagement of non-health sectors within the context of a whole-of-government approach.

The 2030 Agenda recognizes that current tobacco use trends, in Colombia and around the world, are incompatible with sustainable development. Through Sustainable Development Goal (SDG) Target 3.4., Member States commit to achieve a one-third reduction in premature mortality from NCDs (i.e. deaths between ages 30 and 70) by 2030. Accelerating progress on NCDs requires strengthened implementation of the World Health Organization Framework Convention on Tobacco Control (SDG Target 3.a). Tobacco control is not just a primary means to improve population health, but also a proven approach to reduce poverty and inequalities, grow the economy and advance sustainable development broadly.

¹ Tobacco-attributable deaths are sourced from the 2017 Global Burden of Disease Study (GBD), which reports a point estimate, and lower- and upper-bound estimates for tobacco-attributable deaths and DALYs across 37 diseases and conditions. In Colombia, a previous study by the Instituto de Evaluación Tecnológica en Salud (IETS) identified tobacco-attributable deaths for 12 major diseases in 2015 (see IETS, 2016). Country stakeholders requested that the results from the IETS study and GBD be compared. Given that GBD upper-bound estimates of tobacco-attributable deaths for the 12 diseases (31,645) closely corresponded to findings in the IETS study (32,088), the decision was made to use the GBD upper-bound estimates as inputs within the investment case analysis. Using the upper-bound estimates, 34,809 tobacco-attributable deaths were estimated to occur across 37 diseases and conditions in 2017.

Colombia ratified the WHO FCTC in 2008 [16], and enacted a tobacco control law in 2009. Colombia has made tobacco control a priority: raising tobacco taxes, enacting measures to prohibit smoking in public places, mandating that graphic warning labels cover 30 percent of cigarette packs, and banning tobacco advertising, promotion, and sponsorship [17]. An active civil society has informed public debate and public policy, generating evidence around the impact of tobacco taxes, and illicit trade of tobacco products.

Despite these efforts, millions of Colombians continue to suffer from the effects of tobacco use and exposure to tobacco smoke. Intensifying existing policies and implementing new measures can draw the prevalence curve further downward and generate additional health and economic gains. For example, opportunities exist in Colombia to increase the size of the graphic warnings on tobacco products to cover at least 50 percent of tobacco packaging, adopt plain packaging, and to continue to increase taxes to reduce the affordability of tobacco products.

In 2017, the WHO FCTC Convention Secretariat, UNDP, RTI International and WHO/PAHO undertook a joint mission to Colombia to conduct an investment case as part of the FCTC 2030 project. The FCTC 2030 Project is a global initiative funded by the UK Government to support countries to strengthen implementation of the FCTC in order to achieve the Sustainable Development Goals (SDGs).² Colombia is one of the 15 countries worldwide receiving dedicated project support.



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² Including Target 3.4 to reduce premature mortality by one-third by 2030, and Target 3.a to strengthen implementation of the WHO FCTC

An investment case analyzes the health and economic costs of tobacco use as well as the potential gains from scaled-up implementation of WHO FCTC tobacco control measures. It identifies which WHO FCTC demand-reduction measures can produce the largest health and economic returns for Colombia (the return on investment, or ROI). In consultation with the Ministry of Health and Social Protection (MINSALUD) and other government and civil-society organizations,³ and in line with the WHO FCTC Global Strategy to Accelerate Tobacco Control [18] and the Strategy and Plan of Action to Strengthen Tobacco Control in the Region of the Americas 2018–2022, four FCTC provisions were prioritized to model within the investment case:

- 1 Increase tobacco taxation to reduce the affordability of cigarettes.** (*WHO FCTC Article 6*)
- 2 Enforce bans on smoking in all public places to protect people from tobacco smoke.** (*WHO FCTC Article 8*)
- 3 Increase the size of graphic warning labels on packaging to warn about the harms of tobacco use.** (*FCTC Article 11*)
- 4 Implement plain packaging.** (*FCTC Article 11 and Article 13: Guidelines for implementation*)

In addition, at the request of the Government, the investment case investigates the impact of exposure to tobacco smoke on children and adolescents' physical and mental health, education, and health-services utilization, and summarizes potential interventions that can be implemented at the individual- and policy-level to protect them from exposure to tobacco smoke.

Section 3 provides an overview of tobacco control in Colombia, including tobacco use prevalence as well as tobacco-control challenges and opportunities. **Section 4** summarizes the methodology of the investment case (see *Annex* and *Technical Appendix*⁴ for more detail). **Section 5** reports the main findings of the economic analysis. It includes a report on the impact of exposure to tobacco smoke, and protective policies and interventions that are designed to reduce exposure rates. The report concludes under **Section 6** with a set of recommendations.

³ Multiple government and civil-society organizations contributed to the development of the investment case, including: Ministerio de Salud y Protección Social, Instituto Nacional de Salud, Instituto de Evaluación Tecnológica en Salud, and Fundación Anáas

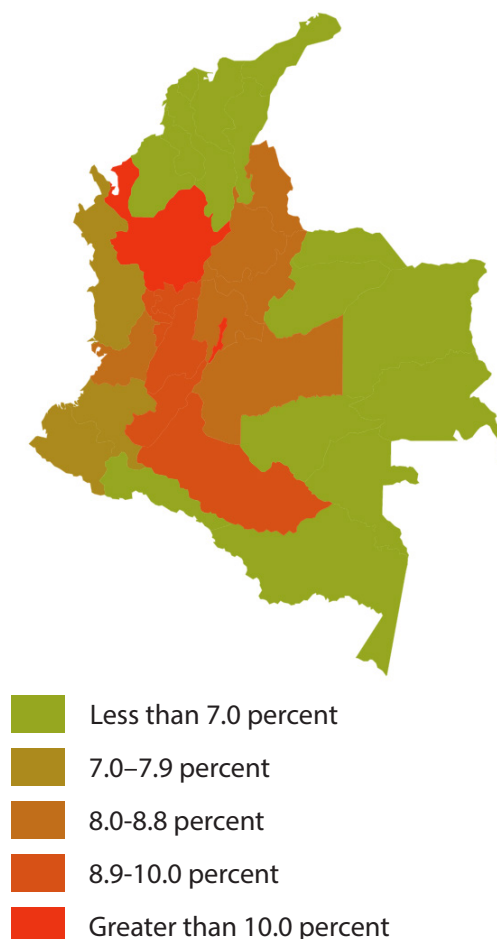
⁴ Available upon request

3. Tobacco control in Colombia: status and context

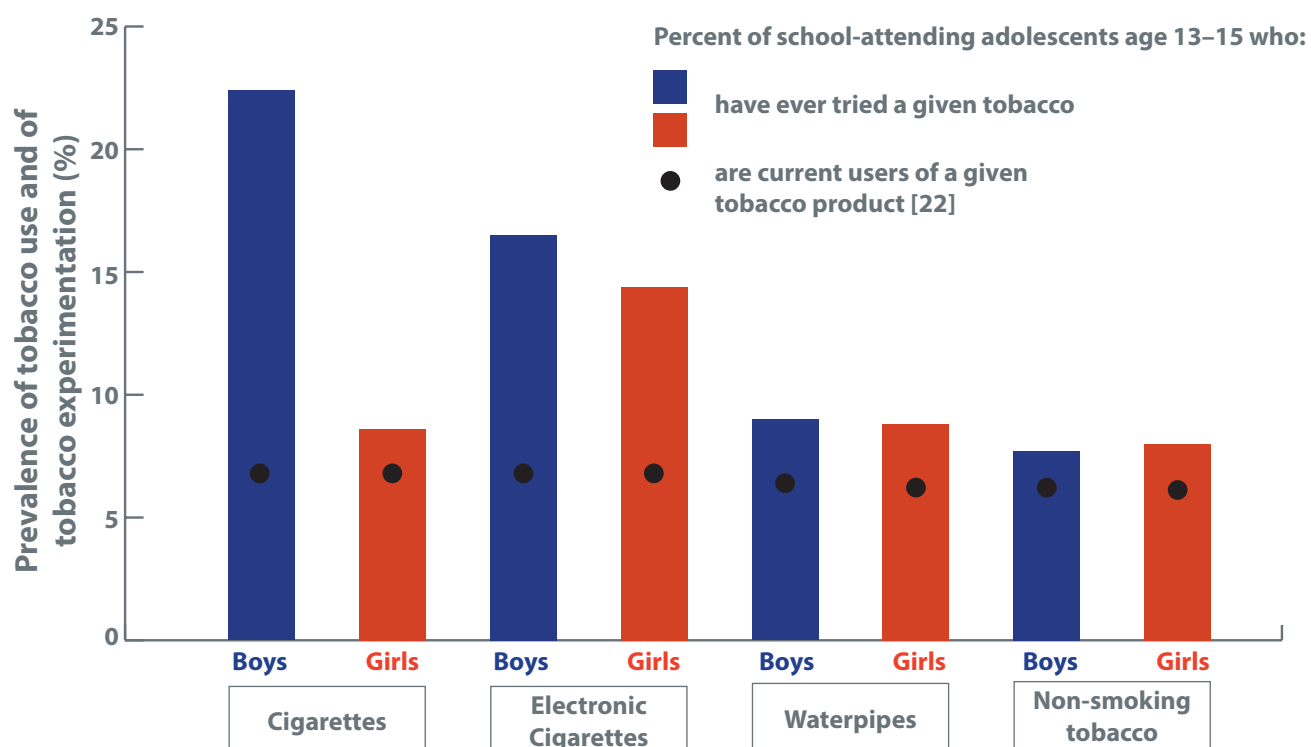
3.1 Tobacco use prevalence, social norms, and awareness-raising

In Colombia, tobacco use prevalence rates have declined over the past three decades. In 1993, 21.4 percent of Colombian adults were considered current smokers [19], meaning that they had consumed at least one cigarette in the last 30 days. Rates of use had nearly halved by 2007 (12.8 percent) [20], and continued to decline over the next decade, with around 8.3 percent of Colombians reported to smoke in 2017 [2]. The trend stagnated in 2018, however, when 8.7 percent of Colombia adults were reported to smoke cigarettes, with the highest rates of use in the Antioquia region and lowest in San Andrés (see **Figure 1**) [21]. While overall declines are notable, prevalence rates of more than eight percent mean that more than three million Colombian adults continue to smoke tobacco, and that they are consequently at increased risk of cardiovascular and respiratory diseases, cancers, and other smoking-attributable diseases.

Fig. 1: Adult smoking prevalence, by region



Among school-going youth age 13–15 years, 22 percent have tried cigarettes at least once in their life, and 11.7 percent have tried tobacco products other than cigarettes [22]. **Figure 2** breaks down tobacco use prevalence among adolescents by sex and tobacco type. Uncommonly, girls are as likely to use tobacco as boys, and slightly more likely to use electronic cigarettes. That youth smoking rates (8.9 percent) are as high as those in the adult population indicates the importance of tobacco-control measures to help ensure that the next generation is not a generation of smokers.

Fig. 2: Tobacco use prevalence among adolescents, by sex and tobacco type

Credit: © World Bank via Flickr

3.2 Tobacco control regulatory measures

Strong fiscal and regulatory measures can powerfully influence norms by signaling to the population that smoking is harmful. Colombia has a set of tobacco policies already in place to reduce demand for tobacco products and protect the health of its population. Law No. 1335, enacted in 2009, is the primary law that regulates tobacco policy in Colombia [17].

Taxation and Pricing



In December 2016, Colombia increased taxes on tobacco products, committing to raising the specific component of the excise tax from COP 700 to 2,100 over a period of two years, and mandating continuous increases of 4 percentage points above inflation for all years thereafter [23].

The tax increases reduced the affordability of cigarettes; since 2016, the average number of minutes of labor required to buy a pack of cigarettes has increased from about 66 to 82 [24]. With the increases, the tax share on the most sold brand of cigarettes is 78.4 percent. This includes a 52.5 percent specific excise tax, a 15.9 percent value-added tax, and a 10 percent ad valorem tax [25]. Colombia could further increase the tax rate, in line with WHO FCTC guidelines recommending that taxes represent at least 75 percent of the retail price of tobacco products. Specifically, Colombia should increase the excise tax component which are below the WHO FCTC guidelines that excise taxes account for at least 70 percent of the retail price.

Evidence shows that prices are widely dispersed across market channels, with many cigarette packs selling at lower-than-expected prices given existing tax levels—a finding that may in part be due to the availability of illicit tobacco and single stick cigarettes [24]. In addition, the affordability of cigarettes remains below many other countries in Latin America and the Caribbean. Overall in the region, purchasing 2,000 packs of the most sold brand of cigarettes requires funds equivalent to 4.2 percent of GDP per capita, compared to only 2 percent in Colombia. Building on recent wins, Colombia should continue to increase tobacco taxes to reduce affordability, and implement a track and trace system to increase the efficiency of tax collection and to fight illicit tobacco.



Smoking Ban in Public Places

Colombia has enacted a ban on smoking in all indoor public and workplaces including open areas with customer service. Compliance with the ban is reported to be relatively high in most types of public areas, with the exception of universities, restaurants, bars and nightclubs [25]. To facilitate enforcement, Colombia is in the process of implementing inspection, surveillance, and control measures, and has also created—and raised awareness of—a compliance mechanism for inspectors to detect violations of the ban on smoking in public places [26].



Warning Labels and Packaging

Colombia requires that graphic warning labels cover 30 percent of the packaging of smoked and smokeless tobacco products, and six warning labels are currently in rotation [27]. Research by Gantiva and colleagues (2016) has demonstrated that Colombian smokers and nonsmokers do not find the current warnings to be highly aversive, and that the warnings are not large enough to sufficiently deter smokers [28]. Increasing the size of warning labels to require that they cover at least 50 percent of tobacco packaging would amplify health messaging about the harms of tobacco use [29].



Plain Packaging

Plain packaging—neutral colors, without branding and logos—is currently not mandated. Plain packaging of tobacco products would enhance the impact of health warnings and eliminate the possibility of using the package as a vehicle for advertising.



Anti-tobacco Awareness Campaigns

Colombia has run targeted national anti-tobacco mass media campaigns in the past several years [30]. These campaigns met most of the criteria for effective campaigns, which is why mass-media campaigns are not included under the investment case model. In addition, civil-society led efforts have included advocacy through press releases and local media interviews to raise awareness about the benefits of increasing tobacco taxes [31].



Tobacco Advertising, Promotion, and Sponsorship (TAPS)

Colombia has enacted a comprehensive ban on nearly all forms of tobacco advertising, promotion, and sponsorship (TAPS), including direct advertising on major forms of media (e.g., TV, radio, print media, billboards, internet) and indirect forms of promotion and sponsorship (e.g., free distribution of tobacco products, point of sale product displays). Stakeholders report medium levels of compliance with the bans [27]. Common violations, for instance, include free-cigarette promotions. In 2017, the Demand for Illicit Cigarettes Survey in Colombia found that “one in five smokers reported having been offered free cigarette samples in the prior eight months” [32, p. 299].

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



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Table 1: Summary of the current state of WHO FCTC demand reduction measures in Colombia, and target goals modelled in the Investment Case

Tobacco Control Policy	Baseline	Target
Increase tobacco taxation to reduce the affordability of tobacco products. (Article 6)	Some market segments are meeting the WHO FCTC obligation to ensure that the share of taxes on a pack of cigarettes represents at least 75 percent or more of the retail price. However, cigarettes remain more affordable in Colombia than in many countries in the region and excise taxes do not currently represent at least 70 percent of the retail price.	Reduce affordability by continuing to increase specific excise taxes on cigarettes and implement regular tax increases to outpace inflation and income growth. ** Ratify the FCTC Protocol to Eliminate Illicit Trade in Tobacco Products and implement track and trace, which will enhance the impact—and revenue-generating capability—of tax increases.
Enforce bans on smoking in all indoor workplaces and indoor public places to protect people from tobacco smoke. (Article 8)	Smoking is banned in all indoor workplaces and indoor public places, but with only medium levels of compliance reported in restaurants, bars, and nightclubs.	Currently meeting the WHO FCTC guidelines for banning smoking in all indoor workplaces and public places; however, increasing compliance with the ban would result in additional gains.
Mandate that tobacco products and packaging carry large graphic health warnings describing the harmful effects of tobacco use. (Article 11)	Graphic warning labels are required to cover 30% of tobacco packaging, with six different labels in rotation.	Increase warning labels to cover 50% of the package per WHO FCTC guidelines.
Mandate plain packaging of all tobacco products. (Article 11 and 13: Guidelines)	No law mandates plain packaging of tobacco products.	Implement a law requiring plain packaging.
Promote and strengthen public awareness about tobacco control issues and the harms of tobacco use through mass media information campaigns. (Article 12)	Within the last several years, Colombia has aired national-scale, mass media campaigns that were researched and tested with a targeted audience, on TV and radio, and evaluated for impact.	✓ Currently meeting the FCTC guidelines for conducting a multi-media national awareness campaign.
Enact and enforce a comprehensive ban on all forms of tobacco advertising sponsorship and promotion. (Article 11 Guidelines and Article 13)	Advertising is banned on major forms of media (e.g., TV, radio, internet, billboards, print) as are indirect forms of promotion and sponsorship. Compliance with the bans needs to be improved, however.	✓ Currently meeting the FCTC guidelines on banning tobacco advertisements, promotions, and sponsorships. Colombia can improve enforcement of existing laws; however, the impact of increasing enforcement is not modelled in the investment case.

*Unless otherwise noted, baseline information in this table is derived from the WHO Report on the Global Tobacco Epidemic: Country profile – Colombia [25].

**The tax increases modelled in the investment case are found in Section 7.3

3.3 National multisectoral tobacco control strategy and coordination

Article 5.1 of the Convention requires Parties to develop, implement, periodically update and review a comprehensive multisectoral national tobacco control strategy, plan and programme. Colombia does not currently have a national tobacco control strategy, though the Government has chosen to incorporate tobacco control goals, objectives and targets within broader plans and strategies, in order to involve all relevant stakeholders and sectors in these efforts. Usually these plans set the guidelines for the health sector, but have limited influence in other sectors. For instance, specific objectives and targets for tobacco control were included under the national Cancer Plan. These include goals related to reducing the prevalence of tobacco consumption in adults and young people, the increase of taxes on tobacco products, and the increase in the size of health warnings to 70 percent of the size of tobacco packaging. To achieve these goals, actions were established at the political, regulatory, community and health services levels. Such plans would benefit from better accountability tools and explicit commitments to allocate resources.

Article 5.2 (a) calls on Parties to establish or reinforce and finance a national coordinating mechanism (NCM) or focal points for tobacco control. Colombia established an NCM chaired by the Ministry of Foreign Affairs, but it has not been mandated yet as a formal entity. Key sectors are represented, though membership could be expanded and the terms of reference for the NCM should be further delineated.

Article 5.3 of the WHO FCTC and the Guidelines⁵ on it issued by the Conference of the Parties call on Parties to protect public health policies against the commercial or other interests of the tobacco industry and those working to further their interests. The tobacco industry is active in Colombia and perhaps the biggest challenge to continued and sustained progress. The industry lobbies lawmakers and has commissioned studies from economists to undermine efforts towards increasing tobacco taxes, claiming that tax increases would exacerbate illicit trade. However, MoH and Fundacion Anaas conducted a study that found that the share of the market occupied by illicit trade was only 3.5 percent for the five cities surveyed—far below the 14 percent claimed by tobacco companies [33].

5 Available at https://www.who.int/fctc/guidelines/article_5_3.pdf

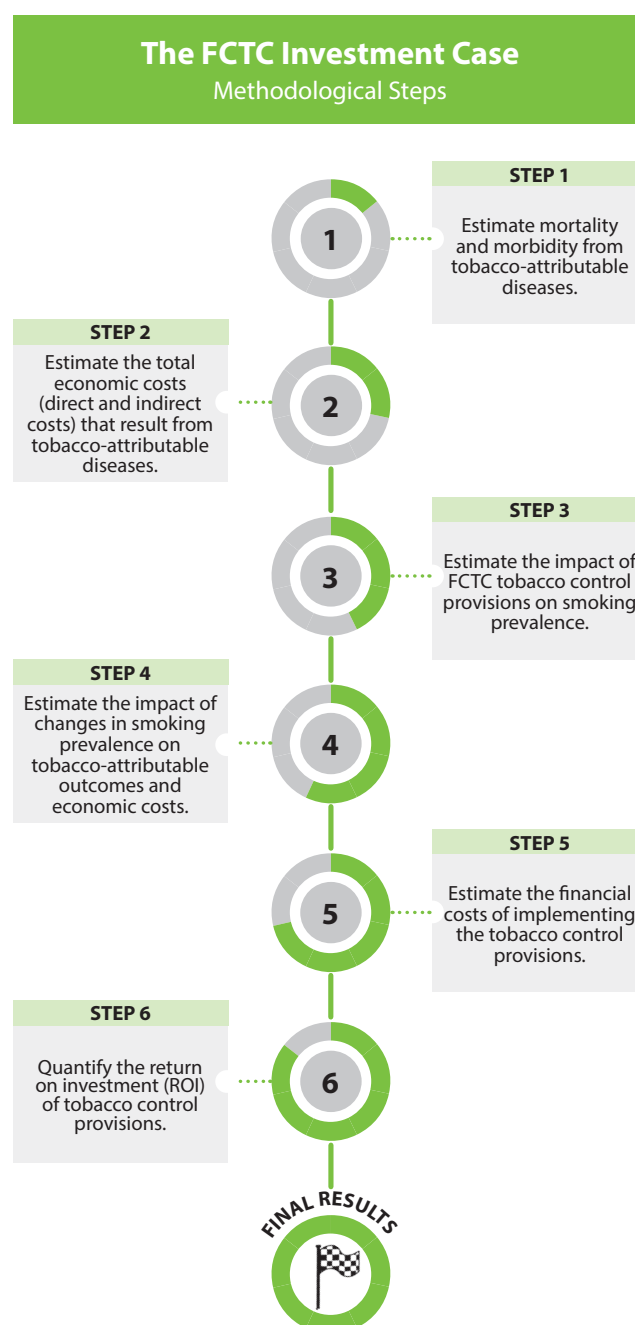
4. Methodology

The purpose of the investment case is to quantify the current health and economic burden of tobacco use in Colombia (in the context of tobacco control measures that are currently in place); estimate the impact that implementing new tobacco control measures—or intensifying existing ones—would have on reducing this burden; and provide analysis of other impacts—e.g., the impact of childhood exposure to tobacco smoke on physical and mental health, education, and healthcare utilization—that may factor into government decisions to implement tobacco control measures.

An RTI International-developed static model incorporating a population attributable fraction approach was created to conduct the investment case and perform the methodological steps in **Figure 3**. The tools and methods used to perform these steps are described in this report's Annex. Interested readers are also referred to this report's separate Technical Appendix for a more thorough account of the methodology.

The investment case team worked with partners in Colombia to collect national data inputs for the model. Where data was unavailable from government or

Fig. 3: Building the FCTC investment case



other in-country sources, the team utilized publicly available national, regional, and global data from sources such as the World Health Organization (WHO), the Pan American Health Organization (PAHO), the World Bank database, the Institute for Health Metrics and Evaluation's (IHME) Global Burden of Disease (GBD) study, and academic literature.

Within the investment case, costs and monetized benefits are reported in constant 2017 Colombian pesos (COP) and discounted at an annual rate of three percent.



Credit: © UNDP

5. Results

5.1 The current burden of tobacco use: health and economic costs⁶

Tobacco use undermines economic growth. In 2017, tobacco use caused an estimated 34,809 deaths in Colombia, 44 percent occurring among those under age 70. Colombia lost productive years in which those individuals would have contributed to the workforce. The economic losses in 2017 due to tobacco-related mortality are estimated at COP 8.6 trillion.

While the costs of premature mortality are high, the consequences of tobacco use begin long before death. As individuals suffer from tobacco-attributable diseases (e.g. heart disease, strokes, cancers), expensive medical care is required to treat them. Spending on medical treatment for illnesses caused by tobacco use cost the Government COP 4.2 trillion in 2017 and caused Colombians to spend COP 1.3 trillion in out-of-pocket (OOP) healthcare expenditures. Private insurance and non-profit institutions serving households spent COP 935.8 billion on treating tobacco-attributable diseases in 2017. In total, smoking generated about COP 6.5 trillion in healthcare expenditures.

In addition to generating healthcare costs, as individuals become sick, they are more likely to miss days of work (absenteeism) or to be less productive at work (presenteeism). In 2017, the costs of excess absenteeism due to tobacco-related illness was COP 340.3 billion and the costs of presenteeism due to tobacco use were COP 1.0 trillion.

Finally, even in their healthy years, working smokers are less productive than non-smokers. Smokers take an average of approximately 8 additional minutes per day more in breaks than non-smoking employees [34]. If 8 minutes of time is valued at the average workers' salary, the compounding impact of 2.3 million employed daily smokers taking 8 minutes per day for smoke breaks is equivalent to losing COP 579.3 billion in productive output annually.

In total, tobacco use cost Colombia's economy 17 trillion , or about 1.8 percent of Colombia's 2017 GDP. **Figure 4** breaks down direct and indirect costs. **Figure 5** and **Figure 6** illustrate the annual health losses that occur due to tobacco use.

⁶ In assessing the 'current burden' of tobacco use, the economic costs of premature mortality include the cost of premature deaths due to any form of exposure to tobacco (including from smoking, "second-hand" smoke exposure, and the use of other types of tobacco products). Only smoking-attributable (not tobacco-attributable) costs are calculated for healthcare expenditures, absenteeism, presenteeism, and smoking breaks. While other forms of tobacco may also cause losses in these categories, no data is available to pinpoint those losses.

The current burden of tobacco use

Fig. 4: Breakdown of the share of direct and indirect economic costs in 2017 (COP)

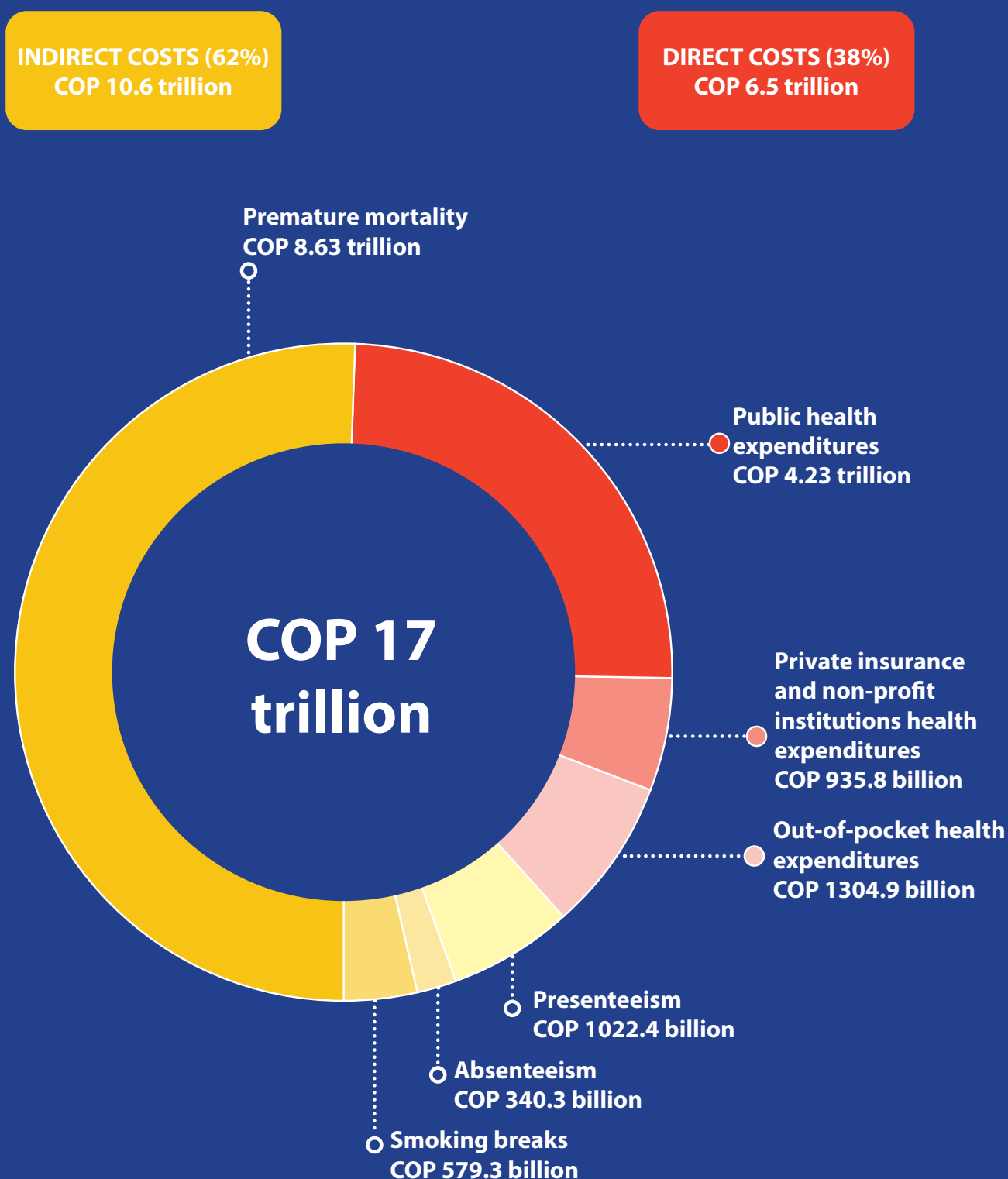


Fig. 5: Tobacco-attributable deaths by disease, 2017 (Results are from the IHME Global Burden of Disease Results Tool and are specific to Colombia. Other causes include Subarachnoid hemorrhage, ischemic stroke, colon and rectum cancer, leukemia, aortic aneurysm, pancreatic cancer, liver cancer, larynx cancer, esophageal cancer, breast cancer, prostate cancer, peptic ulcer disease, lip and oral cavity cancer, bladder cancer, tuberculosis, peripheral artery disease, kidney cancer, other pharynx cancer, atrial fibrillation and flutter, gallbladder and biliary diseases, nasopharynx cancer, asthma, rheumatoid arthritis, and multiple sclerosis.)

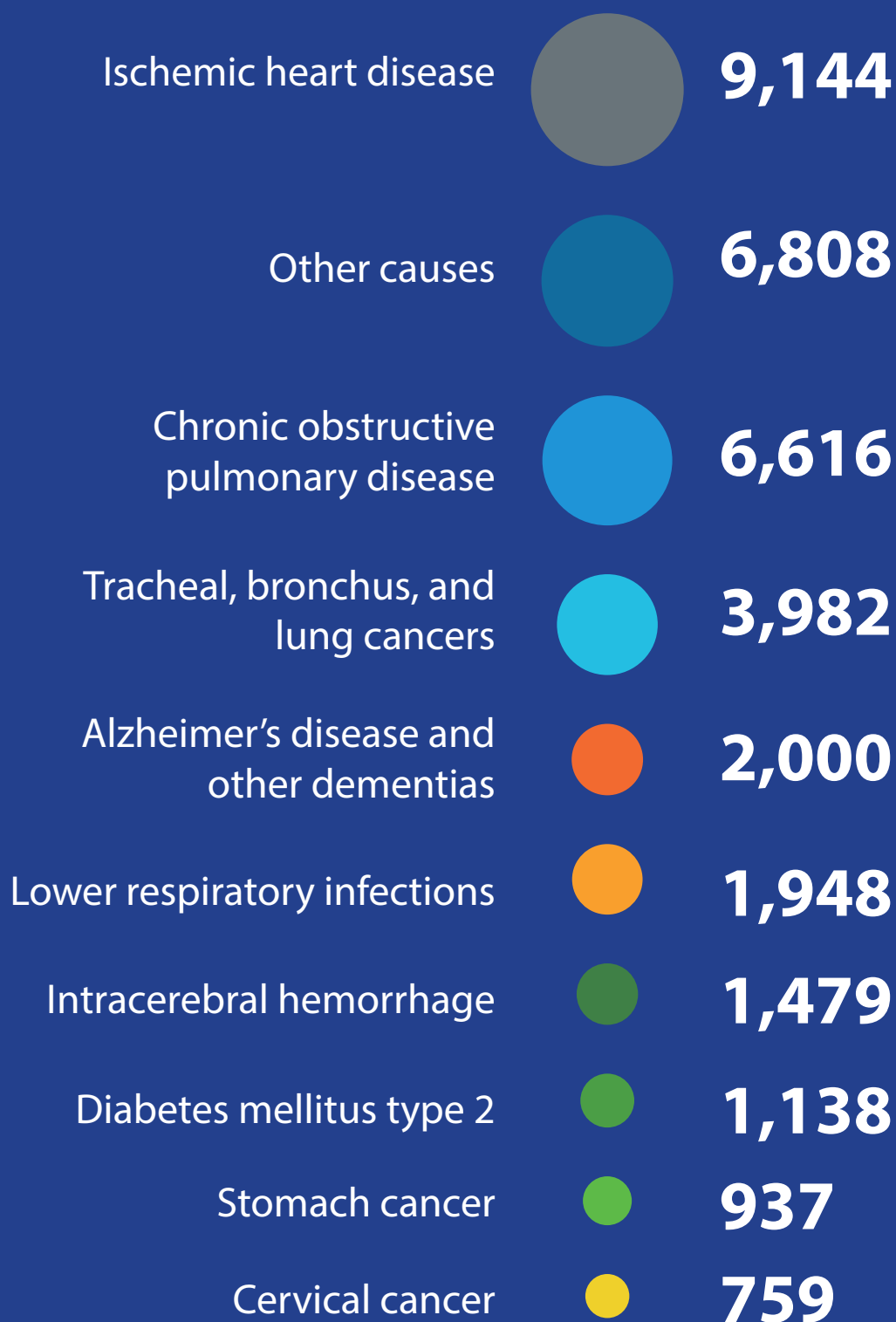
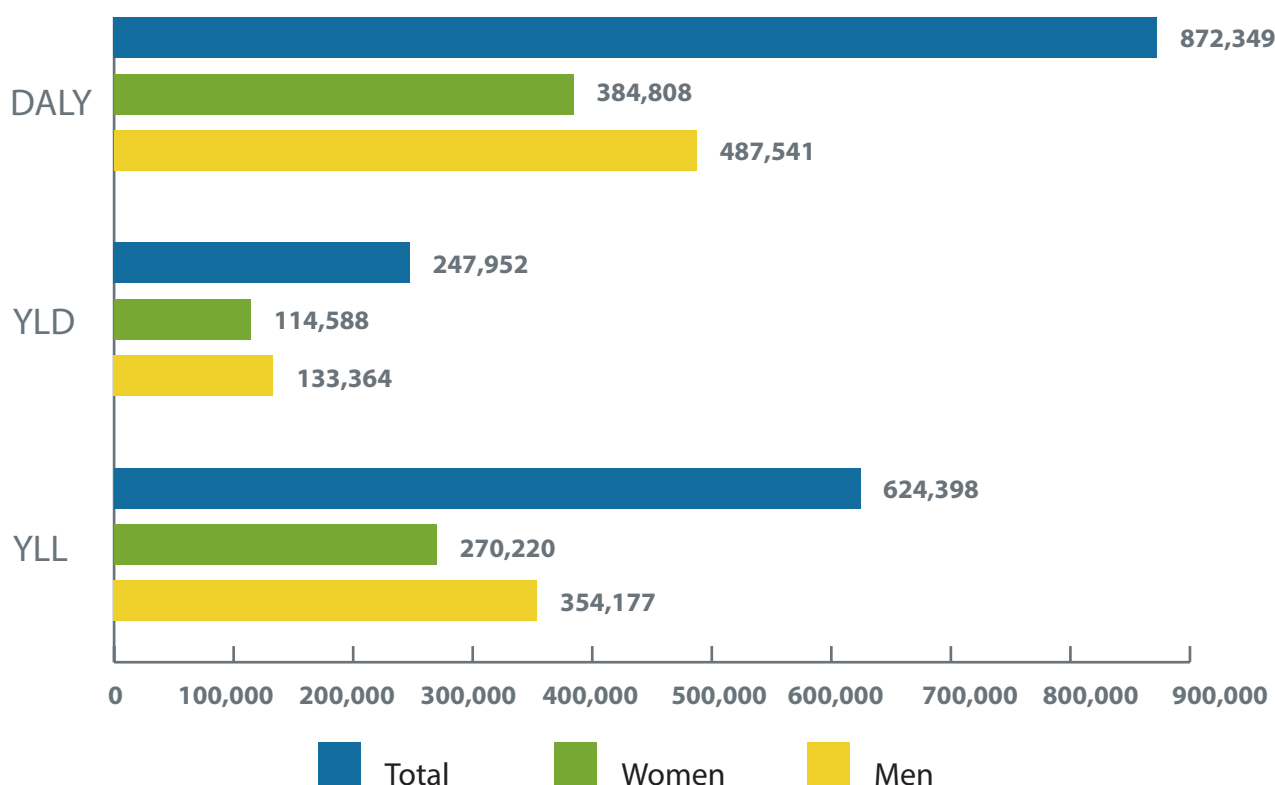


Fig. 6: Tobacco-attributable DALYs, YLDs, and YLLs, 2016, by sex⁷

5.2 Implementing policy measures that reduce the burden of tobacco use

By implementing new FCTC policy measures, or intensifying existing ones, Colombia can secure significant health and economic returns, and begin to reduce the COP 17 trillion in annual direct and indirect economic losses due to tobacco use.

The next two sections present the health and economic benefits that result from four FCTC policy actions to: 1) increase cigarette taxation to reduce the affordability of cigarettes; 2) increase enforcement and of the existing ban on smoking in workplaces and indoor public spaces; 3) increase warning labels to cover 50 percent of cigarette packages, and 4) implement plain packaging of tobacco products.

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

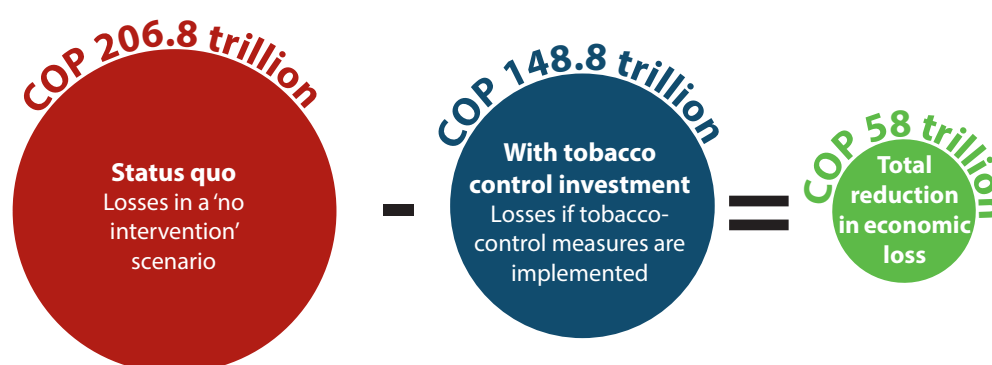
5.3 Health benefits—lives saved

Putting in place the full package of tobacco-control measures (inclusive of all four of the measures listed above) would lower the prevalence of cigarette smoking, leading to substantial health gains. Specifically, enacting the package would reduce the prevalence of cigarette smoking by 49.7 percent (in relative terms) over 15 years, saving an estimated 154,450 lives from 2019–2033, or 10,297 lives annually.

5.4 Economic benefits—costs averted

Implementing the tobacco control policy package would result in Colombia avoiding 28 percent of the economic losses it is expected to incur from smoking over the next 15 years. **Figure 7** illustrates the extent to which Colombia can shrink the economic losses expected under the current status quo.

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

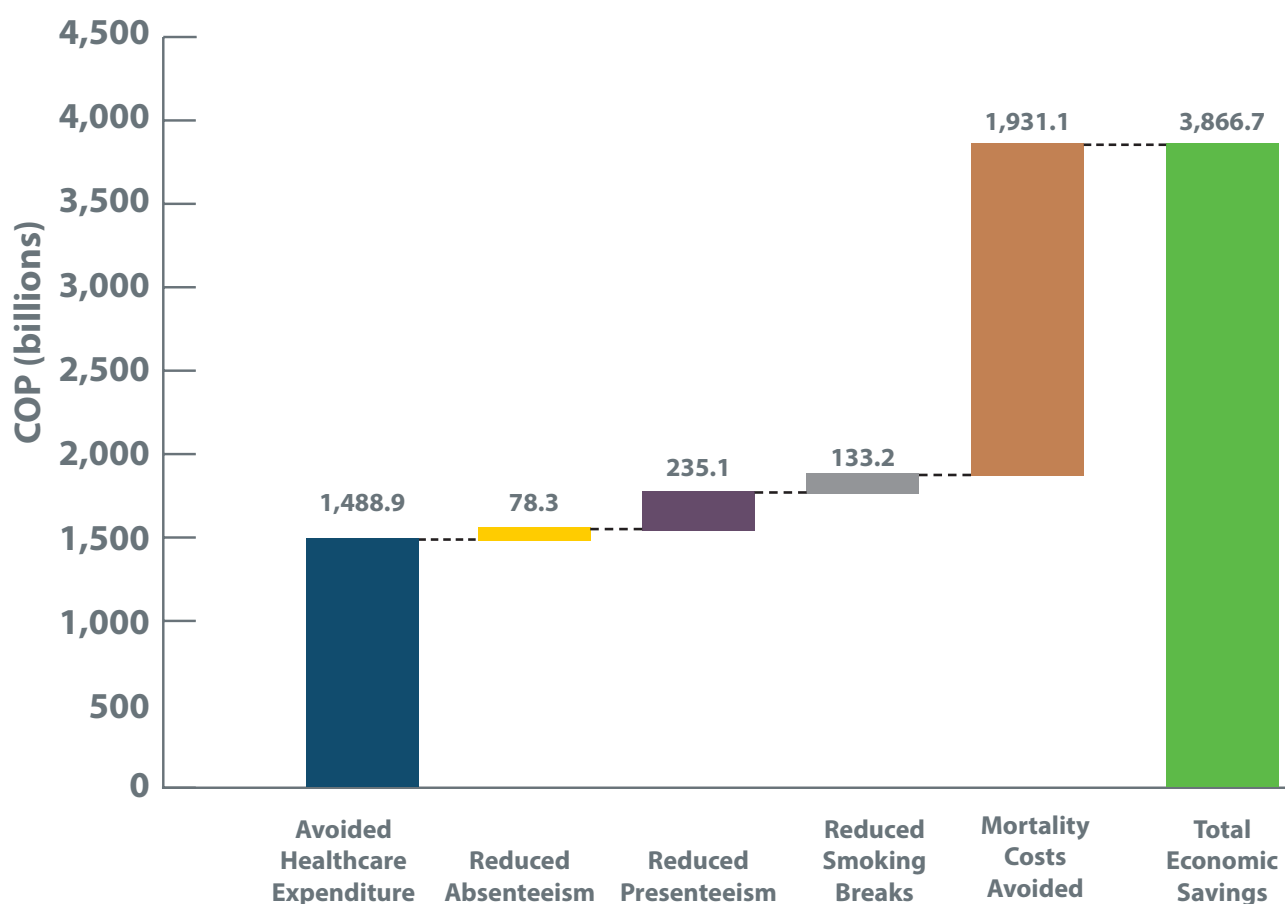


In total, over 15 years Colombia would save about COP 58 trillion that would otherwise be lost if it does not implement the package of tobacco control measures, or the equivalent of about COP 3.9 trillion in annual avoided economic losses.

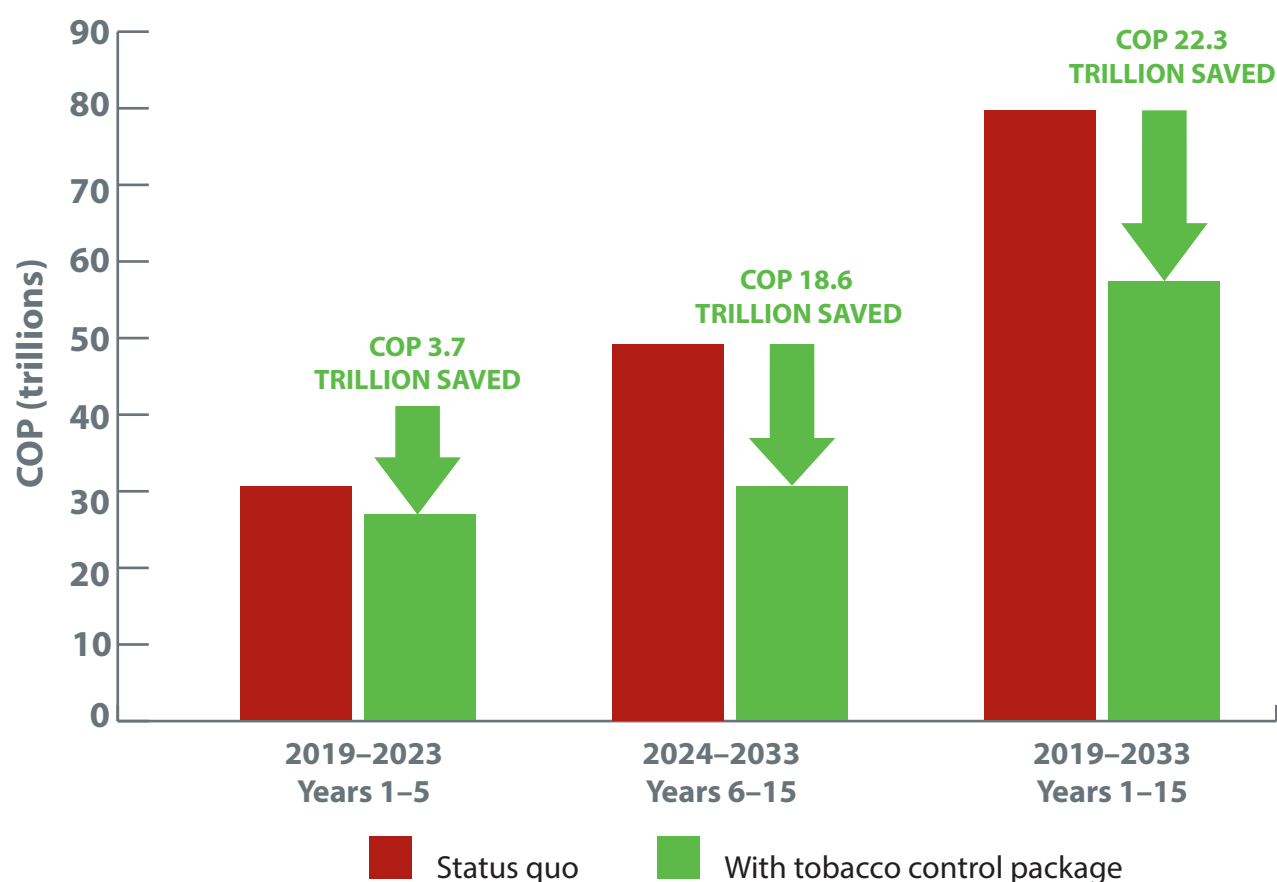
With better health, fewer individuals need to be treated for complications from disease, resulting in direct cost savings to the government and to citizens. In addition, better health leads to increased worker productivity. Fewer working-age individuals leave the workforce prematurely due to death. Laborers miss fewer days of work (absenteeism) and are less hindered by health complications while at work (presenteeism). Finally, because the prevalence of smoking declines, fewer individuals take smoke breaks in the workplace.

Figure 8 breaks down the sources from which annual savings accrue. The largest annual savings result from avoiding premature mortality (COP 1.9 trillion). The next highest source of annual savings is avoided healthcare expenditures (COP 1.5 trillion), reduced presenteeism (COP 235.1 billion), reduced numbers of smoking breaks (COP 133.2 billion), and reduced absenteeism (COP 78.3 billion).

Fig. 8: Sources of annual direct and indirect economic savings as a result of implementing the tobacco control policy package (COP billions)



Year-over-year, the package of interventions lowers smoking prevalence, which leads to less illness, and consequently less healthcare expenditure (see Figure 9). Over the 15-year time horizon of the analysis, the package of interventions averts COP 22.3 trillion in healthcare expenditures, or COP 1.5 trillion annually. Of this, 65 percent of savings accrue to the Government, and 20 percent accrue to individuals who would have paid out-of-pocket for healthcare. The remainder of savings goes to private insurance. Thus, from reduced healthcare costs alone, the Government stands to save about COP 14.6 trillion over 15 years. Simultaneously, the Government would successfully reduce the health expenditure burden tobacco imposes on Colombia's citizens, supporting efforts to reduce economic hardship on families. Rather than spend on treating avoidable disease, these families would be able to invest more in nutrition, education and other inputs to secure a better future.

Fig. 9: Public and private healthcare costs and savings over the 15-year time horizon

5.5 The return on investment (ROI)

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

Table 2 displays costs, benefits and ROI by intervention, as well as for all interventions combined. All individual 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 recoup anywhere from 74 to 357 times its investment. The ROI for each intervention continues to grow over time, reflective of the increasing effectiveness of policy measures as they move from planning and development stages, to full implementation.

Table 2: Return on investment, by tobacco policy/intervention (COP billions), over 15 years⁸

Return on investment, by tobacco control measure (COP billions)	First 5 years (2019–2023)			All 15 years (2019–2033)		
	Total Costs (billions)	Net Benefits (billions)	ROI	Total Costs (billions)	Net Benefits (billions)	ROI
Tobacco Control Package* (combined interventions)	73	9,753	133	190	58,000	305
Increase cigarette taxes (WHO FCTC Article 6)	17	5,999	357	56	36,939	658
Enforce bans on smoking (WHO FCTC Article 8)	22	1,644	74	49	12,775	258
Warning labels (WHO FCTC Article 11)	10	2,044	202	24	15,793	659
Plain packaging (WHO FCTC Article 11 and 13 Guidelines)	10	1,366	135	24	10,653	444

*The combined impact of all interventions is not the sum of individual interventions. To assess the combined impact of interventions, following Levy and colleagues' (2018), "effect sizes [are applied] as constant relative reductions; that is, for policy i and j with effect sizes PR_i and PR_j, (1-PR_i) x (1-PR_j) [is] applied to the current smoking prevalence [36, p. 454]. 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 cigarette taxes and increasing the size of graphic warning labels is expected to have the highest return on investment (659:1). Increasing cigarette taxes has the next highest ROI (658:1), followed by implementing plain packaging (444:1), and enforcing bans on smoking in all public places and workplaces (258:1).

5.6 The Sustainable Development Goals and the WHO FCTC

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

⁸ Costs and benefits have been rounded to the nearest whole number. ROIs were calculated using non-rounded numbers, so individual ROIs may not equal the quotient of the rounded costs and benefits.



SDG Target 3.4

**By 2030 the
FCTC measures
would...**



Reduce economic costs due to tobacco use by COP 44.2 trillion, including saving COP 17 trillion in healthcare expenditures.

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

Table 3: Return on investment through the SDG era (2030), by tobacco control policy/intervention (COP billions)⁹

Return on investment, by tobacco policy/intervention (COP billions)	Total Costs (COP billions)	Total Benefits (COP billions)	ROI by 2030 (end of SDG era)
Tobacco Control Package* (combined interventions)	160	44,229	277
Raise cigarette taxes (WHO FCTC Article 6)	45	27,607	607
Protect people from tobacco smoke (WHO FCTC Article 8)	43	9,651	227
Warning labels (WHO FCTC Article 11)	20	11,939	587
Plain packaging (WHO FCTC Article 11 Guidelines)	20	8,048	396

** The combined impact of all interventions is not the sum of individual interventions. To assess the combined impact of interventions, following Levy and colleagues' (2018), "effect sizes [are applied] as constant relative reductions; that is, for policy i and j with effect sizes PR_i and PR_j, (1-PR_i) x (1-PR_j) [is] applied to the current smoking prevalence [36, p. 454]. 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.

⁹ Costs and benefits have been rounded to the nearest whole number. ROIs were calculated using non-rounded numbers, so individual ROIs may not equal the quotient of the rounded costs and benefits.

5.7 Exposure to tobacco smoke in Colombia

The effect on children

Colombia has committed to protecting peoples' right to health by mandating that indoor workplaces and indoor public spaces are smoke-free. However, recent evidence shows that many children and adolescents remain at risk of exposure to tobacco smoke in public. A 2017 national survey of tobacco use among adolescents age 13–15 finds that more than 32 percent report that they were exposed to tobacco smoke in public spaces in the last seven days [22]. In addition, 15 percent indicate that they were exposed to tobacco smoke within their own homes [22]. Assuming that a 15 percent exposure rate holds for children and adolescents of all ages, then more than two million youths under 18 are exposed to tobacco smoke in their homes.

Exposure to tobacco smoke can have fatal consequences. It is responsible for more 6,000 deaths in Colombia annually, with 154 (2.4 percent) of those deaths occurring among children and adolescents younger than 15 years old [37]. The main cause of these deaths among infants and children is lower respiratory infections.

However, deaths explain only a portion of the devastating losses that occur due to tobacco smoke exposure. To examine the full range of effects of smoke exposure on children, the investment case conducted a literature review of articles that have been published in the last 10 years that examine the links between exposure to tobacco smoke and outcomes in children. The review identified 101 articles that provide evidence that pre- and post-natal exposure to tobacco smoke leads to a myriad of issues in childhood and later in life. The articles describe the negative effects that exposure to tobacco smoke has on children's physical health, mental health, education, and utilization of healthcare services. The investment case summarizes impacts identified in the literature in **Figure 10, Figure 11, Figure 12, and Figure 13**.

In addition, the literature review identified policies, interventions, and programs that protect children from exposure to tobacco smoke. Examples of policies and interventions, as well as their effects, are shown in **Table 4** on page 29.

Fig. 10: Health effects of maternal exposure to tobacco smoke and prenatal maternal smoking on infants [38-52]

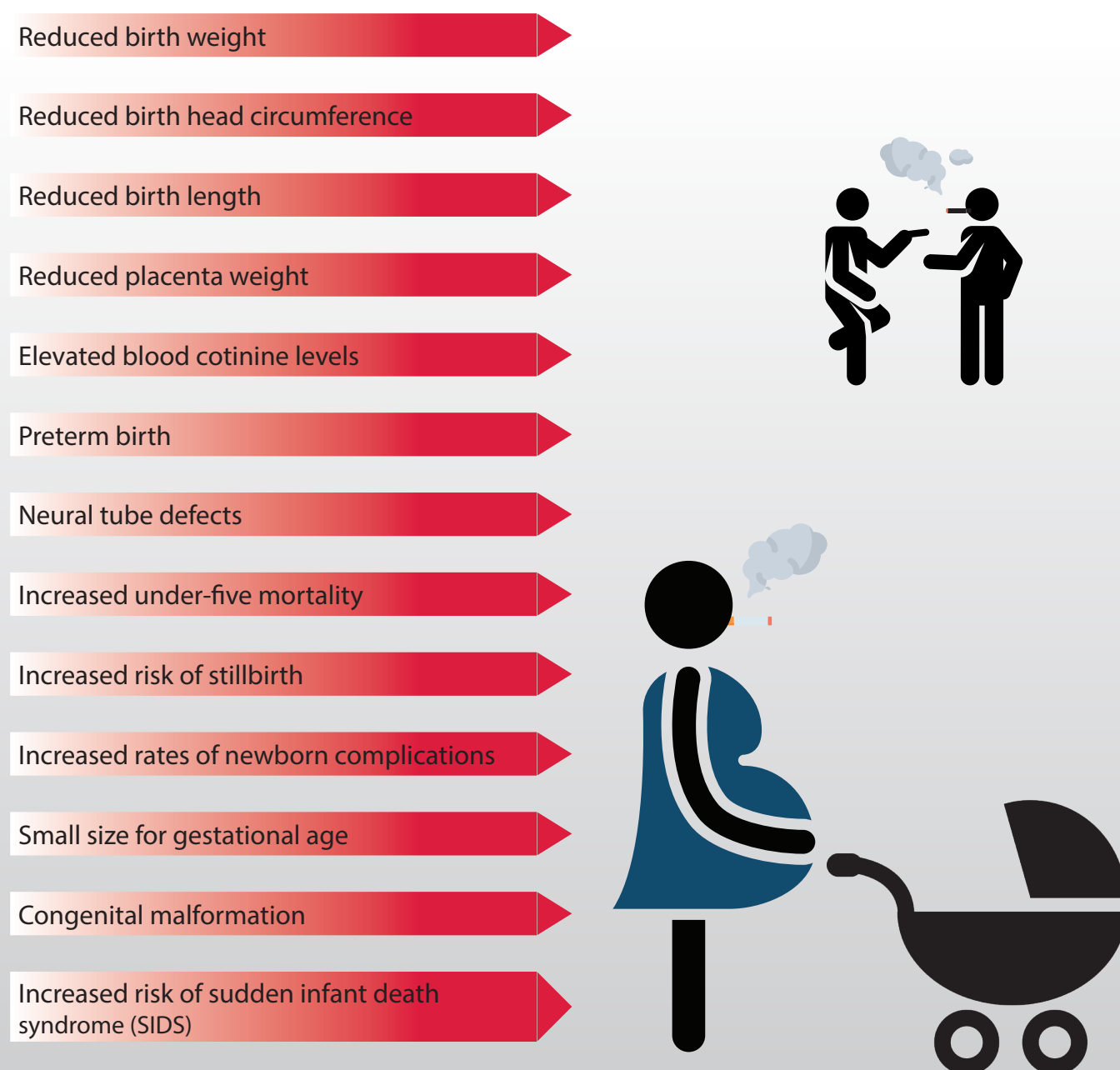


Fig. 11: Health effects of tobacco smoke exposure and prenatal maternal smoking on children [39, 45, 53-123]

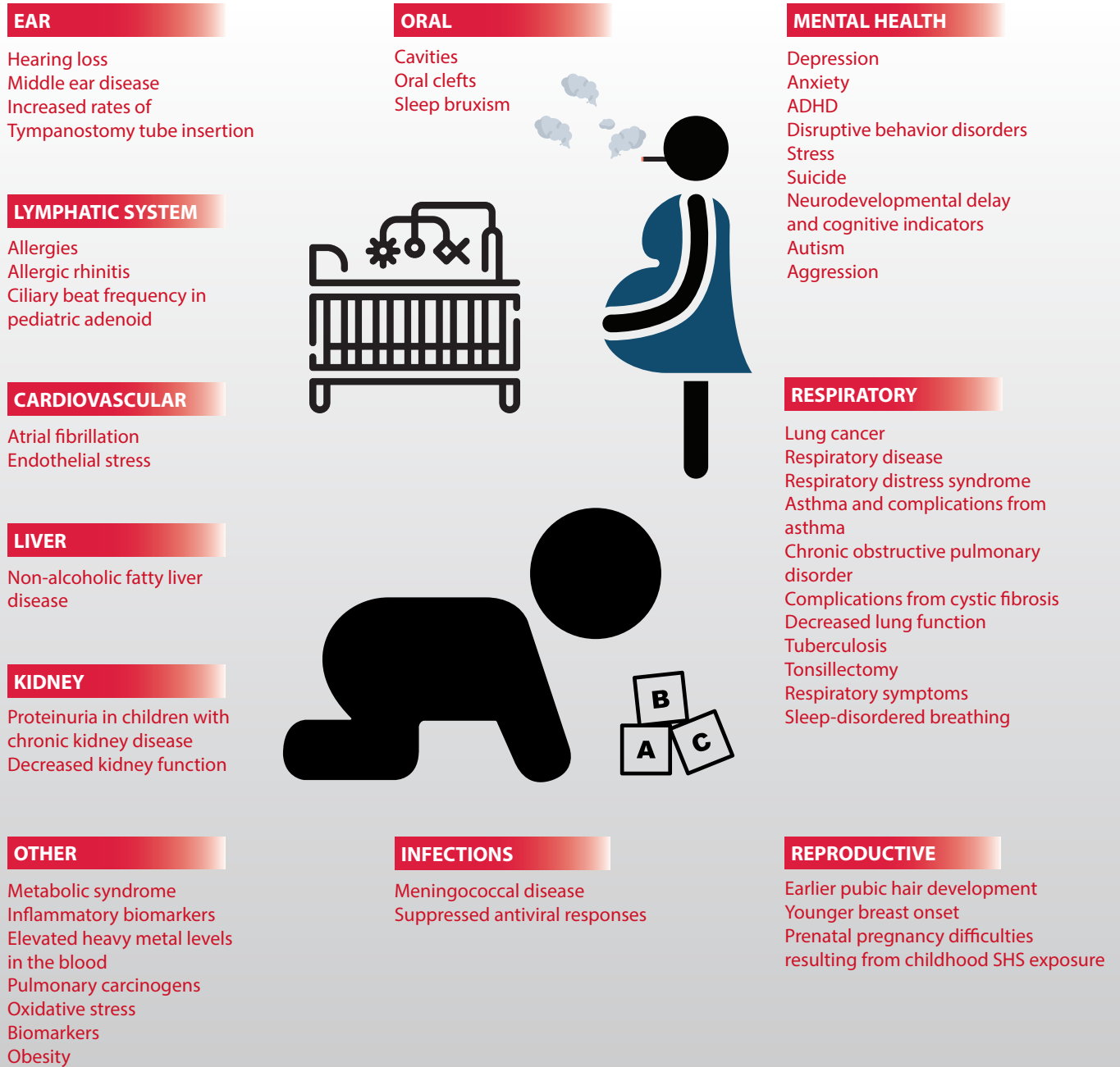
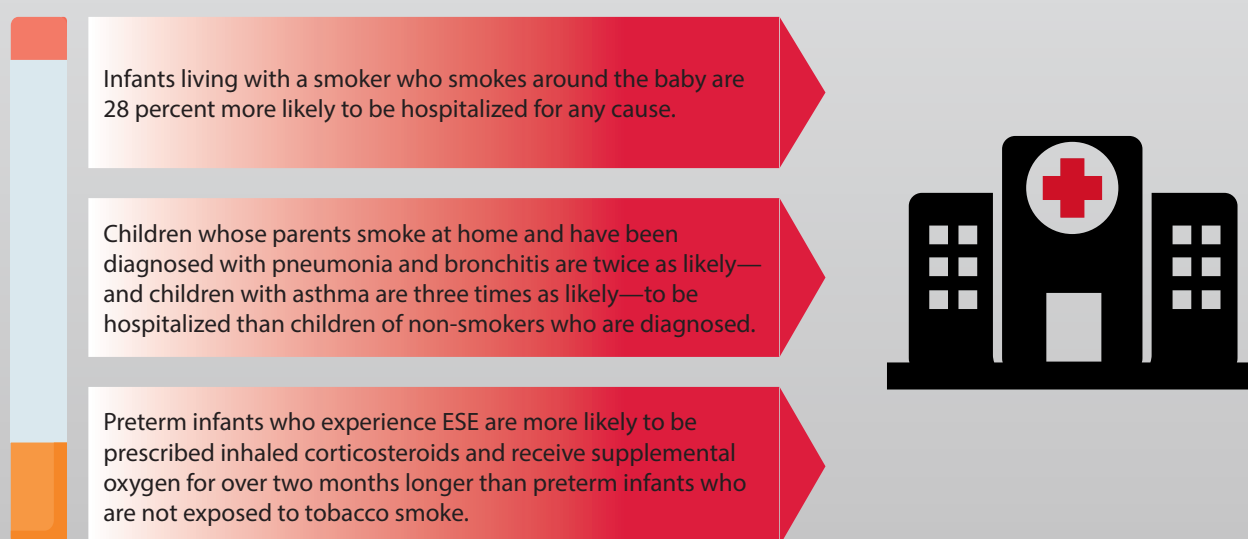


Fig. 12: The effect of tobacco smoke exposure on education attainment [124-126]**Fig. 13: The effect of tobacco smoke exposure on healthcare utilization [127-129]**



Credit: © World Bank via Flickr

Policies and interventions designed to protect against tobacco smoke exposure

Findings from the literature clearly indicate that exposure to tobacco smoke causes an immense loss of life due to increased infant mortality and miscarriages, and that it imposes a large morbidity burden from the many physical and mental health issues caused during childhood and into adulthood. Protection against tobacco smoke exposure is an important way for Colombia to reduce the health and economic burden of tobacco use.

The literature review identified 142 articles that evaluated the impact of interventions designed to protect children from smoke exposure. The interventions were primarily evaluated in high income settings, with a few exceptions (China, India, Mexico, Thailand). Three broad categories of protective interventions were identified, including population-level policies designed to increase awareness of the dangers of exposure to tobacco smoke or to protect against exposure in public places; individual-level interventions that provide parents and caregivers with education or cessation counseling; and, individual-level interventions that educate children about the dangers of tobacco smoke exposure and empower them to advocate for their own health. **Table 4** provides examples of these interventions by category and explains whether the intervention was found to have a statistically significant impact on reducing exposure to tobacco smoke.

MINSALUD has developed signage and social media resources to promote the ban on smoking in public places



Table 4: Interventions that protect against tobacco smoke exposure, and their impact**POPULATION-LEVEL INTERVENTIONS**

Intervention description	Results
Taiwan implemented a smoke-free public places ordinance and media campaigns to raise awareness of exposure to tobacco smoke. The policies were evaluated before, during, and three months after the implementation of the smoke-free law and media campaign.	Exposure to tobacco smoke in the home fell from 36.8 percent before implementation to 21.3 percent after the smoke-free law and media campaign were implemented, and exposure in the workplace fell from 28.5 percent to 24.9 percent [130].
Spain passed national legislation banning smoking in public places. A longitudinal study in Barcelona examined the impact of the law on smoking and exposure to tobacco smoke.	Comparing smoke exposure before and after implementation, researchers identified significant decreases in smoking prevalence and exposure to tobacco smoke at home, work, and in public settings [131].
Seven of Canada's 10 provinces banned smoking in cars with children. The effect of the bans was examined using cross-sectional data from the 2004–2012 Youth Smoking Survey.	One province experienced a significant decrease in exposure to tobacco smoke in cars in the short term only and one province saw a decrease into the immediate and long term. However, the remaining five provinces did not demonstrate a decline in exposure relative to the provinces with no car smoking bans [132].

**INDIVIDUAL-LEVEL INTERVENTIONS TARGETING ADULTS**

Intervention description	Results
USA —Mothers who smoke were offered counselling sessions to assist them to quit, including 10 in-person sessions at home and four telephone sessions over six months. Counseling included detailed contracts describing behavior expectations, self-monitoring, and problem-solving techniques. The study monitored children's urine cotinine levels (an indicator of exposure to tobacco smoke) and home air nicotine levels.	The intervention reduced mothers' smoking rates and self-reports of times when they exposed their children to tobacco smoke (where exposure is defined as a child being in the same physical space as the parent when smoking occurs). However, over time, the study found no statistically significant difference in children's urine cotinine levels between the control and intervention groups, suggesting that children may still ultimately have been exposed to smoke that lingered in rooms/cars, or to smoke that gradually dispersed throughout the house [133].
USA —When their infants were discharged from a neonatal intensive care unit (NICU), caregivers who were smokers or ex-smokers received counseling from nurses on smoking cessation or relapse prevention; education on risks of exposure to tobacco smoke, and; information about resources such as pharmacotherapy options. In addition, the study monitored cotinine levels of infants.	Caregivers initially reported self-imposed bans on smoking within the home, and reductions in infant contact with smokers. Eight months after discharge from the hospital, infants in the treatment group displayed lower salivary cotinine compared to controls, but no significant differences in other clinical outcomes [134].



INDIVIDUAL-LEVEL INTERVENTIONS TARGETING CHILDREN

Intervention description	Results
Spain —A school-based intervention to prevent exposure to ESE was implemented in a population of 12 to 14-year-old schoolchildren. The intervention included six one-hour sessions on exposure to tobacco smoke. Students learned how one is exposed to tobacco smoke and how to protect against it.	The intervention had no effect on exposure to tobacco smoke after adjusting for age, sex, socioeconomic level, origin and the clustering among schools. No significant reduction was found on exposure at home or on transportation. One year after the intervention, the intervention had no effect on children's odds of initiating smoking [135].
Thailand —A school-based intervention taught children about the harms of exposure to tobacco smoke, and how to negotiate with family members to create smoke-free homes; gave children worksheets to take home to facilitate discussions with family members about setting a goal date for creating a smoke-free home, and; educated students on how to avoid exposure to tobacco smoke.	The intervention demonstrated significant improvements in students' attitude and knowledge about how to create a smoke-free home; self-confidence in avoiding exposure to tobacco smoke, and; ability to persuade smokers not smoke in the home. However, no statistically significant reduction in smoke-free homes was observed between the intervention and control groups [136].

Conclusive evidence already exists that well-enforced population-level policies that ban smoking in indoor workplaces and public places reduce secondhand smoke exposure and do not negatively impact businesses [137]. The findings from this literature review support that conclusion, showing that Colombia should continue to direct resources toward increasing compliance with its existing smoke-free legislation. Less evidence exists on other population-level actions, such as banning smoking in private vehicles, which has been legislated in various forms (i.e. bans sometimes exist only when children are present, or only in work vehicles) in places such as Australia, Bahrain, Canada, Chile, Germany, Kuwait, Mauritius, South Africa the United Kingdom. However, Colombia can consider the potential of such actions, and continue to monitor evidence.

Given that many individual-level interventions have largely only been studied in high income contexts, and that several do not measurably impact rates of exposure to tobacco smoke, the extent to which they can protect against tobacco smoke exposure in Colombia is unclear. Colombia can consider these interventions for its own context, while continuing to strengthen implementation of the core WHO FCTC measures to reduce demand for tobacco use. While evidence does not unilaterally demonstrate the ability of individual-level interventions to reduce tobacco smoke exposure, tobacco control measures are proven to reduce the prevalence of smoking, which is guaranteed, by extension, to reduce exposure to tobacco smoke.

6. Conclusion and recommendations

Each year, tobacco use costs Colombia COP 17 trillion in economic losses and causes substantial human development losses. Fortunately, the investment case shows that there is an opportunity to reduce the social and economic burden of tobacco in Colombia. Enacting the recommended multisectoral tobacco control provisions would save 10,297 lives each year and reduce the incidence of disease, leading to savings from averted medical costs and averted productivity losses. In economic terms, these benefits are substantial, adding an estimated COP 58.5 trillion over the next 15 years. Further, the economic benefits of strengthening tobacco control in Colombia greatly outweigh costs of implementation (COP 58 trillion in benefits versus just COP 0.19 trillion in costs).

By investing now to intensify implementation of the four proven tobacco control measures modeled under this investment case—increasing cigarette taxes, enforcing smoke-free public places, expanding graphic health warnings on tobacco product packaging and instituting plain packaging—Colombia would not only reduce tobacco consumption, improve health, reduce government health expenditures and grow the economy, it would also reduce hardships among Colombians, particularly among those with low incomes. Many countries reinvest savings from healthcare expenditures and revenue from increased tobacco taxes into national development priorities such as universal health coverage.

The investment case offers compelling economic and social arguments to implement core WHO FCTC measures. Policymakers across sectors are encouraged to share the investment case findings broadly among all sectors of government, parliament, civil society, the public, development partners and academic institutions. Doing so will strengthen public and political support for tobacco control. An advocacy strategy with key messages, for example on how tobacco control can support economic growth, protect children and reduce hardships on the poor, can assist policymakers in disseminating the message. The full benefits of the investment case are more likely to be realized if the following actions are pursued:



Increase taxes on tobacco products, improve efficiency and transparency in the current tax administration system, and reduce illicit trade.

Though all individual interventions delivered a return on investment at both 5 and 15 years, raised cigarette taxes were among the most cost-effective of the measures examined. Over 15 years, they delivered an impressive return of 658 pesos in economic benefits for every 1 peso invested. The Government of Colombia has raised cigarette taxes over the years, but cigarettes remain affordable; in international dollars, citizens in 134 countries pay higher prices for a pack of the most sold brand of cigarettes than Colombians do for the most sold brand in their country [25].

Continuing to increase specific excise taxes on tobacco products to reduce their affordability would achieve the mutually reinforcing objectives of reducing tobacco consumption (and thus improving health outcomes) and providing the public sector with additional revenue needed to invest in other sustainable development efforts. It is therefore recommended that the Ministry of Health work with the Ministry of Finance to create an enabling political, policy and social environment for further tax increases on tobacco products. The Government should also extend tax increases to all tobacco products (not just cigarettes), including new electronic nicotine delivery systems (e.g. e-cigarettes, vaping devices).

Equally important is the development of a robust strategy and systems to combat illicit tobacco trade and to promote a unified excise tax management system. To this end, Colombia is urged to ratify the Protocol to Eliminate Illicit Trade in Tobacco Products and adopt the Unified Tracking and Tracing System (SUNIR). Adopting SUNIR would also reduce costs, improve efficiency and transparency in the current tax administration system.

In pursuing these efforts, Colombia should not renew or engage in partnerships with the tobacco industry such as the cooperation agreement with PMI-Coltabaco which is not consistent with Colombia's obligations under the WHO FCTC Article 5.3.



Strengthen the tobacco control law.

Colombia adopted a tobacco control law that addresses obligations under many WHO FCTC articles; however, some obligations do not comply fully with the requirements of the treaty. In addition, enforcement of the ban on smoking in public places should be strengthened, especially in restaurants, bars, and nightclubs. It is therefore recommended that law No 1335/2009 be revised to include—or better enforce—the interventions modeled in this investment case, which would draw Colombia into fuller compliance with the requirements of the WHO FCTC treaty.



Strengthen multisectoral engagement in tobacco control and establish a multisectoral national tobacco control strategy.

The Government should strengthen the NCM by formalizing it under a presidential decree, or by mandating the NCM through law. The NCM should also invite additional sectors and non-governmental participants to join its work, including civil society. The Government can further strengthen the engagement of different sectors by demonstrating through the investment case that tobacco control has implications for not just health but also ministries of finance, trade, education, labour and others, as well as Parliamentarians and subnational authorities. Measures like enforcing smoke-free public places and instituting plain packaging require the proactive engagement of non-health ministries. These other ministries can also play a key role in avoiding, identifying and addressing conflicts of interest between commercial entities and the public health goals found in the tobacco control law, as mandated by Article 5.3 of the WHO FCTC.

Further, the NCM should develop a national tobacco control strategy to identify the committee's priorities and goals over the next several years. The Ministry of Health, Ministry of National Development Planning, Ministry of Foreign Affairs and other sectors could also champion integration of tobacco control into relevant national and sectoral planning and policy documents.

4

Take policy measures to counter tobacco industry interference.

The tobacco industry is perhaps the biggest challenge to continued and sustained progress towards full implementation of the WHO FCTC. The Government should introduce transparency and accountability measures to reduce tobacco industry interference, including codes of conduct for civil servants and disclosure of interests forms. It is further recommended to combat tobacco industry interference by developing and building strong alliances with both chambers of the parliament.



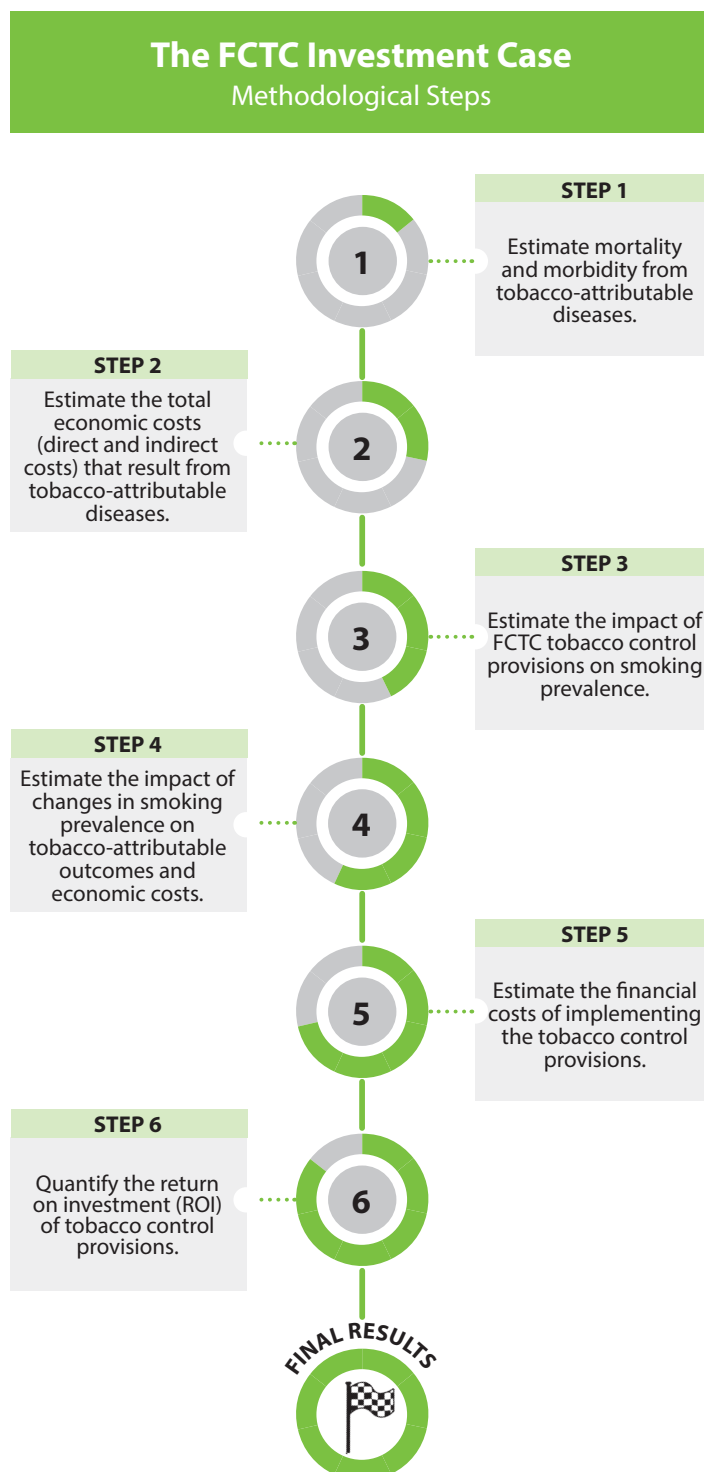
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7. Methodology annex

7.1 Overview

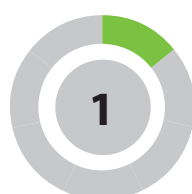
The economic analysis consists of two components: 1) assessing the current burden of tobacco use and 2) examining the extent to which WHO FCTC provisions can reduce the burden. The first two methodological steps depicted in are employed to assess the current burden of tobacco use, while methodological steps 3–6 assess the 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. 14: Steps in the FCTC investment case



7.2 COMPONENT ONE: CURRENT BURDEN

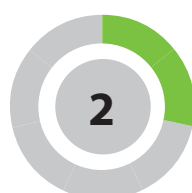
The current burden model component provides a snapshot of the current health and economic burden of tobacco use in Colombia.



STEP 1

Estimate mortality and morbidity from tobacco-related diseases.

The investment case model is populated with country-specific data on tobacco attributable mortality and morbidity from the 2017 Global Burden of Disease Study (GBD) [138]. The study estimates the extent to which smoking and tobacco smoke exposure contribute to the incidence of 37 diseases, healthy life years lost, and deaths, across 195 countries.¹⁰ GBD reports a point estimate, and lower- and upper-bound estimates for tobacco-attributable deaths and DALYs. In Colombia, a previous study by the Instituto de Evaluación Tecnológica en Salud (IETS) identified tobacco-attributable deaths for 12 major diseases in 2015 [139]. Country stakeholders requested that the results from the IETS study and GBD be compared. Given that GBD upper-bound estimates of tobacco-attributable deaths for the 12 diseases (31,645) closely corresponded to findings in the IETS study (32,088), the decision was made to use the GBD upper-bound estimates as inputs within the investment case analysis. Using the upper-bound estimates, 34,809 tobacco-attributable deaths were estimated to occur across 37 diseases and conditions in 2017.



STEP 2

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

Next, the model estimates the total economic costs of disease and death caused by tobacco use,¹¹ including both *direct* and *indirect* costs. *Direct* refers to tobacco-attributable healthcare

¹⁰ The 37 diseases and conditions represent all diseases and conditions on which there is evidence that tobacco increases risk. They include: Age-related macular degeneration, Alzheimer's disease and other dementias, aortic aneurysm, asthma, atrial fibrillation and flutter, bladder cancer, breast cancer, cataract, cervical cancer, chronic obstructive pulmonary disease, colon and rectum cancer, diabetes mellitus type 2, esophageal cancer, gallbladder and biliary diseases, intracerebral hemorrhage, ischemic heart disease, ischemic stroke, kidney cancer, larynx cancer, leukemia, lip and oral cavity cancer, liver cancer, low back pain, lower respiratory infections, multiple sclerosis, nasopharynx cancer, other pharynx cancer, otitis media, pancreatic cancer, peptic ulcer disease, peripheral artery disease, prostate cancer, rheumatoid arthritis, stomach cancer, subarachnoid hemorrhage, tracheal, bronchus, and lung cancer, and tuberculosis.

¹¹ In assessing the current burden of tobacco use, the economic costs of premature mortality include the cost of premature deaths due to any form of exposure to tobacco (including of smoking, "second-hand" smoke exposure, and the use of other types of tobacco products). Only smoking-attributable (not tobacco-attributable) costs are calculated for healthcare expenditures, absenteeism, presenteeism, and smoking breaks. While other forms of tobacco may also cause losses in these categories, no data is available to pinpoint those losses.

expenditures. *Indirect* refers to the value of lives lost due to tobacco-attributable premature mortality, and labor-force productivity losses: absenteeism, presenteeism, and excess smoking breaks.

Direct costs — Direct costs include tobacco-attributable public (government-paid), private (insurance, individual out-of-pocket), and other healthcare expenditures. Healthcare costs attributable to smoking were obtained from Pinchon-Riviere and colleagues (2016), who estimated that smoking caused COP 5.5 billion in healthcare expenditures in 2015 [35]. The investment case updates the study's results by the following method. First, Pinchon-Riviere's results, by disease category, are converted to 2017 COP using World Bank data on Colombia's consumer price index (CPI).¹² Next, 2015 and 2017 data on the number of deaths due to tobacco use, by disease, is obtained from the Global Burden of Disease database. The percent change in the number of deaths in each disease category (averaging about 5 percent across disease categories) is used as a proxy to estimate the extent to which health expenditures in each category may have changed. Pinchon Riviere's updated figures (in 2017 COP) are multiplied by the disease-specific changes in the number of deaths to arrive at COP 6.5 billion in healthcare expenditures in 2017. To calculate the share of smoking-attributable healthcare expenditures borne by public, non-profit, and private entities, it was assumed that each entity incurred smoking-attributable healthcare costs in equal proportion to its contribution to total health expenditure, as obtained from the WHO health expenditures database—from which government is shown to cover 65 percent of total health expenditures, private and nonprofit sources cover 15 percent, and households cover 20 percent through out-of-pocket expenses [140].

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

- *The economic cost of premature mortality due to tobacco use* — Premature mortality is valued using the human capital approach, which places an economic value on each year of life lost. Using GBD data on the age at which tobacco-attributable deaths occur, the model calculates the total number of years of life lost due to tobacco, across the population. Each year of life is valued at 1.4 times GDP per Capita, following the “full income approach” employed by Jamison et al (2013) [141].

12 2015 CPI = 117.59, 2017 CPI = 131.88

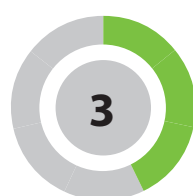
- **Productivity costs** — Productivity costs consist of costs due to absenteeism, presenteeism, and excess work breaks due to smoking. The model incorporates estimates from academic literature on the number of extra working days missed due to active smoking (2.6 days per year) [34]. Presenteeism losses are obtained similarly, under research that shows that smokers in China, the US, and five European countries experience about 22% more impairment at work because of health problems compared to never-smokers [142]. Lost productivity due to smoking breaks is valued under the conservative assumption that working smokers take eight minutes of extra breaks per day [34].

7.3 COMPONENT TWO: POLICY/INTERVENTION SCENARIOS

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

The investment case employs a static model to estimate the total impact of the tobacco control measures, meaning that aside from smoking prevalence, variables do not change throughout the time horizon of the analysis. The model follows a population that does not vary in size or makeup (age/gender) over time in two scenarios: a status quo scenario in which smoking prevalence remains at present day rates, and an intervention scenario in which smoking prevalence is reduced according to the impact of tobacco control measures that are implemented or intensified. Published studies have used similarly static models to estimate the impact of tobacco control measures on mortality and other outcomes [143, 144].

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



STEP 3

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

Selection of priority WHO FCTC measures modeled within the investment case align with the Global Strategy to Accelerate Tobacco Control developed following a decision at the Seventh session of the Conference of the Parties (COP7) to the WHO FCTC. Under Objective 1.1 of the Strategy, Parties seek to accelerate WHO FCTC implementation by setting clear priorities where they will be likely to have the greatest impact in reducing tobacco use. This includes priority implementation of

price and tax measures (Article 6) and time-bound measures of the Convention, including bans on smoking in all public places (Article 8), health warnings and plain tobacco packaging (Article 11), and comprehensive bans on tobacco advertising, promotion and sponsorship (Article 13). In addition, given the importance of awareness in behavior change and shaping cultural norms, the investment cases include instituting mass media campaigns against tobacco use (Article 12) as a measure modeled.

The impacts of implementing the WHO FCTC provisions are obtained from the literature. The impact of enforcing smoke-free air laws, implementing plain packaging, intensifying advertising bans, and conducting mass media campaigns are derived from Levy et al. (2018) [36] and Chipty (2016) [145], as adapted within the Tobacco Use Brief of Appendix 3 of the WHO Global NCD Action Plan 2013–2020 [146], and adjusted based on assessments of Colombia's baseline rates of implementation.

The impact of raising taxes on the prevalence of tobacco use is determined by the 'prevalence elasticity', or the extent to which individuals stop smoking as a result of price changes. Following evidence that prevalence elasticity is approximately one-half of price elasticity [147], the investment case assumes that the prevalence elasticity of demand in Colombia is half of the -0.78 price elasticity of demand estimated by Maldonado and colleagues (2016) [148]. **Table 5** displays the impact sizes used within the investment case analysis. Additional information on their derivation can be found in the Technical Appendix.

Within the analysis, it is assumed that implementation or intensification of new tobacco control measures does not take place until year three. With the exception of taxes—the impact of which is dependent on the timing of increases in tax rates—the full impact of the measures is phased in over a five-year period. The phase-in period follows WHO assumptions [149] that two years of planning and development are required before policies are up and running, followed by three years of partial implementation that are reflective of the time that is needed to roll out policies, and work up to full implementation and enforcement. For taxes, following the current law, specific excise taxes are raised four percentage points over inflation each year from 2019 to 2020. Next, from 2021 to 2025, the specific excise tax is increased by inflation plus four percentage points, and an additional 1,000 pesos each year until 2025—in real terms, more than tripling the current specific excise tax by 2025—and by an average of 650 pesos per year thereafter until 2033.

Table 5: Impact size: Relative reduction in the prevalence of current smoking by tobacco policy/intervention, over a period of 15 years

FCTC Tobacco Policy/Intervention	Relative reduction in the prevalence of current smoking	
	First 5 years (2019–2023)	Over 15 years (2019–2033)
Tobacco Package (all policies)	30.5%	49.7%
Increase taxes on cigarettes (<i>WHO FCTC Art.6</i>)	17.3%	31.7%
Strengthen enforcement of and compliance with the ban on smoking in public places and work places (<i>WHO FCTC Art.8</i>)	5.5%	9.5%
Mandate that tobacco product packages carry large health warnings (<i>WHO FCTC Art. 11</i>)	6.8%	11.8%
Plain packaging of tobacco products (<i>WHO FCTC Art. 11: Guidelines</i>)	4.5%	7.9%
Run a mass media campaign to promote awareness about tobacco control (<i>WHO FCTC Art.12</i>)	Implemented	
Enact comprehensive bans on advertising, promotion, and sponsorship (<i>WHO FCTC Art.13</i>)	Implemented	

* The combined impact of all interventions is not the sum of individual interventions. Following Levy and colleagues' (2018) "effect sizes [are applied] as constant relative reductions; that is, for policy i and j with effect sizes PR_i and PR_j, (1-PR_i) x (1-PR_j) [is] applied to the current smoking prevalence" [36, p. 454]

**STEP 4**

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

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

Using the calculated effect-sizes of the tobacco-control provisions, the investment case model estimates the extent to which reductions in smoking prevalence impact health outcomes and economic costs.

For mortality and morbidity, forecasted changes in smoking prevalence are applied directly to the GBD risk factor attributable outcomes from the base scenario. This means that the investment case adjusts the risk factor attributable outcomes for mortality and morbidity as reported by GBD based on year-over-year relative changes in smoking prevalence for each outcome. For healthcare expenditures, forecasted annual relative changes in smoking prevalence for each intervention scenario are applied to the smoking attributable fraction (SAF). The SAF is adjusted proportionally equal to the relative change in smoking prevalence for each intervention scenario. Workplace smoking outcomes are recalculated by substituting actual smoking prevalence for estimated annual smoking prevalence reductions for each of the intervention scenario that is modeled. More information on these calculations can be found in the Technical Appendix.

**STEP 5**

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

The financial costs to the government of implementing new measures—or of intensifying or enforcing existing ones—is estimated using the WHO NCD Costing Tool. Full explanations of the costs and assumptions embedded in the WHO NCD Costing tool are available [149].

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

Across these categories, the Tool contains default costs from 2011, which are sourced from the WHO CHOICE costing study. Following Shang and colleagues, the Tool is updated to reflect 2017 costs by updating several parameters: the USD to local currency unit exchange rate (2017), purchasing power parity (PPP) exchange rate (2017), GDP per capita (USD, 2017), GDP per capita (PPP, 2017), population (total, and share of the population age 15+, 2017), labor force participation rate (2017), gas per liter, and government spending on health as a percent of total health spending (2015) [150, p. 5]. Unless government or other in-country parameters are received, data is from the World Bank database, with the exception of data on the share of government health spending 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.

As requested by country partners, the WHO Costing Tool’s estimate for the cost of implementing taxes was adjusted to reflect the costs of implementing a track and trace system. Proposals for a track and trace system to support monitoring of tobacco and alcohol products’ movement have estimated COP 8 billion in annual software costs across all departments in Colombia [151]. Beginning in 2021, when the tax increase is enacted within the analysis, half of these annual costs (representing the representative share of costs for tobacco products) are added to the WHO Costing Tool estimates.

**STEP 6**

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

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The return on investment (ROI) analysis measures the efficiency of tobacco control investments by dividing the monetary value of health gains from investments by their respective costs.

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

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



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