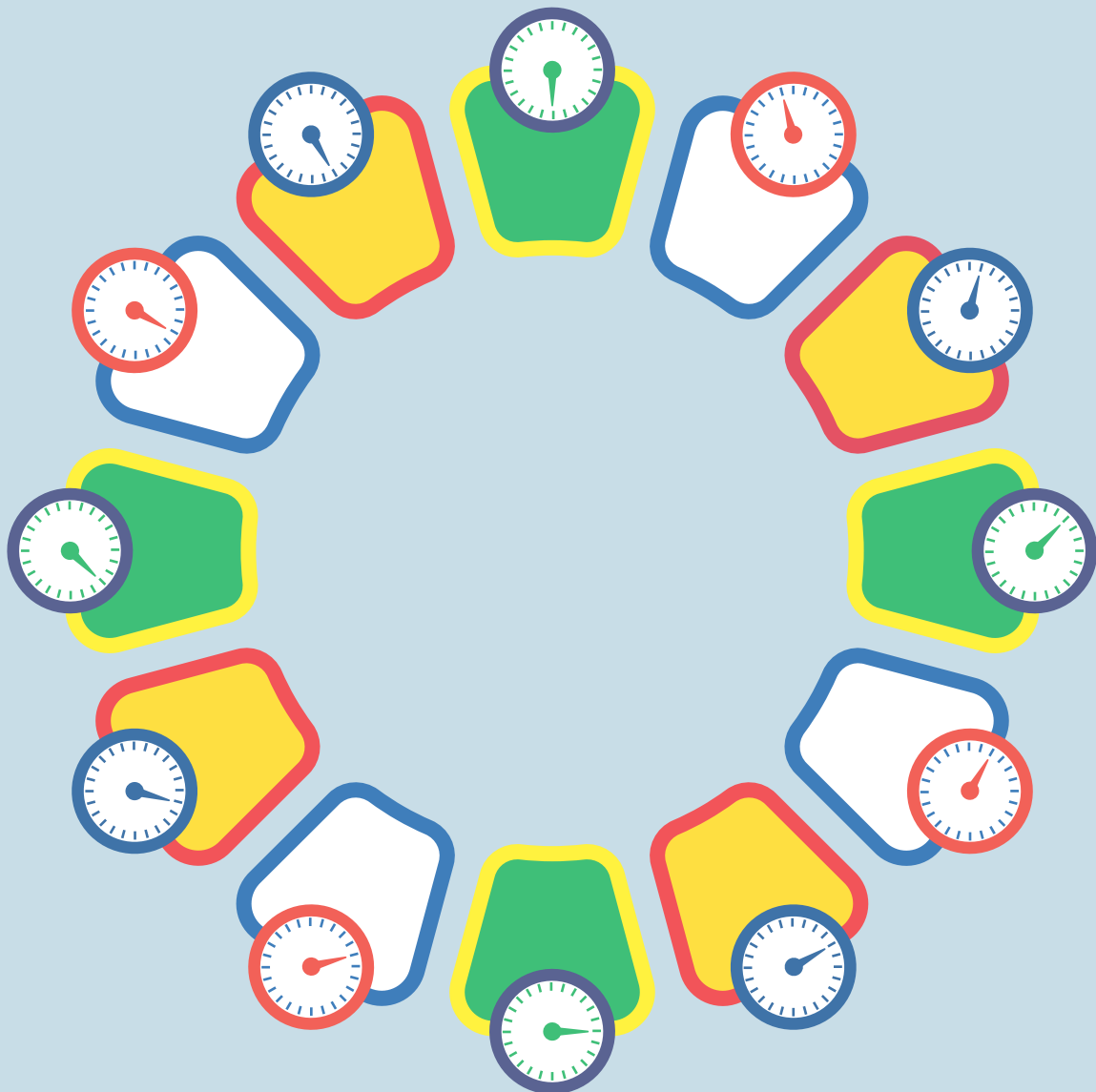


Tackling adolescent obesity in Latin America

The cost of inaction in Brazil, Chile and Colombia

A report by The Economist Intelligence Unit



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About this report

Rising adolescent obesity rates are a major public health challenge in the 21st century, especially in low- and middle-income countries. Marked changes in body weight take place between adolescence and young adulthood, with many young people transitioning into obesity during this period. Strong evidence indicates that if obesity is established in adolescence, achieving healthy weight in adulthood is uncommon. The epidemiological and economic burden of obesity must be addressed by informed policy interventions.

To address this need, The Economist Intelligence Unit (EIU) conducted a research programme on the cost of not acting on adolescent obesity, as well as the potential economic impact of reversing obesity in adolescence, across three emerging markets in Latin America: Brazil, Chile and Colombia. The goal of this report is to help policymakers, health organizations and the private sector work together to tackle the growing threat of adolescent obesity in the region. Alongside this report, we have published an Excel-based tool to enable detailed exploration of the results of our modelling.

Experts and stakeholders were engaged in the process through an expert panel discussion and interviews. We extend our sincere appreciation to the following for their time and contributions to this work:

Expert Panel

- **Ms Aida Lebbos Saad**, founder of Fun4Fit (Colombia)
- **Dr Andrea Pereira**, clinical nutrition support physician, Oncology and Haematology Department, Hospital Israelita Albert Einstein (Brazil)
- **Ms Catalina Abaunza**, currently responsible for the physical activities area of the Ministry of Health and Social Protection (Colombia)
- **Ms Daniela Godoy**, executive secretary of Choose Living Healthy Secretariat, Ministry of Social Development and Family (Chile)
- **Dr Diana Cunha**, adjunct professor in the Department of Epidemiology at the Institute of Social Medicine at the State University of Rio de Janeiro (Brazil)
- **Dr Eve Crowley**, deputy regional representative, Latin America and the Caribbean at FAO of the UN (US)
- **Dr Jorge Castillo**, endocrinologist, National University (Colombia)
- **Dr Luciana Ribeiro Bahia**, researcher at the Health Technology Assessment Institute (Brazil)
- **Mr Luis Fernando Alarcón Urrutia**, researcher of public health, Healthy Living Dimension and Non-Communicable Conditions (Colombia)
- **Dr María Paulina Correa-Burrows**, University of Chile, National Institute of Nutrition and Food Technology (Chile)

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Interviewees

- **Dr Ines González Casanova**, assistant professor, Indiana University, US (Colombia)
- **Dr Jaime Burrows, director of medicine**, Autonomous University of Chile (Chile)
- **Dr Mauro Fisberg**, coordinator of the Center for Excellence in Nutrition and Food Difficulties, Institute Pensi, José Luiz Egydio Setúbal Foundation, Sabará Children's Hospital (Brazil)
- **Dr Rosely Sichieri, professor**, Department of Epidemiology Speciality, Nutritional Epidemiology, State University of Rio de Janeiro (Brazil)
- **Ms Silvia González**, research associate, Group of Epidemiology, Department of Public Health, School of Medicine, Universidad de Los Andes (Colombia)
- **Dr Tito Pizarro Quevedo**, vice dean, Teaching and Extension, Faculty of Medical Sciences, University of Santiago (Chile)

Novo Nordisk commissioned this study, which was independently conducted by The EIU. Chandrika Bagchi and Amanda Stucke led the research, with senior advising by Marcio Zanetti and Vaibhav Sahgal. Debora Pelisson and Keven Sew led the model development, with research conducted by Marcela Casaca and Giulia Garcia. Sarah Greenley conducted the initial evidence search. The report was written by the research team and edited by Biz Pedersen. The findings and views expressed in this report are those of The EIU and do not necessarily reflect the views of expert contributors or project sponsors.

Executive summary

There are few global health concerns more pressing than obesity. Because of the associated comorbidities and broad economic impact of an obese population, this issue demands our immediate attention. The covid-19 pandemic has further highlighted this issue: Obesity was identified as a risk factor for infection, and in some places has been considered a pre-existing condition when determining vaccine access. Exacerbating the crisis is the alarming rise in obesity among children and adolescents. Unhealthy weight gain often begins early in life, and for adolescents already struggling, it becomes significantly less likely that they will ever escape the trap of obesity and its multitude of comorbidities.

More children and adolescents in the world today live with obesity than ever before. Over the past 40 years, the number of such youths increased tenfold, from 11 million in 1976 to 124 million in 2016. The vast scale of this problem cannot be ignored, nor the lifelong impact that it will have on youth who are already obese.

While genes factor into the likelihood that an individual will struggle with obesity, aspects of lifestyle such as diet and physical activity are also significant. Establishing good habits from a young age can curtail the onset of obesity and increase the chances that an individual will maintain those routines in adulthood. These healthy patterns must be established early in life, when lifestyle changes and targeted interventions stand to have the greatest impact.

While the prevalence of childhood and adolescent obesity in some high-income countries appears to be levelling off, in many Latin American nations these numbers are rising at a disconcerting rate. Increased urbanization, shifting nutritional habits, and lifestyle changes all contribute to this distressing development. Immediate intervention is imperative to not only improve population health but also rescue economies from the repercussions of an increasingly obese population.

The economic costs of obesity have received considerable attention in recent years, but the focus has been on adults living with obesity. In this report, The Economist Intelligence Unit examines childhood and adolescent obesity and the socioeconomic burden it generates for individual countries. This report focuses on Brazil, Chile and Colombia and models the economic cost of not acting on the obesity crisis. In turn, the report explores potential interventions and their impact.

Adolescents living with obesity are likely to become adults living with obesity. We must disrupt this trajectory if we hope to avoid the otherwise inevitable conclusion of this economic and health crisis.

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This study pursued three objectives:

- 1 Quantifying the current economic burden of obesity: the epidemiological and socioeconomic consequences of current obesity rates in the selected markets;
- 2 Estimating the economic impact of early interventions: the effects of reversing obesity and managing the obesity pathway; and
- 3 Comparing the cost of action versus inaction: the socioeconomic benefits of measures to reduce the number of adolescents living with obesity.

Obesity in adults is estimated to have cost the health systems in Brazil, Chile and Colombia US\$28bn in 2020 alone, of which US\$1.2bn was directly attributable to adults who lived with obesity as adolescents. Without intervention, the cumulative cost of adults living with obesity since adolescence will reach US\$19bn over a ten-year horizon, which by itself amounts to 1% of the current nominal GDP in these countries. Our analysis also shows that evidence-based interventions to reverse obesity in affected adolescents could save more than US\$4bn cumulatively in healthcare spending over ten years. Thus, addressing obesity is necessary not only for better public health but also for the continued growth of Latin American economies.

Background: adolescent obesity in Latin America

A growing public health challenge

The World Health Organisation (WHO) defines obesity as “abnormal or excessive fat accumulation that presents a risk to health”.¹ Although various methods exist to measure body fat, body mass index (BMI) is the most widely used. The WHO considers adults with a BMI greater than or equal to 25 to be overweight, while obesity is defined as a BMI greater than or equal to 30.

Classifying obesity during adolescence is complicated by the fact that youths’ height is usually increasing and their body composition is changing. For youths aged 10-19 years, overweight is defined as having BMI-for-age greater than 1 standard deviation above the WHO Child Growth Reference median, and obesity as greater than 2 standard deviations above the WHO Child Growth Reference median.²

Obesity threatens public health nationally and globally. According to the WHO, the worldwide prevalence of obesity tripled between 1975 and 2016.³ Obesity imposes an economic burden on individuals, families and countries. In 2014, the global economic impact of obesity was estimated to be US\$2.0trn, or 2.8% of global GDP.³ Once considered a problem of high-income countries, obesity is now on the rise in low- and middle-income countries, particularly in urban settings, because of rapid lifestyle changes.⁴

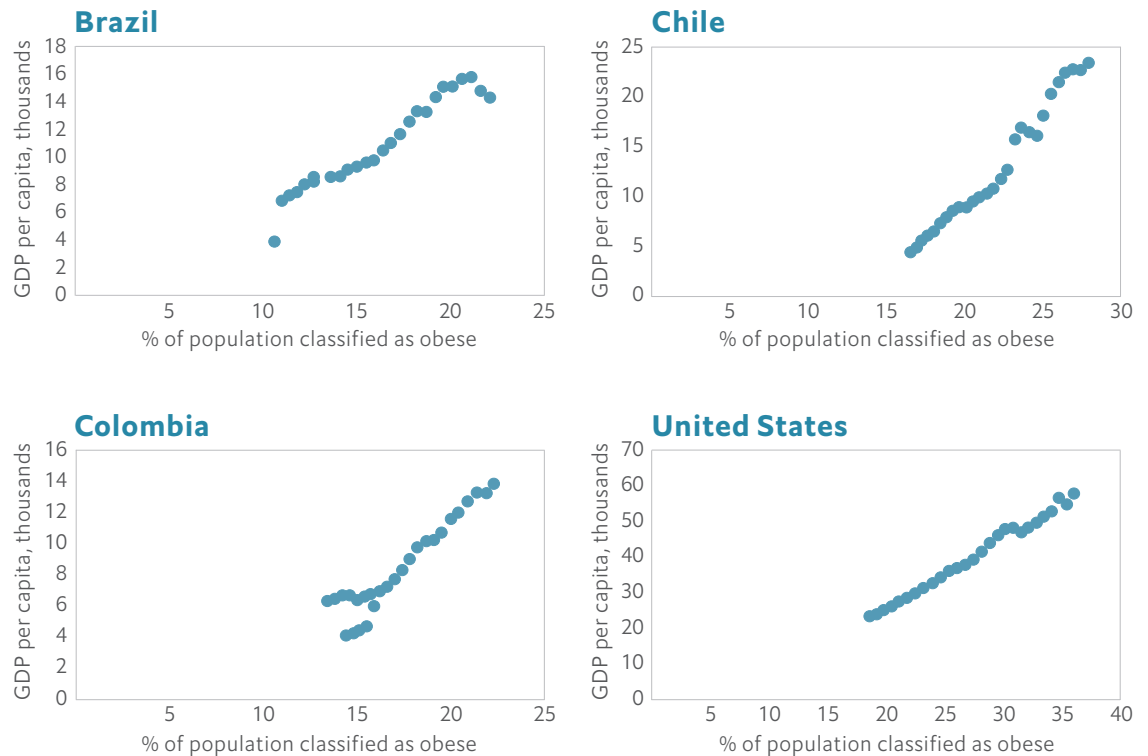
As the GDP of a nation grows, so too does the prevalence of obesity. As shown in the graphs below, Brazil, Chile, and Colombia have experienced dramatic increases in obesity over the past 40 years, closely correlated with the increase in per capita GDP. This rapid growth closely resembles the figures in developed nations, as illustrated in the graph that references the US (see Figure 1). With the rise in GDP comes increased access to unhealthy foods and other unhealthy lifestyle choices. To interrupt this trajectory, the time for intervention must be now.

Children and adolescents with high BMIs often live with obesity as adults and continue to gain weight until they are 60 to 65 years old.⁶ This worrisome trend means that children living with obesity may experience negative health impacts that will follow them into adulthood.⁷ Obesity must be addressed at a young age to halt the increasing rate of obesity among adults, and interventions during childhood and adolescence are demonstrably more effective than interventions attempted during adulthood.

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Figure 1: GDP per capita vs prevalence in Brazil, Chile, Colombia and United States



Causes and consequences

Obesity is a multifactorial disease, with both lifestyle and genetic factors influencing body composition. It can run in families, and parental BMI can predict childhood obesity, suggesting a genetic influence.⁶ Some studies have estimated that BMI is 25-40% heritable.⁸ However, genetics often must be coupled with behaviour to affect weight.⁸ Lack of physical activity, unhealthy eating habits, not enough sleep, stress and increased “screen time” (watching TV, using computers and playing video games) can lead to higher BMIs.⁶ Low socioeconomic status and unhealthy built environments like easy access to unhealthy food and exposure to chemicals that change hormones can also increase obesity.⁶

Some racial and ethnic groups have higher rates of obesity. For instance, rates in US adults are higher in the black population, followed by Hispanic and then white populations. Asian groups in the US have the lowest rate of unhealthy BMIs.⁶ These variations may be due to lower access for some minority groups to a healthy environment and adequate public health services as well as poor health literacy.

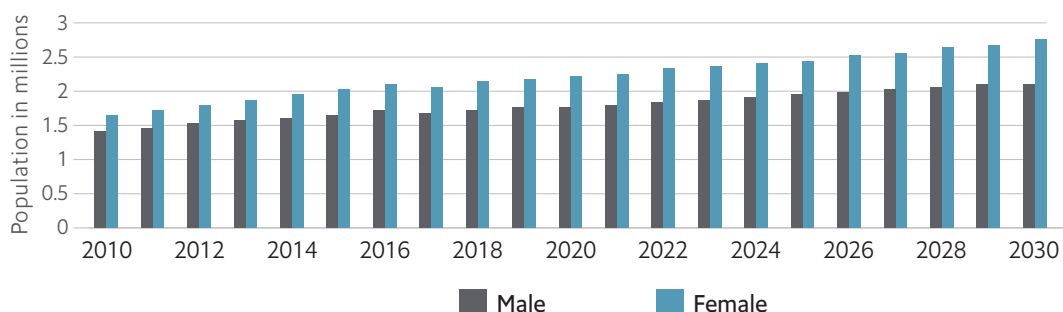
Additionally, a person’s sex can affect the way the body stores fat, and obesity is more common in women than in men.⁶ The steady increase in the number of adolescents living with obesity has been

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distributed unevenly between males and females (see Figure 2). The historical gap in obesity rates has widened over the past ten years and is forecast to expand even further in the next decade.

Figure 2. Prevalence of obesity in adolescents by sex in Brazil, Chile and Colombia, 2010-30



Obesity in adolescence often continues in adulthood, and with it, the risk of other diseases and premature death.⁹ Children and adolescents living with obesity have higher chances of developing non-communicable diseases (NCDs) in adulthood, such as type 2 diabetes (T2D), stroke, hypertension (HTN), colorectal cancer (CRC), and coronary heart disease.

People living with obesity are 80-85% more likely to develop T2D, and the incidence of this disease in children and adolescents has increased considerably as obesity rates have gone up. Cardiovascular risk factors such as low HDL (“good”) cholesterol, high systolic and diastolic blood pressure, and high triglyceride levels also increase with higher levels of obesity in adolescents. Mortality from chronic heart disease in adulthood can be correlated with BMI at age 13,⁹ and another study showed that obesity in childhood was associated with 3.5 times higher risk of cardiovascular mortality in adulthood.¹⁰

Besides affecting physical health, obesity can also affect an adolescent’s social and emotional wellbeing and self-esteem. It is associated with poor academic performance and lower quality of life in adolescence. An OECD analysis showed that children and adolescents living with obesity have lower school performance compared to their healthy-weight counterparts. The research concluded that 69% of adolescents living with obesity had missed school days in the past year compared with 66% of healthy adolescents.¹¹

To address this growing burden, we examined the potential socioeconomic consequences of inaction on adolescent obesity, which we present in the results section of this report. Estimates from our study suggest that currently 4-5% of the total societal cost of obesity is attributable to adults who lived with obesity as adolescents. We estimated this number to increase with the growing prevalence of obesity in pre-adulthood. However, timely multidisciplinary weight-loss interventions can help these adolescents return to healthy weight, reducing the risks associated with obesity in adulthood.¹²

A focus on Brazil, Chile and Colombia

In recent decades, the number of Latin American adolescents living with obesity has increased markedly, as have rates of nutrition-related NCDs, such as T2D and cardiovascular disease among the population generally.¹³ The region's economic transition has had a surprisingly adverse effect on health and is directly linked to a surge in obesity rates. The prevalence of obesity has increased partly because of the well-documented shift in nutrition, whereby diets that were previously high in fibre and complex carbohydrates are now high in saturated fats and sugars. Populations are also increasingly sedentary. Over the past few decades, unprocessed and minimally processed foods have been replaced by ultra-processed, ready-to-eat/ready-to-heat food products that have more saturated fat, sugars and sodium and less fibre, contributing to higher rates of obesity and obesity-related diseases.¹⁴

As this region continues its rapid demographic and environmental changes, the prevalence of obesity will further increase, exacerbating an already critical problem. In this study, we focus on three countries in the region, Brazil, Chile and Colombia, to explore the burden of adolescent obesity. These countries were selected for their socioeconomic and epidemiological diversity (see Table 1). Chile has one of the highest rates of obesity among the OECD countries. We estimate that in 2020, 31% of the adult population was living with obesity in Chile, while the prevalence of adolescent obesity reached 14% of the population.¹⁵ By 2030 it is expected that more than 17% of Chilean adolescents will live with obesity if no action is taken now.

Table 1. Key characteristics of selected countries, 2020

	Total population (millions)	Healthcare spending per capita (US\$)	Adolescent population (as % of total population)	Obesity rate (among adults)	Obesity rate (in adolescents 10-19 years)
Brazil	212	648	15%	24%	9%
Chile	19	1,199	13%	31%	14%
Colombia	51	377	16%	24%	6%

This study pursued three objectives:

- 1** Quantifying the current economic burden of obesity: the epidemiological and socioeconomic consequences of current obesity rates in the selected markets;
- 2** Estimating the economic impact of early interventions: the effects of reversing obesity and managing the obesity pathway; and
- 3** Comparing the cost of action versus inaction: the socioeconomic benefits of measures to reduce the number of adolescents living with obesity.

The socioeconomic burden of adolescent obesity

The cost of inaction: persistence of obesity in adults

The rising prevalence of adolescents living with obesity in Brazil, Chile and Colombia is a serious population health issue with significant economic costs. The association between obesity in adolescence and increased health risks in adulthood¹⁹⁻²¹ gives further cause for concern. Once obesity is established, it is difficult to reverse through interventions¹⁶ and tracks through to adulthood.^{17,18} As highlighted by Dr Ines Gonzalez Casanova, assistant professor at Indiana University Bloomington, “most adolescents living with obesity will go on to become adults living with obesity, making it a critical period to prevent the disease”.

Obesity in childhood and adolescence has a significant impact on both physical and psychosocial health.²² Besides being a risk factor for many comorbidities, adolescent obesity is an independent risk factor for obesity in adulthood.¹⁷⁻²¹ Many cardiovascular problems afflicting adults living with obesity are often preceded by abnormalities in childhood. Hyperlipidaemia, hypertension and abnormal glucose tolerance occur more often in children and adolescents living with obesity²³, as does T2D.²⁴ The condition can also affect psychosocial wellbeing. Obesity makes young people more susceptible to lower self-esteem and quality of life, further underscoring the importance of obesity prevention efforts.^{25,26}

Because adolescents living with obesity are likely to remain obese as adults, the cost for countries' health systems is a lifetime cost. Thus the socioeconomic burden of obesity must be assessed across the life course. However, for Latin America, most studies have focused only on adults. Little evidence exists about the socioeconomic impact of adolescent obesity, reinforcing the importance of this report.²⁷

In this study, we developed a model to quantify the economic cost of obesity in adults and how much of this cost is attributable to adolescents living with obesity. Our model also allows us to assess the impact on national healthcare spending if early weight-loss interventions help these adolescents attain a healthy weight. The goal is to help guide policymakers, health organizations and the private sector to work together to understand and tackle the rising threat of obesity in Latin America.

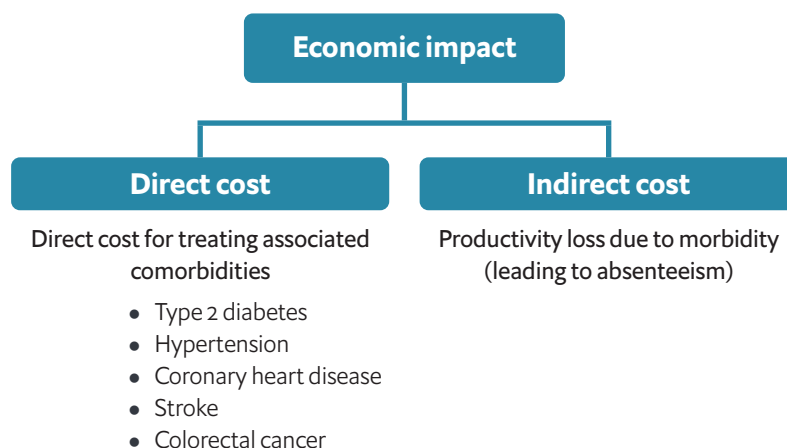
Modelling the cost of obesity in adults

The economic model we developed estimates the current costs of obesity in adults across the selected countries. It is based on the cost-of-illness (COI) approach, which identifies the cost components of specific diseases, including the direct medical costs, direct non-medical costs and indirect costs such as potential future productivity losses due to illness (see Figure 3). This tool can help policymakers quantify the economic burden of disease. The COI model has long been used in public health to formulate and prioritize healthcare policies and allocate healthcare resources by estimating the costs attributable to a disease.²⁸

We based our model on existing literature and recommendations from experts who participated in a one-day panel and interviews we organized. The model represents a unique effort to consolidate and refine comparable datasets on obesity-related conditions across Brazil, Chile and Colombia—an important undertaking because of the lack of directly comparable data across all three countries.

Our approach combines the prevalence of obesity, prevalence of related comorbidities and the associated direct and indirect costs to estimate the total costs of obesity each year and to calculate the portion of those costs directly attributable to adolescent obesity.

Figure 3. Cost-of-illness approach



The obesity-related comorbidities included in the model and listed in Figure 3 were selected based on a review of their incidence in Latin America, according to data from the WHO and other academic papers such as a study by Yuen et al.²⁹ that identified more than 200 obesity-related comorbidities. The comorbidities selected for our study are all highly correlated with obesity: T2D, stroke, CRC, HTN, and coronary artery disease. This selection was further validated by the experts we consulted.

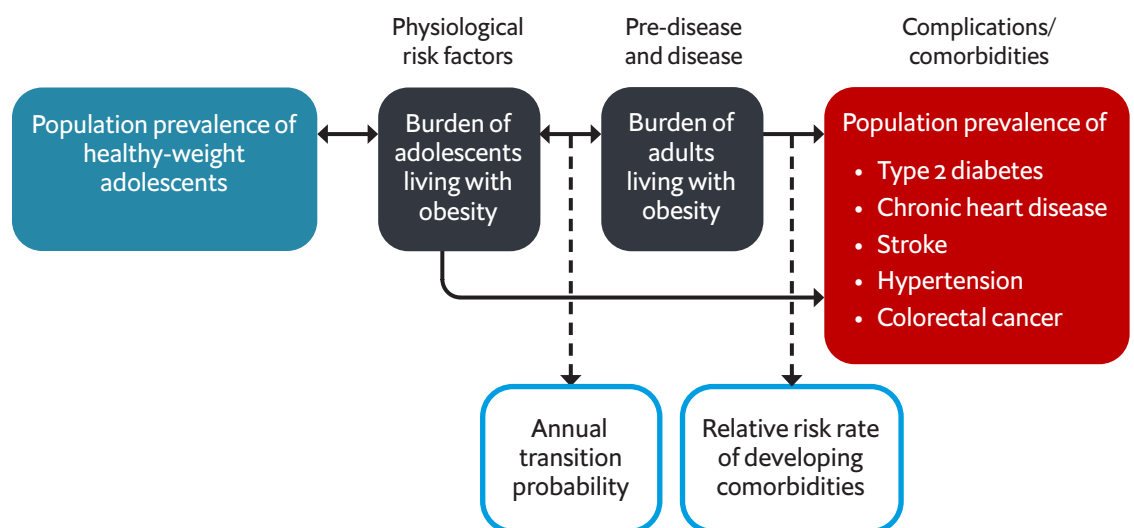
Modelling the cost attributable to adolescent obesity: estimating the impact of inaction

If obesity is established in adolescence, a return to healthy weight in adulthood is uncommon. Intervention in young people, particularly those with lower levels of adiposity, might be a valuable strategy to lower rates of adult obesity.³⁰

As a preliminary step in the study, we defined a simple obesity pathway that outlines the specific state underpinning this model (see Figure 4). Our model is based on the finding by Patton et al. that, without intervention, 49% of adolescents living with obesity will continue to live with obesity as adults.³⁰

We then analysed the average impact of early, multidisciplinary weight-loss interventions (in the form of lifestyle changes and other psychological and physiological interventions) to model, across each of the selected countries, a conservative estimate of the economic benefits of reversing adolescent obesity to healthy weight. As a baseline for this model, we used reversal rates for the population cohort found in the literature.¹² However, given the wide range of variability, the model captures three scenarios (10%, 15% and 20% reversal in adolescent obesity) to provide a broader understanding of the value of early interventions, without regard to any specific type of intervention. These scenarios were further validated by the experts who participated in our one-day panel and interviews.

Figure 4. Obesity pathway



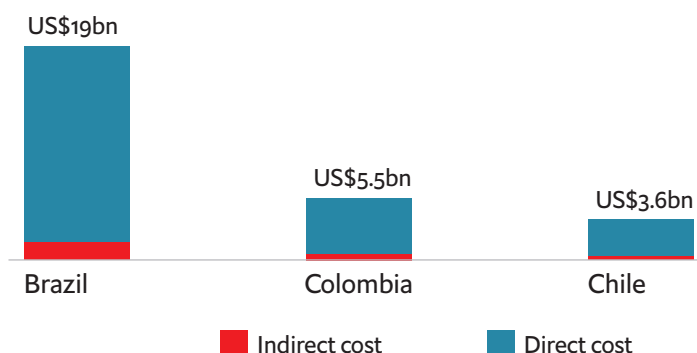
Results

We used the WHO's 2016 estimates of international obesity prevalence to ensure data comparability for our baseline calculation in modelling. To calculate costs for 2020, we made a forecast of the prevalence of obesity and of direct and indirect costs factoring in inflation rates for each country.

Costs of adult obesity

The total cost of adult obesity in 2020 is estimated to have been US\$28.1bn for Brazil, Chile and Colombia combined (see Figure 5 for breakdown by country). Approximately 90% of these costs are direct. In absolute terms, Brazil, due to its large population, is the country most affected, incurring a total cost of US\$19bn (US\$17bn in direct costs and US\$2bn in indirect costs). Brazil is followed by Colombia, with an estimated cost of US\$5.5bn (US\$5bn in direct costs and US\$0.5bn in indirect costs), then Chile, with an estimated cost of US\$3.6bn (US\$3.3bn in direct costs and US\$0.3bn in indirect costs).

Figure 5: Total cost (direct and indirect) of adult obesity, US\$bn, 2020



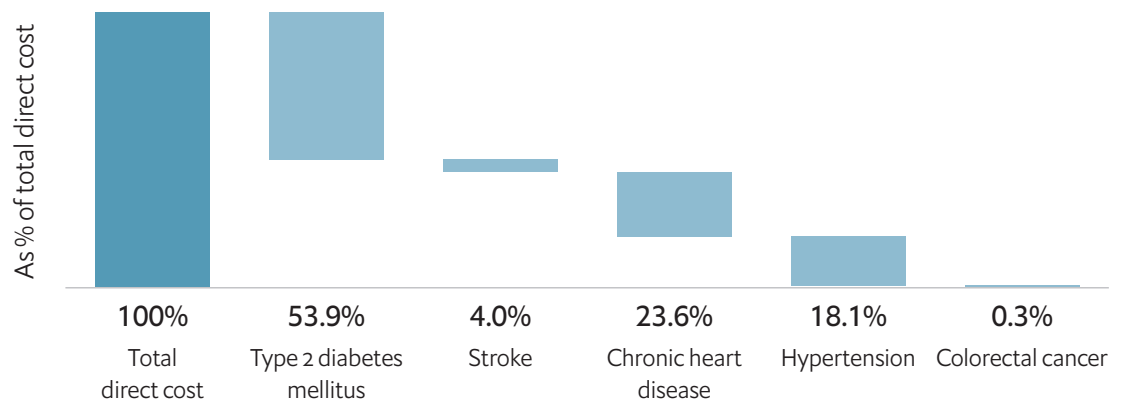
Source: EIU analysis

The direct costs of obesity make up almost 90% of the total costs attributable to obesity while indirect costs make up the remaining 10%. The five comorbidities that make up these direct costs are diabetes, hypertension, colorectal cancer, stroke and chronic heart disease (see Figure 6). Diabetes is by far the most common comorbidity associated with adults and makes up almost 50% of the total direct cost of obesity in adults. Addressing the obesity crisis in Brazil, Chile, and Colombia would thereby significantly reduce the instances of diabetes in their respective populations, simultaneously reducing the direct cost associated with this comorbidity.

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Figure 6. Comorbidities as percentage of total direct costs, adults, Brazil, Chile, and Colombia, 2020



Source: EIU analysis

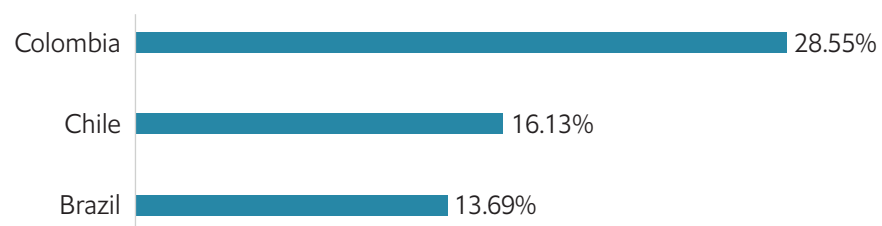
For 2020, the proportional costs of adult obesity were highest in Colombia, at an estimated 2.14% of nominal GDP and 28.55% of national healthcare spending. In Chile, the costs accounted for 1.49% of nominal GDP and 16.13% of national healthcare spending; in Brazil, the costs accounted for 1.37% of nominal GDP and 13.69% of national healthcare spending (see Figure 7 and Figure 8).

Figure 7. Total costs of adult obesity as percentage of nominal GDP, 2020



Source: EIU analysis

Figure 8. Total cost of adult obesity as percentage of healthcare spending, 2020



Source: EIU analysis

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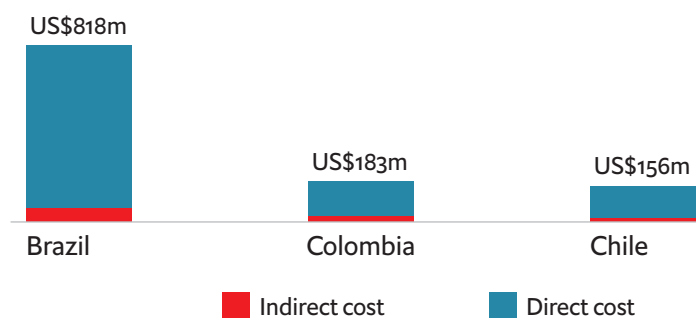
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We expect a subsequent rise in treatment costs with advancements in medical technology, resulting in an increased portion of GDP per capita dedicated to health expenditure. Because we used current data (2020) for both direct and indirect costs associated with obesity, we consider these forecasts conservative because they do not account for the increased cost of medical technology and treatments over time.

Cost of adolescent obesity

Our analysis shows that 49% of the adolescent population living with obesity who become adults living with obesity, without any intervention, contribute 4-5% of the overall cost of adult obesity. The prevalence of adolescent obesity is much lower than that of adults, which explains the low—but still significant—figure. Like adult obesity, the total cost of adolescent obesity is highest in Brazil, US\$818m, followed by US\$183m for Colombia and US\$156m for Chile (see Figure 9).

Figure 9. Total cost (direct and indirect) attributable to adolescent obesity, US\$m, 2020



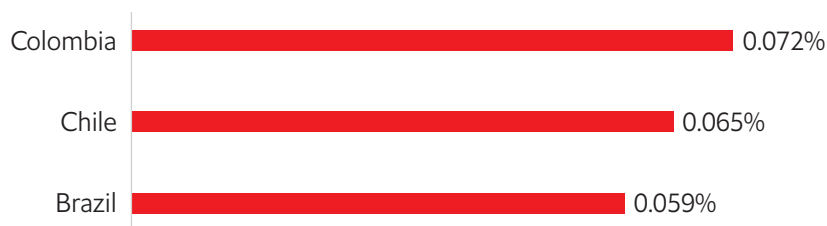
Source: EIU analysis

We present our estimates of the total costs attributable to adolescent obesity, as we did for adults, as a percentage of nominal GDP and a percentage of national healthcare spending (see Figure 10 and Figure 11). We observe the same trend for adolescents as for adults, with Colombia exhibiting the highest proportions (0.072% of nominal GDP and 0.96% of national healthcare spending), followed by Chile (0.065% of nominal GDP and 0.70% of national healthcare spending) and then Brazil (0.059% of nominal GDP and 0.59% of national healthcare spending).

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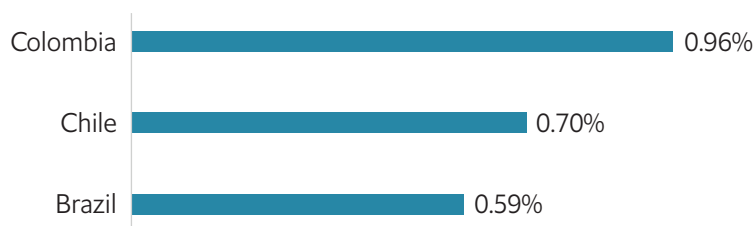
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Figure 10. Total cost of adolescent obesity as percentage of nominal GDP, 2020



Source: EIU analysis

Figure 11. Total cost of adolescent obesity as percentage of healthcare spending, 2020



Source: EIU analysis

Health impact and the cost of inaction

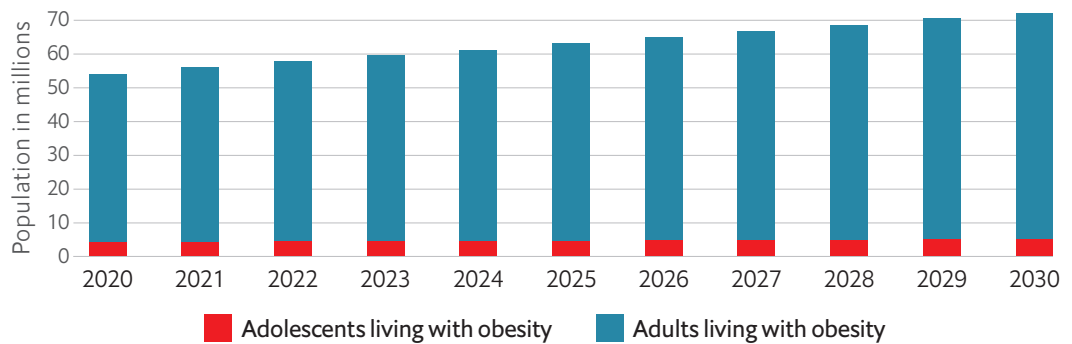
The total cost attributable to adolescent obesity as a percentage of the total cost of obesity in adults is notably low. However, the consequences of inaction as these adolescents progress to adulthood become much greater.

The epidemiological burden of both adolescent and adult obesity is remarkably high in Brazil, Chile and Colombia (see Figure 12) relative to other OECD countries. Chile is one of the worst-hit countries in this health crisis within Latin America, exhibiting the highest rates of obesity. According to WHO data, 28% of adults and 14% of adolescents in Chile were living with obesity in 2016, and without timely action, we estimate these numbers will rise to 36% and 17%, respectively, by 2030 (data not shown). These proportions represent a significant burden on both the country's economy and healthcare system, underscoring the need for early intervention.

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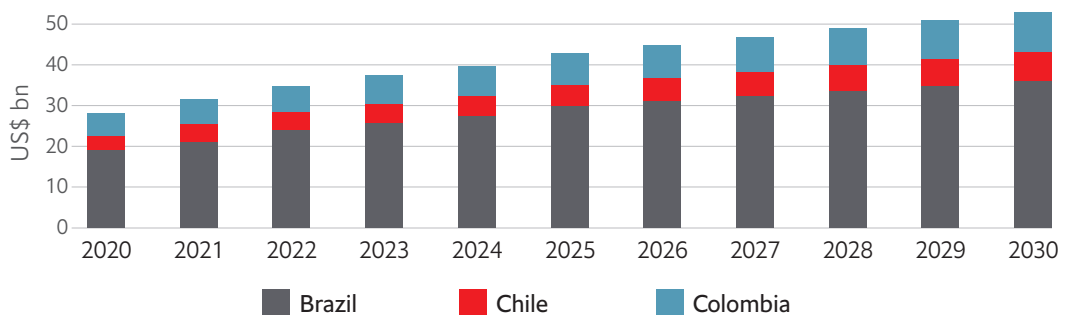
Figure 12. Forecasted prevalence of adolescents and adults living with obesity in Brazil, Chile and Colombia, in millions, 2020-30



Source: EIU analysis

As the prevalence of obesity grows, health systems can expect an ever-greater economic burden. Between 2020 and 2030, the total costs attributable to the adult population living with obesity are expected to almost double from US\$28bn in 2020 to US\$53bn in 2030 (see Figure 13).

Figure 13. Total cost of adult obesity, US\$bn, 2020-30



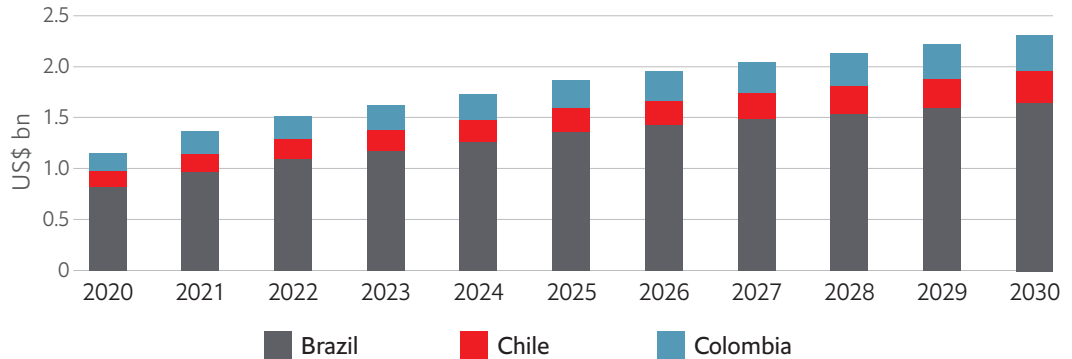
Source: EIU analysis

We estimate that, as the prevalence of obesity among adolescents rises, its cost will nearly double, from US\$1.2bn in 2020 to US\$2.3bn in 2030 (see Figure 14). Cumulatively, this will amount to US\$19bn over a period of ten years if no action is taken—approximately 1% of the current combined nominal GDP of the three selected countries.

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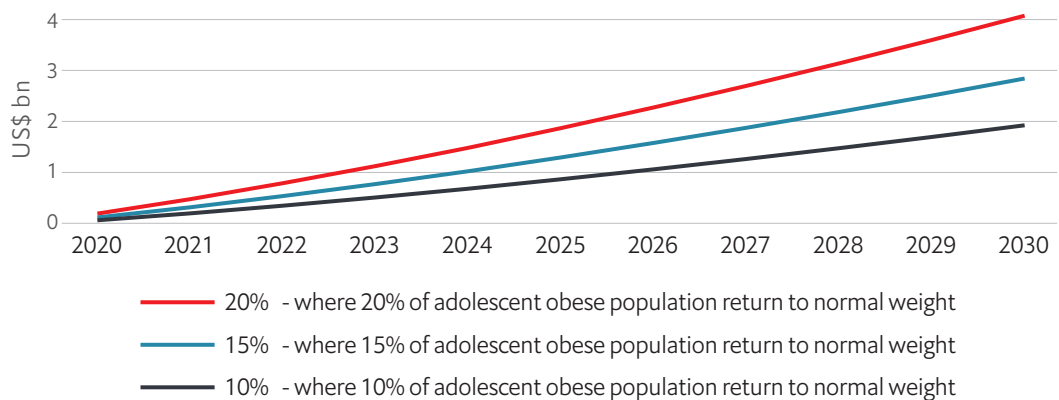
Figure 14. Cost attributable to adolescent obesity by year, US\$bn, 2020-30



Source: EIU analysis

If early, evidence-based, multidisciplinary interventions were implemented for all adolescents living with obesity and the interventions could help 20% of those adolescents achieve a healthy weight, Brazil, Chile and Columbia would save over US\$4bn cumulatively between 2020 to and 2030 (see Figure 15). These savings would amount to more than 0.2% of the current combined economies of these countries (in nominal GDP), quantifying the need to address adolescent obesity now. By using all possible interventions, the three countries have an opportunity to reverse adolescent obesity and thereby not only improve the quality of life for those individuals but also recoup significant savings over the next decade.

Figure 15. Cumulative savings based on different intervention scenarios by year, Brazil, Chile, and Colombia, US\$bn, 2020-30



Source: EIU analysis

Approaches to address adolescent obesity and its consequences

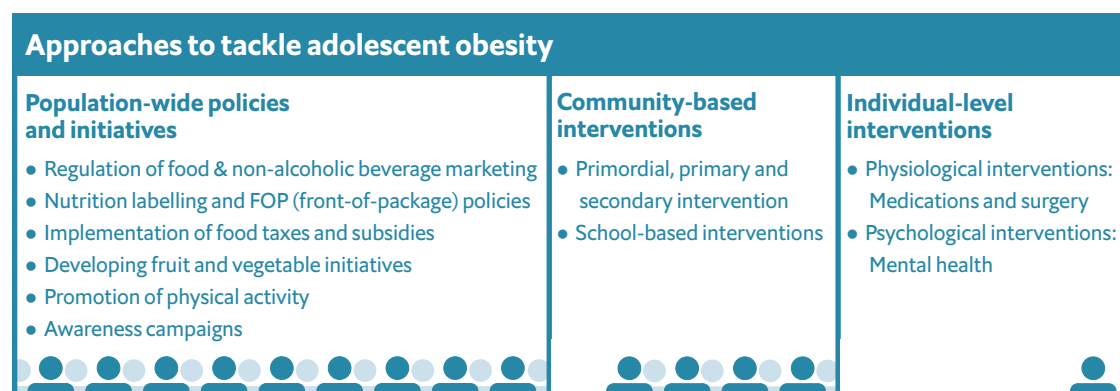
Determinants of obesity are complex; no single approach or strategy can prevent obesity in adolescents. Preventive actions must be well coordinated, incorporate a variety of approaches and include a wide range of stakeholders. With integrated actions, general risk factors and NCD risk factors will also be minimized.³¹

Using selected literature,³¹⁻³³ we developed a framework that includes key components to prevent adolescent obesity, and policies to address the current burden (see Figure 16). We supplemented our review with primary and secondary research on strategies and initiatives that are being trialled and tested in Latin American countries. Across the globe, the key components of obesity prevention in children and adolescents are improvements in diet and physical activity.³¹

Approaches to tackle obesity can be divided into three categories, targeting the broader population, communities, and individuals:

- **Population-wide policies and initiatives:** Regulation of food and non-alcoholic beverage marketing, nutrition labelling, promoting healthy eating habits, and more.
- **Community-based interventions:** Three levels of prevention (primordial, primary, and secondary) as well as school-based interventions.
- **Individual-level physiological and psychological interventions:** Physiological interventions that focus on medications and surgery and psychological interventions to address the mental health and wellness of adolescents.

Figure 16. Tackling adolescent obesity



Population-wide policies and initiatives

In the 1990s, Latin America's food environment began to be influenced by supermarkets, convenience stores, fast food restaurants and vending machines, which provide ultra-processed, high-sugar, high-fat, and high-sodium foods and sugary beverages.¹³ These changes, in association with urban expansion, resulted in an ecosystem that discourages healthy eating and active lifestyles. To address this growing concern, Latin American governments began to implement strategies to shift consumption away from unhealthy foods and improve current food purchasing and consumption patterns, along with promoting a healthy and active lifestyle.

Regulation of marketing unhealthy foods and non-alcoholic beverages:

Television advertising has been associated with increased consumption of snacks and drinks high in sugar and excess calories.³¹ Interventions targeting that influence can counteract obesity or stop it from arising by restricting certain types of food marketing. The WHO recommends regulating marketing to children and adolescents, a strategy that is supported by observational studies.³⁴ Regulating marketing of foods and non-alcoholic beverages high in sugar and fats can reduce NCDs related to obesity, thereby reducing healthcare expenditure.³¹

Nutrition labelling and front-of-package (FOP) policies:

Nutrition labelling—nutrition information in a standardized format on foods for sale—has a significant influence on healthy food intake.³¹ Interpretive labelling of food products, such as using colours (green, amber, and red) to indicate the relative levels of fat, saturated fat, sugar and salt in the product, can help parents and adolescents understand the nutrition information and make healthy choices. In many countries, it is mandatory for processed foods to have nutrition information on the product packaging.³¹ FOP labelling policies are an efficient way to affect consumer behaviour at the point of purchase¹³ and can be used to improve population diets.³¹

Food taxes and policies:

Recent studies suggest that changes in food prices can be used to improve population health.³¹ Governments can increase taxation on unhealthy foods to reduce consumption.³¹

Promotion of active lifestyles:

Inactivity has been a problem in Brazil, Chile and Colombia, but fewer opportunities to be active in urban settings exacerbate this problem. Individual, social, environmental, economic, cultural and political factors affect physical activity levels.³⁵ Studies in high-income countries have shown that physical activity can reduce fat accumulation.³¹ The WHO recommends that children and adolescents aged 5-17 years engage in at least 60 minutes of moderate to intense physical activity every day, which can include playing games and sports, active transportation (walking or cycling), recreation, and school and community activities.³⁶

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Public awareness campaigns:

Mass media campaigns against obesity can slow the rate of prevalence, raise awareness and encourage the population to adopt healthy habits. Campaigns build support for a comprehensive ban on advertisements for sugary drinks and junk food and marketing that targets children and adolescents. These campaigns also raise awareness among parents, guardians and policymakers.³⁷ Sustained media campaigns can be implemented in schools and workplaces and with those who use smartphones, text messages, or computer-based programmes. Educational campaigns are low-cost initiatives that provide straightforward messages.³¹ Individuals and advocacy groups can support, recommend, influence and promote education about youth obesity for the wider public and policymakers.³⁸ Dr Casanova stressed: "Awareness campaigns are needed to show how the environment can have a strong impact in tackling the burden of the disease.

Brazil, Chile and Colombia have all acted in one or more of the aforementioned ways to prevent the rise of obesity. Brazil and Chile have been particularly active in targeting early prevention and intervention. Efforts date back to the 1970s when Brazil targeted regulatory mechanisms on food and beverages through institutional self-regulation monitored by the National Council of Self-Regulatory Publicity. In 2016, Chile implemented a law that expanded a ban on marketing during select TV programmes with audiences that consisted of more than 20% children.³⁹ Chile also leads in creating comprehensive FOP systems. Its government implemented a food labelling and marketing law, requiring that pre-packaged goods high in sugar, saturated fats or sodium have an FOP warning label.⁴⁰

While Brazil and Chile have actively promoted healthy nutrition habits, Colombia has focused its efforts on promoting physical activity. Bogotá, the capital, has promoted active transport and regular physical activity. For example, an initiative called Cicloviá was implemented to close streets and main avenues to cars on Sundays and holidays to promote cycling and walking.³¹

The country profiles (Appendix 3) present further details on the actions and initiatives above.

Community-based interventions

Community-based interventions are critical to prevent and treat adolescent obesity. We draw attention to two main types of community-based interventions: primordial, primary and secondary prevention, and school-based programmes.

Primordial, primary and secondary prevention

Pandita et al. defined three levels of prevention for adolescents living with obesity:³²

- “primordial” prevention to keep a healthy weight and normal BMI through childhood and into adolescence;
- primary prevention to prevent overweight children from becoming obese; and
- secondary prevention to reduce the risk of comorbidities, treat obesity and help individuals return to a healthy weight if possible.

Strategies should also focus on primary healthcare (PHC). PHC can ensure equitable access to services and help prevent the long-term consequences of obesity in children and adolescents. To promote integrated health, Latin American countries need to strengthen PHC services.³³ For instance, Brazil’s Baby-Friendly Hospital Initiative provides in-hospital care at birth with a focus on practices that promote breastfeeding, which can reduce the risk of childhood obesity.

School-based interventions

School-based interventions can significantly improve the knowledge, attitudes and behaviour of children and adolescents. The WHO recommends the following interventions in primary and secondary schools:³¹

- Information on healthy eating, physical activity and body image should be integrated into the curriculum.
- Physical activity and the development of fundamental movement skills should be included in classes.
- The nutritional qualities of foods made available to students should be improved in school canteens.
- Schools should create a culture that supports eating nutritious foods and being active throughout the day.
- Schools should support teachers and staff in implementing health promotion strategies and activities.
- Parents should engage in activities at home to encourage children to become more active, eat healthy foods and engage in less “screen time”.

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The school environment influences the diets and nutritional status of children. Research also shows that school feeding programmes affect physical development, learning, cognitive potential, school attendance and educational performance. Combined interventions in school meals, healthy-eating education and improved local agricultural production help to prevent adolescent obesity. In Brazil, a study with adolescents showed that the availability of unhealthy foods at schools was associated with higher consumption of these products outside the school environment as well.⁴¹

Parental involvement also influences children's lifestyle choices preventing obesity.⁴² In Latin America, experts emphasize the role of parents in the school setting because of the family-centred culture in the region.⁴²

In general, school-based interventions in Latin America have had moderate to high impact in tackling obesity.⁴² Interventions should focus on multiple components of health education, school environments and parental involvement to promote healthy eating and physical activity.⁴² Dr Rosely Sichieri, professor at the Department of Epidemiology Speciality, Nutritional Epidemiology, at the State University of Rio de Janeiro noted: "We have a super obesogenic environment. Physical activity is easier to change than food intake. However, we must focus on food issues to decrease the incidence of obesity".

Individual-level physiological and psychological interventions

Individual-level interventions include individualized health promotion, education, advice and counselling.⁴³

Physiological interventions: medications and surgery

Anti-obesity medications and surgery are the physiological interventions available.

There is limited evidence on the use of obesity pharmacotherapy specifically in adolescents, though it is preferred over surgery. Pharmacotherapy is less invasive and does not expose patients to the risks of anaesthesia and other complications.

If a pharmacotherapy intervention is adopted, then a weight-management multidisciplinary team should support both treatment adherence and possible adverse effects. The team members should include a paediatric specialist; a registered dietitian; a mental health specialist; a coordinator such as a nurse, social worker or other; exercise physiologist, physical therapist or other; and collaboration with a metabolic and bariatric surgeon if such action is taken.⁴⁴

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Figure 17. Medical interventions for adolescents with obesity

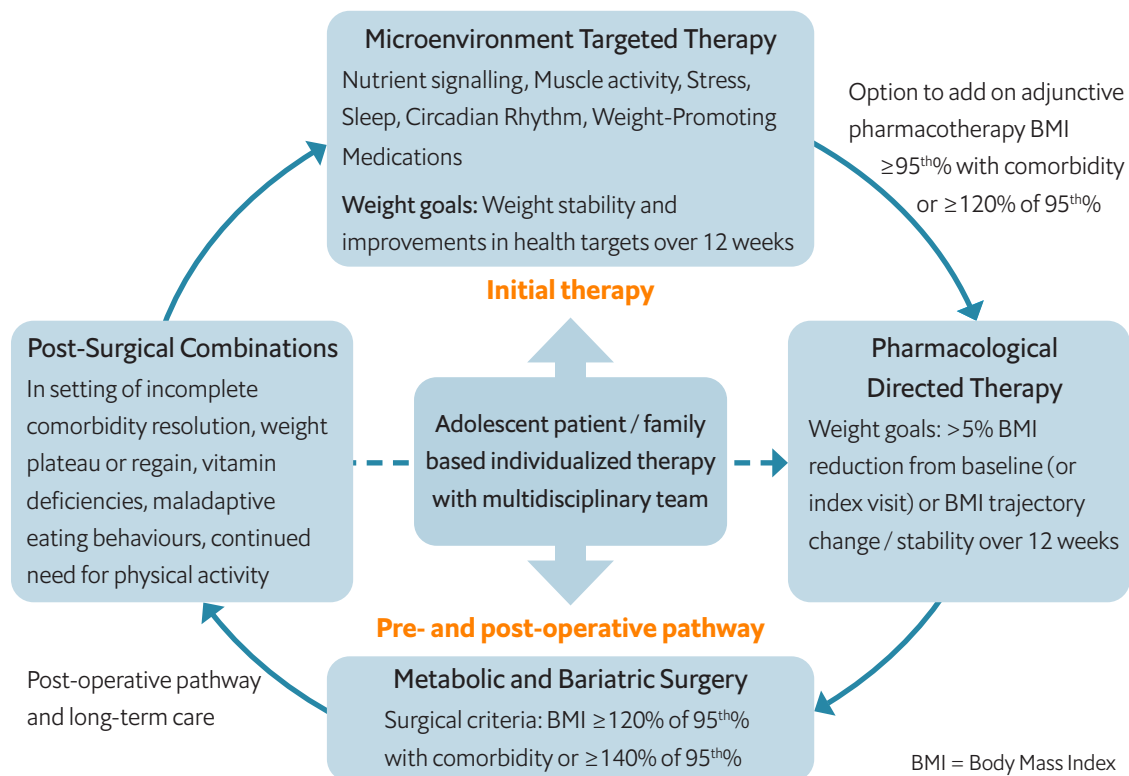


Figure adapted from “A multidisciplinary weight management approach proposed by an independent panel of 12 paediatricians and obesity surgeons in the US.” Source: Srivastava et al. (2019)

Severe obesity cases in adults can require bariatric surgery when other approaches have not been successful. The use of surgery in adolescents, however, is less established. Our interviews indicated that bariatric surgery on adolescents is unusual in the studied countries, in part because five years of alternative treatments are recommended before choosing surgery. In many countries, another major challenge is to ensure equitable access for affected adolescents since most of these services are often available only in the private sector.⁴⁵

Treatment options vary among the studied countries. Brazil has five types of medications registered for the treatment of obesity, but they are not offered in the Unique Health System (Sistema Único de Saúde)⁴⁶; only bariatric surgery is available, and adolescents must be over 16 years old and have had clinical and physiological evaluation.⁴⁷ Colombia also has five types of medications to treat obesity, and their use is increasing.⁴⁸ In Chile, there is not much evidence on medications that are specifically for obesity and overweight.⁴⁹

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Psychological interventions: mental health and wellness

Children and adolescents living with obesity often face bullying and teasing about their size, which can have serious consequences for mental and physical health. Adolescents living with obesity are likely to have low self-esteem that can translate into body dissatisfaction and lack of self-confidence. Adolescents living with obesity are always at risk of psychological comorbidities including depression, anxiety and other behavioural challenges.⁵⁰

Depression can be both cause and consequence of obesity.⁵⁰ Some research has demonstrated a connection between anxiety and obesity, with one study finding a higher lifetime prevalence of anxiety disorders in adolescents living with obesity compared with healthy-weight control subjects.⁵¹ As Dr Jaime Burrows, director of medicine at the Autonomous University of Chile pointed out, “There is an increasing problem of mental health and suicide among adolescents living with obesity. Mental health problems also have a direct impact on school performance”.

Psychosocial and emotional interventions as well as public health policies can target the poor health of adolescents due to obesity and encourage healthy body image and healthy behaviours. Interventions and policies can consider weight bias and weight and shape concerns through education that comes from parents, primary healthcare professionals and school staff.⁵⁰

Conclusion: the way forward

Obesity is a growing public health threat among adolescents in Latin America. Rapid urbanization, demographic shifts and lifestyle changes have all contributed to this dramatic increase. As the region continues to develop, there is significant risk that the obesity crisis will only worsen. Nearly half of all adolescents living with obesity will become adults living with obesity, and this population is at risk of diabetes, hypertension, cancer, stroke and heart diseases, the most common obesity-related comorbidities.

This study demonstrates the economic benefit of early interventions among adolescents living with obesity. Not only will such action have an impact on the individual's future health and wellbeing, but it can produce substantial savings, expected to reach up to US\$4bn over the next ten years in the three selected countries.

To reverse course, interventions promoting healthy food habits and physical activity must be deployed early in life. Strategies include regulating the marketing of calorie-dense unhealthy food, encouraging physical activities in school and requiring food and nutrition labelling. The success of these interventions depends on supportive policy environments. Drawing on insights from our expert panel and interviews and from a systematic literature review, this study has reached the following conclusions:

- **The burden that obesity places on health systems and economies is significant, and it is expected to grow in the future if no immediate action is taken.** Rapid globalization has given rise to a multitude of changes in Brazil, Chile and Colombia, including increased unhealthy lifestyle and food choices. The consequent rise in obesity puts an enormous burden on healthcare systems as countries struggle to provide for individuals living with chronic obesity-related conditions. If no action is taken to reverse the trend, the economies of these three nations will be put under significant strain.
- **The economic burden of obesity is disproportionately larger in Chile. Of the three countries in this study, Chile has the highest rate of obesity (an estimated 31% in 2020) and spends the most per person living with obesity (US\$821 in 2020).** While Chile has had success with its programmes targeting adults, it needs to increase its early interventions to prevent the development of obesity in children and adolescents. Establishing a healthy lifestyle from a young age is essential.

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- **Obesity increases the risk for diabetes, a costly comorbidity. Our analysis suggests that T2D accounts for 50% of the total direct cost of obesity, making it by far the most expensive, and prevalent, comorbidity.** If the obesity rate continues to rise, so too will the cases of T2D, generating significant expense for countries already struggling with the obesity crisis.
- **Early recognition and targeting can slow the rate of adolescent obesity continuing into adulthood.** Because most obesity-related health problems do not manifest until adulthood, adolescent obesity is not given the attention it deserves. But half of adolescents living with obesity will continue to be obese in adulthood, so countries must address the issue early to prevent the development of comorbidities. Additionally, our analysis suggests that countries can save approximately US\$4bn over the next ten years by taking immediate action to reduce and reverse childhood and adolescent obesity.
- **Regulation of marketing unhealthy food and non-alcoholic beverages and nutrition labelling can help to reduce obesity.** Multiple stakeholders—including governments, medical associations, the private sector and patient advocacy groups—can create a supportive environment for implementing the strategies discussed in this study. Organized advocacy in Brazil and Chile have spurred governments to regulate the marketing of unhealthy foods and require nutritional labels.
- **Successful implementation of policies depends on collaboration.** To introduce and implement a new policy, buy-in from all key stakeholders—from political figures such as secretaries of health and education, governors, and mayors, to community figures such as teachers and parents—is essential. School-based programmes that restrict the availability of unhealthy food or increase physical activity rely on parents and teachers to reinforce these goals.
- **Education campaigns can help the public understand obesity and its associated problems.** There are widespread misconceptions about obesity in the Latin American population, which tends to see obesity as an indicator of good health and social status. There are also cultural challenges, including unhealthy ingredients in national dishes. Simple education campaigns targeting parents and promoting healthy food habits and exercise can fight complacency and promote healthier choices. Successful programs include Juntos Santiago in Chile and Programa Crescer Saudável in Brazil.
- **Physiological and psychological interventions are available when lifestyle interventions alone are insufficient to reach health goals.** However, there is limited scientific evidence regarding these interventions in adolescents living with obesity. Research can fill these knowledge gaps and explore the role that these interventions can play. Clinical trials should be promoted to validate the use of pharmacotherapy for adolescents living with obesity.

Appendix 1: Methodology and limitations

The Economist Intelligence Unit's approach comprised the following:

Literature overview:

- Structured review of literature on obesity in adults and adolescents (globally and country specific).
- Quantitative and qualitative data gathering and framework building.

Expert panel and interviews:

- Expert review and framework discussion; findings from the literature review.
- Examples of success and major challenges in the selected countries.
- Identification of critical issues and cost drivers.

Modelling and analysis:

- Refined framework based on expert inputs.
- Scenario building, modelling and analysis.
- Model testing.

Reporting:

- Analysis of findings.
- Conclusions and takeaways.

Literature review

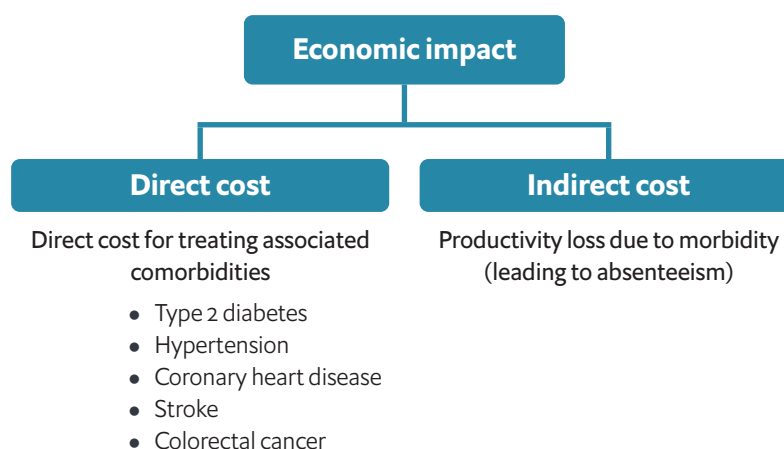
An experienced information specialist performed a structured literature search and found more than 170 published and peer-reviewed articles on both the micro- and macroeconomics of adults and adolescents living with obesity and the identification of care pathways, policies, stakeholder perspectives and other thematic elements. We supplemented this review with policy documents, reports from public sources and data on epidemiological trends. We limited our search to studies and sources published in the last ten years (2010-20) to account for the changing nature of costs, new policy guidelines at national and international levels, and advancements in technologies and treatments that have shifted the understanding of obesity as a healthcare crisis and actions targeting its growth.

Assembling evidence from published sources, databases and experts in the field, we captured new ideas and designed a framework for evaluating the economic toll of inaction concerning adolescent obesity across Latin American markets. While our findings address objectives that are particularly relevant to national finance and health ministers, we also believe the information and analysis will be of significance to a wider set of stakeholders. These additional stakeholders might include multilateral organisations, researchers, business leaders and NGOs.

Modelling and analysis

We developed a robust model (outlined below) to estimate the economic costs of obesity in three Latin American countries: Brazil, Chile and Colombia. This cost assessment framework provides a cross-country comparison of the prevalence of obesity, its related comorbidities and the associated direct and indirect costs.

Figure 1A-1. Cost-of-illness model



“Direct costs” refers to healthcare costs, including all elements or supplies required for the diagnosis of a health problem and its treatment or monitoring, such as cost of hospitalizations, medical consultations, examinations and procedures, medicines, laboratory tests and reagents, and surgical material and instruments, among others. We focused on healthcare costs for five diseases often linked to obesity: type 2 diabetes, stroke, hypertension, colorectal cancer, and chronic heart disease.

“Indirect costs” refers to the broader losses of economic productivity due to absenteeism resulting from obesity and its associated comorbidities. We did not consider other variables that impact productivity, such as the costs of limited productivity on the job due to excess weight.

The model is based on the cost-of-illness (COI) approach, a useful tool to help policymakers quantify and understand the economic burden of disease. COI models have long played a role in public health, to formulate and prioritize healthcare policies and allocate healthcare resources by estimating the costs attributable to the disease.²⁸ The COI approach identifies the cost components of specific diseases, including direct medical costs, direct non-medical costs and indirect costs such as potential productivity losses due to illness. Identified costs can also include disease-related complications and associated comorbidities in specific social groups. The estimates arising from this study will allow

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stakeholders to understand the true breadth and severity of the issue and quantitatively demonstrate the priority adolescent obesity should be afforded.

Using the COI model's detailed breakdown of cost components, stakeholders can explore the potential cost savings of interventions and their varying levels of efficacy. The model can be adapted to consider different perspectives and types of cost to include in the analysis. These options are especially advantageous to assess indirect costs, which have not been as extensively covered as direct costs in the current literature on obesity.

We collected data for cost estimates from a variety of sources. During our early data review, we found significant gaps for each country, especially for data points such as the disease's healthcare costs, absenteeism from work due to obesity, and life expectancy of persons living with obesity. To supplement the available data, we relied on estimates from the literature and national surveys in neighbouring countries like the US and Mexico to use as proxies in our model.

Calculating the direct costs of obesity

The direct costs of obesity were calculated using the following two equations:

$$\text{Population attributable fraction (PAF)} = \text{Pd} (\text{RR} - 1) / [\text{Pd}(\text{RR} - 1) + 1]$$

Where:

Pd = probability of a person in a given population being obese

RR = relative risk for disease in a particular subject

$$\text{Direct cost of obesity} = (\text{Hab} \times \text{PAFab})$$

Where:

a (by comorbidities)

b (by sex)

Hab = costs to treat 'a' disease in 'b' sex

PAFab = population attributable fraction of obesity on 'a' disease in 'b' sex

The PAF method is commonly used to estimate direct obesity-related healthcare costs. The PAF is the proportional reduction in population disease or mortality that would occur if exposure to a risk factor were reduced to an alternative ideal exposure scenario (in this case, no obesity). The PAF method is a robust and viable way to estimate the direct cost of obesity. The relative risk values (by disease) come from our literature review. The value for obesity prevalence in this formula is the population mean value derived from this normal distribution's probability distribution function in each of the three countries considered, making it an extremely reliable stochastic estimate.

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An overview of data sources for the direct healthcare costs is provided in the table below.

Data point	Source
Prevalence of obesity	WHO (World Health Organization)
Relative risk	Guh et al. (2009)
Prevalence of each obesity-related comorbidity	Ministry of health in each country
Treatment cost of each obesity-linked comorbidity (measured as the average annual cost per capita)	Brazil: Araujo et al. (2004), Bahia et al. (2022), Christensen et al. (2009), Nilson et al. (2018), Sichieri et al. (2007) Chile: FONIS (National Research and Development Fund for Healthcare) Colombia: Recommendations of the Colombian Association of Endocrinology, Diabetes and Metabolism for the Management of Obesity

Calculating the indirect costs of obesity

Excess weight affects workforce productivity, which itself varies by the type of job and the individual characteristics of the worker, among other factors. We estimated indirect costs as losses of productivity due to absenteeism. We did not consider other variables that impact productivity, such as the costs of limited productivity on the job due to excess weight.

In the US, the National Health and Wellness Survey of Employees and Companies regularly gathers data on absenteeism. Such information is not available for the countries in our study. Therefore, we made our country-specific estimates using top-down adjustments to the US data based on the size of the informal work sector in each of the countries in the study.

We measured absenteeism as absence due to conditions associated with obesity, a common measure of indirect costs. Several widely cited studies have found that employees living with obesity take more sick leave than healthy-weight colleagues, irrespective of occupational group.⁵²

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We calculated indirect costs from absenteeism based on the following equation:

$$\text{Loss of productivity from absenteeism (sick days)} = \text{Ibd} (\text{Nab} \times \text{PAFab} \times \text{Pb} \times \text{Eb})$$

Where:

Ibd = Average daily wage income of 'b' sex

Nab = Total number of days person suffering 'a' disease who is of 'b' sex is absent from work

PAFab = Population attributable fraction of obesity on 'a' disease in 'b' sex

Pb = Labour force participation rate of 'b' sex

Eb = Employment rate of 'b' sex

Our research team developed estimates to determine the average wages for male and female workers in each country. We first took average wages from The EIU's country data and then adjusted these data based on the gender wage gap and employment ratios to compute the average sex-specific daily wage rates for each country. The research team also considered the structure of labour markets in each country and adjusted labour force participation and employment rates accordingly. These numbers were adjusted upwards to integrate the informal employment of each country. This provides a more robust estimation of productivity losses due to absenteeism.

An overview of data sources for the indirect costs is provided in the table below.

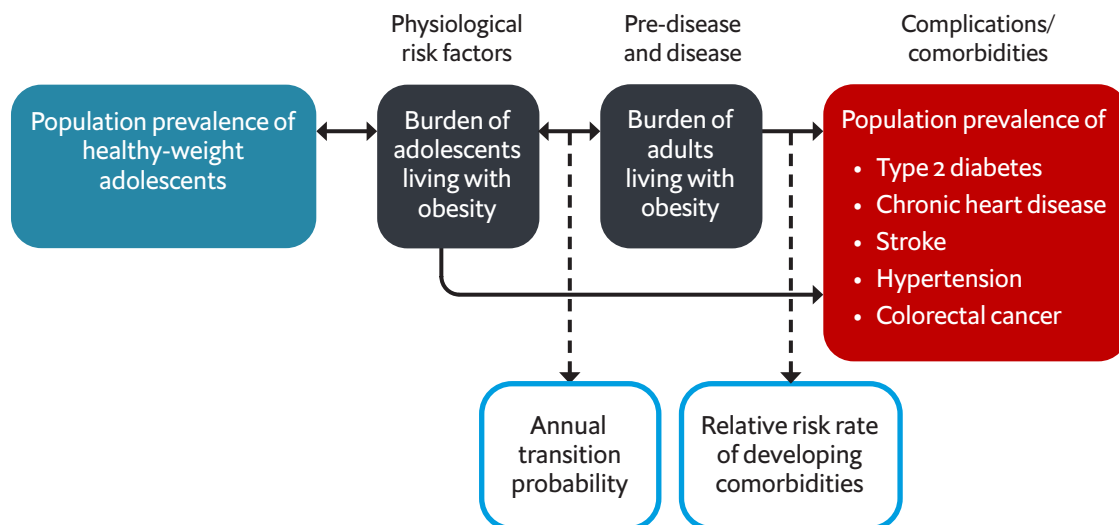
Data point	Source
Daily wages	The Economist Intelligence Unit
Gender wage gap	International Labour Organization (ILO) estimates (Brazil), OECD (Chile and Colombia)
Employment rate (adjusted for informal sector)	World Bank, ILO estimates
Labour force participation (adjusted for informal sector)	World Bank, ILO estimates
Number of days absent from work due to disease	2013 National Health Interview Survey (US)

Calculating the costs attributable to adolescent obesity

We defined a simple “obesity pathway” (see Figure 1A-2) that outlines the specific state underpinning this model. The model assumes that, without any intervention, 49% of adolescents living with obesity will continue to be obese as adults, based on the study by Patton et al.³⁰

We then compared the impact of multidisciplinary interventions (behavioural and lifestyle changes and medical treatment) to model, across each of the selected countries, a conservative estimate of the reversal of obesity in adolescents to healthy weight. As a baseline for this model, we used reversal rates informed by evidence from the literature for the population cohort.¹² However, given the wide range of variability in the literature, the model captures three scenarios (10%, 15%, 20% reversal of adolescent obesity) to present a broader understanding of the value of early interventions, without regard to any specific type of intervention. These scenarios were further validated by the experts who participated in our one-day panel and interviews.

Figure 1A-2. Obesity pathway



By quantifying the current cost in the selected markets attributable to adolescent obesity and estimating the impact of a reversal to healthy weight, the model defines the baseline scenario for inaction and captures a broad understanding of the value of timely interventions, without regard to any specific type of intervention.

Model limitations

The following limitations of this model should be considered when interpreting results:

- **Data limitations:**
Accurate cost data concerning obesity in adolescents and adults in the selected markets were extremely limited, meaning the model's inputs were estimated or extrapolated in some cases.
- **Effectiveness by intervention types:**
Data on effectiveness by type of intervention were not captured in the markets selected for this analysis and were thus out of scope for the model. Further research is required to address this gap.
- **Assumptions:**
This model depends on parameters such as transition rates, intervention impacts and so on, for which the data is very limited. As data availability improves, the underlying assumptions of this model may shift to accommodate.

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TACKLING ADOLESCENT OBESITY IN LATIN AMERICA

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Appendix 3: Country profiles

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BRAZIL

TACKLING ADOLESCENT OBESITY IN LATIN AMERICA



As the most populous country in Latin America, Brazil faces a significant healthcare challenge when it comes to the rapid rise of obesity within its population, along with the associated costs of this health crisis. Though Brazil has implemented various regulatory measures and public policies designed to address the obesity crisis, these efforts have fallen short as regulations and policies are not consistently enforced and new programs designed to combat obesity through community efforts are often discontinued before they are given a chance to succeed. The analysis below shows that it is critical that Brazil re-evaluate its approach to the obesity crisis, or face rapidly rising costs over the next decade as a result of inaction.



Country snapshot*

	2020	2030	2020-30 CAGR
Population (mn)	209.7	221.0	0.5%
Adult population (20+ years old, mn)	152.3	165.5	1.1%
Adolescent population (10-19 years old, mn)	31.2	29.0	-0.7%
Nominal GDP (US\$ bn)	1,385	2,503	5.6%
Annual per capita GDP (US\$)	7,992	12,866	4.9%
Dependency ratio %	29.7	26.8	----
Current healthcare spending (US\$ mn)	138,536	242,791	5.4%
Healthcare expenditure as % of GDP	10	9.7	----
Annual per capita health spending (US\$)	682	1,099	4.9%
Total annual cost per adult living with obesity (US\$)	510	714	3.4%

*Data based on EIU analysis

CAGR = Compound Annual Growth Rate

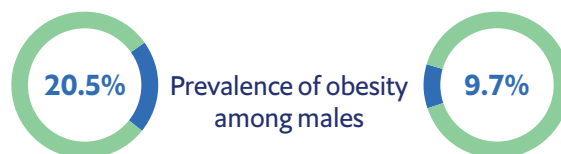
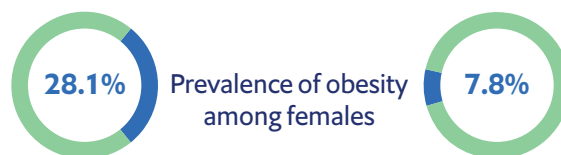
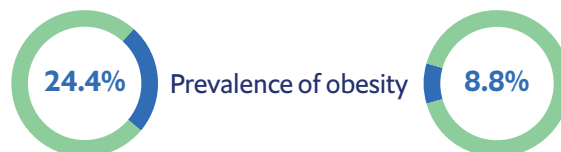
Prevalence of obesity, Brazil, 2020*

Adults

(20+ years old)

Adolescents

(10 - 19 years old)





Economic burden of obesity

According to our estimates, in 2020 the total cost of adult obesity in Brazil was US\$19bn and it will increase at a compound annual growth rate (CAGR) of 6.2%, almost doubling to US\$35.9bn in 2030 (see Figure 1). Obesity in the adolescent population is even more worrisome, as it is expected to grow at a higher CAGR of 7.2%, reaching US\$1.64bn by 2030 (see Figure 2). Cumulatively, this will amount to US\$14bn over a period of ten years if no action is taken – almost 1% of Brazil’s current nominal GDP.

Our analysis also suggests that direct costs make up for almost 90% of the total cost of obesity in Brazil. The five comorbidities that make up these direct costs are diabetes, hypertension, colorectal cancer, stroke, and chronic heart disease. Diabetes and hypertension are the most common comorbidities associated with adults and make up almost 60% of the total direct cost of obesity in adults (see Figure 3). As we observe the forecasted annual growth rates of adolescent obesity - more than 3 times the general annual growth rates for the total population - we can expect these costs to increase dramatically, draining even more resources from the total healthcare budget.

Figure 1: Total cost of adult obesity in Brazil, US\$bn by year, 2020-2030

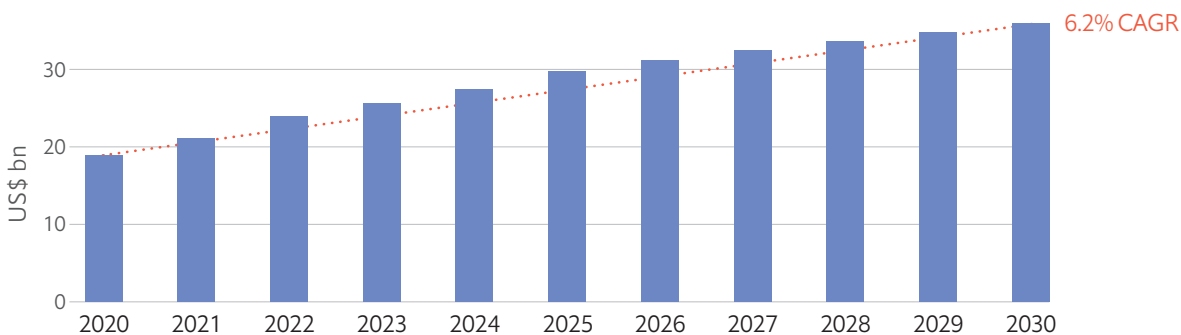


Figure 2: Cost attributable to adolescent obesity in Brazil, US\$bn by year, 2020-2030

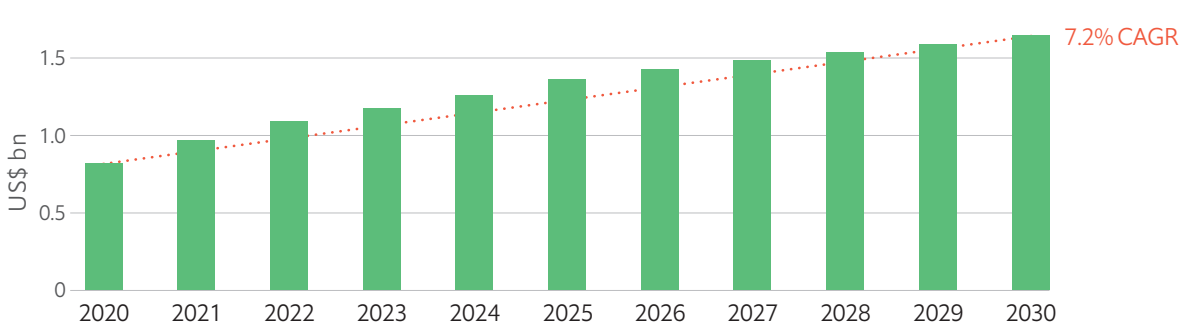
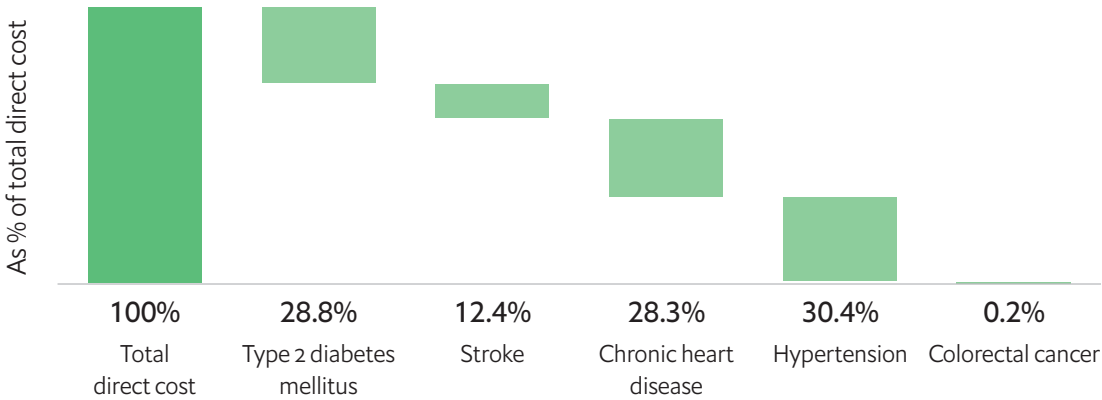


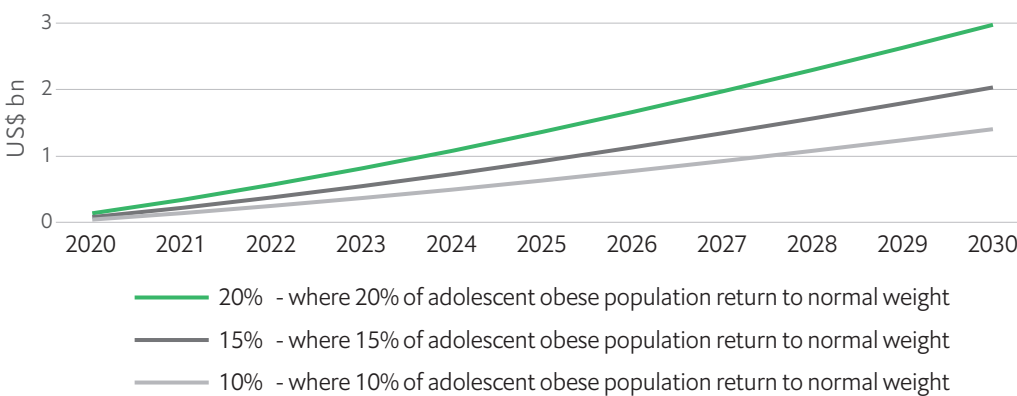


Figure 3: Comorbidities as percentage of the total direct cost in adults, Brazil, 2020



If early, evidence-based, multidisciplinary interventions (behaviour and lifestyle changes, and medical treatment) were implemented for all adolescents living with obesity and if these interventions could help 20% of those adolescents achieve a healthy weight, Brazil would save over US\$3bn cumulatively between 2020 to and 2030 (see Figure 4), which would amount to more than 1% of the current economy of the country (in nominal GDP), quantifying the need to address adolescent obesity now. By using all possible interventions, Brazil has an opportunity to reverse adolescent obesity and thereby not only improve the quality of life for those individuals but also recoup significant savings over the next decade.

Figure 4: Cumulative savings based on different intervention scenarios, Brazil, US\$bn, 2020-2030



Source: EIU analysis



Country-level policy approaches

The rapid rise in adolescent obesity in particular is attributable to changes in the population's dietary habits and a decrease in physical activity.^{1,3} These changes have accelerated over the past few decades, creating an urgent need for government intervention to reverse these alarming trends.² It is crucial to address adolescent obesity as it has been shown that adolescents living with obesity are significantly more likely to become adults living with obesity.⁴ Only by addressing the root causes of obesity from a young age will Brazil be able to avoid incurring the associated healthcare costs of these individuals later on in life.

In 2006, the Brazilian Congress approved the Food and Nutritional Security Law to establish the legal basis for creating specific programmes in that direction, specifically the National System of Food and Nutritional Security. That set the stage for actions to fight obesity such as the National Food and Nutrition Security Plan (PLANSAN),⁵ focused on halting the obesity of the adult population, and two main Brazilian national health promotion policies focused on children and adolescents:

- The Health in School Programme (Programa Saúde na Escola) – an initiative addressing the high rate of adolescent obesity in public schools for adolescents with ages between 15-19 years old,⁶ and
- The Growing Healthier Programme (Programa Crescer Saudável) - designed to tackle children's obesity through the promotion of healthy eating habits and physical activity for children up to 12 years old.⁶

These last two programmes function with municipalities enrolling at their discretion and require their education and health secretariats to adopt full time education and health attention through prevention, and health promotion and attention actions.

According to the experts interviewed, these programmes have had limited success due to the lack of multidisciplinary team approaches and lack of sufficient funding. Without buy-in from key stakeholders, these policies will be unable to have their intended effect.

The Brazilian Federal Government also acted through the regulation of food labelling and children-directed advertising. Food labelling regulations follow the Global Strategy on Diet, Physical Activity and Health as established by the WHO, which emphasizes standardized, accurate and understandable nutritional information on food labels to allow consumers to make healthier choices.⁷ In 2020, the National Agency of Sanitary Surveillance went a step further and published new regulations on nutrition labelling, mostly adding warnings for high levels of saturated fat, sodium and sugar.⁸

Brazil bans advertising directed at children (those under 12 years of age) through its constitution, the Consumer Defence Code, the Child and Adolescent Statute and CONANDA's Resolution 163 of 2014. (CONANDA is the National Council for the Rights of Children and Adolescents, an agency attached to Brazil's Department of Human Rights).⁹



Unfortunately, this resolution has had limited effect due to self-regulatory mechanisms adopted by advertisers, who usually rule in favour of their own interests. In an effort to counterbalance this lenient attitude, especially from the food industry, advertising agencies and regulatory bodies, Instituto Alana has actively worked with the Brazilian Congress and CONANDA to bring such illegal marketing activities to a halt. They have so far had several successes, particularly when an advertisement uses a tone and language designed to appeal directly to children, characters familiar to children, child actors speaking directly to their peers, songs sung in children's voices or links food purchases with the distribution of gifts.⁹

Other actors (such as government and non-profit organisations) are also encouraging companies to restrict marketing to children. For instance, in 2011 the Consumer Protection and Defence Agencies (Procon) fined McDonald's US\$1.5m for advertising to children and promoting matched sales of toys and food. After the company's appeal in 2015 however, the judicial court of the state of São Paulo revoked the fine. The case is still under review through the Brazilian justice system.⁹

Sugar-sweetened beverage (SSB) consumption is a major contributor to the current rise in obesity in Brazil. To combat this public health issue, countries across the globe have been implementing SSB taxes, a policy encouraged by the WHO.¹¹ However, contrary to the WHO's recommendation, the Brazilian government decreased taxes on some sugary drinks in 2017 and 2018.¹⁰ More recently, the debate on taxation has resumed within the federal government, but the country does not yet have concrete resolutions to effectively increase taxes on SSBs.

In conclusion, Brazil has a proper legal framework and established programmes to fight adolescent obesity, but the authorities and the civil society as a whole have not paid the necessary attention to this topic.



The way forward

Obesity is a growing public health challenge among both adolescents and adults in Brazil. Rapid urbanization and lifestyle changes have contributed to this dramatic increase. As it currently stands, the alarming rise in obesity in Brazil will cost the government tens of billions over the coming decade - healthcare costs that could be defrayed if the government was to take an active stance against obesity. Essential to this would be to acknowledge that adolescents living with obesity tend to become adults living with obesity. Hence, it is crucial to intervene at a young age to stop this cycle in its tracks. While some effective policies have been put in place to combat the rise in obesity, they have not been consistently implemented or enforced. If Brazil were to increase the political will and economic incentives to counter the continuing rise in obesity, the country stands to save millions of dollars each year on healthcare expenditure. Drawing on insights from our expert panel and interviews, and from a systematic literature review, this study has reached the following conclusion:

- **The burden that obesity has placed on the health system and economy of Brazil is significant and this is expected to rise in the coming years, if action is not taken.** There is an urgent need to reverse the obesity trend among adolescents who grow up to become adults living with obesity and contribute to the overall burden. If no immediate action is taken, the economy of the country will be put under significant strain.
- **Obesity increases the risk of diabetes and hypertension, both costly comorbidities.** Diabetes and hypertension are the most common comorbidities associated with adults and make up almost 60% of the total direct cost of obesity in adults. If the obesity rate continues to rise, so too will the cases of diabetes and hypertension, generating significant expense for a country that is already struggling with an obesity crisis.
- **Early recognition and targeting can help slow the rise of obesity among adolescents and help reverse the trend.** School-based interventions targeting children and adolescents can help achieve this target. These early interventions can have a significant impact on the knowledge, attitude, and behaviour of the youth population. Though the government has undertaken some positive initiatives such as Programa Saúde na Escola and Programa Crescer Saudável, implementation has been a challenge at the municipal level due to socioeconomic differences across regions and an overall lack of funds. For implementation to be successful at the municipal level, there should be involvement from the top authorities (mayors, secretaries of health and education), NGOs, Parent and Teacher Associations, and patient advocacy groups to educate and train school staff and teachers, as well as periodic follow ups by healthcare professionals and an effort to increase family awareness about the



importance of healthy lifestyle choices. Additionally, KPIs should be defined and customized to each region and socioeconomic group to allow comparisons and discussion on how to improve and guarantee success in areas where support is needed the most.

- **Education campaigns should be implemented to promote healthier lifestyle choices among the public.** Focus should especially be on low-income communities that often do not have access to such education and can therefore contribute more significantly to the socioeconomic burden of obesity. These efforts must however be paired with a push to offer healthy, low-cost alternative food choices to low-income communities where nutritional food choices are often lacking or are prohibitively expensive.
- **There is also an urgent need to impose taxes on sugar-sweetened beverages and calorie-dense food.** Such taxes can be effective in curtailing obesity at both an individual and population level. Such taxes were higher prior to 2017, and it is important to revitalize these efforts.
- **Policy monitoring will be essential to evaluate the development and performance of obesity policies once implemented.** Successful implementation of the aforementioned policies and initiatives is often a challenge due to limited attention from public managers and a lack of understanding of the importance of such policies by civil society. By involving NGOs and private sector stakeholders, they can play a critical role by raising the profile of such policies and monitoring their implementation while also emphasizing to local government authorities the benefits of such actions. Most successful examples show that top authorities at the State level work in coordination to support a multi-disciplinary approach, with physicians, psychologists, nutritionists and educators working together, as well as the secretaries of education and health, both at State and Municipal level.
- **Physiological and psychological interventions are available when lifestyle interventions alone are insufficient to reach health goals.** However, there is limited scientific evidence regarding these interventions in adolescents living with obesity. Research can fill these knowledge gaps and explore the role that these interventions can play. Clinical trials should be promoted to validate the use of pharmacotherapy for adolescents living with obesity.



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CHILE

TACKLING ADOLESCENT OBESITY IN LATIN AMERICA



Chile has one of the highest obesity rates in the world, and it is only continuing to climb. This rapid increase represents a major concern for both population health and the economy. The Chilean government has implemented a number of policies to address this rise in obesity, including population-level fiscal policies, school-based programs, and primary care interventions. While these policies do have their strengths and successes, there are also ways in which they could be expanded or made more effective. This analysis will examine policies currently in effect, as well as make recommendations as to how they could be fortified to combat the urgent obesity crisis in Chile.



Country snapshot*

	2020	2030	2020-30 CAGR
Population (mn)	18.8	19.1	0.1%
Adult population (20+ years old, mn)	13.9	14.5	0.4%
Adolescent population (10-19 years old, mn)	2.5	2.4	-0.4%
Nominal GDP (US\$ bn)	253	511	6.8%
Annual per capita GDP (US\$)	15,383	30,160	7.3%
Dependency ratio %	28.1	25.6	----
Current healthcare spending (US\$ mn)	23,400	50,020	7.9%
Healthcare expenditure as % of GDP	9.3	9.8	----
Annual per capita health spending (US\$)	1,239	2,622	4.6%
Total annual cost per adult living with obesity (US\$)	821	1,290	3.1%

*Data based on EIU analysis

CAGR = Compound Annual Growth Rate

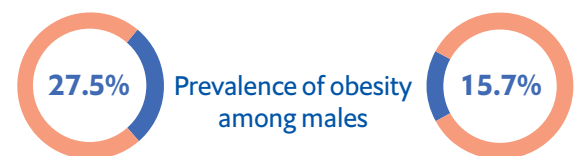
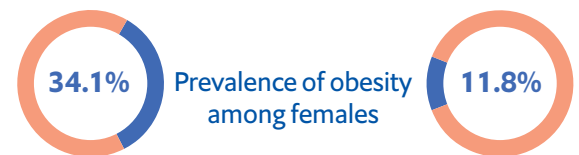
Prevalence of obesity, Chile, 2020*

Adults

(20+ years old)

Adolescents

(10 - 19 years old)





Economic burden of obesity

Obesity is one of the most significant health challenges in Chile, with more than 30% of the adult population struggling with obesity, a number that continues to rise at an alarming rate. According to our estimates, in 2020 the total cost of adult obesity in Chile was US \$3.6bn. This number will only increase as the prevalence of obesity grows over time and is, in fact, expected to almost double over the next ten years, reaching up to US \$7bn by 2030 (see Figure 1). Obesity is on the rise not only among adults, but in the adolescent population as well. The cost attributable directly to the rise of obesity among adolescents will also double from US \$160mn in 2020 to US \$309mn 2030 (See Figure 2). Four out of the five main comorbidities are at the top ten causes of deaths in Chile (coronary heart disease, stroke, hypertension, and type 2 diabetes), and just type 2 diabetes represents over half of the total direct costs associated with obesity among adults.

Figure 1: Total cost of adult obesity in Chile, US\$bn by year, 2020-2030

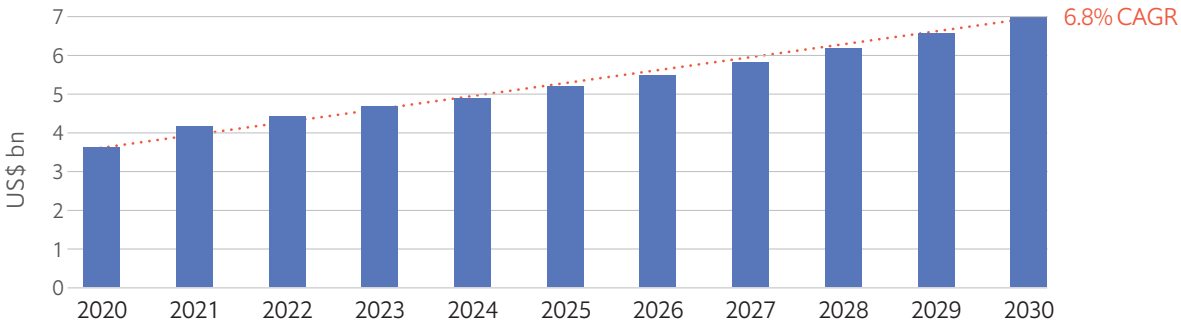


Figure 2: Cost attributable to adolescent obesity in Chile, US\$m by year, 2020-2030

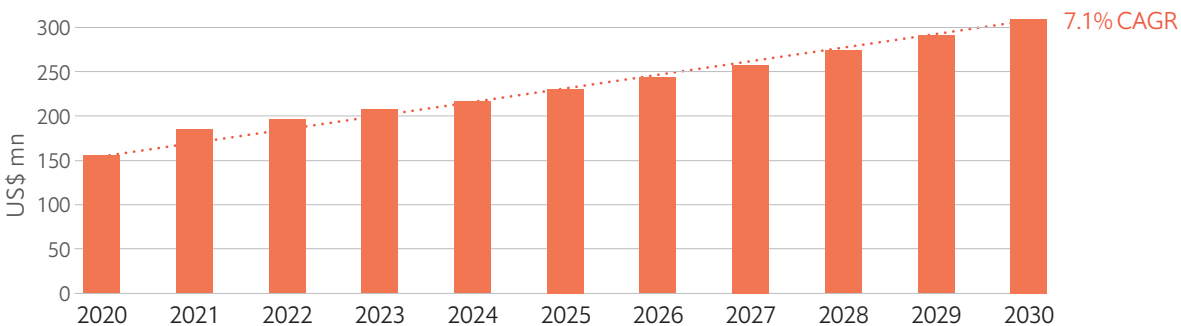
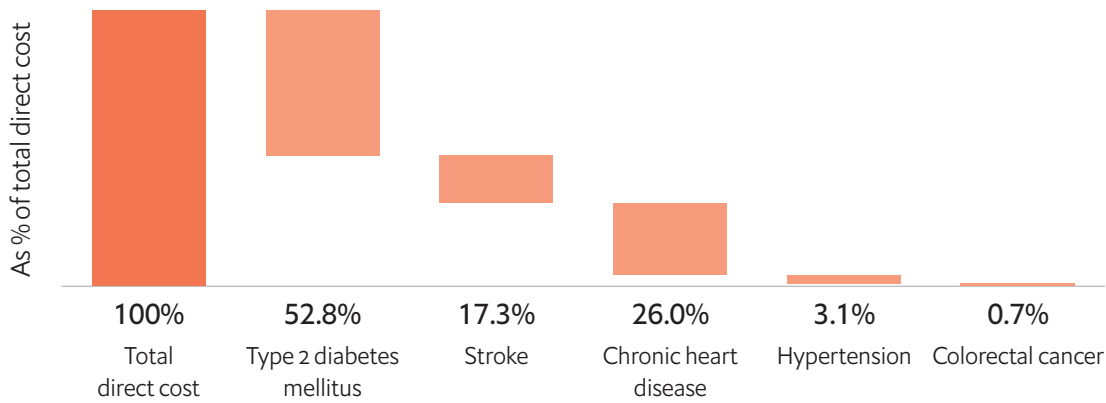


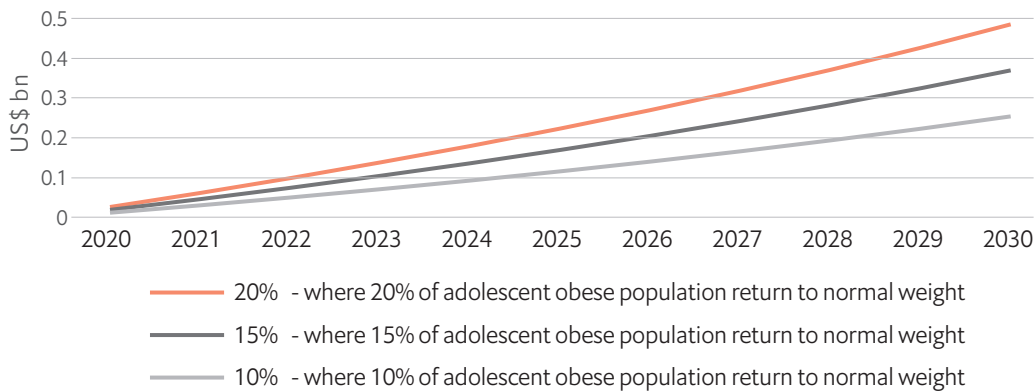


Figure 3: Comorbidities as percentage of the total direct cost in adults, Chile, 2020



If obesity rates among adolescents continue to rise as predicted, the cumulative cost over the next decade will amount to US\$2.6bn, which would account for almost 0.2% of Chile’s present day GDP. These staggering numbers illustrate the socioeconomic cost of inaction - only by taking steps today to reverse and reduce the prevalence of obesity in Chilean society can these costs be avoided.

Figure 4: Cumulative savings based on different intervention scenarios, Chile, US\$bn, 2020-2030





Country-level policy approaches

Chile has launched several policies and initiatives to reduce the obesity burden, but with modest results. The main reason is the decentralization aspect of the Chilean government system, where the federal government has limited power to implement these policies. However, there are good examples of government led policies and initiatives to stop the rising trend of obesity. One example is the *Eligir Vivir Sano* (Choose Healthy Living) programme, run by the Ministry of Social Development and supported by the Ministries of Health, Education, Labour and Social Welfare, Housing, Sport, and Finance. There are many policies under this programme, with the objectives of promoting healthy eating, sports, outdoor activities, family development activities and education, and communication measures. This programme is also a good example of how a multidisciplinary approach can help in successful implementation of health initiatives.²

As mentioned before, the administration of the Chilean government is decentralized, therefore executing population-wide health initiatives is the responsibility of the municipalities, which can make consistent implementation challenging. As an example of an initiative, Santiago, the capital of Chile, implemented *Juntos Santiago* (Together Santiago) with the objective of decreasing obesity in schools and neighbourhood communities. This programme encourages children, teachers and parents to compete and win prizes for completing healthy challenges.¹ There are also civil society led initiatives such as school-based interventions such as the programme *Contrapeso* (Counterweight), managed by JUNAEB (National Board of School Aid and Scholarships), which is responsible for the wellbeing of students. This programme includes measures such as restricting the sale of unhealthy food and beverages in schools while increasing the availability of healthy alternatives, wearable monitors of physical activity and increasing family involvement.¹

Another way to address adolescent obesity is directly through the healthcare system and primary caregivers. Chile has focused on a programme called *Vida Sana* (Healthy Lifestyle), a counselling and physical activity programme to improve physical activity and diet in children, adolescents and pregnant women who are living as overweight or obese and have other risk factors. It is a one-year programme, and the participants receive both individual and group advice from nutritionists and psychologists, along with guided classes with a teacher, physical activity therapist, and kinesiologist.¹

While there have been multiple policies and initiatives introduced by the government that are ambitious, these have clearly not had the intended effect given the rising trend in obesity. For these programmes to be successfully implemented, there is a need for increased engagement across Chilean society including patient groups, parents, teachers, school communities, food and beverage industries, and other civil society actors. Only by encouraging all stakeholders to take urgent action will Chile be able to pursue meaningful change and find policies and programs that produce the reduction in obesity they are aiming for.

Chile has implemented several policies to tackle adolescent obesity, including population- level initiatives and individual interventions. Few of the examples are listed as below: School-based interventions have been implemented through the programme *Contrapeso* (Counterweight), managed by JUNAEB (National Board of School Aid and Scholarships), which is responsible for the wellbeing of students. This programme includes measures such as restricting the sale of unhealthy food and beverages in schools while increasing the availability of healthy alternatives, wearable monitors of physical activity and increasing family involvement.¹



The Chilean federal authorities implemented regulatory measures to fight adolescent obesity. In 2016, a food labelling system was introduced in Chile to help the population make healthier food choices. This front-of-package system uses four black labels to indicate high values of calories, saturated fat, salt or sugar content as shown in Fig 5. It is a strategy to prevent childhood obesity and discourage children’s consumption of unhealthy foods.³ The labels determine where and how a product can be marketed and sold; for example, products that have these warning labels cannot be sold in schools or to children under 14 and cannot be given away for free or accompanied by presents or toys.⁴

Fig. 5: Food labelling system



Source: Ramirez, Sternsdorff, and Pastor (2016).

This regulation has already had a successful impact. The government found that 44% of consumers used the labels to compare products and 92% were encouraged to buy fewer of these healthier options or to choose different products. The new system also motivated the food industry to reformulate some products and introduce healthy alternatives.⁵

Also in 2016, Chile implemented regulations that restrict marketing of unhealthy foods in television programmes targeting children with characters, toys or other child-direct appeals. It was part of Chile’s multi-faceted effort to reduce the overall consumption of calorie-dense and low nutrition value foods. After the implementation of this regulation, a study showed that preschool children’s and adolescents’ exposure to such advertisements on television decreased by an average of 44% and 58%, respectively.⁶ However, limiting children’s and adolescents’ exposure to unhealthy foods by advertising regulations alone could not be effective in preventing obesity unless it is combined with other policies ultimately aimed at promoting health eating habits among children.

Finally, according to the Chilean National Food Consumption Survey of 2010-12, Chilean children consumed on average close to 500 ml of sugar-sweetened beverages (SSBs) per day. Chile was also at the top of the worldwide ranking per capita for daily SSB consumption in 2014.⁷ Sugar-sweetened beverages (SSBs) can contribute significantly to obesity in children and adolescents, so to address this issue in 1960 the government implemented the Additional Tax on Soft Drinks (Impuesto Adicional a las Bebidas Alcohólicas), which is an ad valorem tax that was fixed at 13% in 1976. In 2014, a modification increased the tax rate from 13% to 18% for beverages above an added sugar concentration of 6.25 grams per 100 ml.⁷ However, with regard to household purchases, the impact seen has been very small, with an overall decline of only 3.4% by volume. Much of this can be attributed to the tiered-tax structure that creates a price differential between low sugar content and high sugar content SSBs.⁹



A study conducted in a public school in Chile, aiming to identify eating habits and behaviours among adolescents, concluded that they have information about healthy vs. unhealthy eating and recognize the foods in each category. The challenge is to transform this knowledge into healthy habits.⁸ The 2013 Global School-based Student Health Survey showed that adolescents infrequently consumed healthy food. Food choices are often used to generate affinity and acceptance in a social group; for instance, adolescents commonly consume unhealthy foods when eating with friends at the mall.⁸

To address this issue and encourage adolescents to form new habits, the 5-a-day Chile Corporation, academic institutions and private sector organizations rolled out mass media campaigns in 2004 to promote the consumption of five portions of fruits and vegetables a day.¹

The campaign reached the population through a website, Twitter feed and advertising campaigns on radio and television. The campaign also included educational materials such as posters and leaflets in supermarkets, workplaces and schools.¹

While these programs all represent a strong effort to tackle the obesity crisis, there is unfortunately no available data to show what, if any, effect they have had on the rising obesity rate among adolescents. This underscores two issues - first that it is imperative to track data as new programmes are implemented in order to evaluate their efficacy, and second that while it is a positive sign that Chile has taken action to address the crisis, this action will only benefit adolescents at risk of or living with obesity if the programmes implemented actually provide useful tools. For Chile, the most crucial necessary change in strategy is to not only take action to combat rising obesity rates, but to take effective action.



The way forward

The Chilean government recognizes obesity to be a public health crisis and has implemented several advertising campaigns to counter the aggressive marketing of energy- dense, low- nutrition foods and beverages. The food labelling regulation implemented in 2016 has been particularly effective in enabling consumers make smart and informed choices when deciding between healthy and unhealthy foods.

However, marketing and advertising is just one aspect of the three-pronged approach listed in our framework for tackling obesity. In order to counter the rising challenge of obesity in the country, here are few additional measures that the government should focus on:

- **School-based interventions are critical to control the rise of obesity among children and adolescents.** These early interventions can have a significant impact on knowledge, attitude, and behaviour of the youth population. Options include restricting the availability of high-fat or high-sugar food in school canteens, investing more in physical activity infrastructure and making physical education a central part of the curriculum. The school-based program JUNAEB includes these measures. However, the program should be well-monitored in order to maximize its impact on children and adolescents. Target indicators should be defined and customized in each educational facility to improve the existing policy.
- **The administration of the Chilean government is decentralized and it is the role of municipalities to design and implement prevention and intervention policies at the regional level.** Hence, it is critical to form alliances between multiple stakeholders – including governments, municipalities, health organizations and patient advocacy groups, to create a supportive environment for the successful implementation of policies. As an example of best practices, the Eligir Vivir Sano programme (supported by the Ministry of Social Development and the Ministries of Health, Education, Labour and Social Welfare, Housing, Sport, and Finance) shows how multiple actors can work together to promote healthy eating, physical activity and awareness around the risks of obesity. More alliances like this are needed to address the burden of obesity in the country.
- **Physical activity plays an important role in preventing and reducing obesity. The government can promote a healthy and active lifestyle by improving access to exercise facilities, not only in schools, but also at the community level.** Programmes such as the Juntos Santiago, implemented in Santiago, can be replicated in other provinces to involve children, educators, and families in completing healthy challenges, thereby keeping the community well, active and informed.



- **Focus on education campaigns to raise awareness among the public.** In Chile, there is still a widespread misconception that, from a cultural perspective, equates obesity to high social status. This stigma can make it more challenging for those living with obesity to seek out the help they need. Simple awareness campaigns can help tackle complacency and promote transforming some of this knowledge into habits.
- **Policy monitoring is also essential to support and evaluate the obesity strategy in Chile.** There is a lack of understanding of the overall impact of existing policies on obesity and efforts at a national level are needed to accumulate data and solve this issue. For example, the Ministry of Health could evaluate and monitor these current policies to provide data and help create high-value best practices and guidelines for municipalities.



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COLOMBIA

TACKLING ADOLESCENT OBESITY IN LATIN AMERICA



Colombia, like many other South American nations, faces a dual crisis in regard to population nutrition. While historically low-income members of Colombian society have suffered from poor nutrition, in recent years there has been a rise in the prevalence of obesity. While Colombia's obesity rate is still lower than the regional average, it is nonetheless a rising trend, and therefore a matter of urgent concern. An increasingly obese population creates not only a healthcare challenge, but also an economic one, as the impact of obesity will cost Colombia billions of dollars over the next decade. The below analysis will illustrate the urgent nature of the obesity crisis while also looking at what steps Colombia has taken so far to address obesity, and what other actions are recommended to reverse or reduce the prevalence of obesity within the nation.



Country snapshot*

	2020	2030	2020-30 CAGR
Population (mn)	50.2	52.7	0.5%
Adult population (20+ years old, mn)	34.7	38.6	1.1%
Adolescent population (10-19 years old, mn)	8.1	7.3	-1.0%
Nominal GDP (US\$ bn)	256	533	7.0%
Annual per capita GDP (US\$)	6,345	11,602	6.2%
Dependency ratio %	32.3	28.8	----
Current healthcare spending (US\$ mn)	19,165	39,975	7.0%
Healthcare expenditure as % of GDP	7.5	7.5	----
Annual per capita health spending (US\$)	406	759	6.5%
Total annual cost per adult living with obesity (US\$)	644	871	3.1%

*Data based on EIU analysis

CAGR = Compound Annual Growth Rate

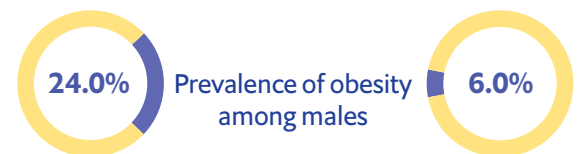
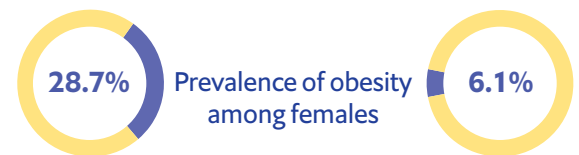
Prevalence of obesity, Colombia, 2020*

Adults

(20+ years old)

Adolescents

(10 - 19 years old)





Economic burden of obesity

According to our estimates, in 2020 the total cost of adult obesity in Colombia was US\$5.5bn. This number will only increase as the prevalence of obesity grows over time and is, in fact, expected to almost double over the next ten years, reaching up to US \$10bn by 2030 (see Figure 1). Obesity is on the rise not only among adults, but in the adolescent population as well. The cost attributable directly to the rise of obesity among adolescents will also double from US \$183mn in 2020 to US \$351mn2030 (See Figure 2).

Although Colombia has the lowest prevalence of obesity in adolescents among the three countries analyzed (with only 6% of its adolescent population facing that health condition, as opposed to Chile’s 14% and Brazil’s 9%), it faces the highest economic burden – the total cost of obesity in Colombia accounts for 2.14% of the current GDP (2020) and 28.5% of the total healthcare spending (2020).

Of the total obesity cost in Colombia, direct costs make up almost 90% of the total cost of obesity in Colombia. The five comorbidities that make up these direct costs are diabetes, hypertension, colorectal cancer, stroke, and chronic heart disease. Coronary heart disease is by far the most common comorbidity associated with adults living with obesity and makes up more than 50% of the total direct costs of obesity in adults (See Figure 3). Addressing this obesity crisis in Colombia would therefore significantly reduce the instances of coronary heart disease in the country, simultaneously reducing the direct cost associated with it.

If early, evidence-based, multidisciplinary interventions (behaviour and lifestyle changes, and medical treatment) were implemented for all adolescents living with obesity and if these interventions could help 20% of those adolescents achieve a healthy weight, Colombia would save over US\$0.6bn cumulatively between 2020 to and 2030 (see Figure 4), which would amount to more than 1% of the current economy of the country (in nominal GDP), quantifying the need to address adolescent obesity now. By using all possible interventions, Colombia has an opportunity to reverse adolescent obesity and thereby not only improve the quality of life for those individuals but also recoup significant savings over the next decade.

Figure 1: Total cost of adult obesity in Colombia, US\$bn by year, 2020-2030

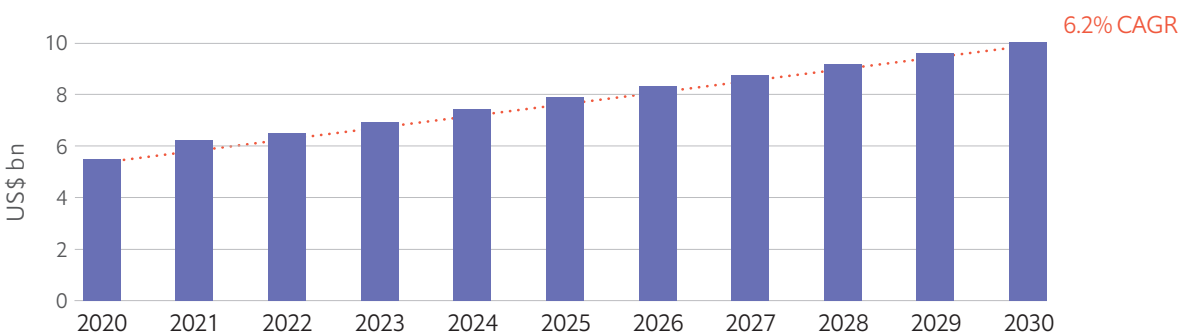




Figure 2: Costs attributable to adolescent obesity in Colombia, US\$m by year, 2020-2030

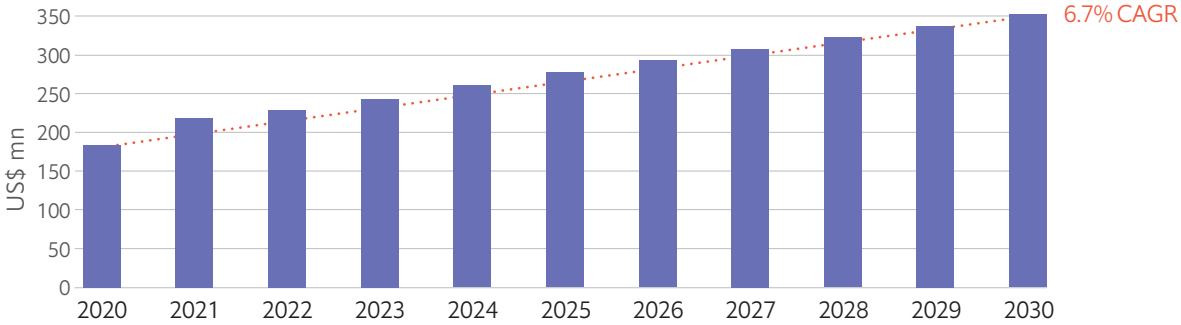


Figure 3: Comorbidities as percentage of the total direct cost in adults, Colombia, 2020

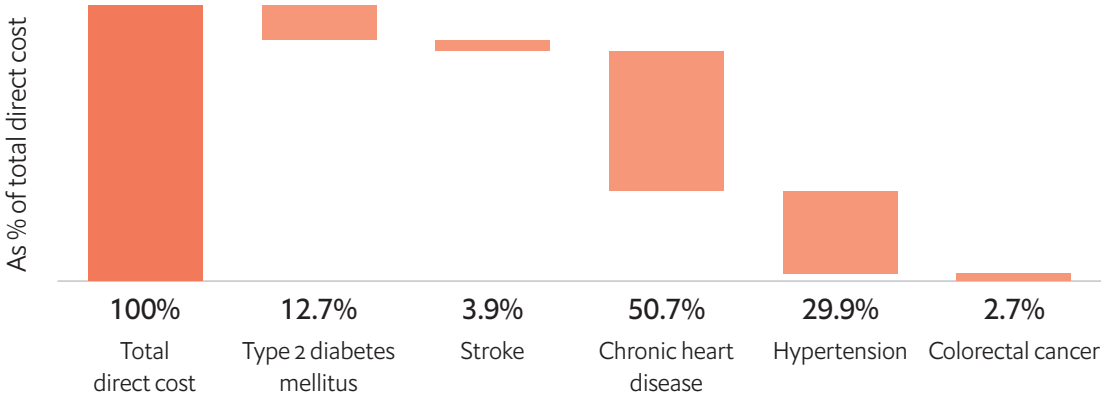
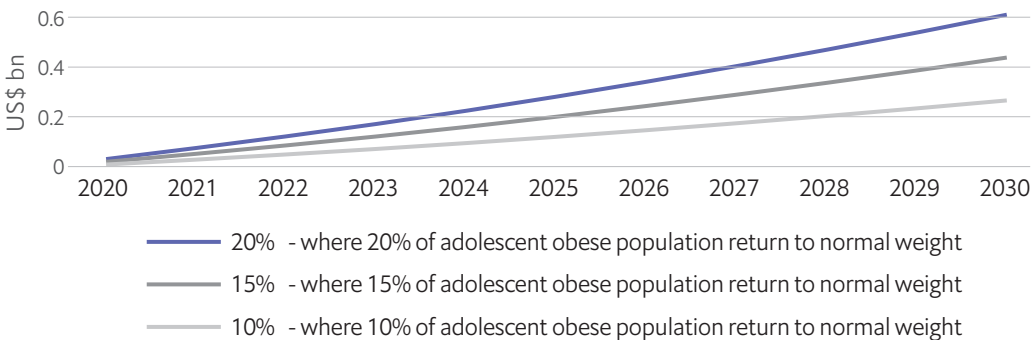


Figure 4: Cumulative savings based on different intervention scenarios, Colombia, US\$bn, 2020-2030





Country-level policy approaches

In Colombia, as in the rest of the Latin American region, the average BMI of Colombians has been on the rise.^{1,2} This issue is particularly common among low-income communities and people living in urban areas.² While historically it has been high-income members of society who have struggled with obesity, more recently a shift has occurred and obesity is now more prevalent among low-income communities. This is a well-documented trend as countries develop economically, and appears to affect women more than men.² This change can be attributed in part to the increased availability of low-cost, low-nutritional value foods that low-income members of society rely on as high-quality, because healthy food alternatives are often prohibitively expensive.²

It is not only unhealthy foods that have created this health crisis in Colombia - lack of physical activity has also had a detrimental effect on the public's health. The 2018 Report Card on Physical Activity for Children and Youth showed that only three out of ten Colombian children are achieving the recommended levels of physical activity, while six out of ten engage in excessive screen time.³

Colombia has launched initiatives and policies to combat this issue, but they came too late and have been timid so far. In 2009, Colombia approved Obesity Act 1355, whose central goal is to reverse inactivity and obesity trends by promoting healthy habits in schools, defining obesity as a public health priority and enacting measures for control, care and prevention.^{4,5} In addition, Colombia's 10-year Public Health Plan 2012-21 includes policies to address the nutritional habits of the population and to promote healthy lifestyles. The plan also has specific goals related to decreasing the burden of obesity.^{5,6} However, implementation depends largely on local governments, and periodic changes in leadership often reduce these policies to short-term initiatives.

In 2020, Colombia implemented front-of-package warning label for foods high in sugar, sodium and saturated fats,⁷ but according to one of our expert interviewees, the food industry in Colombia has significant political influence used to block the implementation of these sort of regulations despite the support of local community, academy and advocacy groups.

Colombia does not have an outreach strategy designed to specifically reach adolescents living with obesity, as pointed out by one of our experts in the interview, who noted that programmes targeting adults do not specifically address the challenges facing adolescents. Colombia would benefit from the development of mass media campaigns and other communication strategies that speak directly to adolescents, addressing the importance of healthy eating and physical activity.

The link between adolescent obesity and adult obesity often remains unacknowledged; many people believe that once adolescents living with obesity grow into adults, they will lose the additional weight. In fact, the opposite is true as adolescents living with obesity are significantly more likely to become adults living with obesity. It is therefore important to educate adolescents on the nature of obesity and help them form healthy habits early on in life that they can carry them with them into adulthood.



Colombian policy makers should pay attention to the importance of these policies and to the enforcement of their implementation, since they could bring significant cost savings. If multidisciplinary interventions were planned and implemented in tandem to focus on the reduction of adolescent obesity, Colombia could save almost \$1.4 billion over the next 10 years. This is 75% of what Colombia spends on coronary heart disease every year.



The way forward

Despite having the lowest obesity prevalence rate of the three countries analysed in our study, the impact of the disease is the largest as it accounts for almost 30% of the total healthcare spending. This is worrisome for Colombia as with the current trend the situation is going to worsen with the rising prevalence of obesity among adolescents and adults.

This study has demonstrated the economic benefit of early multidisciplinary interventions among adolescents living with obesity. Not only will such action have an impact on the individuals' future health and wellbeing, but it will also produce a substantial saving of more than US\$0.6bn over the period of the next ten years, which accounts for almost 0.2% of the current nominal GDP (2020). Hence, Colombia should act fast in order to avoid reaching the levels observed in Brazil and Chile, as these levels would put significant strain on its economy. Drawing on insights from our expert panel and interviews, and from a systematic literature review, this study has reached the following conclusions:

- **The burden that obesity places on the health systems and economies is highest in Colombia out of the three countries analyzed and it is expected to grow in the future if no immediate action is taken.** Rapid globalization has given rise to a multitude of changes in the country, including increased unhealthy lifestyle and food choices. The consequent rise in obesity puts an enormous burden on healthcare systems as countries struggle to provide for individuals living with chronic obesity-related conditions. If no action is taken to reverse the trend, the economies of these three nations will be put under significant strain.
- **Obesity increases the risk for coronary heart disease (CHD), a costly comorbidity. Our analysis suggests that CHD accounts for 50% of the total direct cost of obesity, making it by far the most expensive, and prevalent, comorbidity.** If the obesity rate continues to rise, so too will the cases of CHD, generating significant expense for countries already struggling with the obesity crisis.
- **Early recognition and targeting can slow the rate of adolescent obesity continuing into adulthood. Because most obesity-related health problems do not manifest until adulthood, adolescent obesity is not given the attention it deserves.** But half of adolescents living with obesity will continue to be obese in adulthood, so Colombia must address the issue early to prevent the development of comorbidities. Moreover, reversing this trend can result in cumulative savings of US\$ 0.6bn, which accounts for approximately 0.2% of the current nominal GDP (2020). School-based interventions need more attention from policy makers and higher investments, using multidisciplinary teams and enhanced surveillance. Parents and teachers and medical associations can use this economic impact model to make strong business cases for that purpose.



- **Regulation of marketing unhealthy food and non-alcoholic beverages and nutrition labelling can help to reduce obesity.** Colombia is lagging behind its peers when it comes to advertising and food labelling regulations. The country should follow good examples from Brazil and Chile, where patient advocacy groups and consumer defense organizations initiated conversations with food and sugary drink producers to point out to the importance of reducing unhealthy food advertisement and of implementing effective food labelling information, as well as coordinating with legislative and judiciary members to enforcement stricter regulations. Finally, important stakeholders could use this important tool to raise the discussion about the economic burden of obesity to prevent this disease among adolescent with the civil society, medical associations, patient advocacy and consumer defense groups and policy makers.



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