

The Case for Investment in Prevention and Control of Noncommunicable Diseases in Jamaica:

Evaluating the return on investment of selected tobacco, alcohol, diabetes, and cardiovascular disease interventions



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Executive Summary

Noncommunicable diseases (NCDs) are a major driver of morbidity and mortality in Jamaica. Beyond the toll on health, NCDs also impose a significant burden on the national economy since individuals with NCDs are more likely to exit the labor force, miss days of work, and/or work at reduced capacity. In addition, high expenditures to treat NCDs impose a *direct* economic burden to the health system, the society and to the nation of Jamaica, which can lead to reduced investments in areas like education and physical capital, which increase gross domestic product (GDP) in the long run. Unless urgently and adequately addressed, the health and economic burden of NCDs will continue to rise.

To help strengthen Member States' capacity to generate and use economic evidence on NCDs, the Pan American Health Organization (PAHO) partnered with the Ministry of Health of Jamaica, the World Health Organization (WHO), the United Nations Development Programme (UNDP), and RTI International to develop an *Investment Case for NCDs* in Jamaica.

This project aims to develop evidence and guidance to support the development, financing and implementation of national multisectoral NCD prevention and control strategies. Specifically, it estimates the return on investment (ROI) from implementing priority policy interventions for tobacco and alcohol control, as well as clinical interventions to reduce NCDs, more specifically cardiovascular disease (CVD) and diabetes. It also evaluates the political feasibility of putting these interventions into practice.

Overall, the results indicate that investing in the prevention and control of NCDs would support the Government of Jamaica to avoid significant direct costs and indirect economic losses. Over the period 2017 to 2032, scaling up the recommended package of interventions would at a minimum:

- Save over 5,700 lives and restore over 67,400 healthy life years
- Avoid labor productivity losses of over 47.3 billion Jamaican dollars (JMD)
- Save over 29.8 billion JMD of direct medical costs to treat diseases
- Grow GDP by an extra 0.11 percentage points by year five alone

The costs to achieve these significant results would be far less than the return. Overall, the model calculates a minimum ROI of 2.10 (a 2.10 JMD return for every dollar invested) for implementing the selected package of interventions. Thus, the modeled priority interventions offer a cost-effective path toward Jamaica's 4-year goal to grow the economy by 5%, and general well-being (GWB). The interventions also support specific national objectives, not least universal health coverage.

It should be noted that the focused nature of the case *underestimates the true costs associated with NCDs in Jamaica*: only 17 out of the 88 interventions cited in the updated Appendix 3 of the WHO Global NCD Action Plan 2013-2020 are modeled; cancer and chronic respiratory disease interventions are not considered; not all the health benefits of the interventions (for example, the impact of tobacco control policies on lung cancer or chronic respiratory diseases) are accounted for; and for alcohol policies, only the economic impact of averted mortality is included (the benefits of reducing absenteeism and presenteeism are not) due to methodological limitations.

I. Introduction

The Pan American Health Organization (PAHO) has partnered with the United Nations Interagency Task Force Secretariat (UNIATF) on NCDs to develop a series of *Investment Cases for NCDs* within the region of the Americas to help strengthen Member States' capacity to generate and use economic evidence on NCDs. The Investment Case for NCDs in Jamaica was conducted in collaboration with the Ministry of Health of Jamaica, the World Health Organization (WHO), the United Nations Development Programme (UNDP), and RTI International.

Noncommunicable Diseases: A Threat to Sustainable Development

In Jamaica, nearly four out of five individuals die from NCDs, and a 30-year-old has a 17% chance of dying prematurely from any of the four main NCDs (cardiovascular disease, diabetes, chronic respiratory disease, and cancer) before reaching his or her 70th birthday [1]. The impact of NCDs goes beyond health, and their economic and social effects are staggering.

Jamaica spends about 15% of its health budget on the four main NCDs [2, 3]. These high expenditures impose a *direct* economic burden on the country and reduce investments in education and other investments, which increase GDP in the long run. The economic burden of NCDs also stems from *indirect* sources. Poor health reduces productivity by permanently or temporarily removing individuals from formal or informal labor markets. When individuals die prematurely, the labor output that they would have produced in their remaining years is lost. In addition, individuals with NCDs are more likely to miss days of work (absenteeism) or to work at a reduced capacity while at work (presenteeism). A previous study estimates that over the period of 2015-2030, the total losses associated with NCDs and mental health conditions in Jamaica exceed US\$ 18.45 billion [4].¹

At the individual and household levels, NCDs represent diminished quality of life (along with productivity) and lengthy and expensive treatments that can rapidly drain household resources and divert resources away from food, education, and savings [5]. At a population level, these trends can result in poverty traps.

The 2030 Agenda for Sustainable Development, adopted at the United Nations Summit on Sustainable Development in September 2015, recognizes NCDs as a major challenge for sustainable development. Specifically, Target 3.4 of the SDGs calls for a one-third reduction in premature mortality from NCDs by 2030 through prevention and treatment and promoting mental health and well-being [6]. Target 3.a seeks to address a leading NCD risk factor—tobacco use—through strengthened implementation of the WHO FCTC in all countries, as appropriate. Other important targets addressing NCD risk factors include SDG 2.2, ending malnutrition, and 3.5, preventing harmful use of alcohol.

WHO Best Buy NCD Policies

NCDs are largely preventable, and proven solutions to reduce the burden of NCDs exist at both the clinical and policy levels. In recognition of the tremendous health and economic toll of NCDs and mental health

¹ Total economic losses of NCDs and mental health is given by the difference between gross domestic product (GDP) values of *counterfactual scenario* (assumes complete elimination of NCDs and mental health at no cost) and the *status quo scenario* (NCD prevalence evolves as expected without any interventions).

conditions, in 2013, the World Health Assembly endorsed the World Health Organization (WHO) Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020, along with a set of nine voluntary global targets to be achieved by 2025 (see Figure 1 below) [7].

Figure 1: Global Voluntary NCD Targets



To assist Member States in achieving these targets, the Global Action Plan also offers a road map and a menu of cost-effective policy options for reducing the burden of NCDs (often referred to as “Appendix 3”). This road map offers a list of options for each of the four key risk factors for NCDs (tobacco use, harmful use of alcohol, unhealthy diet, and physical inactivity) and for four disease areas (cardiovascular disease, diabetes, cancer, and chronic respiratory disease).

In May 2017, the 66th World Health Assembly endorsed updates to the menu of policy options to take into consideration the emergence of new evidence of cost-effectiveness or new WHO recommendations since the adoption of

the Global Action Plan in 2013. The recommended interventions and policies increased from 62 in 2013, to 88 interventions. Of these 88 interventions, 15 are highlighted as most cost-effective² and most feasible for implementation (often referred to as "best buys") [8]. Of note, the majority of the 88 cost-effective interventions require the assistance of government sectors beyond health.

Acknowledging that the cost and effectiveness of NCD interventions may vary according to a country’s epidemiological and socioeconomic profiles and the potential for successful implementation affected by local political and institutional contexts, the updated menu of policy options urges Member States to supplement the global guidance with country-specific economic analyses and to take into consideration non-economic factors.

Investment Case Overview

The NCD investment cases seek to help policy makers understand the expected benefits and costs from investing in NCD interventions in their respective countries. Generally, a country “investment case” consists of a combined economic analysis and institutional context analysis.

² Average cost-effectiveness ratio ≤ I\$100/DALY in low- and middle-income countries. DALY = disability adjusted life-year, a measure of quality and quantity of life.

The economic analysis evaluates the country-specific costs and benefits of scaling up a selected package of priority policy options presented in the WHO Global Action Plan.³ By providing policymakers with return of investment (ROI) estimates for individual interventions, the economic analysis also aims to inform prioritization of national NCD interventions.

The economic analysis is complemented by an institutional context analysis (ICA), developed to understand the diverse range of institutions, actors and stakeholders relevant to NCDs in a given context. The ICA recognizes that policy decisions often consider more than cost-effectiveness data alone. Thus, the ICA aims to uncover the most promising policy pathways in line with national circumstance. Globally, under the work program of the UNIATF, the WHO and UNDP have carried out Investment Cases for NCDs in six countries.

II. Situational Analysis & Progress in Implementation of WHO Best Buys

This section provides a brief overview of the NCD situation in Jamaica. It includes summaries on the epidemiological situation and status of implementation of related WHO Best Buys⁴ of the four main NCDs (although the ROI analysis is only conducted for cardiovascular and diabetes interventions), and their four main risk factors (although the ROI is only conducted for tobacco and alcohol interventions).

The Epidemiological Burden of NCDs

Jamaica has made significant progress on its NCD response, both in health service provision and multisectoral action for population prevention. However, NCDs continue to pose a major and growing public health challenge in Jamaica. In 2011, 79% of premature deaths are attributable to NCDs. Despite progress made, Jamaica is not on track to meet the overall regional NCD goal of a 15% reduction in premature mortality by 2019 [10]. Jamaica's high rate of NCDs is driven by dramatic increases in modifiable risk factors that cause NCDs. Additionally, population aging, which is causing a demographic shift, is also fueling the growth in NCDs. The following sub-sections provide an overview of the four main NCDs: cardiovascular disease, diabetes, chronic respiratory disease, and cancer.

Cardiovascular Diseases (CVD)

In 2014, diseases of the circulatory system claimed 6,476 out of the 19,557 total lives lost in Jamaica, or roughly 33% of all deaths. Previous studies have documented a high prevalence of CVD risk factors, including high blood pressure and elevated cholesterol in the Jamaican population. A total of 31.7% of Jamaicans aged 24 years and older have hypertension (SBP \geq 140 mmHg) and 2.9% have elevated total cholesterol (\geq 6.2 mmol/L). Higher prevalence rates of both metabolic risk factors are seen in women; 32.8% have hypertension and 3.9% have high cholesterol, compared to 30.6% and 1.9% of men [11].

³ The economic analysis of the investment case is conducted using the WHO OneHealth Tool (OHT) and WHO CHOICE costing tools.

⁴ Unless otherwise noted, the status of implementation of related WHO Best Buys is based on the 2017 Noncommunicable Diseases Progress Monitor [9].

Table 1: Current state of implementation of CVD Best Buys

Best Buy	Description	Current state in Jamaica
Country has provision of drug therapy (including glycemic control for diabetes mellitus and control of hypertension using a total risk approach), and counselling to individuals who have had a heart attack or stroke and to persons with high risk ($\geq 30\%$, or $\geq 20\%$) of a fatal and non-fatal cardiovascular event in the next 10 years	More than 50% of primary health care facilities are offering cardiovascular risk stratification for the management of patients at high risk for heart attack and stroke and that all drugs listed above were generally available in the primary care facilities of the public health sector: insulin, aspirin, metformin, thiazide diuretics, ACE inhibitors, CC blockers, statins, and sulphonyl urea(s).	2017 Progress monitor status: Not Achieved In the second Jamaican Life and Health survey (2008), 49.3% of those with high blood pressure indicated that they were unaware of their condition, while 86% of those with high cholesterol were unaware [11]. Of those aware of their risk and actively receiving treatment for high blood pressure and cholesterol, only 41.4% of those receiving treatment for high blood pressure, and 76.3% of those receiving treatment for cholesterol had these risk factors under control [12].

Diabetes

Among adults aged 25 years or older, an estimated 9.5% of males and 13.3% of females have diabetes. The prevalence of diabetes increases significantly with age. Around 16% of individuals aged 45-54 years have diabetes, compared to 22% of those aged 55-64 years and 31.3% of those aged 65-74 years [11]. Based on current estimates, the levels of diabetes are expected to rise because levels of overweight and obesity remain high [10].

Chronic Respiratory Diseases

Globally, some of the most common chronic respiratory diseases are asthma, chronic obstructive pulmonary disease (COPD), occupational lung diseases and pulmonary hypertension. Estimates for Jamaica indicate a 7% prevalence of asthma among Jamaicans aged 15-74, and a prevalence of 12.1% among adults aged 40 and above [12, 13].⁵

Cancer

Cancer is the second leading cause of death in Jamaica, with an estimated 3,502 deaths occurring in 2014 [14]. Prostate cancer among men, and breast and cervical cancer among women are the leading cancer types. Cancer screening is offered in primary care clinics for cervical cancer, for women aged 18 years and over using the Pap test and both visual inspection with acetic acid and Pap test in the Southern Health Region; and for breast cancer, using clinical breast exams opportunistically. Cancer diagnosis, treatment and palliative care services are generally available in the public sector. The Jamaica Ministry of Health, through its Strategic Plan for NCD and Cancer Prevention and Control (2013-2018), has included several objectives, activities and indicators for primary cancer prevention (tobacco, alcohol, physical activity, fruit and vegetable consumption), and secondary cancer prevention (medical interventions for cervical cancer, breast cancer, prostate cancer, and colon cancer). Population-based cancer registry information is currently collected by, and available from the Jamaica Cancer Registry for Kingston and St. Andrew parish, located in the Department of Pathology at the University of West Indies.

⁵ Asthma estimates based on self-reported data.

Table 2: Current state of implementation of Cancer Best Buys

Best Buy	Description*	Current state in Jamaica
Vaccination against human papillomavirus	Vaccination against human papillomavirus (2 doses) of 9–13-year-old girls (at a national level)	In 2017, Jamaica reported that there is no national HPV vaccination program.
Prevention of cervical cancer by screening women, either through visual inspection with acetic acid, pap smear, or human papillomavirus test	Prevention of cervical cancer by screening women aged 30–49 years, either through: <ul style="list-style-type: none"> > Visual inspection with acetic acid linked with timely treatment of pre-cancerous lesions > Pap smear (cervical cytology) every 3–5 years linked with timely treatment of pre-cancerous lesions > Human papillomavirus tests every 5 years linked with timely treatment of pre-cancerous lesions 	Jamaica reported organized population-based cervical cancer screening for women aged 18 years and older through pap smears. There is also visual inspection with acetic acid along with Pap smears in Southern Health Region. A 2008 survey indicates that 71.3% of young women (15–24 years) reported never doing a Pap smear while approximately 20% of Jamaican women aged 25–54 years reported having a Pap smear in the last year [12].
* Unless otherwise noted, information and language in this table is derived from the forthcoming publication of 2017 Country Capacity Survey Results [15]. 2017 Noncommunicable Diseases Progress Monitor does not track implementation of Cancer Best Buys [9].		

The Burden of NCD Risk Factors

An important way to control NCDs is to focus on reducing the modifiable risk factors associated with these diseases; tobacco use, harmful use of alcohol, physical inactivity and unhealthy diet. In fact, many of the policy options to prevent and control NCDs outlines in the road map focus on these four modifiable key risk factors. The following sub-sections provide an overview of the prevalence and status of implementation of related best buys.

Tobacco Use

Tobacco use is the only common risk factor that is shared by the four main NCDs. Findings from the 2016 National Drug Use Prevalence Survey indicate that 11 % of Jamaicans are considered “current smokers,” meaning that they have smoked tobacco within the previous month, and 7% are considered daily users, meaning that they smoke daily. The prevalence of tobacco use is higher in men than in women. Only 5.3% of women are considered current smokers, compared to 16.8% of men [16]. Moreover, tobacco consumption prevalence among youth (aged 13–15) is the highest in the Region, at 28.7% [17]. Table 3 summarizes the current state of implementation of tobacco control Best Buys in Jamaica.

Table 3: Current state of implementation of Tobacco Control Best Buys

Best Buy	Description*	Current state in Jamaica
Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places, public transport	All indoor public places (health care, educational, and government facilities) and workplaces and public transport are completely smoke-free (or at least 90% of the population is covered by subnational legislation).	2017 Progress monitor status: Fully achieved Although smoking is banned in all enclosed and other specified public places and workplaces, the restrictions are followed with moderate to high compliance: except for in hotels, cafes, bars, and pubs, where compliance with the law remains exceedingly low.
Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages	Mandated plain/standardized packaging (does not allow for the use of logos, colors, brand images, or promotion information other than the brand and product names) and/or large graphic warnings (average of at least 50% coverage on the front and back of the package).	2017 Progress monitor status: Fully Achieved By law, it is required that 60% of all tobacco product packages be covered in health warnings (text, photos) that describe harmful health effects of tobacco. No law exists mandating plain packaging.
Implement effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second-hand smoke	Implemented a national anti-tobacco mass media campaign designed to support tobacco control (including increase knowledge about smoking and its effects) of at least 3 weeks duration, with 7 out of the following characteristics:	2017 Progress monitor status: No Response Each year World No Tobacco Day is commemorated by the Ministry of Health in collaboration with Civil Society and Jamaica Tobacco Coalition host school competition,

	(1) campaign was part of a comprehensive tobacco control program; before the campaign, research was undertaken or reviewed to gain a thorough understanding of the target audience; (2) campaign communications materials were pre-tested with the target audience and refined in line with campaign objectives; (3) air time (radio, television) and/or placement (billboards, print advertising, etc.) was obtained by purchasing or securing it using either the organization’s own internal resources or an external media planner or agency (this information indicates whether the campaign adopted a thorough media planning and buying process to effectively and efficiently reach its target audience); (4) the implementing agency worked with journalists to gain publicity or news coverage for the campaign; (5) process evaluation was undertaken to assess how effectively the campaign had been implemented; (6) an outcome evaluation process was implemented to assess campaign impact; (7) the campaign was aired on television and/or radio.	leadership workshop. A school-based program is ongoing under the Healthy Youth Positive Energy (H.Y.P.E. program) and National Council on Drug Abuse.
Enact and enforce comprehensive bans on tobacco advertising, promotion, and sponsorship	Complete bans all forms of direct and indirect tobacco advertising, promotion and sponsorship. Direct advertising bans include: national television and radio; local magazines and newspapers; billboards and outdoor advertising; point of sale. Indirect advertising bans include: free distribution of tobacco products in the mail or through other means; promotional discounts; non-tobacco products identified with tobacco brand names (brand stretching); brand names of non-tobacco products used for tobacco products (brand sharing); appearance of tobacco brands (product placement) or tobacco products in television and/or films; and sponsorship (contributions and/ or publicity of contributions).	2017 Progress monitor status: Not Achieved Advertising is banned on TV and radio, but not in print media, on billboards, on the internet, or at the point of sale. In addition, there are no bans on indirect advertising (e.g., free distribution, promotional discounts, product placement).
Increase excise taxes and prices on tobacco products	Total taxes (including excise tax, value added/sales tax, import duties (where applicable) and any other taxes levied) set at a level that accounts for more than 75% of the retail price of tobacco products [9].	2017 Progress monitor status: Not Achieved Tobacco taxes have increased annually since 2015, with total tobacco tax share currently at 44.5% and the total excise tax rate currently at 28.3% (2017 Global Tobacco Epidemic Report). This is below the WHO recommended tobacco excise tax share of 70% and the 75% total tobacco tax share specified in the Progress Monitor and WHO Global Tobacco Epidemic Report.
* Unless otherwise noted, information and language in the ‘Intervention Description’ column is derived from the WHO Report on the Global Tobacco Epidemic [18].		

Harmful Alcohol Use

The 2016 National Drug Use Prevalence survey indicates that alcohol continues to be the most widely used drug in Jamaica. Approximately 40% of the population report being current drinkers and 75% report that they used alcohol at some time in their lifetime. Nearly 15% of Jamaicans are at medium to high risk of alcohol dependence. Heavy episodic drinking is disproportionate among men and women. About 23% of males (vs. 9.9% of females) indicated that they had participated in “binge” drinking in the previous two

weeks or that they drank more than four drinks⁶ on the average drinking occasion, and these drinking patterns would be of high risk for harmful use of alcohol as well [16].⁷

Note that in addition to the three “Best Buy” modeled interventions, drink-driving laws and brief psychosocial interventions at a primary health care level have also been classified as cost-effective interventions in the Updated Appendix 3 and could in the future be modeled.

Table 4: Current state of implementation of Alcohol Control Best Buys

Best Buy	Description *	Current state in Jamaica
Enact and enforce restrictions on the physical availability of retail alcohol	Enacted restrictions to physical access to retail alcohol through: (1) a licensing system or monopoly on retail sales, (2) restrictions in on-/off-premise hours and days of sales, and (3) legal age limits for being sold and served alcoholic beverages. ⁸	2017 Progress monitor status: Partially Achieved The Spirit License Act does not regulate the number or location of alcohol outlets [19]. Regarding location, it states only that licenses can be refused if the premises “cannot be kept under effective police control” are “unfit,” or if the business may be a “nuisance” to the surrounding neighborhood (p. 24). Regarding the number of outlets, the Act states that licenses can be denied if “the needs of the neighborhood” are already met” (p. 25). Power is given to the Minister to regulate the days and hours of retail sales (p. 33), but we do not find definitive times enshrined in law.
Enact and enforce bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media)⁹	Enacted regulatory or co-regulatory frameworks ¹⁰ for alcohol advertising through different channels (public service/national TV, commercial/private TV, national radio, local radio, print media, billboards, points of sale, cinema, internet, and social media). As well as a detection system for infringements on marketing restrictions.	2017 Progress monitor status: Not Achieved 1) The Television and Sound Broadcasting Regulations prohibit advertisements from portraying the consumption of alcoholic beverages, but we do not find additional regulations that restrict the content and volume of advertising [20]. 2/3) We do not find evidence specifying the existence or effectiveness of surveillance systems and deterrents. The Jamaica Broadcasting Commission is the entity that monitors for any breaches. However, the Broadcasting Regulations prescribe fines and imprisonment for violations of the regulations therein [20].
Increase excise taxes on alcoholic beverages	Excise tax on all alcoholic beverages (beer, wine, and spirits) is implemented, there are no tax incentives or rebates for production of other alcoholic beverages, adjustment of level of taxation for inflation for beer, wine, and spirits is implemented.	2017 Progress monitor status: Partially Achieved In March 2017, the government approved a 9.8% increase of the existing alcohol excise tax, raising the tax per pure liter of alcohol to 1,230 JMD.
* Unless otherwise noted, information and language in the Intervention Description column is derived from the Noncommunicable Diseases Progress Monitor, 2017 [9].		

Unhealthy Diet & Physical Inactivity

Unhealthy diet is one of the main risk factors for high blood pressure, raised blood glucose, and overweight or obesity, and is associated with cardiovascular disease, cancer and diabetes. Similarly, low levels of physical activity are a strong predictor of obesity, diabetes, and cardiovascular disease.

⁶ One standard drink = vodka 25 ml, beer 330 ml, wine 100 ml. Note that these are not equivalent; 100 ml of wine is 9.5 g of pure alcohol while the 25 ml of vodka is 12.6 g and beer is 13 g.

⁷ Data from the national survey differ from the data from the Global Status Report (2014) on Alcohol and Global School Health Survey done in Jamaica (2006). Particularly, the Jamaican National Drug Use Prevalence survey uses a different definition of harmful use of alcohol, which may underestimate estimates for harmful use of alcohol prevalence.

⁸ Additional measures to regulate access include: regulating the number and location of on-premise and off-premise alcohol outlets; regulating modes of retail sales of alcohol; regulating retail sales in certain places or during special events; and adopting policies to prevent sales to intoxicated persons [19].

⁹ Note that although promotions and sponsorships are not included in this definition of this best buy, they are a critical part of the control of alcohol marketing.

¹⁰ Regulatory frameworks should seek to regulate: the content and the volume of marketing; direct or indirect marketing in certain or all media; sponsorship activities that promote alcoholic beverages; promotions in connection with activities targeting young people; and new forms of alcohol marketing techniques, for instance social media [19].

Estimates indicate that in 2014, 48% of male and 63.4% of female adults in Jamaica respectively, were overweight or obese. Moreover, in 2010, the prevalence of insufficient physical activity in adults was estimated at 31.8% [21]. In terms of unhealthy diet, according to the latest Jamaica Health and Lifestyle Survey, the vast majority, or 99% of Jamaicans are currently consuming below the daily recommended portion of vegetables, and roughly 55% of the population consumes one or more bottle/glass of sweetened beverage per day [12].

Table 5: Current state of implementation of Unhealthy Diet and Physical Inactivity Best Buys

Best Buys	Description*	Current state in Jamaica
Reduce salt intake through: (1) the reformulation of food products to contain less salt; (2) establishment of a supportive environment in public institutions to provide lower sodium options; (3) communication and mass media campaign; (4) implementation of front-of-pack labelling	Implementation of national policies to reduce population salt/sodium consumption, including reformulation of food products; establishment of a supportive environment in public institutions to enable lower sodium options to be provided; behavior change communication and mass media campaigns; and front-of-pack labelling.	2017 Progress monitor: Fully Achieved In 2017, Jamaica reported the implementation of public awareness programs and regulation of salt content of food (through government legislation) citing the Food and Nutrition Security Policy of 2013.
Implement community wide public education and awareness campaign for physical activity which includes a mass media campaign combined with other community-based education, motivational, and environmental programs aimed at supporting behavioral change of physical activity levels	Implementation of at least one recent (within the past 5 years) national public awareness program on physical activity.	2017 Progress monitor: Fully Achieved In April 2017, the Jamaica Moves campaign was launched. Jamaica Moves features physical activity but also includes attention to screening and healthy eating as well as a communications campaign with celebrity support. Despite the progress made, challenges in infrastructure, including a limited number of parks, undeveloped and not well-lit or maintained parks/reserves, and inadequate sidewalks for physical activity, continue to prevent higher levels of physical activity.
* Unless otherwise noted, information and language in the Intervention Description column is derived from the Noncommunicable Diseases Progress Monitor, 2017 [9].		

Institutional Context

Jamaica is conducive to an even stronger NCD response and health remains high on the public agenda. The current administration gives dual attention to (1) job creation and economic growth (gross domestic product; GDP) and (2) healthy, educated and “socially well-adapted” citizens (general well-being; GWB). The environment is particularly conducive as the Prime Minister called specific attention to NCDs in a March 2017 budget speech and within the context of Jamaica moving forward in prioritizing universal health coverage (UHC) for all Jamaicans.¹¹

Underpinning momentum on NCDs in Jamaica is strong commitment, technical capacity, and institutional memory across MoH units. Moreover, the “non-health” sectors in Jamaica display a higher than average level of sensitization and understanding of NCDs, including as a multisectoral issue that matters for sustainable development.¹² There is near-unanimous willingness and readiness to support a strengthened NCD response in line with national priorities. In fact, multiple stakeholders expressed pride in Jamaica’s *international* role in NCD prevention and control, including its leadership in CARICOM and raising global awareness of NCDs as a development challenge in the 2011 Political Declaration.

¹¹ Contribution to the 2017/18 Budget Debate by Prime Minister Andrew Holness. Available at: <http://jis.gov.jm/contribution-prime-minister-andrew-holness-201718-budget-debate/>.

¹² For example, many sectors mentioned the WHO FCTC without provocation.

To support implementation of investment case findings, Jamaica has a multisectoral NCD committee with 8 sub-committees. However, as of the ICA mission, only some sub-committees were active and the committee *in full* has not held a meeting since May 2014. Encouragingly, the committee is being re-activated and will come to term again soon as a Commission or Taskforce. Even with the full NCD committee not fully active, coordination on NCDs between sectors in Jamaica is fairly strong, and the health ministry has built good relationships with colleagues across sectors.

NCDs and other national priorities in Jamaica

Guided by Jamaica’s Vision 2030, the country is highly focused on growing the economy, specifically employment and productivity. Last year the Prime Minister decreed an ambitious goal to grow Jamaica’s GDP by five percent in four years (known as ‘5 in 4’). The results support the framing of NCD action as a driver of national prosperity. Beyond Jamaica’s economic priorities, the country is focused on crime reduction (“biggest social issue”), combatting violence including interpersonal violence, gender-based violence and child abuse, and climate action/the greening of policies. NCD prevention and control can deliver co-benefits across these national priorities.¹³

III. Economic Analysis

The economic analysis evaluates the cost and benefits of select WHO-recommended policies and clinical interventions. This section provides an overview of the methodology used to conduct the economic analysis, a description of the interventions modeled, and the results of the analysis.

Overview of Methodology

There are five main methodological steps in the economic analysis component of the investment case. Figure 2 provides an overview of these steps, and additional detail on each step is provided below.

Step1: Selecting Interventions. A joint programming mission to Jamaica¹⁴ was undertaken in March 2017 to conduct an investment case analysis. During this mission, in collaboration with the Ministry of Health, the interventions for the economic analysis were selected, baseline levels for the interventions were determined and scale up targets were established.

Inclusion of NCD interventions was guided by: (1) the list of “best buys” (or cost-effective interventions) outlined in the WHO Global Action Plan, (2) ongoing country priorities and initiatives, and (3) available programmed interventions in the analytical models used (WHO OneHealth Tool and WHO Costing Tool). The *Modeled Intervention* subsection provides an overview of the specific of interventions analyzed in this investment case, along with target and baseline levels. Clinical diabetes and CVD control interventions as well as tobacco and alcohol policy interventions were selected for analysis.¹⁵

¹³ For example: combatting illicit tobacco trade including gang involvement can support crime reduction; reducing harmful use of alcohol can reduce interpersonal violence; increasing walking and cycling can reduce carbon emissions; and getting sugary drinks out of schools can protect children.

¹⁴ Consisting of Jamaica’s Ministry of Health, the Pan American Health Organization, United Nations Development Programme, the World Health Organization, and RTI International.

¹⁵ An analysis of selected Mental Health Interventions is underway.

Unfortunately, despite the fact that cancer, unhealthy diet, and physical inactivity are areas of priority for the Ministry of Health of Jamaica and that the WHO Global Action Plan includes related Best Buys (see section II, *Situational Analysis & Progress in Implementation of WHO Best Buys*), the WHO OneHealth Tool (OHT) did not have the capability to include interventions related to these priority areas at the time of the analysis. There are ongoing efforts to expand and improve the collection of interventions available for inclusion in NCD Investment Cases.

Step 2: Assessing Cost of Interventions. An ingredients-based approach, whereby each resource required for the intervention is identified and valued, was used to cost both policy and clinical interventions.

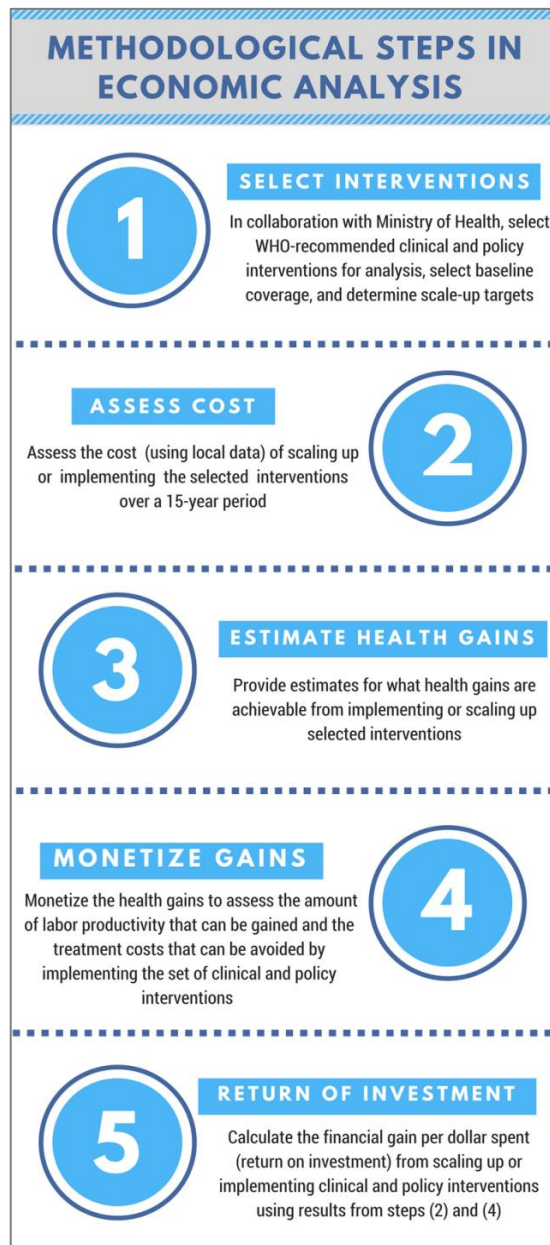
To calculate the total costs for clinical interventions, the OHT¹⁶ was used. This tool estimates costs by calculating the additional number of people (in need of care) that each intervention will reach multiplied by the per person resource needed for the intervention times the unit price of the resource.

For costing policy interventions, the WHO Costing tool was used. This tool uses a similar ingredients-based approach to calculate cost for policy interventions. As part of this tool, each resource that is required to implement and enforce policies was identified and quantified by WHO experts.

In collaboration with the Jamaican Ministry of Health, the WHO clinical care protocols were reviewed and, when relevant, modified to reflect Jamaican standard levels of care. Jamaican specific costs of drug supplies and human resources were used in the analysis.

Step 3: Assessing Health Benefits. To assess the benefits of implementing or scaling up health interventions, the OHT was used to model the number of disease cases averted, healthy years gained, and lives saved over a 15-year period. OHT is customizable, meaning users can input data that reflects a country's health services, local costs, coverage levels of interventions, prevalence and incidence rates of

Figure 2: Steps in economic analysis



¹⁶ Version 4.54 Beta 4.

NCDs, and demographic composition. All Jamaican inputs were fed into OHT, and then run with the Tool's existing cost and benefit modules to provide the benefits of both clinical and policy interventions.

Taking CVD as an example: To evaluate benefits, the OHT looks at a baseline scenario, and assesses how many CVD events would occur among the population and how many deaths would result. It then assesses how scaled up CVD clinical and policy interventions will reduce the probability that a person will transition from a disease-free state to a disease state (IHD, stroke) or die from disease. The benefits of scaling CVD clinical and policy interventions are therefore calculated as how many CVD events and deaths are averted.

Step 4: Monetizing Benefits. In this exercise, the expected health benefits—avoided incidence and deaths—are translated into economic gains through modeling the value of increased labor productivity derived from improved health.

Productivity gains from avoided absenteeism (missed days of work) and presenteeism (impaired activity while at work) due to tobacco, CVD, and diabetes interventions were calculated as the number of individuals who avoided morbidity times the fraction that would engage in the labor force (and be gainfully employed) times the net gain in worker productivity (GDP per worker) from avoided morbidity. Estimates for the net gain in worker productivity were obtained from the literature [22, 23]. Due to methodological limitations, the labor productivity gains from reduced absenteeism and presenteeism due to alcohol interventions could not be estimated. Labor productivity gains from lives saved, on the other hand, are calculated as lives saved due to the intervention times the fraction of individuals who would engage in the labor force times worker productivity (GDP per worker).

In addition, with better health, fewer individuals need to be treated for complications from disease, resulting in direct cost savings to the government. The avoided treatment care costs are also considered an economic benefit resulting from health interventions. The averted treatment costs can be used to invest in physical capital (e.g., the equipment and structures used to produce goods and services) or human capital (e.g., education) that can boost GDP in the long run.

Step 5: Return of Investment. Return on investment (ROI) analysis measures the efficiency of an investment. An investment is efficient if the net financial gain from the investment exceeds the cost of making the investment ($ROI > 1$). In this exercise, the ROI of selected NCD interventions is calculated by dividing the monetary value of productivity gains from investments (defined as labor productivity gains and treatment costs averted) by the respective costs of scaling up or implementing the intervention.

$$ROI_{it} = \frac{\text{Value of avoided mortality}_{it} + \text{Value of avoided morbidity}_{it} + \text{Value of averted treatment costs}_{it}}{\text{Total cost of intervention package } i}$$

Methodological Limitations. The methodological tools utilized have limitations that are important to acknowledge as they impact the scope of the analysis. The first limitation is that not all Best Buy interventions outlined in the WHO Updated Appendix 3 are programmed in the OneHealth Tool and thus are not available for inclusion in the analysis. This is particularly relevant for the Investment Case in Jamaica because cancer, chronic respiratory disease, insufficient physical activity, and unhealthy diets are among the areas of action within the Ministry of Health but are not available for inclusion in the analysis.

Particularly, policy interventions to reduce physical inactivity and unhealthy diet are at the forefront of the Ministry of Health’s priorities.

The second important limitation is that not all the health benefits of the interventions are accounted for in the health impact of selected CVD, tobacco control, and diabetes, and alcohol interventions. For example, while the impact of tobacco control policies takes into account the impact on strokes and IHD events averted, the impact on reducing cancer or chronic respiratory diseases is not accounted for. For these interventions only, the impact on CVD or diabetes-related complications are considered. This implies that the health and economic benefits are underestimated. Thirdly, the labor productivity gains from reduced absenteeism and presenteeism due to alcohol interventions could not be estimated and is likely to be substantial.

Modeled Interventions

There are four categories or packages of NCD interventions that were modeled as part of this analysis: 1) tobacco control policies, 2) alcohol policies, 3) CVD clinical control interventions, and 4) diabetes control interventions. Table 6 provides details of the specific NCD prevention and control interventions that were modeled as part of this analysis along with their respective targets and baselines.

Table 6: Baselines and Targets Modeled

Package		NCD prevention and control Interventions	Baseline*	Target
Prevention Interventions	Tobacco	Increase excise taxes and prices on tobacco products	Excise taxes equal to 28.3% of the retail price of the most sold brand of tobacco	Excise taxes equal to 70% of the retail price of the most sold brand of tobacco. Target set in accordance with Guidelines for Implementation of Article 6 of Framework Convention on Tobacco Control (FCTC)
		Bans on tobacco advertising, promotion, and sponsorship	Banned advertising on TV & radio, but not on other forms of direct and indirect advertising	Ban on all forms of direct and indirect advertising. Target set in accordance with Article 13 of FCTC
		Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places, public transport (raise enforcement)	Smoking is banned in all enclosed and other specified public places, but is not well enforced in hotels, cafes, bars, and pubs	Smoking banned in all public places, AND cafes, bars, and pubs are compliant. Target set in accordance with Article 8 of FCTC
		Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages	Plain packaging is not mandated for tobacco products. Large graphic health warnings covering 60% of the principal display area is required on all tobacco product packages	Plain packaging is mandated for tobacco products. Target set in accordance with Article 11 of FCTC
		Implement effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second-hand smoke	No tobacco mass media campaign has been run since 2013/2014	Mass media campaign in place with all recommended characteristics set forth in Article 11 of FCTC

Package		NCD prevention and control Interventions	Baseline*	Target
Prevention Interventions	Alcohol ¹⁷	Increase excise taxes on alcoholic beverages	Percentage of final retail price corresponding to indirect taxes (excises, import duties, and VAT) Beer: 16.0%; Wine: 22.0%; Spirits: 26.0%	Percentage of final retail price corresponding to indirect taxes (excises, import duties, and VAT) Beer: 48.5%; Wine: 44.8% Spirits: 45.2% Target set by projecting the implied yearly reduction rate set forth in Jamaican NCD Plan 2013-2018, through 2032. ¹⁸
		Enact and enforce bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media)	Advertisements cannot display the consumption of alcoholic beverages, but no other regulations are in place	Regulation of the content and volume of marketing, sponsorship activities, etc.
		Enact and enforce restrictions on the physical availability of retailed alcohol	No national regulations on the number or location of alcohol outlets, or the days/hours/modes of sale	The number and location of alcohol outlets are regulated, as are days/hours/modes of sale
Control Interventions	Diabetes	Standard glycemetic control	Percent of those with a given condition who receive the intervention: 71.5%	Percent of those with a given condition who receive the intervention: 89%. Target set in expert consultation.
		Screening and treatment for sight-threatening retinopathy	Percent of those with a given condition who receive the intervention: 7%	Percent of those with a given condition who receive the intervention: 50%. Target set in expert consultation.
		Intensive glycemetic control	Percent of those with a given condition who receive the intervention: 71.5%	Percent of those with a given condition who receive the intervention: 89%. Target set in expert consultation.
Package		NCD prevention and control Interventions	Baseline*	Target
Control Interventions	CVD	Treat new cases of acute myocardial infarction with aspirin	Percent of those with a given condition who receive the intervention: 80%	Percent of those with a given condition who receive the intervention: 100%. Target set in expert consultation.
		Treatment for high cholesterol (≥ 6.2 mmol/L), but low absolute CVD risk <20%	Percent of those with a given condition who receive the intervention: 11.2%	Percent of those with a given condition who receive the intervention: 35%. Target set in expert consultation.
		Treatment for individuals with high CVD risk ($\geq 20\%$)	Percent of those with a given condition who receive the intervention: 55.7%	Percent of those with a given condition who receive the intervention: 79.8%. Target set in expert consultation.

¹⁷ Note that in addition to the three Best Buys modeled interventions, drink-driving laws and brief psychosocial interventions at a primary health care level have also been classified as cost-effective interventions in the Updated Appendix 3 and could in the future be modeled.

¹⁸ The 5-year (2013–2018) Jamaica NCD plan states an objective to reduce the harmful use of alcohol, in persons aged 15+ years by 3%. This expresses a desire for Jamaica to reduce harmful use of alcohol by approximately 0.60% (3/5) per year. Consequently, in this investment case we model a scale up in excise taxes to reduce the harmful use of alcohol from 2018 to 2032 by 8.4% (0.60*14). Using price elasticities of liquor, beer and wine we calculated tax shares that will achieve this goal. The source for elasticities is: Nelson, Jon P. "Meta-analysis of alcohol price and income elasticities—with corrections for publication bias." *Health Economics Review* 3.1 (2013): 17.

		Multidrug therapy to treat established IHD	Percent of those with a given condition who receive the intervention: 62.4%	Percent of those with a given condition who receive the intervention: 82.4%. Target set in expert consultation.
		Treatment for high blood pressure (≥ 140 mmHg), but low absolute CVD risk $<20\%$	Percent of those with a given condition who receive the intervention: 40%	Percent of those with a given condition who receive the intervention: 63.6%. Target set in expert consultation.
		Multidrug therapy to treat established stroke	Percent of those with a given condition who receive the intervention: 50.1%	Percent of those with a given condition who receive the intervention: 70.1%. Target set in expert consultation.
* Unless otherwise noted, information for baselines is derived from consultations with Ministry of Health Officials and the following sources: tobacco [18], diabetes [12], CVD [12], and alcohol [12, 19, 20]. Targets set in consultation with Ministry of Health Officials.				

Results

The analysis finds that implementing the intervention packages would result in significant health and economic benefits. This sub-section presents the health benefits, economic benefits, and ROI estimates of scaling up and implemented the selected packages of interventions outlined in Table 6. Overall, the analysis finds that all four packages of interventions (tobacco, diabetes, CVD, and alcohol) are efficient since the gains from these investments exceed their costs over the 15-year period (2017-2032).

Health Benefits & Implementation Costs

Results indicate that an estimated 5,735 lives will be saved over the 15-year period and 67,462 healthy life years will be restored to the Jamaican population. Table 4 summarizes the estimated health impact by intervention package. CVD prevention and treatment interventions responsible for most deaths averted (76%) and for the most healthy life years gained (45%).

It should be noted that these results present an underestimation of the health benefits of investing in NCD prevention and control interventions as only 17 out of the 88 (20%) interventions cited in the updated Appendix 3 of the WHO Global NCD Action Plan 2013-2020 are modeled, and the CVD, diabetes, tobacco packages modeled only represent the impact of those interventions on CVD or diabetes-related complications. The impact of alcohol interventions is modeled across more diseases including cancers, road injuries, epilepsy, and cirrhosis deaths averted.

Table 7: Estimated health benefits over a 15-year time horizon, by intervention package*

Intervention package		Strokes averted	IHD events averted	Blindness averted	Amputations averted	Averted deaths	Healthy life years gained	Total 15-year Implementation Cost (billion JMD)
Prevention	Tobacco	1,176	967	--	--	597	7,355	1.19
	Alcohol*	--*	--*	--*	--*	518	23,292	1.42
Control	Cardiovascular disease	6,068	4,346	--	--	4,358	30,456	17.30
	Diabetes	--	--	4,812	297	262	6,359	16.78
Total						5,735	67,462	36.69

*Alcohol interventions' impact is estimated across multiple diseases (e.g. pancreatitis, road injuries, liver cirrhosis, poisonings, falls, drownings, unintentional injuries, larynx cancer, liver cancer and intrapersonal violence) therefore expressed only as deaths averted and healthy life-years gained as opposed to other interventions whose impact is expressed in terms of strokes averted, IHD events averted, blindness averted, and amputations averted. Health benefits of the other packages—only represent those interventions' impact on CVD or diabetes-related complications.

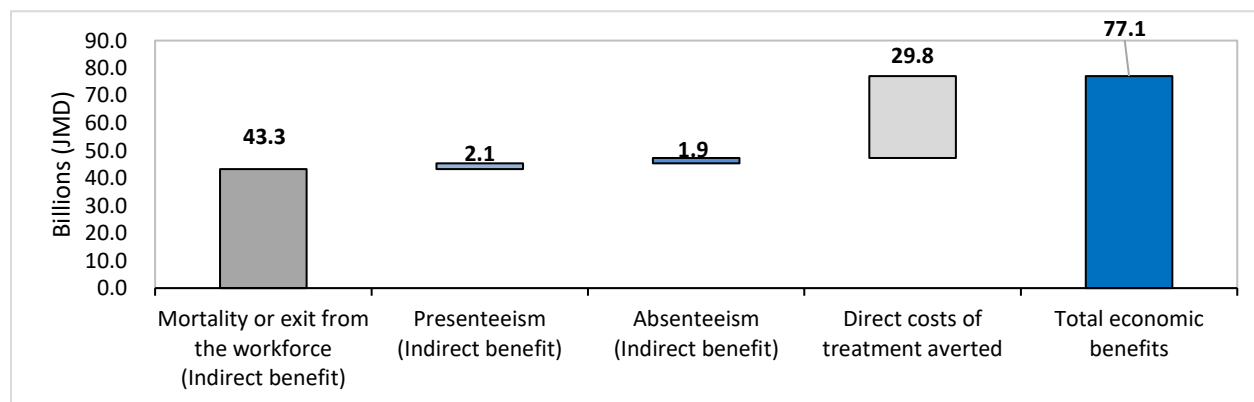
Economic Benefits

By monetizing the health benefits, this analysis finds that over the 15-year period, implementing the policy packages contribute a net present value of 77.1 billion JMD (US\$ 607 million) to the Jamaican economy. For comparison, the current annual GDP of Jamaica is approximately 1.8 trillion JMD (US\$ 14 billion). The gain from implementing the policy package is therefore 4.3% of current annual GDP. These economic gains can be disaggregated to productivity gains and averted costs of treatment.

Productivity Gains. Scaling up the selected packages of NCDs represents over 47.3 billion JMD in productivity gains over 15 years. The economic gains are a direct result of decreased numbers of Jamaicans 1) dropping out of the workforce due to premature mortality, 2) missing days of work, and 3) working at a reduced capacity due to poor health. The largest gains result from avoided mortality and avoided exit from the workforce, which represent over half of the four packages' (tobacco, alcohol, diabetes, and CVD) total economic benefits.

Adverted Treatment Costs. The next largest economic gains result from direct costs of treatment averted (29.8 billion JMD). Again, it should be noted that this is likely an underestimate as not all the health benefits of the interventions are accounted for due to methodological limitations. For example, the impact of tobacco control policies on averted cancer treatments are not included. Currently, Jamaica spends about 15% of its health budget on cardiovascular disease, diabetes, chronic respiratory disease, and cancer. By reducing the burden of disease from NCDs, treatment-costs are averted, and resources can be used to invest in physical capital (e.g., the equipment and structures used to produce goods and services) or human capital (e.g., education) that can boost GDP in the long run.

Figure 3: Recovered economic output from implementing tobacco, alcohol, diabetes, and CVD clinical and policy interventions



Optimizing Standards of Care. In addition to reducing the burden of NCDs in Jamaica it is also important to consider optimizing the standard and quality of clinical care. The WHO has developed standard treatment and prevention protocols for NCDs which are available in the OHT. Comparing the standards of clinical care outlined by WHO experts, and those utilized in Jamaica, the study finds that care in Jamaica is more labor intensive—which ultimately increases the cost of care. Using these WHO protocols¹⁹ for the

¹⁹ WHO recommended treatment/prevention inputs that differ from Jamaica's standard of care are available in: <http://avenirhealth.org/Download/Spectrum/Manuals/Treatment%20Assumptions%202016%201%2010.pdf>

selected interventions included in this analysis, Jamaica could reduce the costs of delivering care (of interventions studied) by as much as 2.1 billion JMD over 15 years (a 5.5% reduction in costs). This result emphasizes the importance of optimizing standards of care in addition to scaling up interventions.

Return of Investment (ROI)

Comparing the costs and benefits of each package of interventions, the analysis finds that all four packages of interventions are efficient since the gains from these investments exceed their costs over the 15-year period (2017-2032). Table 8 presents the ROI of the four packages.

Table 8: Return on investment, by NCD package (JMD Billions)

NCD prevention and control Interventions		5-Year Implementation			15-Year Implementation		
		Cost (JMD billions)	Benefit (JMD billions)	5-year ROI	Cost (JMD billions)	Benefit (JMD billions)	15-year ROI
Prevention	Tobacco	0.45	0.36	0.81	1.19	6.63	5.37
	Alcohol ²⁰	1.80	2.20	1.30	17.30	36.30	2.10
Control	Diabetes	1.49	1.45	0.97	16.78	31.80	1.90
	CVD	0.48	0.22	0.46	1.42	2.65	1.86
All packages		4.22	4.23	1.00	36.68	77.11	2.10

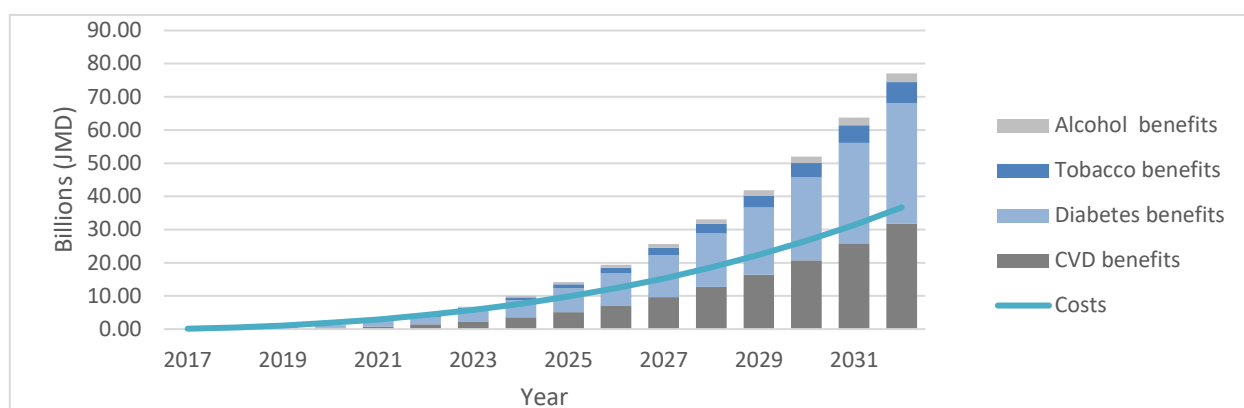
Tobacco interventions have the highest 15-year period return on investment at 5.37, meaning that for every dollar invested in tobacco control, one can expect to see 5.37 dollars return. The diabetes package has the next highest ROI (2.10), followed by the CVD package (1.90), and then the alcohol policy package (1.86).

Investing in all four packages also provides an efficient investment. Over the 15-year period (2017-2032), the total economic benefits (77.1 billion JMD) significantly outweigh the costs (36.7 billion JMD). The analysis finds that at the end of the 15-period (year 2032), ROI of the selected packages will have more than doubled (ROI=2.10), and that the “break-even” point, where the benefits equal the costs (ROI is equal to 1), of Jamaica’s investment would be reached within 5 years.

Figure 4 shows that in the long-run the economic benefits are amplified “exponentially” over time while their costs increase by a smaller degree, as a fraction of the benefits. It depicts how the projected gap between economic benefits and costs continues to increase over time.

²⁰ Note that for alcohol interventions the labor productivity gains due to reduced presenteeism and absenteeism are not accounted for, and that in addition to the three Best Buy interventions modeled, drink-driving laws and brief psychosocial interventions at a primary health care level have also been classified as cost-effective interventions in the Updated Appendix 3, and could be modeled in the future.

Figure 4: Cumulative benefits and cost of selected NCD package 2017-2032



ROI and Priority Setting. Within packages, the ROI of interventions can differ widely (from 0.6 to 16.0). The ROI of individual interventions can assist with the establishment of priorities for resource allocation within a package. To aid in the efficient and targeted allocation of resources, Table 9 also displays the return on investment along with projected cost of implementation for each of the individual clinical and policy intervention. Results in the table are grouped (1) by category (tobacco, CVD, diabetes, and alcohol), and (2) from highest to lowest ROI.

Table 9: Return on investment, by NCD package (JMD billions)

NCD prevention and control interventions	5-year ROI	15-year ROI	15-year implementation cost (billion JMD)
Tobacco	0.81	5.37	1.19
Raise taxes	2.1	16.0	0.2
Bans on tobacco advertising	2.5	14.5	0.25
Protect people from tobacco smoke (raise enforcement)	0.2	2.8	0.06
Warn about danger: Mass media campaign	0.6	2.6	0.45
Plain packaging	0.1	0.6	0.23
Diabetes	1.30	2.10	17.3
Standard glycemetic control	1.5	2.8	7.2
Screening and treatment for sight-threatening retinopathy	1.2	1.5	1.7
Intensive glycemetic control	0.8	1.4	5.9
CVD	0.97	1.90	2.5
Treat new cases of acute myocardial infarction with aspirin	10.5	13.9	16.78
Treatment for high cholesterol (≥ 6.2 mmol/L), but low absolute CVD risk <20%	1.5	3.6	0.02
Treatment for individuals with high CVD risk ($\geq 20\%$)	1.3	2.9	0.68
Multidrug therapy to treat established IHD	1.9	2.2	1.46
Treatment for high blood pressure (≥ 140 mmHg), but low absolute CVD risk <20%	0.9	2.1	0.99
Multidrug therapy to treat established stroke	1.3	1.4	7.38
Alcohol	0.46	1.86	2.34
Raise taxes	1.6	8.1	0.2

Restrict alcohol advertising	0.5	1.6	0.22
Restrict availability of retailed alcohol	0.2	0.7	0.99
All packages	1.00	2.10	36.69

For clinical interventions, treatment of AMI with aspirin provides the highest ROI. Preventive actions such as treatment for those with high cholesterol, and high CVD risk follows. This result emphasizes the importance of a paradigm shift away from focusing on the clinical treatment of already existing illness, toward preemptive efforts that can *prevent* disease from occurring in the first place.

For behavioral risk factors, the ROI from increases in taxation are high: ROI of 16.0 for tobacco and 8.1 for alcohol. The high ROI from tax increases is consistent with previous studies which have shown that people reduce consumption of tobacco and alcohol in response to tax increases [24, 25].

IV. Discussion

Consistent with the shift away from focusing on the clinical treatment of already existing illness, towards preemptive efforts that can *prevent* disease from occurring in the first place, this study analyzed both policy interventions that target behavioral risk factors and clinical interventions. Consistent with global evidence and the “best buys” from the WHO Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020, the results show that there is an opportunity to reduce the burden of NCDs through preventative actions that target behavioral and metabolic risk factors for NCDs while also ensuring treatment for those most in need. In terms of clinical interventions, it is pivotal to invest more in health system strengthening to ensure that those with high diabetes and CVD risk receive treatment, which have been shown to be cost effective and have a positive ROI.

Nonetheless, results also indicate that some of the most efficient NCD reduction and control investments lie beyond the direct competencies of the Ministry of Health. For example, increasing alcohol and tobacco taxes (15-year ROI of 16 and 8.1, respectively) and implementing alcohol advertising restrictions and tobacco advertising bans (15-year ROI of 1.6 and 14.5, respectively). This highlights the need to engage stakeholders beyond the health sector and the need to foster comprehensive and coherent policies across government sectors.

Encouragingly, Jamaica is conducive to an even stronger NCD response and health remains high on the public agenda. In a 2017 budget speech, the Prime Minister called specific attention to the need to decrease the burden of NCDs. Similarly, Ministries beyond the Ministry of Health display a higher than average level of sensitization and understanding of NCDs, including their impact on sustainable development, national prosperity, and potential role in meeting the goal to grow Jamaica’s GDP by five percent in four years (known as “5 in 4”).

V. Opportunities

NCDs have emerged as the leading cause of morbidity and mortality in Jamaica continue to pose a major and growing challenge [1]. The results of this analysis show that investments to tackle the rise of NCDs in Jamaica can effectively reduce the burden of NCDs on the economy and improve the quality of life of its

citizens. Concretely, the results show that Jamaica can reduce the burden of NCDs through preventative actions, while also ensuring treatment for those most in need.

1. **Operationalize the National Committee on NCD as a governance and coordination mechanism.**

Many of the interventions required for the prevention and control of NCDs and their risk factors lie beyond the area of work of the Ministry of Health, stressing the need for a working multisector committee. For example, both tobacco taxes and alcohol taxes had the highest ROI in their respective packages and tobacco taxes provided the highest ROI of all the interventions analyzed (note that the estimated ROI is an underestimation as not all the health benefits, i.e. impact on lung cancer of tobacco tax, are accounted for nor is the increased productivity of reduced absenteeism and presenteeism of alcohol tax). To further advance this committee, securing higher level political commitment for a scaled up and coherent national response across sectors should be considered with the aim of supporting other sectors to incorporate NCDs and NCD-related interventions into their sectoral policies, plans, projects and programs, including during revision or evaluation processes. Leveraging the long-time institutional experience of key MoH focal points, and nurturing and existing relationships and partnerships, the MoH should:

- Ensure a functional NCD Commission which is chaired at the highest level, meets regularly, has firewalls against industry influence, and includes adequate representation of relevant non-health sector focal points. Further elevation of the Commission to a formal mechanism could later be championed as appropriate;
- Support other sectors to incorporate NCDs and NCD-related interventions into their sectoral policies, plans, projects and programs especially during revision or evaluation processes;
- Nudge stakeholders away from understanding NCDs as “lifestyle” diseases driven principally by “individual choice” and encourage creation of environments (through regulatory and fiscal actions) that enable healthy choices.
- Connect, in all relevant discussions/platforms, NCD burdens and investment case results to sectoral and governmental priorities.
- Request greater UNCT engagement to mirror and support stronger cross-government efforts on NCDs, perhaps starting with a mapping of existing and potential areas of support.

2. **Accelerate momentum to implement the most politically feasible policies.** Examples, which span investment case recommendations and NCD action more broadly, include:

- Physical activity – given the momentum of Jamaica *Moves*;
- Increase taxes on tobacco, introduce of taxes on sugar-sweetened beverages, and increase taxes on alcohol – using other CARICOM successes as motivation;
- Healthy eating in schools (e.g. free of marketing, restricting access to fast-food and sugary beverages, available nutritious lunches) – stressing child protection;
- Approval of the comprehensive bill on tobacco control;
- Accurate, easy-to-understand food labelling based on best practices in countries within and beyond the region of the Americas as well as stronger marketing restrictions for all health-harming products – also stressing child protection;

- Increased action on mental health – relying on the new CMO and pushing the proposed national mental health policy and strategic plan; and
 - Strengthened engagement of communities and community leaders, including religious leaders and social clubs – with an empowered civil society.
3. **Preserve and expand tobacco control gains.** Tobacco interventions have the highest 15-year period return on investment (ROI): for every JMD invested in tobacco control, one can expect to see 5.37 JMD in return. Within the tobacco package, raising excise taxes has the highest ROI of 16.0, and is closely followed by bans on tobacco advertising, promotion and sponsorship, which has an ROI of 14.5. Jamaica can readily expand the gains made in tobacco control through implementing sustained **increases of tobacco excise taxes** that accounting for inflation and income increases; **enforcing the existing tobacco legislation**, approving the development of a **comprehensive tobacco control legislation**, at the earliest convenience, including the FCTC time-bound commitment as banning all forms of tobacco advertising, promotion and sponsorship.
 4. **Make Jamaica Moves synonymous with a proactive, inclusive, and comprehensive national NCD response.** Capitalize on ongoing efforts to ensure this campaign represents Jamaica’s proactive initiative amongst peers in all areas of NCD prevention and control, i.e., the campaign should include but extend beyond physical activity and healthy eating encompassing all relevant aspects of NCD prevention and control. Examples include but are not limited to: strengthened cross-sectoral engagement, harmful use of alcohol control, tobacco control efforts, public-private partnerships that are appropriate and productive, and effective community and youth outreach and engagement.

Although unhealthy diet interventions were not included in the economic analysis due to methodological constraints,²¹ these remain a major priority area for Jamaica due to the high prevalence of overweight, obesity, and diabetes. Assessing the Jamaican-context specific ROI of diet interventions, for example, a SSB tax, trans fat reductions and adequate food and drink labelling, remains a critical pending task.

5. **Safeguard stronger NCD action across government from industry interference in policymaking.** Protect NCD action from commercial and other vested interests by building the capacity of parliamentarians and lawmakers on the role of law in addressing NCDs, empowering civil society in its independent “watchdog” function, and continue developing evidence (e.g. on job loss, regressivity, etc.) which further disproves common industry arguments.
6. **Encourage economic studies to better understand the cost and ROI of comprehensive NCD action.** The scope of this investment case is limited to selected alcohol, tobacco, CVD, and diabetes interventions—only 17 out of the 88 interventions cited in the updated Appendix 3 of the WHO Global NCD Action Plan 2013-2020 are modeled and not all health benefits are monetized. Comprehensive studies that explore the cost and ROI of best buys related to cancer,

²¹ The main analytical tool used in the analysis does not include these interventions, but WHO is working on expanding the tool as to include unhealthy diet interventions. This study could be expanded to include unhealthy diet and insufficient physical activity interventions once analytical tool has been modified.

chronic respiratory, physical activity and diet are needed. Additionally, efforts should be made to explore the ROI of other cost-effective interventions, beyond the best buys, cited in the updated Appendix 3, such as enactment and enforcement of drink-driving laws and blood alcohol concentration limits via sobriety checkpoints, and brief psychosocial interventions for persons with hazardous and harmful alcohol use.

- 7. Leverage Investment Case findings to show that NCD action supports Jamaica's 5 in 4 economic growth plans.** The results of the study, which present a lower-bound of benefits, show that NCD action has positive returns and supports economic growth plan by alleviating the financial and human toll on health and social services and generating resources (through increased tobacco and alcohol tax revenues) which can be invested social programs including Universal Health Care. With a break-even ROI of 1 at year 5, primary prevention can be billed as paying itself off in the near-term while saving billions in the medium and longer term.

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The United Nations Inter-Agency Task Force on the Prevention and Control of Noncommunicable Diseases (UNIATF) was established in 2013 by the Secretary General and placed under the leadership of WHO to coordinate the activities of the UN System to support the realization of the commitments made by Heads of State and Government in the 2011 Political Declaration on NCDs. Joint activities included in the work plan of the Task Force are additive to various, more comprehensive efforts conducted by the UN agencies to prevent and control NCDs. These joint activities offer important opportunities to address cross-cutting issues and to advance capacity and learning in countries.



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