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The Case for Investment in Prevention and Control of Noncommunicable Diseases and Mental Disorders in Suriname

A return-on-investment analysis

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United Nations Interagency Taskforce on NCDs, United Nations Development Programme,
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The Case for Investment in Prevention and Control of Noncommunicable Diseases and Mental Disorders in Suriname: A return-on-investment analysis

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Executive summary

Noncommunicable diseases (NCDs) and mental disorders are the leading cause of ill-health in Suriname, accounting for 78% of all deaths. NCDs and mental disorders also impose a high economic burden, as individuals with these diseases and disorders are more likely to exit the labor force, miss days of work (absenteeism), or to work at a reduced capacity while at work (presenteeism).

This report presents the findings of an economic analysis that examines the case for investing in prevention and control of NCDs and mental disorders in Suriname. In line with the stated priorities of the Ministry of Health, the investment case measures the annual social and economic burden of select NCDs and mental disorders, and the costs and benefits of 1) scaling clinical interventions that target two NCDs (cardiovascular disease and diabetes) and three mental disorders (depression, psychosis, and alcohol dependence), and 2) implementing policy measures to reduce four NCD risk factors (alcohol use, physical inactivity, tobacco use, and high sodium consumption).

By acting now, the Government of Suriname can reduce the burden of NCDs and mental disorders, which the analysis estimates cause over 2.6 billion Surinamese dollars (SRD) in social and economic losses each year, with productivity losses equivalent to 3.8% of 2019 GDP. The investment case findings demonstrate that over the next 15 years (2021 to 2036) implementing or intensifying policy measures and scaling up clinical interventions would:

- **Save more than 3500 lives**.
- **Avert nearly SRD 2.0 billion in social and economic losses**, including SRD 1.1 billion in productivity losses averted. The policy measures and clinical interventions stimulate economic output by ensuring that fewer Surinamese 1) drop out of the workforce due to premature mortality or disability, 2) miss days of work due to disability or sickness, and 3) work at a reduced capacity due to sickness. Together, the interventions are projected to add one-third of a percentage point of growth to GDP over the next 15 years.
- **Lead to SRD 121 million in savings in healthcare expenditures.** Of this total, an estimated SRD 90 million is savings to the Government, SRD 24 million is savings to households and individuals in out-of-pocket expenses, and the remainder is savings to other voluntary healthcare schemes. These savings mean government and households will have additional resources to fund health, education, and other priorities.
- **By investing SRD 41 million annually (equivalent to SRD 84 per person in Suriname, or about 3% of annual government health expenditures), Suriname can generate significant social and economic returns.** Policies that act as primary prevention measures to stop disease before it starts all have positive returns on investment (ROI). For every Surinamese dollar invested in measures to reduce demand for tobacco, Suriname can expect 10.3 dollars in social and economic benefits in return (ROIs for sodium, alcohol, and physical inactivity measures are 3.7, 2.4, and 1.9, respectively). Scaling clinical treatment of mental disorders accounts for nearly 25% of the healthy life years projected to be generated from the interventions in the analysis, with positive ROIs for each intervention package (ROIs for depression, alcohol dependence, and psychosis interventions are 4.6, 1.7, and 1.1). Together, the cardiovascular disease and diabetes packages accounted for nearly one-third of all social and economic benefits (ROIs 2.2 and 0.96). Clinical interventions targeting diabetes did not demonstrate an ROI greater than one; however, model limitations prevented the analysis from capturing a

significant share of the health benefits that accrue from controlling fasting blood glucose levels. Future analyses should more closely investigate these interventions, as the existing diabetes burden in Suriname is high and strengthening access to diabetes care is essential to the right to health.

- People living with NCDs are among those most affected by the COVID-19 pandemic, and the pandemic has also increased mental health burdens worldwide. The investment case results for Suriname show that there is an evidence-based opportunity to reduce the health, economic, and other development burdens caused by NCDs and mental disorders through preventive actions, while ensuring treatment for those most in need. By investing now as part of its COVID-19 response and recovery, Suriname can strengthen its health system, economy, and society, while restoring progress toward achieving the Sustainable Development Goals, which call for a one-third reduction in premature mortality and morbidity due to NCDs by 2030.

1. Introduction

In Suriname, noncommunicable diseases (NCDs) and mental disorders are responsible for about 78% of all deaths *(1)*. One in four Surinamese dies from these diseases and disorders before the age of 70 *(1)*, showing a significant opportunity to make progress on United Nations Sustainable Development Goal 3.4, which aims to reduce premature mortality from NCDs by one-third by 2030.

NCDs and mental disorders also have economic and social repercussions. High treatment costs impose a **direct** economic burden on households and country governments. In addition, NCDs and mental health disorders also cause an **indirect** economic burden with important development implications. Poor health reduces productivity by permanently or temporarily removing individuals from formal and informal labor markets. When individuals die prematurely, the labor output they would have produced in their remaining years is lost. In addition, ill-health reduces workforce participation rates *(2)*, increases the number of days that individuals miss work (absenteeism), and undermines individuals' capacity to function while at work (presenteeism) *(3, 4)*.

The need to reduce the burden of NCDs and mental disorders is clear. Fortunately, solutions exist at the clinical, community, and policy levels. As part of the Global Action Plan for the Prevention and Control of Noncommunicable Diseases and the Comprehensive Mental Health Action Plan 2013–2030, the World Health Organization (WHO) has developed a set of cost-effective policy options and interventions to assist Member States to reduce the burden of NCDs *(5)* and mental disorders *(6)*.

Knowing the benefits and costs of NCD interventions and mental disorders is key to making informed decisions about which policies and clinical interventions to implement to reduce the burden. Against this background, a joint programming mission[1] was undertaken to conduct a national investment case to examine the potential gains from scaled-up implementation of policy measures and clinical interventions that target NCDs and mental disorders.

The report features results from an economic analysis that examines 1) the social and economic burden of select NCDs and mental disorders, and 2) the impact of implementing a subset of the interventions described in the WHO Global Action Plan on NCDs and the WHO Menu of Cost-effective Interventions for Mental Health. Interventions were selected in consultation with the Ministry of Health and align with its stated priorities. The investment case economic analysis assesses the costs and benefits of 1) scaling clinical interventions that target **two NCDs** (cardiovascular disease [CVD] and diabetes) and **three mental disorders** (depression, psychosis, and alcohol dependence), and 2) implementing policy measures to reduce **four NCD risk factors** (alcohol use, tobacco use, physical inactivity, and high sodium consumption). Descriptions of the included interventions are in the Technical Appendix to this report.

The investment case focuses on primary prevention (e.g., policy measures that reduce exposure to NCD behavioral risk factors) and secondary prevention measures (e.g., screening to enable detection of CVD risk factors, management of diabetes to prevent complications from neuropathy and retinopathy). These strategies are part of a paradigm shift toward efforts that can stop disease from occurring in the first place. In addition, the investment case includes clinical interventions to treat existing NCD cases—such as treatment of heart attacks and strokes—and mild, moderate, and severe forms of mental disorders.

1 Consisting of Suriname's Ministry of Health, the Pan American Health Organization, and the United Nations Development Programme.

Section 2 of this report provides background information on the status of NCDs, NCD risk factors, and Mental Health Disorders within the Surinamese population. Section 3 reviews the status of WHO-recommended interventions in Suriname and required steps to scale interventions to meet national goals and international recommendations. Section 4 presents the institutional context analysis (ICA), which complements the economic analysis, developed to understand the diverse range of institutions, actors, and stakeholders relevant to NCDs in a given context. Section 5 introduces the economic-analysis methods (see the Technical Appendix for additional information). Section 6 presents results. First it quantifies the annual economic burden of select NCDs and mental disorders in Suriname. Then it examines the costs of implementing—or scaling—clinical interventions and policies, and the resulting health, social, and economic benefits. Section 7 discusses and frames the results and implications for Suriname.

2. Background: NCDs, NCD risk factors, and mental health disorders

NCDs are the dominant cause of ill-health in Suriname *(1)*. Over the period from 2000 to 2019, **Figure 1a** shows the share of disability-adjusted life years (DALYs) attributable to NCDs; mental and substance use disorders; communicable, maternal, neonatal, and nutritional (CMNN) diseases; and injuries.

DALYs represent the number of years of full health lost. They comprise years of life lost from premature death as well as years that people live in a state of reduced health due to disease *(7)*. **Figure 1b** shows that in terms of DALYs, CVD contributes the most to ill-health, followed by diabetes and kidney diseases, and then cancer.

Figure 1a. Distribution of disability-adjusted life years (DALYs) in Suriname, by cause, 2000–2019

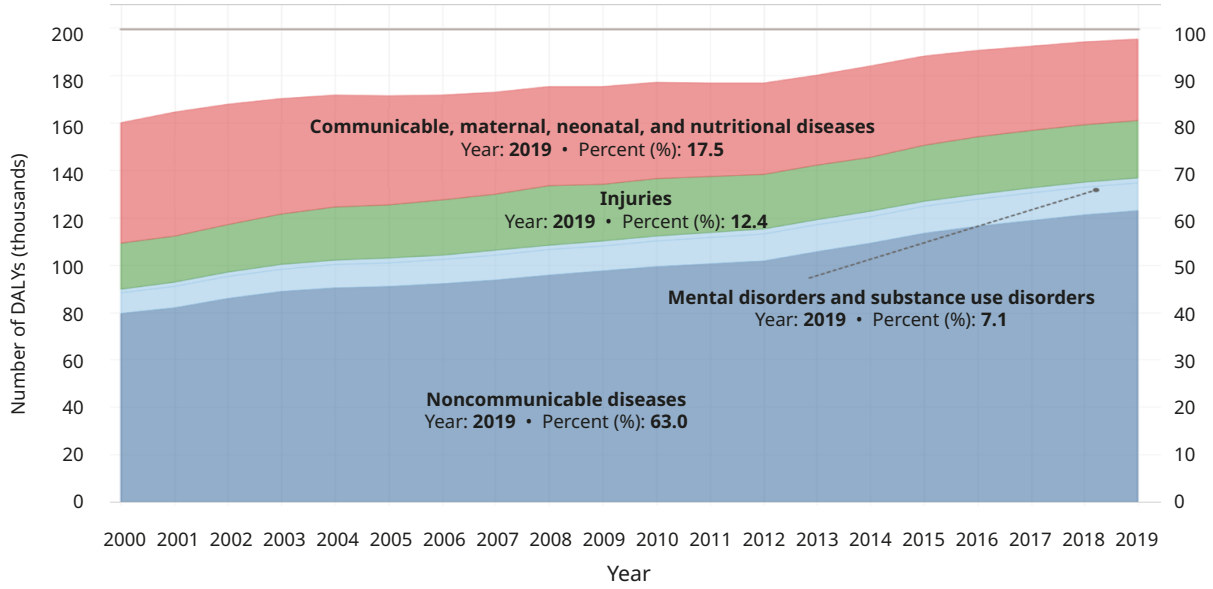
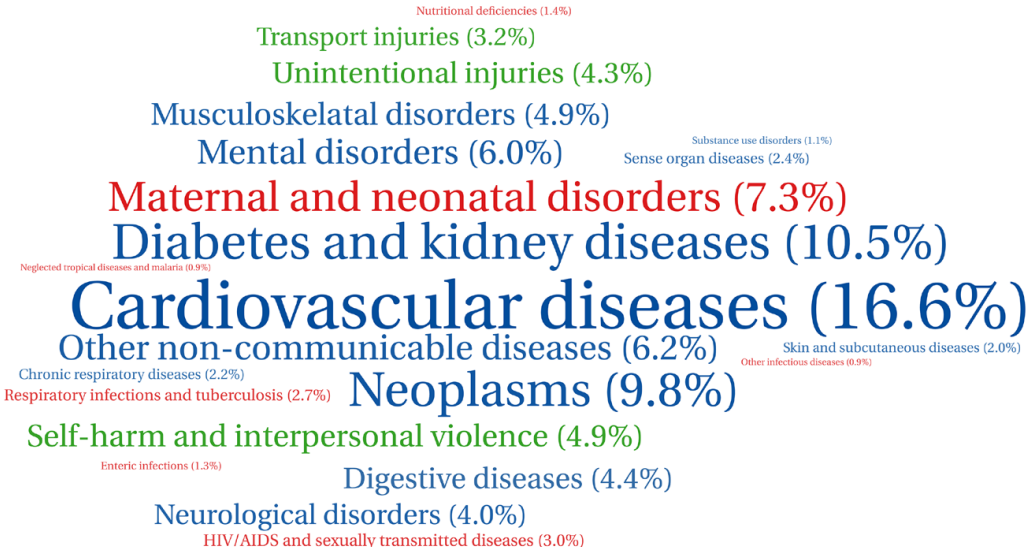


Figure 1b. Distribution of DALYs in Suriname, by disease, 2019



Source: Institute for Health Metrics and Evaluation. The Global Burden of Disease Results Tool. Seattle: IHME; 2020. Available from: http://ghdx.healthdata.org/gbd-results-tool.

Noncommunicable diseases are driven in part by increasing life spans and changes in urbanization, trade, and globally integrated markets that have increased populations' exposure to environmental and behavioral risk factors *(7)*, including tobacco and alcohol use, unhealthy diets, and physical inactivity. **Table 1** shows the status of these and other NCD risk factors in Suriname—including metabolic risk factors such as high blood pressure, total cholesterol, and diabetes—and compares them to global averages.

Table 1. Prevalence or severity level of NCD risk factors, comparison between Suriname and global averages

	National average		Global average		Difference	
NCD risk factor	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Mean systolic blood pressure (mmHg)[a]	127.8	122.9	127.0	122.3	●	●
Mean total cholesterol (mmol/L)[b]	4.4	4.6	4.5	4.6	■	●
Diabetes (prevalence, all ages)[c]	11.6	11.9	6.3	5.3	●	●
Smoking prevalence (%)[d]	27.3	7.5	25	5.4	●	●
Alcohol use (DALYs attributable fraction)[e]	6.8	1.5	5.5	1.1	●	●
Sodium consumption (grams per day)[f]	3.0	2.8	4.0	4.0	■	■
Physical inactivity prevalence (%)[g]	38.1	50.6	23.4	31.7	●	●

Notes: ● above global average; ■ below global average

a Mean mmHg, age-standardized *(8)*.
b Mean mmol/L, age-standardized *(8)*.
c Prevalence (%), all ages *(1)*.
d Age-standardized daily smoking rates *(9)*.
e DALYs attributable fraction *(10)*.
f Mean daily sodium consumption (grams per day) *(11)*.
g <150 minutes of moderate-intensity physical activity, or <75 min of vigorous-intensity physical activity per week *(12)*.

In general, Suriname's risk factor prevalence or severity is above global averages, with the prevalence of diabetes and physical inactivity both nearly double global averages. There are also disparities in NCDs among Suriname's multi-ethnic and multicultural population. For example, data from a national study found that hypertension prevalence was highest among Creole, Hindustani, and Javanese Surinamese compared to Amerindians, Maroons, and Surinamese of mixed ethnicity *(13)*. Similarly, the prevalence of diabetes was greatest among Hindustanis compared to other ethnic groups *(14)*. Targeted programs are needed to address NCD disparities.

3. Status of WHO-recommended interventions: goals, current efforts, targets

To meet the growing challenge posed by NCDs and mental disorders, Suriname will need to increase investment in its health system, with particular attention to strengthening the primary care system, which can provide targeted screening, diagnosis, and treatment of NCD risk factors to prevent disease even before it starts. Moreover, by enacting new population-level policies that promote healthy behaviors—and intensifying existing prevention policies—Suriname can guard against increases in the consumption of products (e.g., cigarettes, alcohol) that are major drivers of NCDs.

In May 2017, the 66th World Health Assembly endorsed updates to the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2030 *(5)*. The Global Action Plan contains 88 interventions, policy measures, and enabling policy actions, which are described in Appendix 3 of the Plan. Of these 88 interventions, 16 are highlighted as the most cost-effective[2] and feasible for implementation.

For the investment case, interventions for analysis were selected based on input from Suriname's Ministry of Health, whether the intervention was included in the OneHealth Tool, and available resources for the analysis. Based on these criteria, 21 interventions from the Global Action Plan[3] were included in the analysis. In addition, the investment case includes analysis of eight interventions to treat depression, alcohol use disorders, and psychosis—many included in the WHO Menu of Cost-effective Interventions for Mental Health. The limited scope of the analysis and constrained modeling capacity precluded analysis of interventions addressing additional NCDs (e.g., cancer), NCD risk factors, (e.g., unhealthy diet other than high sodium consumption), and mental disorders (e.g., epilepsy). However, these diseases, risk factors, and disorders are important contributors to the burden of disease in Suriname. An expanded analysis would be beneficial to prevention and control efforts in Suriname, and a future national mental health investment case is already planned.

The investment case assesses the extent to which Suriname already has tobacco, alcohol, sodium, and physical inactivity policies in place, and then models the health and social and economic impact of expanding those policies. For clinical interventions, the investment case assesses how many individuals are currently reached by the interventions and then models a scale-up in coverage levels based on country input. The status of Suriname's actions toward enacting and enforcing policy measures and

2 Average Cost-Effectiveness Ratio ≤ I$100 per DALY in low- and middle-income countries. DALY = disability adjusted life-year, a measure of quality and quantity of life.

3 Including 14 of the most cost-effective interventions.

interventions is summarized below. The Technical Appendix summarizes baseline and target coverages and describes the sources from which coverages were derived, across all assessed interventions.

3.1. Select policy measures to reduce NCD risk factors

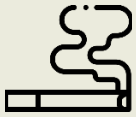
3.1.1. Tobacco

Strong fiscal and regulatory measures can influence norms by signaling to the population that tobacco use—which causes more than 30 different diseases *(9)*—is extraordinarily harmful. After ratifying the WHO Framework Convention on Tobacco Control (WHO FCTC) Act in 2008, Suriname passed the National Tobacco Control Act in 2013 *(15)*. Although Suriname's Tobacco Control Act is strong, existing measures within the act can be strengthened and additional measures, in line with the WHO FCTC, can be put in place to further reduce demand for tobacco products and protect the health of the population.

Reducing the affordability of tobacco products is a key strategy to incentivize individuals to quit using tobacco products, or to curb consumption. Cigarettes are less affordable in Suriname than in about 70% of countries in the Americas *(16)*, but opportunities exist to continue to reduce cigarette affordability. Currently, specific **excise taxes** and the value added tax comprise about 47.6% of the retail price of the most sold brand of cigarettes *(17, Annex 9.1)*.[4] The investment case examines the impact of increasing cigarette taxes to levels that would meet and exceed the WHO recommended benchmark of 75% total tax share *(17)*; beginning in 2023, the specific excise tax is raised an average of SRD 2.4 per year until the end of the analysis in 2035 when total tax share reaches 81%.

BOX 1

Tobacco control policy measures



1. Increase cigarette taxation to reduce the affordability of tobacco products.
2. Enforce bans on smoking in all public places to protect people from tobacco smoke.
3. Promote and strengthen public awareness about tobacco control issues and the harms of tobacco use through mass media information campaigns.
4. Mandate that tobacco product and packaging carry large graphic health warnings describing the harms of tobacco use.
5. Adopt regulations mandating plain packaging of tobacco products.
6. Enforce comprehensive bans on tobacco advertising, promotion, and sponsorship.
7. Provide support for reducing tobacco dependence and cessation: offer brief advice to quit at the primary care level.

Mandating and enforcing 100% smoke-free public places is shown to change social norms around smoking, increase quit rates, and protect nonsmokers from second-hand tobacco smoke exposure *(18)*. The 2013 National Tobacco Control Act **bans smoking in all indoor public places, workplaces, and on all public transport** *(19)*, in alignment with Article 8 of the WHO FCTC. Although there is high compliance in healthcare facilities and indoor offices, the bans are not well enforced in restaurants, cafés, bars, public transportation, and other public places *(20)*.

Mass media information campaigns have not recently aired to shift the culture around tobacco smoking and inform the population about the harms of tobacco use.

4 Data from the 2020 Global Tobacco Control Report show the total tax share is 26.5% of the retail price of the most sold brand of cigarettes. The investment case draws on data from the 2018 report, which was the most recent available at the time of the analysis.

The Suriname Tobacco Control Act mandates **regular rotation of large and graphic warning labels** that cover 50% of packaging, in alignment with Article 11 of the WHO FCTC. Plain packaging of tobacco products—uniform, neutral-color packaging that is devoid of branding and logos—is currently not mandated *(20)*.

The tobacco control act comprehensively **bans tobacco advertising, promotion, and sponsorship (TAPS)**, in alignment with Article 13 of the WHO FCTC, with high compliance *(20, 21)*. The ban is inclusive of national and international TV and radio, print media, Internet, and billboards and outdoor advertising. Indirect advertising, such as product placement in TV and film, is also banned, and there are complete bans on tobacco industry corporate social responsibility and sponsorship contributions.

Smoking cessation support is available in some community health centers but is generally not available in hospitals or health clinics. Supportive cessation advice from trained providers can motivate individuals to quit or increase quit attempts. However, evidence shows that in low- and middle-income countries, over half of health providers do not deliver this advice *(22)*. The investment case examines the impact of training at least 50% of primary health providers to offer cessation advice in primary care settings.

3.1.2 Alcohol

Restricting the availability of alcohol; regulating alcohol advertising, promotion, and sponsorship; and increasing taxes on alcohol are all policy measures that are proven to lower hazardous alcohol use, reducing disease (e.g., liver cancer), interpersonal violence, and injuries (e.g., transport injuries) *(23)*.

In Suriname, per capita, alcohol consumption levels have remained relatively stagnant during the past three decades *(24)*. Suriname has adopted alcohol policies at the subnational level but has yet to adopt a written national policy on alcohol or national drinking guidelines *(25–27)*. The Ministry of Health has signaled intentions to prioritize reductions in alcohol use, with the Ministry of Health's Policy Plan 2021–2025, which indicates that an alcohol reduction plan will be finalized in 2023 *(28)*.

BOX 2

Policy measures to reduce hazardous and/or harmful alcohol use

1. Increase restrictions on the availability of alcohol through policies that limit the number and location of alcohol outlets and prohibit sales during certain days or hours.
2. Regulate direct and indirect advertising of alcohol and the volume and content of alcohol advertisements. Enforce regulations through the development of effective surveillance and deterrence systems.
3. Increase alcohol taxes to reduce the affordability of beer, wine, and spirits.

Restrictions on alcohol availability are associated with decreases in crime (e.g., assaults), injuries, and drunk driving offenses *(29)*. Compared to its regional counterparts, Suriname has implemented few restrictions on alcohol availability *(30)*. Retailers do not need licenses to sell alcohol *(31)*. Moreover, regulations do not exist to restrict the locations at which alcohol can be sold or the times (days or hours) during which it can be sold *(32)*.

Alcohol advertising is linked to increased alcohol consumption among adults—including particularly hazardous forms of consumption such as binge drinking *(33)*—and to the age of initiation and intensity of use among adolescents *(34–36)*. There are no existing restrictions on advertising on major forms of

media, such as television, radio, print media, the Internet, and social media platforms *(31)*. Suriname has not implemented a surveillance system for enforcing the limited regulations that are in place *(31)*.

Globally, studies show that **increasing alcohol taxes** can reduce alcohol-related harms *(37)*. Suriname applies a specific excise tax to alcohol ranging from about 16% of the retail price of beer, to 18% for wine, and 43% for liquor *(38)*. Continued increases in alcohol taxes can reduce alcohol consumption, with tax increases in the investment case mapped to reduce hazardous and harmful consumption of alcohol by 10% (in relative terms) over the 15-year time horizon of the analysis.

3.1.3 Sodium consumption

Suriname's National NCD Action Plan 2015–2020 highlights the need to develop national sodium content levels for food with a goal of reducing sodium content in locally produced and imported foods by 30% *(15)*. Despite the target, Suriname has not yet implemented national policies to reduce sodium consumption *(39–42)*.

The WHO SHAKE technical package for sodium reduction recommends key actions that governments can take to reduce sodium consumption. Introducing **surveillance** measures would allow Suriname to monitor existing sources of sodium intake and understand behaviors and attitudes around sodium consumption.

National-level surveillance on sodium consumption has not been conducted *(39)*. However, once sodium content in food products is better understood, the government can enact regulatory policies to reduce sodium intake, including by **setting mandatory targets for industry to reduce sodium content in food products** and enforcing maximum allowable sodium content, as recommended by WHO and the Pan American Health Organization (PAHO) *(43, 44)*. Previous programmatic efforts to reduce sodium content in food products—such as bread—in Peru have shown that reducing sodium content by 20% resulted in no discernable difference in taste and no downturn in sales *(45)*.

BOX 3

Policy measures to reduce sodium consumption

1. Introduce surveillance programs to measure and monitor sodium consumption and sources of intake.
2. Establish mandatory targets for industry to reduce sodium in food sources that represent major sources of intake.
3. Introduce front-of-pack nutrition warning labels.
4. Launch education and communication campaigns to raise awareness about major sources of sodium consumption and health risks.
5. Promote healthy eating in public institutions by developing sodium content standards.

In addition, Suriname can: mandate that **front-of-pack nutrition warning labels** be placed on food products to indicate whether the product is high in sodium, sugars, and saturated and/or trans fats *(46)*; **promote healthy eating in public spaces** by requiring that foods meeting low-sodium criteria are served in public settings such as school cafeterias and hospitals, and that access to sodium shakers is restricted; and, implement **education and communication campaigns**—including via mass media—that can educate Surinamese about sources of sodium and the risks of high consumption. While Suriname has demonstrated interest in prioritizing these initiatives as part of its National NCD Action Plan 2015–2020, the country has not yet implemented these measures *(15, 39–42)*. The Ministry of Health plans to finalize a salt reduction plan in 2023 and implement a national salt standard for imported and locally produced products by 2024 *(28)*.

3.1.4 Physical inactivity

Community-wide public education and awareness campaigns for physical activity, including via mass media, communicate the physiological and mental benefits of physical activity and can influence behavior, thereby reducing sedentary time and acting to increase physical activity that can in turn prevent CVD *(47–49)* and diabetes *(50)*. As promoted by the WHO Global Action Plan on Physical Activity 2018–2030, campaigns for physical activity are considered a globally cost-effective measure *(51, 52)*. Developing a well-designed mass media campaign and distributing it on multiple media platforms is a designated priority for Suriname in its National NCD Action Plan *(15)*.

BOX 4

Policy measures to increase physical activity

1. Institute community-wide public education and awareness campaigns—including via mass media—designed to educate the population about the benefits of physical activity.

3.2 Clinical interventions to treat NCDs and mental disorders

3.2.1 Cardiovascular disease and diabetes

Early identification of individuals with metabolic risk factors like hypertension, high cholesterol, and diabetes is important to provide behavioral advice and pharmacological treatment to high-risk individuals and lower the risk of acute CVD events and complications from diabetes.

The 2013 STEPS survey indicates that around four out of 10 Surinamese adults between ages 40 and 64 with high blood pressure and one out of every two Surinamese with diabetes are not receiving pharmacological treatment *(53)*. While little national-level information is available on treatment for hyperlipidemia, evidence from comparable countries in the region—Guyana and Trinidad and Tobago—shows that fewer than 50% of adults with hyperlipidemia receive treatment.

BOX 5

Clinical interventions to prevent and treat CVD, diabetes, and related complications

1. At the primary care level, increase screening rates of adults age 40+ to ensure early identification and treatment of those with hypertension, high cholesterol, high CVD risk, and undiagnosed diabetes.
2. Increase treatment rates for those who develop CVD and diabetes complications (e.g., stroke, neuropathy, retinopathy).

By scaling up screening rates, more individuals who have undiagnosed hypertension, hyperlipidemia, or diabetes can be identified. Considering only a proportion of the population will, when screened and diagnosed, move on to receive treatment and adhere to the treatment regimen, the investment case projects how treatment rates increase as more people are screened.

Individuals with existing disease also need treatment to prevent complications or disease progression. In South America, only one out of three adults with a history of stroke or ischemic heart disease are on pharmacological treatment to prevent a second CVD event *(54)*. In Suriname, few individuals with diabetes are regularly screened for early-stage retinopathy or neuropathy, precluding prevention of complications such as blindness or limb amputation.

Using input from the Ministry of Health and PAHO, the analysis sets baseline and target coverage rates for scaling screening and treatment of those with existing cases of CVD and diabetes. More information on coverage rates can be found in the Technical Appendix.

3.2.2 Mental disorders: depression, psychosis, and alcohol use disorder

People with mental disorders have a greater chance of dying prematurely than the general population, owing to unattended physical health problems (e.g., CVD, diabetes, cancers *[55]*) and suicide. Psychosocial interventions and pharmacological treatment are essential to assist individuals to recover from mental disorders that can lead to increased social isolation, economic stress (e.g., reduced capacity to work) *(56)*, and high rates of disability *(57)*.

However, a large treatment gap persists in Suriname. A survey of households in two districts—Paramaribo and Nickerie—found that around nine out of 10 individuals with major depression had never sought help from a health professional *(58)*. These treatment rates are in line with studies of other countries in Latin America and the Caribbean, which have identified a median 15% treatment rate of individuals with mild forms of mental disorders and a 26% treatment rate of individuals with severe forms *(59)*. Treatment rates of patients suffering from psychosis are similarly low throughout the region, with about one in three persons receiving treatment *(59)*.

Worldwide, few healthcare providers are trained to screen for use of alcohol and to provide brief interventions (e.g., motivational interviewing) to those who use alcohol harmfully or hazardously or who are considered "dependent on alcohol" *(60)*, despite evidence that brief interventions can reduce alcohol consumption by as much as four to five drinks per week (persistent to at least one year) in those who receive them *(61, 62)*. In Paramaribo and Nickerie, eight in 10 harmful or hazardous users of alcohol are not seeking treatment for their condition *(63)*, consistent with overall treatment rates reported in Latin America and the Caribbean *(59)*.

Using input from the Ministry of Health and PAHO, the analysis sets baseline and target coverage rates for scaling screening and treatment of those with mental disorders and alcohol use disorders.

BOX 6

Clinical interventions to induce remission of depression, psychosis, alcohol dependence

1. Increase treatment rates of individuals with mild to severe forms of depression, consisting of psychosocial interventions and pharmacological treatment for those with moderate or severe depression.
2. Increase treatment rates of individuals experiencing psychosis.
3. Increase screening for hazardous or harmful use of alcohol, and provision of brief interventions (e.g., motivational interviewing). For individuals diagnosed as "dependent" on alcohol, provide psychosocial education (e.g., motivational enhancement therapy) and treatment to manage symptoms of alcohol withdrawal.

3.3 Impact of COVID-19 on Suriname's NCD and mental health progress

As of November 2021, Suriname ranked 32nd worldwide in rates of cumulative confirmed COVID-19 deaths with nearly 2000 deaths per million people *(64)*. At the beginning of the outbreak and during surges, Suriname's case fatality rate (ratio between the 7-day average of confirmed COVID-19 deaths and 7-day average of confirmed cases of COVID-19) generally peaked at 10% *(64)*.

COVID-19 has had a ripple effect on those living with—or at risk of—NCDs. About one in five individuals worldwide are estimated to be at an increased risk of severe COVID-19 because of underlying NCDs that weaken their ability to fight the virus *(65)*. Moreover, redistributing healthcare resources to address the immediate health needs of COVID-19 patients has made accessing services for NCDs more difficult. In Suriname, according to a WHO global survey of health service disruption, more than a quarter of the country's health services could not provide services to 25%–50% of users who would usually be seen under normal circumstances *(66)*. Pressure on Suriname's centralized procurement system to acquire supplies for COVID-19 cases has also made accessing critical medication difficult for chronic NCD patients *(67)*.

COVID-19 also impacts mental health. Data from helpline calls in 19 countries during the COVID-19 era show individuals coping with increased fear, loneliness, and concerns about physical health *(68)*. In addition, during containment and lockdown scenarios, suicide-related calls increased, potentially in relation to the increased economic stress placed on individuals who lost opportunities for—or sources of—income generation *(68)*.

The COVID-19 epidemic makes clear the need to invest in addressing NCDs and mental health as part of response and recovery efforts. Implementing preventive NCD and mental health measures is a strategic investment to address the ongoing crisis and mitigate the impact of future infectious disease outbreaks.

4. Institutional context analysis

Action to address NCDs and improve mental health is on the public agenda in Suriname. The National Preparedness and Response Plan for COVID-19 includes attention to NCDs and mental health. The National Policy Development Plan 2017–2021, the Ministry of Health Policy Plan 2021–2025, and the National Strategic Plan for Health and Wellbeing in Suriname 2019–2028 *(28, 69–71)* all promote a healthy population and greater focus on primary health care and prevention, highlighting the importance of awareness, legislation, and regulation to reduce NCDs and their risk factors. Stakeholders collaborate to address NCDs and mental health, with strong technical capacities and integrated approaches developed by key government actors, such as the Ministry of Public Health, the Ministry of Social Affairs and Housing Works, and the Ministry of Labor, Employment Opportunities, and Youth Affairs, among others. Action is supported by the academic sector, nongovernmental organizations working on relevant public health initiatives, key media outlets, and leaders such as the First Lady of Suriname. Suriname has also received significant multilateral support on NCDs, tobacco control, and mental health, positioning it to become a regional leader in championing strong, integrated, and whole-of-society approaches to these issues.

In addition to the opportunities highlighted above, the institutional context analysis also identified challenges. NCD risk factors in Suriname are aggregating among youth, a worrying trend considering that behaviors established earlier in life can continue and compound over time, and suicide rates are high among young adults. Further, reaching underserved and rural communities with NCD prevention and treatment has been a challenge, and health service delivery in the country has been described as "fragmented." The Ministry of Health and current Health Minister have highlighted retooling public health services as a priority issue, and indeed have started reform to leave no one behind through a "New Model of Care" that is advancing integrated and more efficient service delivery *(71)*.

Although Suriname has mental health policies as well as a mental health strategic plan, there are opportunities to make these more comprehensive and strategic. There is only one mental health hospital in the country, with all mental health services and human resources centralized to it. There is also a

need to increase mental health care for children and youth, and to close gaps in protection of vulnerable populations such as asylum seekers and refugees. Key for Suriname is to decentralize mental health services through primary and community-based care, while working to destigmatize the issue, drive equity, and strengthen prevention.

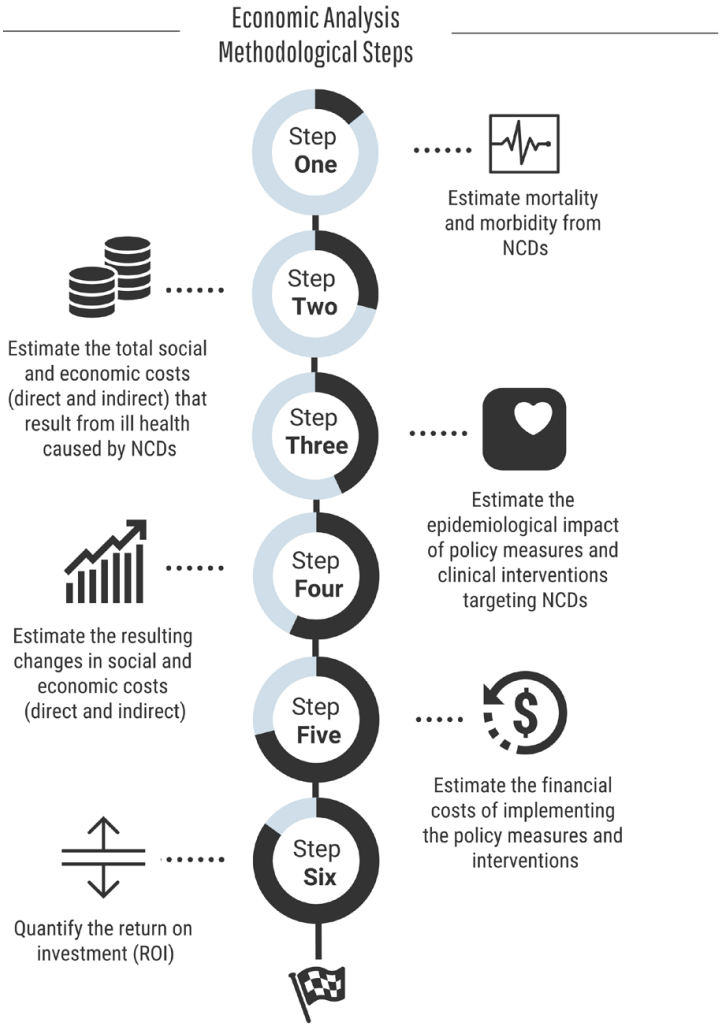
Suriname's high performing economy has been hit by the COVID-19 pandemic, as was the case in many countries. Results and recommendations from the investment case on NCDs and mental health can be promoted as a way of protecting and restoring human capital and productivity as part of economic recovery and building back stronger from COVID-19, in line with the 2020–2022 Recovery Plan *(72)*. Strengthening taxes on tobacco, alcohol, and sugar-sweetened beverages would not only improve health and avoid the costs of ill-health but also help finance key development issues and health sector goals, in line with priorities per national plans *(28, 71)*. Further opportunities to advance investment case findings and recommendations can be found toward the end of the report.

5. Methods

The investment case analyzes the health and economic benefits of implementing policy measures that address NCD risk factors, and of scaling up clinical interventions to prevent and treat NCDs and treat mental disorders. The overall time horizon of the analysis is the 15-year period from 2021 to 2036, a medium-term interval selected to align with the number of years allotted to the Sustainable Development Goals. Five-year analysis (2021–2025) is also included to highlight the gains Suriname can expect to receive in the shorter term.

The United Nations interagency OneHealth Tool is used to perform the methodological steps in **Figure 2** for all risk factors, diseases, and disorders—excepting tobacco, for which the analysis was conducted using an RTI-International population attributable fraction model for tobacco. Modeling and data limitations prevent analysis of all potential health and economic outcomes for each package, and modeling is more extensive for some packages (e.g., tobacco) than others. A summary of examined diseases and outcomes by package and more information on the tools and methods used to perform these steps are described in the Technical Appendix.

Figure 2. Building the investment case



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

Costs and monetized benefits are reported in constant 2019 Suriname dollars (SRD) and are discounted at a rate of 3%.

6. Results

This section presents the current burden of select NCDs and mental disorders.[5] In addition, it shows the impact of implementing new tobacco, alcohol, physical inactivity, and sodium policy measures—or intensifying existing ones—and of scaling up clinical interventions that address NCDs and mental disorders. Single interventions and policy measures that target a particular disease or risk factor[6] are bundled together as "packages" within the analysis. For instance, each of the interventions addressing diabetes or diabetes complications (i.e., glycemic control, screening and treatment of retinopathy and neuropathy) are together named the "diabetes package."

6.1 The burden of select NCDs and mental disorders

The investment case quantifies the social and economic burden attributable to four diseases (CVD, diabetes, chronic obstructive pulmonary disease [COPD], and asthma) and three mental disorders (depression, psychosis, and alcohol dependence). The economic burden is a measure of 1) the "workforce" or productivity loss caused by ill-health—including that due to premature mortality, labor force exit caused by ill health, absenteeism, and presenteeism—and 2) health expenditures to treat diseases and disorders. The social burden represents intrinsic losses associated with foregone health, or losses outside of what can be reflected in GDP measures.[7]

In total, examined sub-disorders under these major health categories cause SRD 2.6 billion in annual economic and social losses. **Figure 3** shows the share of the burden attributable to a given disease or disorder. Diabetes comprises the largest share of the burden (31%), followed by CVD (21%), alcohol dependence (19%), depression (12%), asthma (9%), COPD (7%), and psychosis (1%).

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5 The analysis does not capture all conditions under each disease category. CVD encompasses the burden attributable to stroke, ischemic heart disease, and modifiable CVD risk factors such as hyperlipidemia and hypertension; diabetes the burden attributable to diabetes and two specific end-point complications of diabetic retinopathy and neuropathy—blindness and lower-limb amputation; and, COPD and asthma the burden attributable to exacerbations. Other conditions under each category (e.g., heart disease, nephropathy, diabetic foot ulcers) are not included in the analysis. Thus, in each case, the economic burden numbers presented here are underestimates of the total NCD burden.

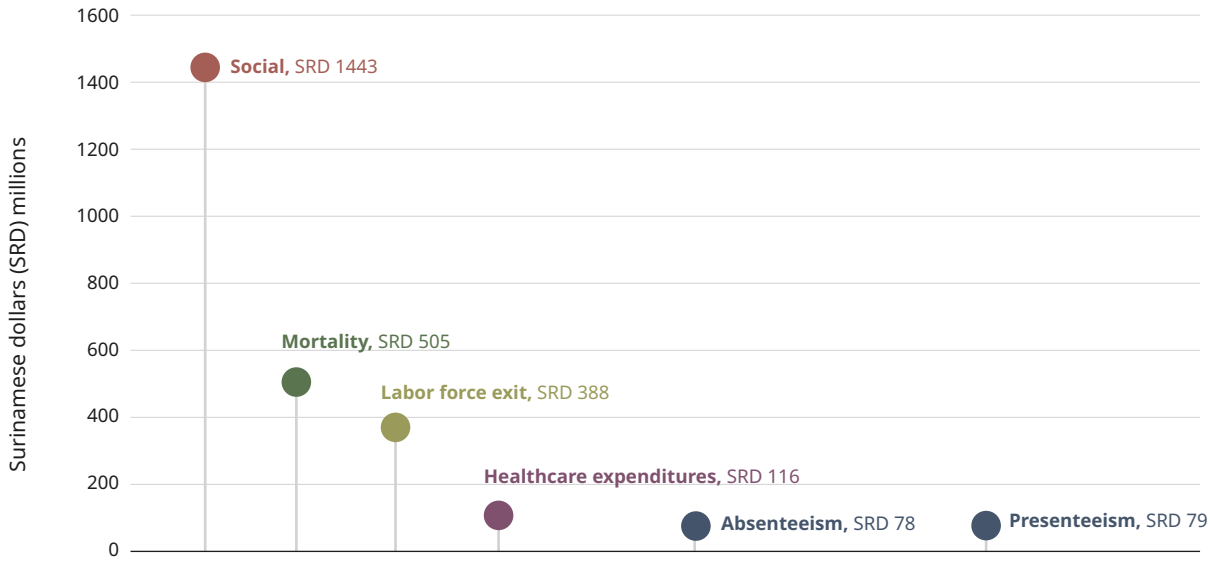
6 See Section 3 for a list of the interventions included in each "package."

7 "[Social] benefits, although equally real and certainly economic in a broader welfare sense, will not be reflected in conventional GDP measures. A mother's life saved so that she can look after her children and support her community has great social value even if she does not enter the paid workforce. Equally, the value of a child's life saved does not depend only on his or her participation in the labor force when an adult. We refer to the benefits not captured in existing GDP measures as *social benefits*" *(73).*

Figure 3. Share of economic losses attributable to CVD, diabetes, COPD, asthma, depression, alcohol dependence, and psychosis

A breakdown of losses by category is shown in **Figure 4**. Social losses comprise 55% of all losses. Forty percent of losses are workplace productivity losses due to premature mortality, early labor-force exit due to ill-health, absenteeism, and presenteeism. These annual productivity losses are equivalent to 3.8% of 2019 GDP. The remaining 5% of losses are due to healthcare expenditures.

Figure 4. Annual economic losses due to CVD, diabetes, COPD, asthma, depression, alcohol dependence, and psychosis

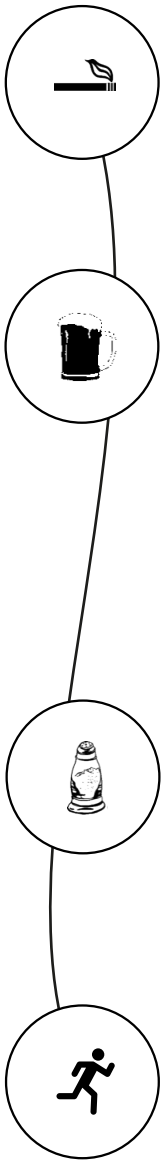


6.2 Implementing interventions and policies: financial costs and impact

Proven interventions exist to reduce the SRD 2.6 billion in annual social and economic losses attributable to the examined NCDs, mental disorders, and alcohol use disorders.

The investment case quantifies the financial cost and health and economic benefit of implementing—or intensifying—national-level policy measures to address NCD risk factors (i.e., tobacco use, harmful use of alcohol, sodium consumption, and physical inactivity) and scale up clinical interventions targeting CVD, diabetes, depression, psychosis, and alcohol use disorders. Policy measures and clinical interventions examined in the investment case are summarized in **Figure 5**.

Figure 5. Examined policy measures and interventions



Tobacco use

1. Increase tobacco taxes
2. Enforce bans on smoking in all indoor public places, workplaces, and public transport
3. Institute mass media campaigns
4. Mandate plain packaging of tobacco products
5. Train health providers and scale provision of brief advice to quit tobacco.

Alcohol dependence

Policies

1. Restrict the availability of alcohol
2. Regulate direct and indirect advertising, and the volume and content of alcohol advertisements
3. Increase taxes on alcoholic beverages

Clinical interventions

1. Screen for hazardous or harmful use of alcohol
2. Treat harmful and hazardous alcohol use with motivational interviewing, and
3. Treat alcohol dependence with motivational enhancement therapy and manage alcohol withdrawal.

Sodium consumption

1. Introduce surveillance programs to measure and monitor sodium consumption
2. Establish mandatory targets for industry to reduce sodium in food sources that represent major sources of intake
3. Introduce front-of-pack nutrition warning labels
4. Launch education and communication campaigns
5. Promote healthy eating in public institutions.

Physical inactivity

1. Institute a community-wide public education and awareness campaign, including via use of mass media, to promote physical activity and education about the harms of sedentary lifestyles.

Diabetes

1. Glycemic treatment to control fasting blood glucose
2. Screen for diabetes-attributable complications (retinopathy, neuropathy)
3. Treat individuals with sight-threatening retinopathy using laser photocoagulation
4. Treat indviduals with neuropathy through provision of footwear and lifestyle advice.

Psychosis

1. Provision of psychosocial treament for individuals with mild depression
2. Intensive psychosocial and pharmacological treatment for individuals with moderate or severe depression
3. Psychosocial and pharmacological treatment for individuals experiencing psychosis.

CVD

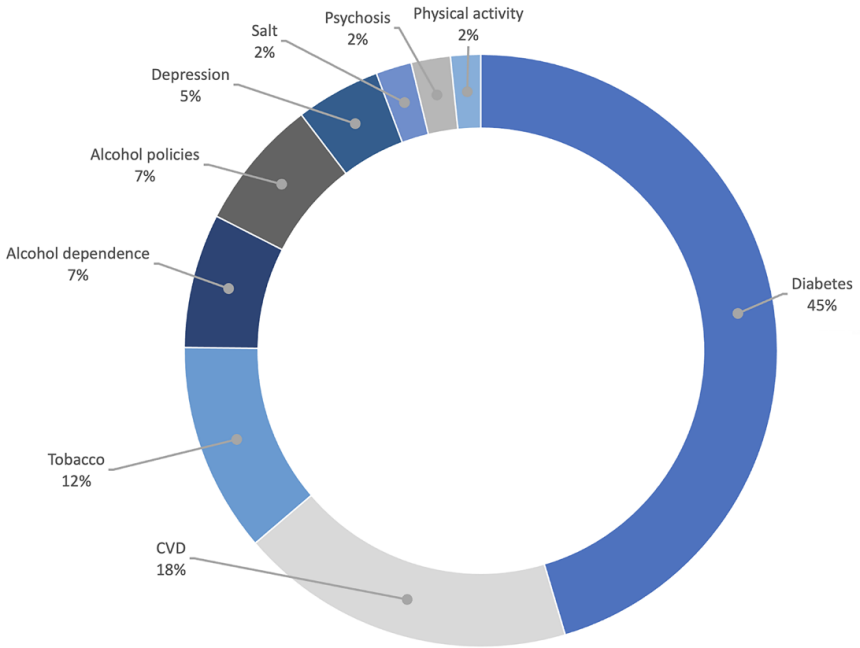
1. Screen for CVD risk factors
2. Treat adults with 10-year CVD risk ≥ 20%
3. Treat adults with hypertension
4. Treat adults with hyperlipidemia
5. Treat new cases of myocardial infarction and stroke
6. Treat established cases of ischemic heart disease and stroke.

6.2.1 Financial costs

In total, over 15 years, implementing and scaling the policy measures and clinical interventions would cost about SRD 741 million (discounted).[8] On average, this is about SRD 49 million annually, or an additional SRD 85 per person in Suriname.

Figure 6 breaks down costs by intervention package. The cost of population-level policy measures designed to reduce the prevalence of behavioral NCD risk factors represents about one-fifth of all costs. In-person, clinically-based interventions[9] to treat metabolic risk factors or existing disease cases or mental disorders account for the remaining four-fifths of costs—indicative of the intensive human-resource and pharmacological costs of treating patients within health systems, as well as supply chain costs to transport and warehouse medicines. Clinical interventions to treat diabetes or prevent or treat diabetes complications represent nearly half (48%) of all estimated costs.

Figure 6. Cost of clinical interventions and policy measures (SRD, discounted), share by package



Medications, diagnostics, and supplies are the biggest cost drivers of the clinical interventions, representing about 59% of all costs (see Technical Appendix Figure A3 for a breakdown by disease or condition). Cost of outpatient visits represent the next highest share of costs (19%), followed by supply chain (11%), individual or group therapy for individuals with mental disorders (7%), and inpatient costs (3%).

8 All costs and benefits are discounted using a 3% discount rate.

9 Note: the tobacco package contains one clinical intervention administered at the primary care level.

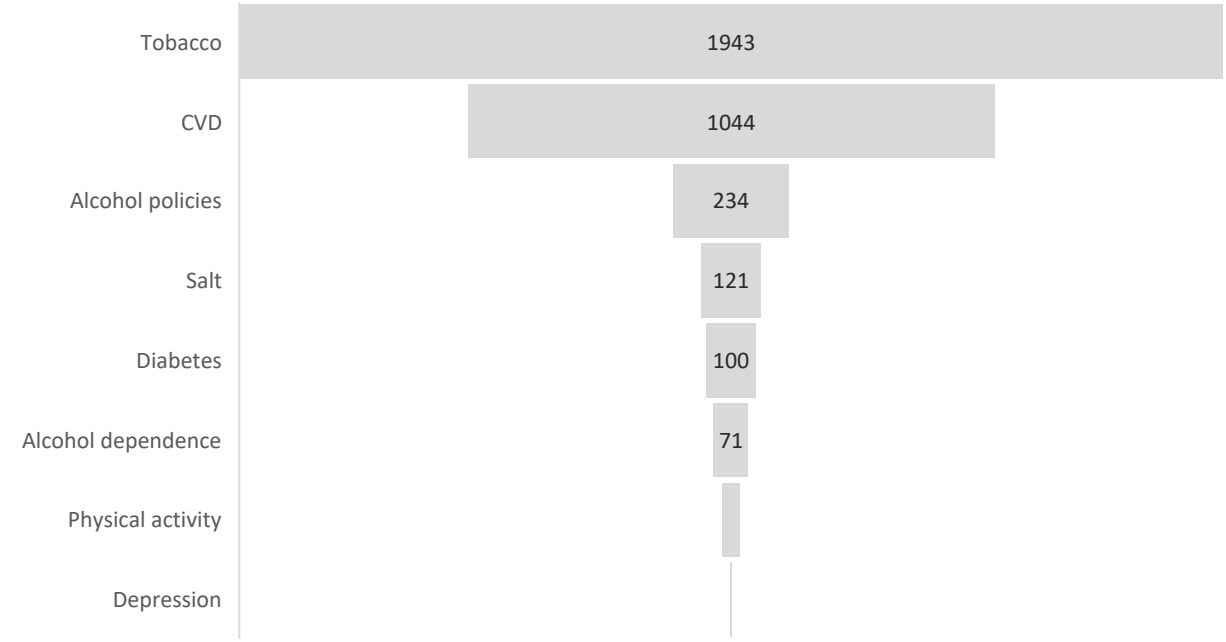
6.2.2 Health benefits

By investing in interventions to prevent and treat NCDs and mental disorders, Suriname can generate substantial benefits. Implementing—or intensifying—policy measures and scaling up clinical interventions to reduce disease incidence and prevalence of mental disorders results in the prevention of death and disability.

Together, the packages save more than 3500 Surinamese lives over the 15-year time horizon of the analysis. **Figure 7** shows total deaths averted by package. The tobacco control package reduces smoking rates by over one-third, in relative terms, saving 1943 lives. Other primary prevention policy measures targeting NCD risk factors (harmful alcohol use, sodium consumption, and physical inactivity) also generate health benefits, saving 393 lives over the 15-year period. Secondary prevention clinical interventions to treat metabolic risk factors for CVD or to prevent CVD recurrence save 1044 lives. Treating individuals with diabetes to control hyperglycemia and prevent severe retinopathy and neuropathy saves 100 lives.

Together, the packages ensure that the Surinamese population lives longer and more healthy lives. Healthy life years (HLYs) are a measure of the number of additional life years that individuals live in a state of full health. The tobacco package generates the highest number of HLYs (17 000), followed by the package of interventions targeting depression (5400), the alcohol policy package (5300), CVD package (4900), clinical interventions to treat alcohol dependence (3400), diabetes (2300), salt (1300), psychosis (900), and physical inactivity (600).

Figure 7. Lives saved over 15 years, by intervention package



Note: The analysis does not find that the psychosis interventions reduce mortality.

6.2.3 Social and economic benefits

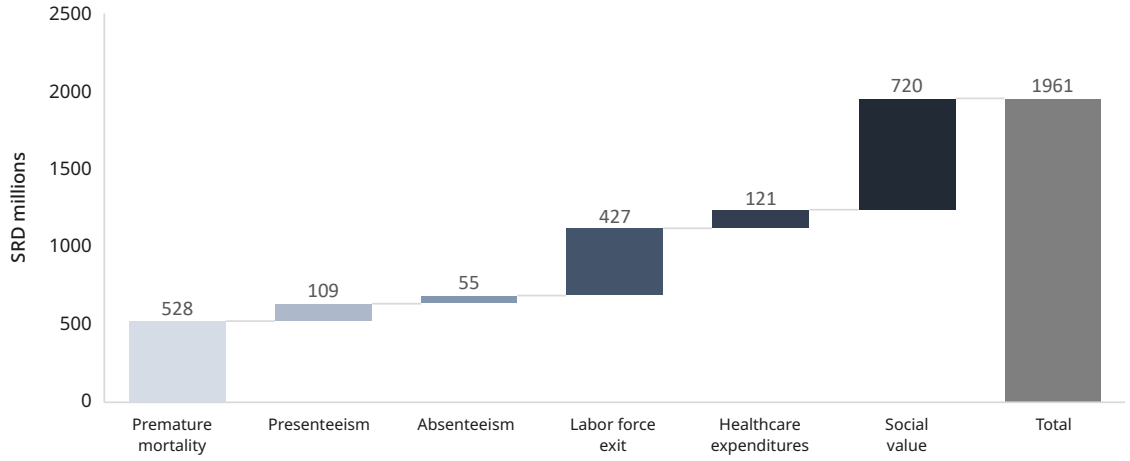
With better health, fewer individuals need to be treated for complications from diseases, resulting in direct cost-savings to the government, households, and private insurers. In addition, improved health increases worker productivity. Fewer individuals leave the workforce prematurely due to death or disease. Laborers miss fewer days of work (absenteeism) and are less hindered by health complications while at work (presenteeism). Finally, there are substantial social benefits, with improvements in health facilitating individuals' ability to pursue the lives that they want to lead.

By acting now to implement new policy measures—or intensify existing ones—and scale up clinical interventions, Suriname can generate nearly SRD 2.0 billion in economic and social benefits (discounted) over the next 15 years.

Figure 8 illustrates the sources of the benefits. The largest gains result from social benefits (SRD 720 million). In addition, the interventions generate workforce productivity benefits that result from decreases in premature mortality (SRD 528 million), avoided labor exit (SRD 427 million)—due to disabling events, such as stroke, myocardial infarction, lower-leg amputation, blindness, and depression—presenteeism (SRD 109 million), and absenteeism (SRD 55 million). In total, increases in workforce productivity comprise 57% of the social and economic benefits.[10]

Further, Suriname averts SRD 121 million in healthcare expenditure. Of this total, an estimated SRD 90 million is savings to the government, SRD 24 million is savings to households and individuals in out-of-pocket expenses, and the remainder is savings to other voluntary healthcare schemes.[11] These savings mean government and households will have additional resources to fund health, education, or other priorities.

Figure 8. 15-year recovered economic output (SRD millions, discounted), by source



10 Although social benefits form a higher share of the burden than workplace benefits (see Figure 4), the interventions avert more workforce productivity losses than social losses in part because workforce losses are higher value (e.g., one year of workforce productivity is valued at GDP per worker [SRD 142 000] where one year of social benefits at is valued at 0.5 times GDP per capita [SRD 24 000]). See Technical Appendix for more information on the valuation of benefits.

11 To calculate the share of healthcare expenditure savings for public, nonprofit, and private entities, the investment case assumes that savings accrue to each entity in equal proportion to its contribution to total health expenditure, as obtained from the WHO health expenditures database—from which government is shown to cover 75% of total health expenditures, voluntary healthcare schemes cover 5%, and households cover 20% through out-of-pocket expenses *(74)*.

6.2.4 Comparing benefits and financial costs

A return on investment (ROI) analysis assesses whether the benefits of intervening outweigh the costs. The ROI for intervention packages-targeted NCDs and mental disorders was evaluated in the short term (5 years) and in the medium term (15 years).

Table 2 ranks the packages by ROI. Over the medium term, all packages have ROIs greater than one, except for the diabetes package. The tobacco package has the highest return on investment: for every SRD invested in scaling up tobacco control measures, Suriname can expect to gain 10.3 dollars in economic and social benefits in return. The package of interventions treating depression has the next highest ROI (4.6), followed by the sodium package (3.7), alcohol control policies (2.4), clinical interventions to prevent or treat CVD (2.2), physical activity policies (1.9), and clinical interventions to prevent or treat alcohol dependence (1.7), psychosis (1.1), and diabetes (0.96).

Table 2. Return on investment, by NCD package (SRD millions, discounted)

	Return on investment by package					
	5-year period			15-year period		
NCD intervention packages	Total costs	Total benefits	ROI	Total costs	Total benefits	ROI
Tobacco	39	131	3.4	84	869	10.3
Depression	05	22	4.4	34	156	4.6
Sodium	07	01	0.1	14	53	3.7
Alcohol policies	23	12	0.54	53	127	2.4
CVD	23	24	1.0	136	300	2.2
Physical activity (media campaign)	05	01	0.21	12	23	1.9
Alcohol dependence	15	06	0.45	55	94	1.7
Psychosis	02	02	1.0	16	17	1.1
Diabetes	45	14	0.30	336	323	0.96
All packages	**165**	**214**	**1.3**	**741**	**1961**	**2.6**

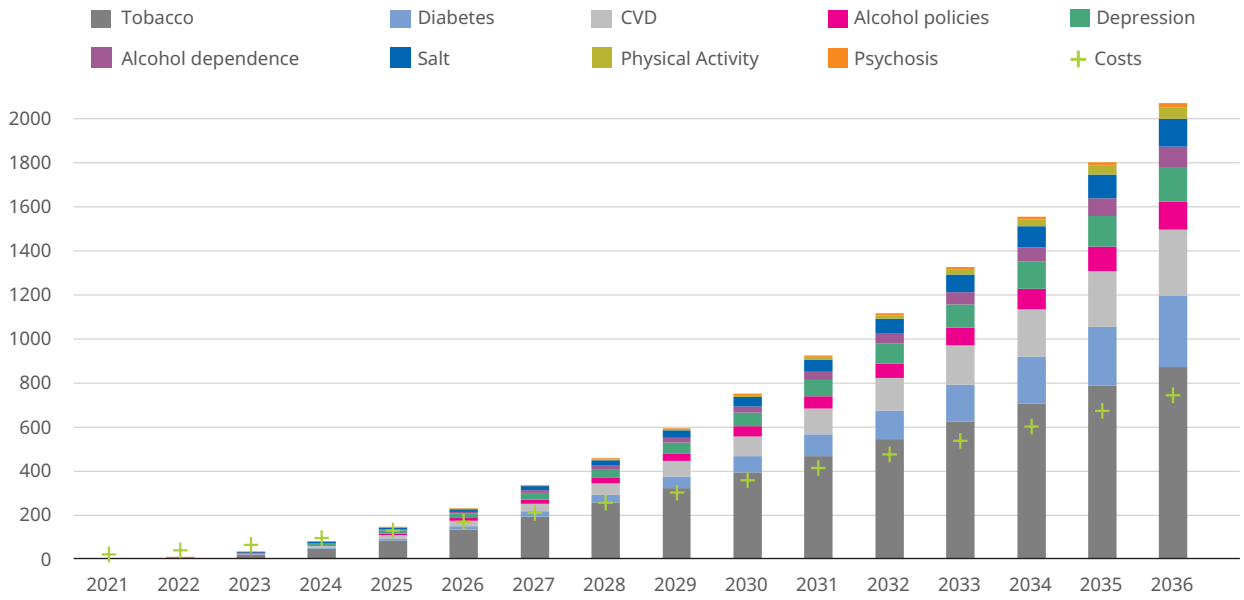
Notes: All packages - The total costs and total benefits presented for "all packages" are assumed to be additive. The investment case analysis does not consider synergetic effects of implementing all packages simultaneously.

Modeling and data limitations prevent analysis of all potential health and economic outcomes for each package, and modeling is more extensive for some packages (e.g., tobacco) than others. Rankings of packages should be interpreted with caution. A summary of examined diseases and outcomes by package is found in the Technical Appendix.

While the ROI measures the efficiency of a given investment, total social and economic benefits are a measure of the magnitude of the impact. Tobacco demand-reduction measures generate the highest share of benefits (44%), followed by diabetes (16%), and CVD (15%).

Figure 9 illustrates cumulative benefits and costs of the eight intervention packages over the 15-year time horizon. The combined ROI of the interventions grows (1.3 at 5 years, 2.1 after 10 years, and 2.6 after 15 years), demonstrating that the dividends from investment in prevention and control of NCDs and mental disorders grow over time.

Figure 9. Cumulative benefits and costs over 15 years (SRD millions, discounted)



7. Discussion

Each year, the subset of NCDs and mental disorders examined in the investment case causes SRD 2.6 billion in annual social and economic losses to Suriname. Fortunately, opportunities exist to decrease the annual burden attributable to these conditions. Implementing new policy measures—or intensifying existing ones—and scaling clinical interventions can save more than 3500 lives over 15 years. The preventive nature of many of the interventions will lower health expenditures, saving SRD 121 million. These savings mean government and households will have additional resources to fund health, education, or other priorities. In addition, by preventing early mortality and sickness, the interventions provide SRD 1.1 billion in workforce productivity benefits over the 15-year period—contributing an extra third of a percentage point of growth to GDP and demonstrating that improving health is directly aligned with Suriname's economic development priorities.

Primary prevention measures targeting four major behavioral risk factors that drive NCDs offer an opportunity to prevent disease at population level. Population-level measures to lower harmful and/or hazardous alcohol use, physical inactivity, sodium intake, and tobacco use are high-yield opportunities. These measures only represented about 20% of the total costs of all the interventions examined in the analysis but produced 55% of the benefits—with most generated by the tobacco control measures. The benefits of implementing measures to control harmful alcohol use and physical inactivity are likely even higher than quantified in the analysis. For example, modeling limitations precluded analysis of the productivity benefits and savings in healthcare expenditures that are likely to result from implementing the alcohol policy measures, and the analysis did not measure the benefit of increasing physical activity on outcomes such as improved mental health or reduced cancer incidence.

For the SHAKE package, the analysis assumed that at least three years of planning and development are required to foster a receptive political economy in which SHAKE can be implemented, and that the impact

of the interventions scales gradually (see Technical Appendix – Section 2). The conservative scale-up pattern is based on evidence from 12 countries where salt-reduction policies have been implemented. In most countries, in the years following implementation, salt intake decreased around 1% to 2% per year (39).[12] Even with a conservative scale-up pattern, by the end of the analysis, the SHAKE package is annually preventing seven CVD deaths per year, or 12% of all estimated CVD deaths attributable to diets high in sodium,[13] and the benefits of the intervention far outweigh the costs (3.7:1). The health benefits and return on investment of the SHAKE program will continue to grow beyond the analysis time horizon. To accelerate the impact of SHAKE interventions, Suriname can take specific actions, such as convening cross-sector stakeholders to develop a national plan to reduce population salt intake and to establish mandatory national sodium reduction targets; and establishing monitoring programs to measure baseline levels of sodium intake, sodium levels in the food supply, main food sources of sodium, and the impact of sodium-reduction initiatives.

Clinical interventions are more expensive to implement and scale than policy measures, but they ensure that immediate interpersonal support and treatment is available for those who do acquire disease. Aligning with Suriname's efforts to develop an integrated chronic care model at the primary level of care, the investment case shows that focusing on secondary prevention generates significant returns. Controlling hypertension, hyperlipidemia, and diabetes shields the health system against devastating, expensive-to-treat disorders that also destroy individuals' ability to work and to live fulfilling lives.

Diabetes—with the highest social and economic burden among the seven diseases and disorders analyzed—is a special challenge in Suriname. Treatment is costly—nearly half of all intervention costs in the analysis are attributable to treatment for diabetes and related complications—demonstrating the imperative to focus on primary prevention efforts. The analysis, for example, identifies that mass media campaigns to motivate physical activity and communicate about the harms of sedentary lifestyles are cost-efficient and could prevent up to 200 diabetes cases over 15 years.

High treatment costs contribute to the diabetes package's low ROI. However, the benefits of the diabetes interventions are undercounted because the analysis only quantifies the extent to which glycemic control can prevent two severe outcomes: sight-threatening retinopathy and lower-limb amputation. In reality, the diabetes interventions would also decrease CVD events and chronic kidney disease. Even withstanding these omissions, the analysis found that the diabetes interventions prevented nearly 2200 disabling events (blindness, lower-limb amputation) over the 15-year time horizon of the analysis. With growing prevalence of diabetes *(75)* and expensive-to-treat complications like lower-limb amputation and end-stage renal disease, strengthening diabetes care is an essential component of controlling health expenditures.

Mental and alcohol-use disorders substantially reduce day-to-day functioning, causing an outsize burden. Nearly one-fourth of the healthy life years generated by all packages are from scaling interventions to treat mental disorders. Continued integration of mental services within primary care and other health system access points is essential to holistic health among the Surinamese population.

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12 The highest reduction was seen in Finland, which achieved a 36% relative reduction in salt intake over 28 years.

13 The Institute for Health Metrics and Evaluation's Global Burden of Disease Results Tool *(1)* shows that around 4% of stroke and ischemic heart disease deaths are attributable to high salt intake. The investment case's OneHealth Tool modeling estimates 1400 annual CVD deaths in Suriname at the end of the analysis in 2034, around 56 of which would be attributable to diets high in sodium (1400 * 0.04). Thus, the SHAKE package averts around 12% of sodium-attributable deaths by the end of the analysis (7/56).

Implementing—or intensifying—the policy measures and scaling up the clinical interventions will require significant resources. In total, the packages of interventions and policy measures cost SRD 741 million over 15 years, or about SRD 49 million annually. Thus, Suriname needs to increase current government health expenditures by 3.2% to fund implementation and scale-up. Provision of clinical interventions accounts for four-fifths of all costs, driven mostly by medications, diagnostics, and supplies. Considering such findings, regional entities such as the Strategic Fund of the Pan American Health Organization are of especial importance in controlling health system costs through regional purchasing power to negotiate and procure affordable, safe, effective, and quality-assured essential medicines and health supplies.

Financial costs quantified in the investment case should be considered minimum investments; additional resources will be required to strengthen the health system and available forms of treatment. For example, the investment case does not account for costs such as required capital investments or monitoring and evaluation (i.e., health information systems) to support service provision. Further, the investment case only considered a limited set of interventions. Suriname may consider scaling other high-impact interventions that improve outcomes and support individuals in need but that require significant investments. For example, pharmacological relapse-prevention interventions for individuals who are dependent on alcohol were not considered in this analysis, and given high medication costs, inclusion of this intervention would likely draw the ROI of the alcohol dependence package downward even while providing additional health benefit.

Despite limitations, the investment case provides a baseline estimate of required investments. Opportunities exist to close funding gaps. Two policy measures examined in this analysis—increases in tobacco and alcohol taxes—could provide additional revenue to finance a share of the costs. A recent tobacco control investment case for Suriname identified that increases in tobacco taxes alone could generate SRD 89 million over five years, enough to fund about half of the first five years of costs of the policy measures and interventions examined in this analysis. Other potential health taxes, such as those on sugar-sweetened beverages, could generate further revenue while also helping to address a key contributor to obesity in one in four Surinamese adults and one in 10 adolescents and children *(76)*.

NCDs and mental disorders represent a growing threat to the human right to health and well-being. Their high prevalence has exacerbated the impacts of COVID-19, and the pandemic has hampered NCD and mental health responses in turn. The investment case presents an evidence-based path forward for Suriname to halt and reverse the trend as a component of building back better. By investing now in interventions that address NCDs and mental disorders, Suriname can accelerate its efforts toward universal health care, achieve Sustainable Development Goal 3.4—which calls for a one-third reduction in premature mortality and morbidity due to NCDs by 2030—, leverage its human capital, and grow its economy.

8. Opportunities

This investment case for Suriname provides compelling social and economic evidence for the country to invest in even stronger action for NCDs and mental health. The full benefits of the case are more likely to be realized if the following enabling actions are pursued:

1. **Disseminate the investment case findings broadly, specifically outlining how different actors can support and benefit from implementation.** NCDs and mental health require a whole-of-government and whole-of-society response, and such action delivers diffuse societal benefits. The

findings of the investment case must reach key sectors of government, Congress, the Judiciary, local authorities, community health workers, civil society, media, development partners, academic institutions, and the public. An advocacy strategy and audience-specific recommendations can raise awareness, strengthen political and public support, and advance integrated action. Opportunities include engaging civil society and youth in line with Suriname's Comprehensive National Preparedness and Response Plan for COVID-19 *(69)*, continued partnership with the First Lady of Suriname, and highlighting the importance of the investment case recommendations in enabling the "healthy culture" articulated in Suriname's 2017–2021 Policy Development Plan *(70)*.

2. **Embed action on NCDs and mental health as part of building back Suriname's economy better and stronger than ever.** Suriname's high-performing economy suffered a blow due to COVID-19, as did the economies of many countries. As part of getting economic growth back on track, Suriname should address NCDs and mental health to protect human capital accumulation and boost productivity. This is especially pertinent considering Suriname's large working-age population. Implementing the investment case recommendations would support Suriname's 2020–2022 Recovery Plan *(72)*, including by helping to restore macroeconomic stability. The investment case on NCDs and mental health, like COVID-19, makes clear that health and well-being must be central to economic development.

3. **Strengthen multisectoral planning, coordination, and prevention of industry interference in policy-making.** Stakeholders in Suriname already collaborate to address NCDs and mental health, with successes including the Tobacco Control Act 2013, the first-ever National Action Plan for the Prevention and Control of NCDs for 2015–2020 *(15)*, and the joined-up response to mental health in the context of COVID-19. The whole-of-society process for the investment case, led by the Ministry of Health, can ignite even broader, stronger, and more sustained coalitions. Renewed solidarity on NCDs and mental health must be anchored in multisectoral planning, coordination, and prevention of industry interference in policymaking, in line with Suriname's commitment to strong leadership and governance in health. Indeed, the investment can catalyze commitments in the Ministry of Health Policy Plan 2021–2025 and the National Strategic Plan for Health and Wellbeing in Suriname 2019–2028 *(28, 71)*. Its findings and priority interventions should also feature in the updated NCD action plan and mental health and suicide strategy and plan under development. Many countries have used their investment case to focus national coordination for NCDs and mental health. Capacity-building across sectors for policy coherence and conflict of interest identification and management is critical to safeguard efforts from industry interference.

4. **Raise taxes on tobacco and alcohol products as well as sugar-sweetened beverages.** Effective health taxes are particularly relevant in the context of COVID-19. They can support resilient health systems, economies, and societies while raising revenue to finance response and recovery efforts. Examples include financing basic services and social safety nets, in addition to funding NCD, tobacco control, and mental health responses as part of pandemic preparedness and response. As COVID-19 has reaffirmed, the relationship between infectious and noncommunicable diseases can be deadly and strong, with people living with NCDs at greater risk of severe disease and death from COVID-19 *(77)*. Health taxes contribute to preventing NCDs by reducing consumption of health-harming products, thereby boosting preparedness for pandemics and public health emergencies. The investment case shows high ROIs for taxes on alcohol and tobacco products, and analysis on tobacco taxes as part of the FCTC investment case shows the untapped revenue potential. Suriname should combine this fiscal analysis with other support such as PAHO's study on fiscal space for health

to boost health taxes, including to advance Suriname's objective to ensure equitable, sustainable, and universal financing for health *(71)*. Indeed, Suriname is a leader in health expenditure as a percentage of GDP and in effective financial protection of its citizens, in line with its National Basic Health Insurance Law of 2014. Comprehensive review of tax policy and structure in line with investment case findings can preserve this status, inform dialogue between the ministries of health and finance, and support achievement of the SDGs.

5. **Build upon the strong progress on and increased attention to mental health in the context of COVID-19.** COVID-19 has raised awareness of mental health globally and in Suriname. The country is stepping up action across sectors on mental health in partnership with the United Nations. Strategic directions to strengthen the response further include: decentralizing mental health services through primary and community-based care, integrating psychosocial support, and leveraging digital technology; increasing the workforce and infrastructure for delivery, including for inpatient and outpatient treatment; strengthening prevention and public promotion; ensuring greater focus on children, adolescents, and vulnerable populations; updating legislation and strengthening human rights dimensions; and addressing stigma. Comprehensive support from PAHO and UNDP on investment approaches, governance, and surveillance can support Suriname in integrating mental health and NCDs responses.

6. **Put NCDs and mental health at the center of efforts to leave no one behind.** NCDs are amplifying the impacts of COVID-19, and COVID-19 is exacerbating the burden of NCDs, particularly in already disadvantaged communities *(78)*. NCDs and mental disorders are enmeshed with poverty, financial vulnerability, and inequalities. In Suriname, NCDs and mental ill-health are common among vulnerable groups; for example, the high rates of suicide among young adults and the Hindustani. Alcohol use, gender-based violence, and HIV are negatively reinforcing. This underscores the importance of Suriname addressing the underlying determinants of NCDs and mental ill-health, including as urgent matters of child protection, safety and well-being, gender equality, and equity. Taxation of health-harming products can drive equity while financing integrated primary health care for Suriname's remote and hard-to-reach populations, in line with the "New Model of Care" *(71)*.

7. **Leverage the comprehensive multilateral support provided on NCDs, tobacco control, and mental health to become a regional leader on these issues.** Suriname is in a rare position of having received investment case support across health issues—NCDs, tobacco control, and mental health—from United Nations partners and RTI International. It now has strong, evidence-backed momentum to push these agendas forward together, ensuring a response commensurate with the country's high burden. The PAHO/WHO and UNDP-supported project on Catalyzing Multisectoral Action for NCDs can support integrated efforts within and beyond Suriname's health sector while providing a platform to exchange good practices with other countries such as Guyana and Trinidad and Tobago. The FCTC 2030 project can help to strengthen tobacco control to make up lost ground on the SDGs. The recently established United Nations Multi-Partner Trust Fund on NCDs and mental health aims to provide catalytic support to committed countries.

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This report presents the results of the investment case for prevention and control of noncommunicable diseases (NCDs) and mental disorders in Suriname, and develops evidence and guidance to support the financing and implementation of national multisectoral NCDs prevention, control strategies, and treatment of mental disorders. The study estimates the return on investment from implementing or scaling up priority interventions to reduce specific NCDs and mental disorders, and also evaluates the political feasibility of putting these interventions into practice.

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