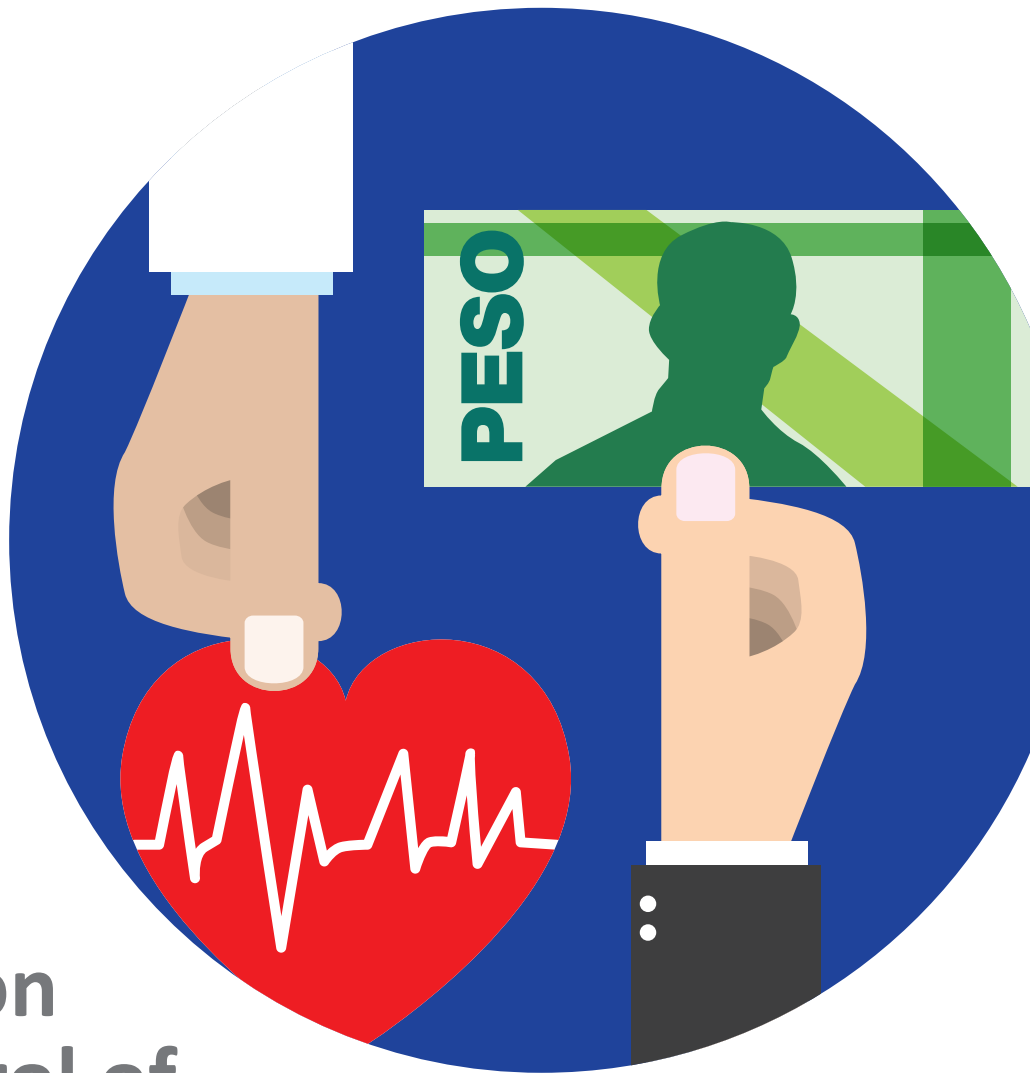




Empowered lives.  
Resilient nations.



# Prevention and control of noncommunicable diseases in the Philippines

## The case for investment

# Prevention and control of noncommunicable diseases in the Philippines

## The case for investment

Prepared for the Ministry of Health of the Philippines

by

World Health Organization

United Nations Development Programme

2019



*Empowered lives.  
Resilient nations.*



# Abstract

Noncommunicable diseases (NCDs) such as cancer, cardiovascular disease, diabetes and chronic respiratory diseases and their risk factors are an increasing public health and development challenge in the Philippines. This report provides evidence through three analyses that NCDs reduce economic output and discusses potential options in response, outlining details of their relative returns on investment. An economic burden analysis shows that economic losses from NCDs (direct and indirect costs) comprise PHP 756.5 billion, which is equivalent to 4.8% of gross domestic product in 2017. An intervention costing analysis provides an estimate of the funding required to implement a set of policy interventions for prevention and clinical interventions. A cost–benefit analysis compares these implementation costs with the estimated health gains and identifies which policy packages would provide the greatest returns on investment.

## Keywords

NONCOMMUNICABLE DISEASES – PREVENTION AND CONTROL  
CHRONIC DISEASE – ECONOMICS, PREVENTION AND CONTROL  
DELIVERY OF HEALTH CARE  
HEALTH CARE FINANCING  
HEALTH SYSTEMS PLANS  
PHILIPPINES

WHO/UHC/CD-NCD/19.90

© World Health Organization 2019

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO); <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>.

Under the terms of this license, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons license. If you create a translation of this work, you should add the following disclaimer along with the suggested citation:

“This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition”.

Any mediation relating to disputes arising under the license shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization.

**Suggested citation.** Prevention and control of Noncommunicable Diseases in the Philippines. The Case for Investment, Philippines, 2019. Geneva: World Health Organization; 2019 (WHO/UHC/CDS-NCD/19.90). License: CC BY-NC-SA 3.0 IGO.

**Cataloguing-in-Publication (CIP) data.** CIP data are available at <http://apps.who.int/iris>.

**Sales, rights and licensing.** To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

**Third-party materials.** If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

**General disclaimers.** The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by WHO to verify the information contained in this publication.

However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall WHO be liable for damages arising from its use.

# Contents

|   |            |
|---|------------|
| <b>Acknowledgements</b> .....   | <b>iv</b>  |
| <b>Abbreviations</b> .....  | <b>v</b>   |
| <b>Key findings and messages</b> .....                                      | <b>vii</b> |
| <b>Executive summary</b> .....  | <b>vii</b> |
| <b>1. Introduction</b> .....  | <b>1</b>   |
| Purpose of the economic analysis component of the case for investment ..... | 2          |
| <b>2. Situation analysis: NCDs and risk factors</b> .....                   | <b>3</b>   |
| Tobacco .....   | 3          |
| Alcohol .....   | 4          |
| Physical inactivity.....  | 4          |
| Unhealthy diet .....  | 4          |
| Metabolic risk factors .....  | 4          |
| <b>3. Policies and treatments to reduce the NCD burden</b> .....            | <b>5</b>   |
| Tobacco .....   | 6          |
| Alcohol .....   | 7          |
| Physical activity.....  | 7          |
| Unhealthy diet .....  | 8          |
| Clinical interventions for cardiovascular diseases and diabetes.....        | 9          |
| <b>4. Methods</b> .....   | <b>9</b>   |
| Calculating the economic burden of NCDs .....                               | 9          |
| Calculating policy and intervention costs.....                              | 10         |
| Return on investment.....   | 11         |
| <b>5. Results</b> .....   | <b>11</b>  |
| Economic burden assessment.....   | 11         |
| Total economic costs .....  | 14         |
| Intervention cost assessment.....   | 15         |
| Health benefit assessment .....   | 16         |
| Economic benefit assessment.....  | 17         |
| Return on investment assessment.....  | 17         |
| <b>6. Conclusion and recommendations</b> .....                              | <b>18</b>  |
| <b>References</b> .....   | <b>22</b>  |
| <b>Annex 1. Data used for calculating the burden of NCDs</b> .....          | <b>25</b>  |

## Acknowledgements

The authors are sincerely grateful to the Department of Health of the Philippines, the national team that supported the data collection and analysis and the stakeholders who took the time to be interviewed and share their views during the visit.

Anna Kontsevaya, WHO consultant and member of the WHO Collaborating Centre on Development and Implementation of Noncommunicable Disease Prevention Policy and Programmes, Moscow, Russian Federation carried out the economic analysis, with input from Yuliya Ermakova, WHO consultant and Jhiedon Florentino, WHO consultant. The report benefited from the advice of Alexey Kulikov, United Nations Interagency Task Force on the Prevention and Control of Noncommunicable Diseases.

The report also benefited from the advice of David Tordrup, WHO consultant, and includes contributions from Daniel Grafton, Mashida Rashid, Dudley Tarlton and Kazuyuki Uji, United Nations Development Programme and Nadia Putoud, WHO consultant as well as insight from the approach taken for the noncommunicable disease investment cases for Barbados, Belarus, Jamaica, Kyrgyzstan, Mongolia, Turkey, Uzbekistan and Viet Nam.

The contributions of the WHO Country Office in the Philippines and Department of Health in organizing the WHO visit and the Philippine ministries and national institutions in providing materials to inform this report are also gratefully acknowledged.

The assessment was conducted under the overall guidance of Gundo Weiler, WHO representative in the Philippines, and Nick Banatvala, Head of the Secretariat of the United Nations Interagency Task Force on the Prevention and Control of Noncommunicable Diseases.

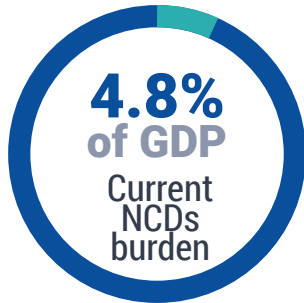
A voluntary contribution from the Russian Federation funded this report.

## Abbreviations

|        |  |
|--------|--|
| AMI    | acute myocardial infarction  |
| CVD    | cardiovascular disease   |
| FCTC   | Framework Convention on Tobacco Control [of WHO]   |
| GDP    | gross domestic product   |
| ICA    | institutional context analysis   |
| IHD    | ischaemic heart disease  |
| LMIC   | low- and middle-income country   |
| MPOWER | monitor tobacco use and prevention policies; protect people from tobacco smoke; offer help to quit tobacco use; warn people about the dangers of tobacco; enforce bans on tobacco advertising, promotion and sponsorship; raise taxes on tobacco [WHO package] |
| NCD    | noncommunicable disease  |
| PHP    | Philippine pesos   |
| PEN    | package of essential noncommunicable disease interventions   |
| ROI    | return on investment   |
| SHAKE  | surveillance; harness industry; adopt standards for labelling and marketing; knowledge; environment [WHO package]  |
| STEPS  | STEPwise approach to surveillance [of WHO]   |

# THE PHILIPPINES

The case for investment in preventing and controlling NCDs



lost per year



indirect cost due to loss of workforce and reduced productivity



of dying prematurely from one of the four main NCDs

**PHP 28.9 billion**



Investment required for selected best buy intervention packages over 15 years

Billion PHP



Tobacco control package



Alcohol control package



Salt-reduction package

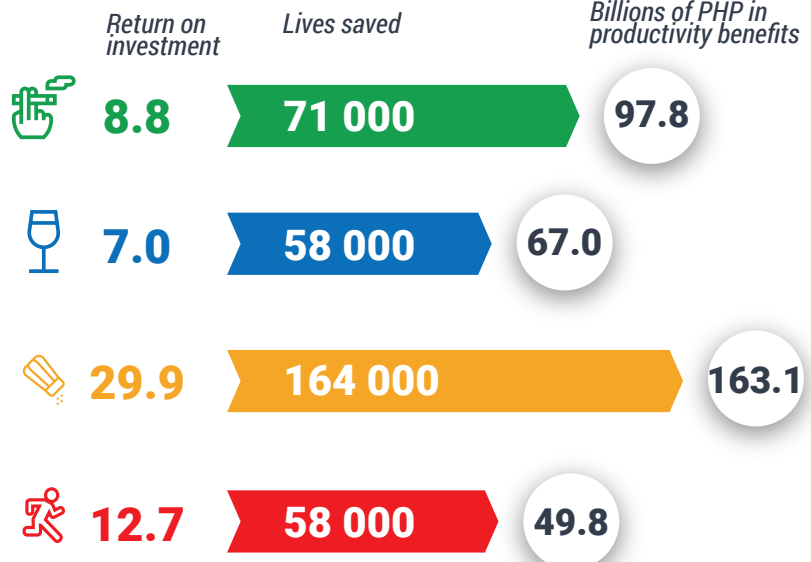


Physical activity awareness package

**PHP 377.7 billion**



Return on investment over 15 years



## Key findings and messages

- NCDs account for 68% of all deaths in the Philippines, and the probability of dying between the ages of 30 and 70 years from one of the four main NCDs is 29% in the Philippines.
- The economic cost of NCDs to the Philippine economy is PHP 756.5 billion per year, which is equivalent to 4.8% of the country's annual gross domestic product.
- NCDs in the Philippines are causing a surge in health-care costs and social care and welfare support needs and are contributing to reduced productivity.
- This report presents evidence that actions to prevent NCDs in the Philippines are relatively cheap and cost-effective.
- The economic modelling for the return on investment analysis suggests that the intervention with highest economic benefit in Philippines is the package of salt-reduction interventions, followed by reducing tobacco consumption and increasing physical activity in the population.
- A national multisectoral NCD coordination mechanism needs to be established that can bring together and strengthen existing cross-agency initiatives on NCDs.

## Executive summary

This report highlights the growing need for investing in the prevention and control of noncommunicable diseases (NCDs) in the Philippines.

First and foremost, this need stems from the high burden of NCDs on the country's population. According to the report's findings, NCDs such as cancer, cardiovascular diseases, diabetes and chronic respiratory disease cause 68% of all deaths and result in a 29% probability of dying prematurely before the age of 70. This is largely caused by the high prevalence of several major risk factors for NCDs that, despite notable progress in implementing certain regulatory measures (such as stronger tobacco control legislation), remains high.

Second, there are also strong economic grounds for addressing NCDs, since the report identifies substantial financial benefits that can be derived from timely and effective NCD prevention measures.

The report shows that NCDs significantly reduce economic output in the Philippines. Based on a joint United Nations visit to the Philippines in May 2018 and an extensive economic study conducted in cooperation with the Department of Health of the Philippines, the estimated cost of NCDs to the Philippine economy is equivalent to PHP 756.5 billion (US\$ 14.5 billion) or about 4.8% of the national gross domestic product.

This cost includes the direct costs of NCDs associated with treatment, care and social security provision but also indirect costs that arise from the loss of workforce and reduced productivity. The report estimates that the financial burden of these indirect costs is about 9 times higher than the burden of the direct costs.

Nevertheless, the cost analysis of selected intervention packages to address the major NCDs and their risk factors demonstrates that only moderate expenditure is required to implement preventive measures that could reduce the prevalence of NCDs and help to mitigate their harmful effects on the economy of the Philippines.

Specifically, four packages of interventions in tobacco control, harmful use of alcohol, physical inactivity and unhealthy diet are reviewed as well as a package of clinical interventions for cardiovascular diseases and diabetes. Policy packages to reduce the consumption of tobacco, alcohol and salt and to increase physical activity are



estimated to cost PHP 2.6 billion, PHP 2.6 billion, PHP 1.3 billion and PHP 1.1 billion over a five-year period, respectively. The clinical cardiovascular disease and diabetes interventions are the most expensive options, costing PHP 70.7 billion over five years.

Investing in preventing NCDs is highly cost-effective. By factoring in the expected benefits from realizing the selected intervention packages (including averted mortality), the report offers a return on investment analysis that suggests that, for every Philippine peso invested in the selected prevention policies, a return of 7 to 29.9 Philippine pesos can be expected. In particular, the salt policy package has the highest benefit-to-cost ratio when considered across both 5-year and 15-year timelines.

In this context, investing in NCD prevention policies appears beneficial and highly desirable. The report highlights the importance of establishing a national multisectoral NCD coordination mechanism that can bring together and strengthen existing cross-agency initiatives on NCDs. A review of current NCD interventions at the policy and individual service levels uncovers gaps in implementing the WHO-recommended cost-effective NCD prevention and clinical interventions. The report draws attention to areas that need to be strengthened and scaled up.

# 1. Introduction

In 2015, noncommunicable diseases (NCDs) accounted for 68% of all deaths in the Philippines (WHO, 2017a). The figures from 2015 show that every third Filipino (29%) can die before the age of 70 years from one of the four main NCDs (cardiovascular diseases, diabetes, chronic respiratory disease and cancer) (WHO, 2017a). This highlights a pressing need to make progress specifically on Sustainable Development Goals target 3.4, which aims to reduce premature mortality from NCDs by one third by 2030. NCDs also have development impacts on other Sustainable Development Goals, including: Sustainable Development Goals 1 (poverty), 2 (malnutrition), 4 (education for sustainable lifestyles), 5 (gender equality), 6 (access to clean water), 7 (access to clean air), 8 (safe working environment), 10 (reduce inequalities), 11 (access to safe, green public places) and 12 (sustainable consumption and production).

How NCDs affect human health is clear, but this is only one part of the story. NCDs also result in high economic costs, far exceeding direct health-care costs. NCDs reduce productivity at the macroeconomic level by interrupting full participation in the labour force and subsequently affecting individuals, their caregivers and the public sector. When individuals die prematurely, the labour output they would have produced in their remaining working years is lost. In addition, individuals who suffer from a disease are more likely to miss days of work (absenteeism) or to work at a reduced capacity while at work (presenteeism<sup>1</sup>). In low- and middle-income countries, between 2011 and 2030 NCDs are estimated to cause more than US\$ 21 trillion in lost economic output, with nearly one third of that figure attributable to cardiovascular diseases alone (Bloom et al., 2011). For individuals and governments, high financial burden of disease implies significant opportunity cost,<sup>2</sup> including decreased investment in education, transport projects or other forms of human or physical capital that can produce long-term returns.

High human and economic costs highlight the need to reduce the burden of NCDs in the Philippines. WHO recognizes that the risk of NCDs can be reduced by modifying four types of behaviour (tobacco use, harmful use of alcohol, an unhealthy diet and physical inactivity) and metabolic risk factors such as high blood pressure and cholesterol (WHO, 2013). Fig. 1 illustrates the determinants and risk factors that drive the development of NCDs, many of which are beyond the control of the health sector alone.

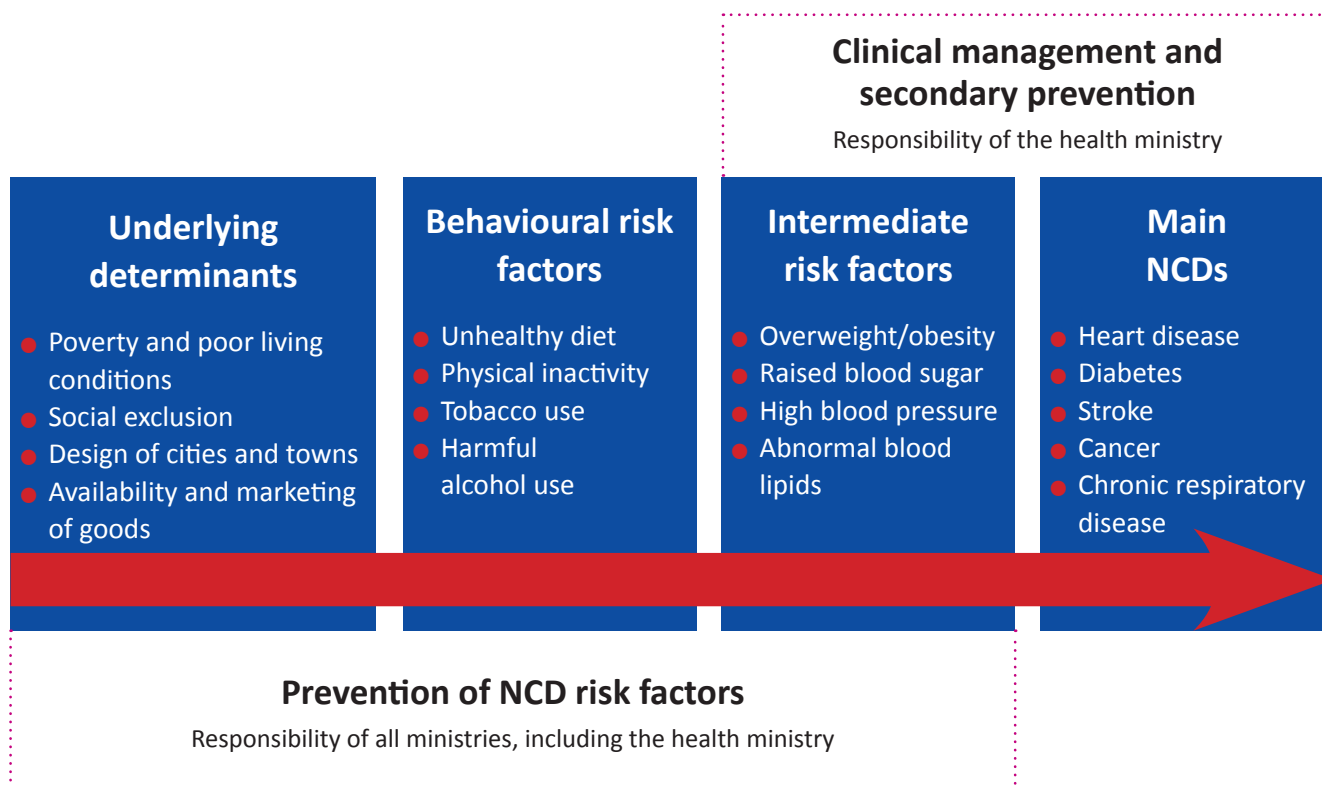
WHO developed a menu of policy options and cost-effective interventions to assist Member States to reduce the NCD burden within its global action plan for the prevention and control of NCDs 2013–2020 (WHO, 2013). These best buys were recently updated at the World Health Assembly (WHO, 2017b) and include measures to reduce behavioural and metabolic risk factors known to lead to NCDs as well as clinical interventions to prevent and treat disease.

---

<sup>1</sup> “Presenteeism” is defined as reduced productivity at work.

<sup>2</sup> “Opportunity cost” is a term used in economics, defined as the cost of something in terms of an opportunity forgone: “opportunity cost is given by the benefits that could have been obtained by choosing the best alternative opportunity” (Oxford Dictionary of Economics [online]).

**Fig. 1. Determinants of NCDs and responsibilities for response**



### Purpose of the economic analysis component of the case for investment

The negative economic effects of NCDs are too often overlooked in budgetary allocation processes and in weighing the advantages and disadvantages of stronger fiscal and regulatory action. Member States have requested giving high priority to quantifying the costs of NCD management and interventions to prevent and control NCDs and their returns on investment in relation to the costs of inaction. Investment cases are designed to help countries make their own economic rationales for action to prevent and control NCDs.

In 2017, given the increasing interest in NCD prevention and declaration of measures set by the Government of the Philippines, WHO and the Department of Health discussed the potential value of investigating the economic case for investing in NCDs. A joint United Nations visit to the Philippines was therefore undertaken in May 2018 to conduct this economic analysis.

Three analyses were performed for the investment case.

- An economic burden analysis showed the scale of disruption to the economy from NCDs by assessing their direct and indirect costs. Direct costs include government (public) health-care costs for treating cardiovascular diseases, diabetes, cancer and respiratory disease. Indirect costs are based on the costs of absenteeism, the costs of presenteeism and the economic losses caused by premature deaths among people of working age.
- An intervention costing analysis estimated the funding required to implement a set of interventions for NCD prevention; policy packages to reduce tobacco use, harmful alcohol consumption and unhealthy diet and to improve physical activity; and a package of clinical interventions for cardiovascular diseases and diabetes.
- A return on investment analysis compared the estimated implementation costs during the costing analysis with the estimated health gains and economic returns of a set of interventions over five and 15 years.

The investment case allows scaled-up action – and the costs of inaction – to be modelled in medium-term (five years) and long-term (fifteen years) time frames. One scenario is continuing the status quo, in which no new policies are implemented and current coverage levels remain in place: the costs of inaction. The other scenario is one in which selected policies and clinical interventions are scaled up over the next 15 years. The analysis used the WHO OneHealth Tool, an epidemiology-based population model developed by United Nations partners to enable strategic planning, costing of interventions and projection of the health benefits expected from their implementation. Health benefits are generated in terms of natural units (cases or deaths averted) but also monetized using the human capital approach to enable benefit–cost ratios (the primary way to measure the return on investment) to be evaluated and reported for each package of interventions. The human capital approach assumes that forgone economic output is equivalent to the total output that would have been generated by workers through the course of their life until reaching retirement age.

Section 2 analyses the NCD behavioural risk factors in the Philippines, including current levels and patterns of tobacco and alcohol consumption, diet and physical inactivity and the existing prevalence of metabolic risk factors such as raised total cholesterol and raised blood pressure within the population. Section 3 outlines evidence-informed policies and clinical interventions that can contribute to reducing the burden of disease – especially cardiovascular diseases – and details the current implementation level of policies and interventions in the Philippines. Section 4 describes the methods and tools used in the analysis. Section 5 presents the results, including the total costs and the expected health and economic benefits (such as healthy life-years gained, mortality averted and productivity gains) of implementing the three policy packages described and the clinical interventions. Section 6 outlines the conclusions to be drawn from these.

## 2. Situation analysis: NCDs and risk factors

This section sets out the background information used in preparing the investment case analysis. It addresses NCDs as a whole and the extent to which behavioural risk factors are present in the lifestyles of the Philippine population and the prevalence of metabolic risk factors such as raised blood pressure, raised cholesterol and diabetes. The selection of behavioural and metabolic risk factors has been narrowed to focus on those most relevant for the economic analysis.

### Tobacco

Findings from the 2015 Global Adult Tobacco Survey (Epidemiology Bureau, Department of Health, 2015a) indicate that 40% of adult Filipino men (and 23% of all adults) 15 years and older currently smoke cigarettes. Almost one fifth of adults (19% or 13.1 million) are daily smokers (34% among men and 4% among women). Among adults, more men than women smoke (40% versus 5%). Further, 2% of adults reported current smokeless tobacco use (3% of men and 1% of women) (Epidemiology Bureau, Department of Health, 2015a). Of great concern is that 12% of school-based adolescents 13–15 years old (18% of boys and 7% of girls) are current smokers (Philippines Global School-based Student Health Survey, 2015). The smoking prevalence is still greatest among people with low income, who smoke cheap tobacco (Department of Health, 2018).

Second-hand smoke remains an issue in the Philippines: According to the Global Adult Tobacco Survey (Epidemiology Bureau, Department of Health, 2015a), an estimated 22% of adults (3.6 million adults) were exposed to tobacco smoke in enclosed

#### Box 1. Tobacco snapshot

**Tobacco use** is a major concern, since 40% of men smoke and 12% of school-based adolescents (13–15 years old) are current smokers.

**Attributable NCDs** include multiple forms of cancer; ischaemic heart disease, stroke and other cardiovascular and circulatory diseases; chronic obstructive pulmonary disease and pneumoconiosis; and peptic ulcer disease, diabetes, cataract, macular degeneration and rheumatoid arthritis.

areas at the workplace in the past month. In the past month, 35% of adults (24.0 million adults) were exposed to tobacco smoke at home. Among those who visited public places in the past 30 days, 22% of adults visiting restaurants and 38% of adults using public transport reported being exposed to second-hand smoke (Epidemiology Bureau, Department of Health, 2015a).

Box 1 summarizes key facts.

## Alcohol

WHO's *Global status report on alcohol and health* (WHO, 2018a) indicates that per capita alcohol consumption in the Philippines is 6.6 litres per year. Men are estimated to consume six times as much alcohol (11.3 litres) per capita as women (1.9 litres).

Among alcohol users, 48% of men binge (consumed six or more drinks in one sitting) during the month before the survey versus 17% of women.

The 2015 Philippines Global School-based Student Health Survey (Department of Health, 2015) revealed that 18% of students 13–15 years old currently drink alcohol and almost 57% of students had their first drink of alcohol before age 14 years, with boys more likely to have drunk alcohol before 14 years old than girls.

Box 2 summarizes key facts.

## Physical inactivity

Physical inactivity is one of the leading risk factors for NCDs in the Philippines. In 2015, an estimated 43% of adults were not sufficiently physically active (Food and Nutrition Research Institute, Department of Science and Technology, 2015a). Women are more frequently physical inactive (53%) than men (30%), especially those living in urban areas.

Box 3 summarizes key facts.

## Unhealthy diet

This section focuses on salt, given the policy interventions that can be modelled and the data available. Sodium consumption in the Philippines is high. The estimated age-standardized intake in 2010 for people aged 20 years and older was 4.29 g of sodium per day (Powles et al., 2013) – more than twice the WHO recommendation to consume less than 2 g of sodium per day (WHO, 2012).

Box 4 summarizes key facts.

## Metabolic risk factors

High levels of metabolic factors – such as blood pressure, body mass index or blood lipid levels – significantly increase the risk of having a cardiovascular event. Within the Philippines, 31% of adults are

### Box 2. Alcohol snapshot

**Alcohol use** is of concern since, on average, men drink six times as much as women and one in two male drinkers binge (consumed six or more drinks in one sitting) in the past month.

**Attributable NCDs** include multiple forms of cancer, pancreatitis, epilepsy, diabetes, cirrhosis and ischaemic heart disease, stroke and other cardiovascular and circulatory diseases.

### Box 3. Physical inactivity snapshot

**Activity levels.** Almost half of adults in the Philippines are insufficiently physically active.

**Attributable NCDs** include coronary heart disease, type 2 diabetes and breast and colon cancer (Lee et al., 2012).

### Box 4. Salt snapshot

**Sodium and salt consumption** in the Philippines is high, estimated to be more than twice as high as the WHO recommendation.

**Attributable NCDs** include stomach cancer and increased risk of ischaemic heart disease, stroke and other cardiovascular and circulatory diseases due to hypertension.

**The proportion of cardiovascular deaths attributable to high sodium is 28%.**

overweight<sup>3</sup> or obese<sup>4</sup> (Food and Nutrition Research Institute, Department of Science and Technology, 2015a). These figures are higher for women than for men (35% of women and 27% of men are overweight or obese).

An estimated 19% of adults older than 18 years (20% of men and 18% of women) have raised blood pressure<sup>5</sup> (WHO, 2018b). The prevalence of high total cholesterol among adults (20 years and over) has been rising in the past two decades. The National Nutrition Survey (Food and Nutrition Research Institute, Department of Science and Technology, 2015b) indicates that 19% of adults older than 20 years had raised total cholesterol<sup>6</sup> in 2013 versus 4% in 1998.

A total of 5.6% of adults aged over 20 years (5.8% of men and 5.4% of women) have raised fasting blood glucose<sup>7</sup> (Food and Nutrition Research Institute, Department of Science and Technology, 2015b).

### 3. Policies and treatments to reduce the NCD burden

There is great recognition and understanding of NCDs and how they adversely affect health and development in the Philippines. The Government of the Philippines is committed to tackling NCDs and is already demonstrating significant efforts to take action.

Multiple strategies, plans and legislation are in place in tobacco control, harmful use of alcohol, unhealthy diets and physical activity. These include:

- A national multisectoral plan and a Department of Health strategic action plan for NCD prevention and control 2017–2025;
- a recently updated national tobacco control strategy;
- tobacco and alcohol taxation: 2012 Republic Act 10351 (also known as the Sin Tax Reform Law); and 2017 Republic Act 10963 (Tax Reform for Acceleration and Inclusion (TRAIN))
- Package of Essential NCD Interventions (PhilPEN);
- Philhealth primary care benefit package for NCDs;
- provision of NCD maintenance medicines under the Medicines Access Program of the Department of Health;
- policies on cancer prevention and control, including palliative and hospice care;
- STOPSMOKE mobile health programme together with a quit-line and smoking-cessation clinics;
- Philippine Plan of Action for Nutrition 2017–2022, which addresses stunting, overweight and obesity; and
- guidelines for front-of-pack labelling for prepackaged food.

As highlighted in Section 1, WHO has published a menu of policy options and interventions to prevent and treat NCDs (WHO, 2017c). The following sections review current national NCD prevention and control efforts against

<sup>3</sup> Body mass index 25.0–29.9 kg/m<sup>2</sup>.

<sup>4</sup> Body mass index ≥30.0 kg/m<sup>2</sup>.

<sup>5</sup> Systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg or currently on medication for raised blood pressure.

<sup>6</sup> Raised total cholesterol ≥5.0 mmol/L or ≥190 mg/dl or currently on medication for raised cholesterol.

<sup>7</sup> Raised blood glucose (defined as either plasma venous value of ≥7.0 mmol/L (126 mg/dl) or capillary whole-blood value of ≥6.1 mmol/L (110 mg/dl)) or currently on medication for diabetes.

these to identify areas of strength and areas that may need to be developed further or scaled up to achieve full coverage.

## Tobacco

The Philippines has been a party to the WHO Framework Convention on Tobacco Control (WHO, 2019a) since 2005 and has made implementation a priority, including it in the 2016–2022 Philippine Health Agenda as a national objective for health (WHO, 2017d). The Philippines developed a national strategy for tobacco control for 2017–2022.

Gaps in implementing the strategy and the Convention as a whole remain, however. This results, to various degrees, from tobacco industry interference, lack of resources and capacity for enforcement and misconceptions regarding tobacco control policies among government officials, especially at the local level.

The Philippines established a national coordinating mechanism for tobacco control in 2003: the Inter-Agency Committee – Tobacco.

Situated within the Department of Health, the Committee has multisectoral representation, but this includes a representative from the tobacco industry, the National Tobacco Administration. Further, the Department of Health and National Tobacco Control Programme has no dedicated, full-time focal point for tobacco control.

Most recently, tax reform increased excise taxes on tobacco products in 2018, and further increases are scheduled from 1 January 2020 to 31 December 2023 and by 4% every year thereafter. However, the tax share of retail price remains below the 75% recommended by the WHO Framework Convention on Tobacco Control, and sales of single-stick cigarettes remain a significant challenge and make tobacco products easily available and affordable, especially to young and poor people.

The Philippines is a forerunner in allocating sin tax revenue to health programmes; 85% of incremental revenue from tobacco and alcohol taxes is allocated to the National Health Insurance Programme, medical assistance and health facility enhancement programmes. The other 15% of tax revenue is allocated to local governments of tobacco-growing regions, incentivizing tobacco production.

The Tobacco Regulation Act restricts tobacco advertising in most areas but does not include bans on advertising at points of sale or on corporate social responsibility activities. Enforcement of bans remains an issue at the local level, and half the students are exposed to tobacco advertising or promotions when visiting point-of-sale stores (Epidemiology Bureau, Department of Health, 2015b).

To fulfill the obligations of the WHO Framework Convention on Tobacco Control:

- WHO has helped local government units (cities, municipalities and provinces) to develop and enforce Convention-compliant ordinances.
- A pro-forma template of an ideal 100% tobacco-free ordinance was developed in close collaboration with legal experts from civil society partners.
- To assist local government units in addressing legal challenges to the development and enforcement of local policies (the result of a vibrant tobacco industry presence in the Philippines), a primer on legal issues was developed in the implementation of the Convention in the Philippines.
- At the national level, WHO has helped the Department of Health in creating the Sector Wide Anti-Tobacco committees for priority Convention articles, and this has become the national coordinating mechanism to harmonize the anti-tobacco efforts of various government agencies and civil society (these committees were later renamed National Tobacco Control Committees (WHO, 2015).

In summary, the Philippines has succeeded in fully implementing two of the five demand-reduction measures of the WHO Framework Convention on Tobacco Control. Important milestones in tobacco legislation include:

- 2012: Republic Act 10351, also known as Sin Tax Reform Law;
- 2014: Republic Act 10643: Graphic Health Warnings Law; and
- 2017: Executive Order No. 26: Providing for the Establishment of Smoke-free Environments in Public and Enclosed Places.

Most of these policy interventions are also WHO best buys (WHO, 2017c): that is, effective interventions with a cost-effectiveness ratio of  $\leq 100$  international dollars per disability-adjusted life-year averted in low- and middle-income countries. This list largely corresponds with those listed within the OneHealth Tool that can be modelled as part of the return on investment analysis:

- monitor tobacco use and prevention policies
- protect people from tobacco smoke
- offer to help quit tobacco use: mCessation
- warn about danger: warning labels
- warn about danger: mass-media campaign
- enforce bans on tobacco advertising
- enforce youth access restriction
- raise taxes on tobacco
- plain packaging of tobacco products.

## Alcohol

The updated Appendix 3 of WHO's global action plan for the prevention and control of NCDs 2013–2020 lists core policy options for alcohol control (WHO, 2017c).

These policy interventions can be modelled as part of the return on investment analysis:

- raise taxes on alcoholic beverages
- enforce restrictions on the availability of retail alcohol
- enforce restrictions on alcohol advertising
- enforce drink-driving laws (sobriety checkpoints).

## Physical activity

The Philippines has made efforts to encourage physical activity. Some schools have access to sporting facilities, and the Great Filipino Workout is a preventive physical fitness programme adopted by all government agencies. However, in general, urban residents do not have opportunities for physical activity because of lack of green space, parks, sidewalks, sporting facilities or cycle paths. Given rapid urbanization in the Philippines, it is important that the government strengthens healthy cities (Government of Malaysia, 2018; WHO, 2019b) and age-friendly cities (WHO, 2019c, d) approaches. There are no apparent significant government investments and budgeting for promoting health in urban settings (WHO, 2018c).



For more than a decade, the Philippine Coalition for the Prevention and Control of NCDs, composed of about 40 organizations, has supported the Department of Health in addressing NCD risk factors, including by promoting healthy lifestyles and physical activity. However, budgetary support for the Coalition was removed in recent years because of changes in priorities and fiscal constraints. The Joint Mission of the United Nations Interagency Task Force on the Prevention and Control of Noncommunicable Diseases to the Philippines in May 2018 found that health promotion measures are funded through regular health department processes and that funding is inadequate. Health promotion and communication campaigns for NCD prevention and control would benefit from direct allocation of sin tax revenue.

The updated Appendix 3 of WHO's global action plan for the prevention and control of NCDs 2013–2020 lists several policy options for improving physical activity levels (WHO, 2017c).

The return on investment analysis can model the following policy change:

- public awareness campaigning on physical activity.

## Unhealthy diet

The Philippines has implemented a range of policies, including nutrition labelling of prepackaged food products (mandatory labelling of nutrient declarations), introducing taxation on sweetened beverages and regulating the food and beverages available in schools. Several actions have been implemented to promote healthy diet and prevent overweight and obesity and diet-related NCDs, including food-based dietary guidelines, nutrition labelling, mass-media campaign, behavioural change communication and counselling. The challenge, however, is to strengthen the coherence of existing policies and strategies to effectively address the growing double burden of undernutrition and overweight and obesity.

The 2018 Joint Mission to the Philippines of the United Nations Interagency Task Force on the Prevention and Control of Noncommunicable Diseases (WHO, 2018c) found that legislators were interested in developing legislation to remove *trans*-fat from all food and to restrict the marketing of unhealthy food to children. The mission also found indications that the Department of Education faces budgetary constraints in implementing school-based interventions to promote healthy diets and improve nutrition among children attending school (WHO, 2018c).

In 2018, the government introduced taxes on sugar-sweetened beverages by adopting the taxation of sugar-sweetened beverages under the Tax Reform for Acceleration and Inclusion (TRAIN) legislation. A WHO study confirmed the effectiveness of sugar-sweetened beverage taxes by estimating that the tax would help avert 24 000 deaths over 20 years, resulting in health-care savings of US\$ 627 million and annual revenue of US\$ 813 million. Since the OneHealth Tool cannot yet calculate the impact of interventions on fat and sugar, the economic analysis focuses on salt only.

These policy interventions correspond with those listed within the OneHealth Tool that can be modelled as part of the return on investment analysis:

- surveillance
- harness industry for reformulation
- adopt standards: front-of-pack labelling
- adopt standards: strategies to combat misleading marketing
- knowledge: education and communication
- environment: salt-reduction strategies in community-based eating spaces.

## Clinical interventions for cardiovascular diseases and diabetes

The updated Appendix 3 of WHO's global action plan for the prevention and control of NCDs 2013–2020 lists multiple clinical interventions for cardiovascular diseases and diabetes (WHO, 2017c).

The OneHealth Tool can model the following package of interventions as part of the return on investment analysis modelled:

- screening for risk of cardiovascular diseases and diabetes
- treatment for those with high absolute risk of cardiovascular diseases and diabetes (>30%)
- treatment of new cases of acute myocardial infarction with aspirin
- treatment of cases with established ischaemic heart disease and post-myocardial infarction
- treatment for those with established cerebrovascular disease and post-stroke
- treatment of cases with rheumatic heart disease (with benzathine penicillin)
- standard glycaemic control
- intensive glycaemic control
- retinopathy screening and photocoagulation
- neuropathy screening and preventive foot care.

## 4. Methods

A multiagency, multidisciplinary team comprising staff from the Ministry of Health, WHO, United Nations Interagency Task Force on the Prevention and Control of Noncommunicable Diseases, United Nations Development Programme and WHO Collaborating Centre on Development and Implementation of Noncommunicable Disease Prevention Policy and Programmes undertook initial data collection and analysis in Philippines during 7–11 May 2018 to complete a three-tier economic NCD investment case, complemented by institutional context analysis. The team consisted of health economists, epidemiologists and social development and public health experts.

This section outlines the different methods and economic models applied at different stages in the economic analysis:

- calculation of economic burden of NCDs in terms of direct costs and indirect costs (absenteeism, presenteeism and premature death);
- costing of interventions (clinical and policy interventions);
- assessment of health impacts; and
- return on investment analysis.

### Calculating the economic burden of NCDs

WHO and the United Nations Development Programme developed the NCD economic burden model, which provides estimates of the current direct and indirect costs of NCDs in the Philippines. The data used on the population by age and sex for the period 2018–2032 were modelled based on the population trends during 2008–2018. The details incorporated were incidence rates by age and sex for heart attack and stroke and prevalence rates by age and sex for diabetes, hypertension and chronic respiratory disease. Mortality rates by age and sex were applied for each condition. The model calculated projections for incidence, prevalence and

mortality for diabetes, cardiovascular diseases and chronic respiratory disease between 2018 and 2032, holding current incidence rates constant.<sup>8</sup> These projections were summarized as total incidence, prevalence and mortality for both the entire population and the working-age population, defined as those 15–64 years old.

The following steps were carried out to calculate the economic costs.

- Both total government health expenditure data, and health expenditure on NCDs in the Philippines were available.
- The annual value (in terms of economic output) of each full-time worker in the Philippines was calculated. This is based on gross domestic product (GDP) per employed person, defined as the country's GDP divided by its total employed labour force. To arrive at the total employed labour force for the Philippines, local data were used on the total labour force 15 years and older, the unemployment rate and the labour force participation rate.
- Data were incorporated on the extent to which NCDs impact indirect costs. From the academic literature (Anesetti-Rothermel & Sambamoorthi, 2011; Wang et al., 2003), rates were found to describe (a) the reduction in labour force participation caused by hypertension, stroke, heart attack and diabetes; (b) the reduction in full-time hours worked caused by absenteeism; and (c) the reduction in productivity caused by presenteeism (see Annex 1, Table A2).
- The exact number of people with NCDs working in the Philippines in 2018 was determined. Using the labour force participation, unemployment and mortality rates, the model began with Philippine people of working age with NCDs; subtracting those who chose not to participate in the labour force or were unemployed; subtracting those who could not participate in the labour force specifically because of their NCD; and finally, subtracting those who died. The result was an estimate of the number of active workers with NCDs.
- The final steps were to calculate the losses caused by the premature death of active workers who died and would-be workers who could not participate in the labour force and to calculate the costs of absenteeism and presenteeism for surviving active workers with NCDs. The model applied the relevant productivity figures to the population numbers and multiplied this by the GDP per employed person. This calculation resulted in the total indirect costs of each NCD.

## Calculating policy and intervention costs

The costs of policy intervention and the costs of clinical interventions were calculated using the WHO Costing Tool (Chisholm, Mendis & Abegunde, 2012). This identifies, quantifies and values each resource required for the intervention as follows:

- For each policy, the Tool costs human resources, training, external meetings, mass-media campaigns (such as television and radio time and newspaper ads) and other miscellaneous equipment needed to enact policies and programmes.
- Each policy contains assumptions, set by WHO experts, about the quantity of inputs required to implement and enforce it. The Tool estimates the quantity of resources needed at the national, regional and district levels.
- The unit costs for resource items are taken from the WHO-CHOICE database (WHO, 2019e).

---

<sup>8</sup> The model estimates growth in prevalence, incidence and mortality from population growth only – not growth in disease rates.

## Return on investment

The return on investment is a performance measure used to evaluate the efficiency of health-care investment. It compares the magnitude and timing of benefits from health intervention directly with the magnitude and timing of investment costs. The return on investment is the ratio of the discounted (present) value of the benefits to the investment costs. Future benefits are discounted since a unit of currency in the future is worth less than a unit today owing to the time value of money.

A return on investment analysis, based on a spreadsheet model developed by WHO, provided estimates of the economic gains that accrue from investing in the set of cost-effective interventions identified during the visit.

The method used is the NCD return on investment model developed in 2015 for use by the United Nations Development Programme/WHO Joint Programme on Governance of NCDs using the OneHealth Tool and WHO Costing Tool. More detail on the use of these tools is available from the OneHealth Tool Manual (Avenir Health, 2017) and is discussed in detail in the technical appendix to the forthcoming RTI International (in press) report.

To determine the overall impact of the set of interventions in terms of the increase in GDP, productivity measures were assessed using the following steps.

Data on the amount by which NCDs reduce worker productivity were incorporated, as noted for the NCD economic burden model. Since interventions reduce the projected incidence of ischaemic heart disease and stroke, there is an associated increase in the number of healthy life-years of the population. By considering the increase in healthy life-years, GDP per employed person and the reduction in rates for absenteeism and presenteeism, an increase in GDP can be determined, attributed to the value of avoided absenteeism and presenteeism.

By considering the labour force participation rate in the Philippines and the projected number of deaths avoided, the increase in labour force participation resulting from avoided deaths was calculated. An increase in economic output was therefore attributed to the value of avoided mortality.

The projected economic gains from implementing the cost-effective interventions were therefore the value of avoided presenteeism, the value of avoided absenteeism and the value of avoided mortality. The impact of an intervention, measured as the total increase in GDP, was calculated by combining the three types of gain.

The return on investment for the Philippines was reached by comparing the impact (increase in GDP) of the interventions with the total costs of setting up and implementing the interventions. This was calculated using the net present value approach to future costs and economic gains, with 3% discounting.

## 5. Results

This section assesses the economic burden of NCDs before summarizing the component parts of the return on investment analysis – including health benefits, economic benefits and total costs – and discussing the return on investment for each package of interventions.

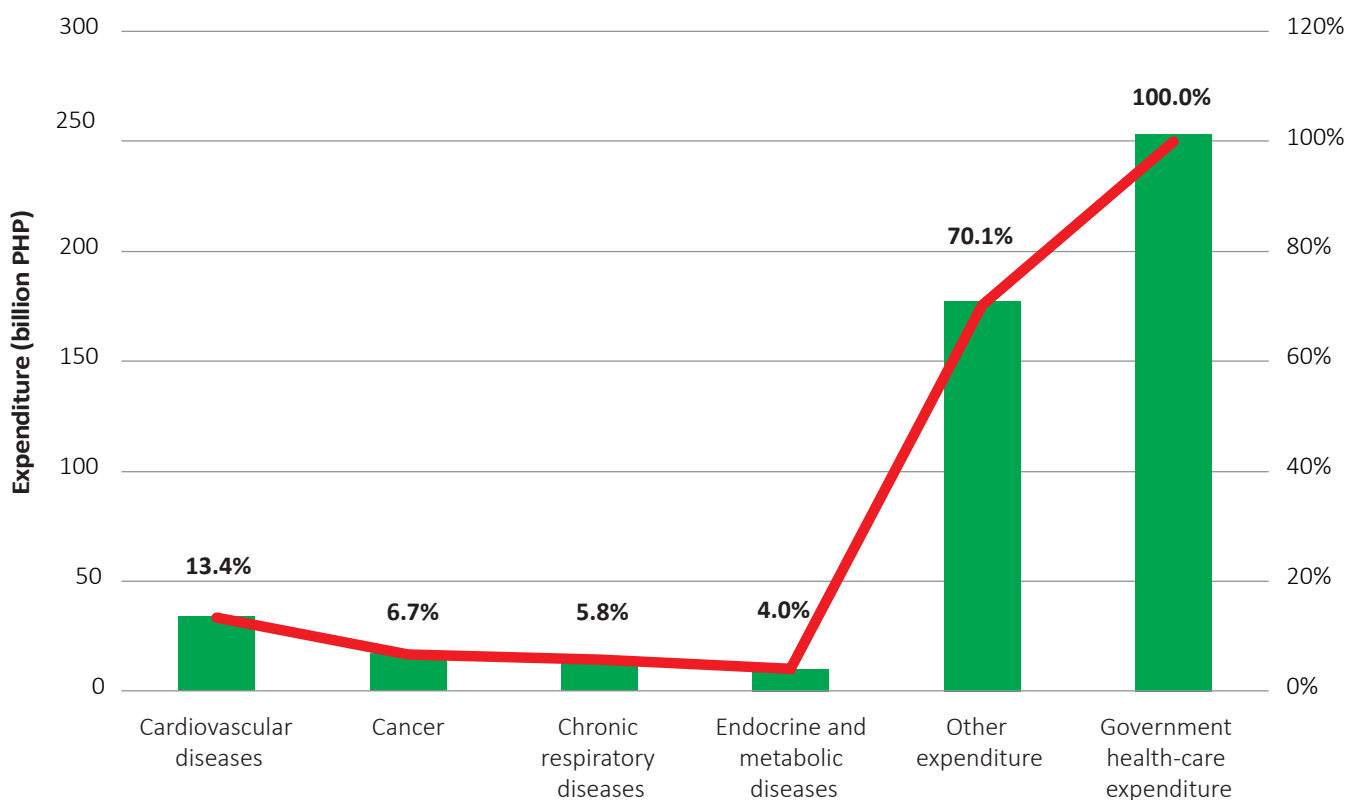
### Economic burden assessment

#### Direct costs

The estimate of the direct costs of the economic burden considered only government health-care expenditure and excluded non-health care costs such as transport.

The total government health expenditure for the Philippines in 2018 was PHP 253 billion. As noted above, government health-care spending on NCDs was estimated based on national health account data on NCD spending in 13 other countries (Garg & Evans, 2011). Assuming consistency with these countries (all have a similarly high NCD burden, although some are high-income countries), 30% of government expenditure on health would be attributable to NCDs (45% on cardiovascular diseases; 22% on cancer; 19% on chronic respiratory disease; and 13% on diabetes). Using international rather than country-specific numbers is a limitation of this study, considering the wide variability of the share of health-care expenditure per disease group (see Annex 1, Table A1). The total health-care expenditure on the four main NCDs is an estimated PHP 75 billion for 2018 (Fig. 2).

**Fig. 2. Government health-care expenditure, 2016**

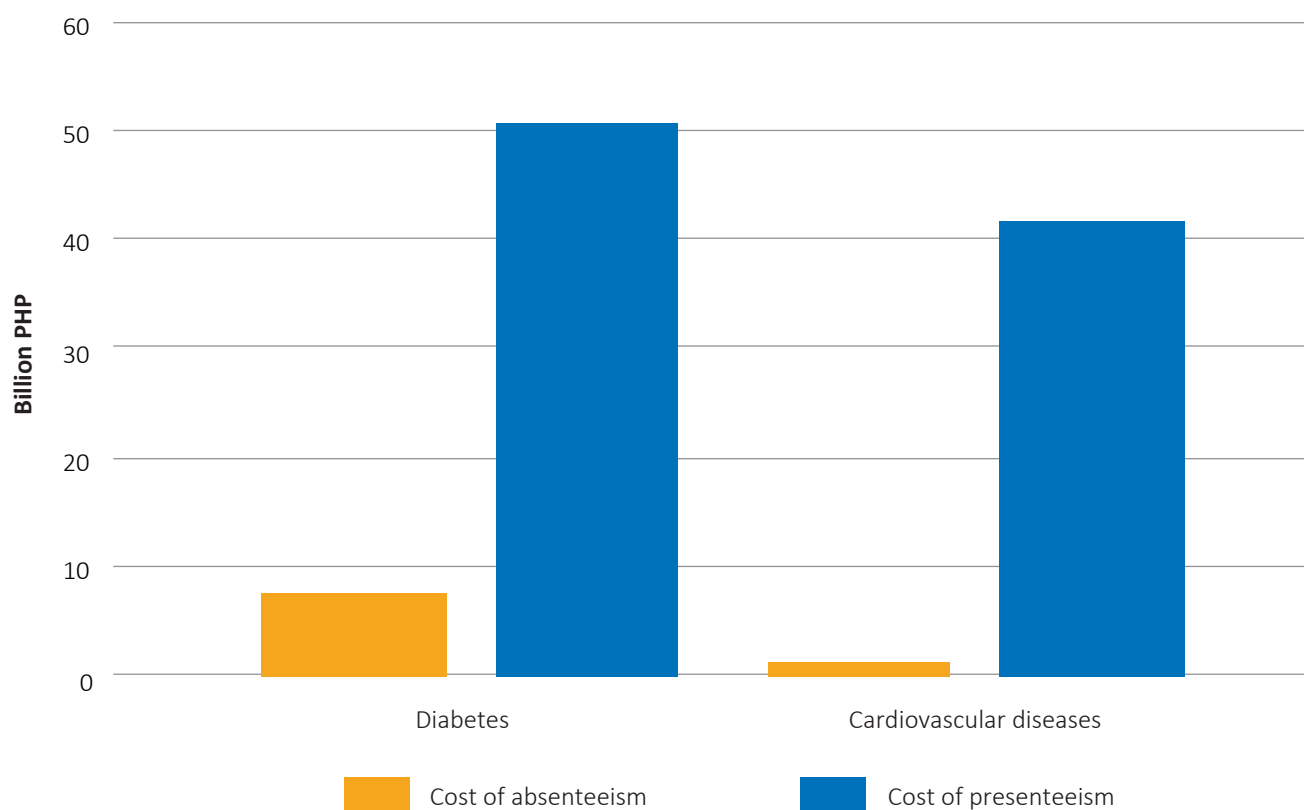


### Indirect costs

For the Philippines, indirect economic losses caused by NCDs were modelled from reduced labour force participation, increased absenteeism and presenteeism and losses caused by premature death.

The calculation of absenteeism and presenteeism is based on the surviving workforce. Fig. 3 shows the results for 2017. They could only be calculated for cardiovascular diseases and for diabetes because data are lacking on the impact of cancer and chronic respiratory diseases for these parameters. The cost of absenteeism resulting from cardiovascular diseases was an estimated PHP 7.3 billion. For presenteeism, the corresponding calculation found that the burden is PHP 50.6 billion. For diabetes, the corresponding numbers were also high, especially for presenteeism.

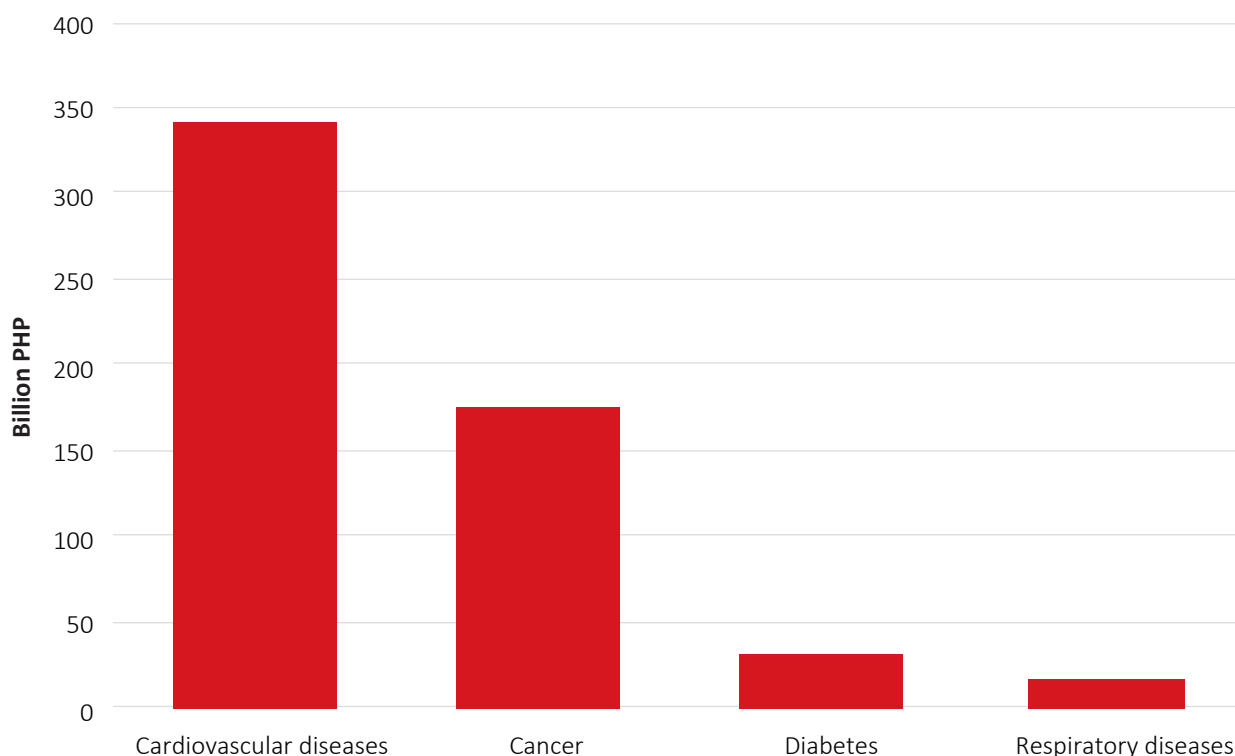
**Fig. 3. Costs of absenteeism and presenteeism for cardiovascular diseases and diabetes, 2017**



Indirect costs caused by premature death in the Philippines were estimated using the human capital method. This assumes that forgone economic output is equivalent to the total output that would have been generated by workers through their life until reaching retirement age. The cost of premature death was calculated by multiplying GDP per worker by the labour force participation rate, by the age-specific employment rate and by the 476 684 years of life lost in working age in 2017 from the four main NCDs. The total cost of premature death to the economy was an estimated PHP 565.4 billion (Fig. 4).

Cardiovascular diseases are the costliest of the four NCDs in terms of economic losses resulting from mortality. Diabetes is not associated with a high economic burden from mortality, despite the high economic burden resulting from presenteeism.

**Fig. 4. Costs of premature death, 2017**



### Total economic costs

Table 1 summarizes the total direct and indirect costs of NCDs in the Philippines. Economic losses resulting from indirect costs are 9 times higher (PHP 680.8 billion) than direct costs, with the government’s estimated spending on the four main NCDs being PHP 75.7 billion. Indirect costs to the economy (absenteeism, presenteeism, premature death) amount to PHP 680.8 billion. This would be even larger had it been possible to estimate the costs of absenteeism and presenteeism for cancer and respiratory diseases.

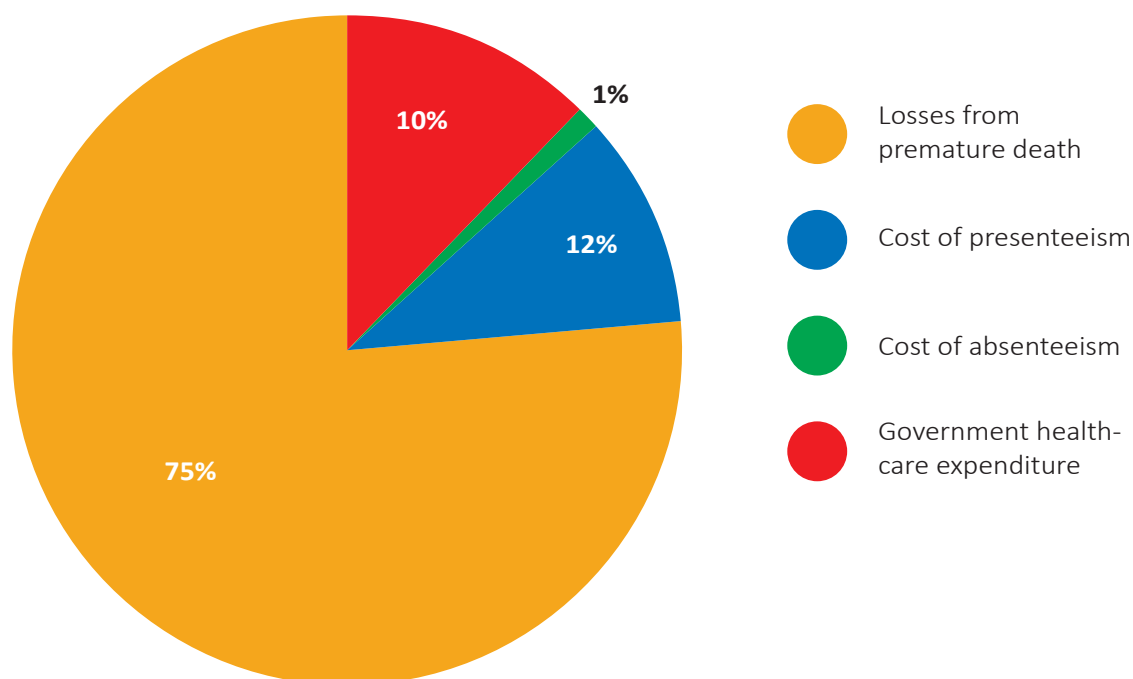
**Table 1. Economic burden of NCDs in the Philippines (billions of Philippine pesos), 2017**

| Cost                                      | Cardiovascular diseases | Cancer | Endocrine and metabolic diseases (include diabetes) | Chronic respiratory disease | Total for all NCDs |
|---|-------------------------|--------|---|-----------------------------|--------------------|
| <b>Direct costs</b>                       |                         |        |   |                             |                    |
| <i>Government health-care expenditure</i> | 33.9                    | 17.0   | 10.1  | 14.7                        | 75.7               |
| <b>Indirect costs</b>                     |                         |        |   |                             |                    |
| Absenteeism                               | 7.3                     | N/A    | 1.2   | N/A                         | 8.5                |
| Presenteeism                              | 50.6                    | N/A    | 41.6  | N/A                         | 92.2               |
| Premature deaths                          | 341.6                   | 175.5  | 32.1  | 16.1                        | 565.4              |
| Total indirect costs                      | 399.5                   | 175.5  | 75.0  | 30.8                        | 680.8              |
| <b>Total burden</b>                       | 433.4                   | 192.5  | 85.1  | 45.5                        | 756.5              |

The total burden on the economy of Philippines is PHP 756.5 billion, which is equivalent to 4.8% of GDP annually.

Fig. 5 shows the structure of the NCD burden in the Philippines in 2017. Government health-care expenditure represents 10% of all NCD-related costs, but these are just a small share of the NCD economic burden.

**Fig. 5. Structure of the NCD burden in the Philippines, 2017**



### Intervention cost assessment

Incremental intervention costs were estimated for the period 2018–2032. Table 2 shows the costs for each of the first five years of this period plus the five-year and 15-year totals.

The cardiovascular diseases and diabetes clinical interventions produced the largest cost estimates. Treating cardiovascular diseases and diabetes costs PHP 7.2 billion in the baseline year and increases to PHP 21.4 billion in 2022. Implementing the clinical intervention package over the five-year scale-up period would cost PHP 70.7 billion.

The total costs for the tobacco package based on MPOWER guidelines are PHP 2.6 billion over five years and PHP 10 billion over 15 years, although the individual interventions that make up the package vary in implementation costs. Certain policies, such as mass-media campaigns or protecting people from smoking, have large planned costs. Nevertheless, a range of low-cost tobacco policies exists, including package warning labels, bans on tobacco advertising and raising taxes.



**Table 2. Cost overview of policy and clinical interventions (millions of Philippine pesos), 2018–2022**

| Intervention type  | 2018    | 2019     | 2020     | 2021     | 2022     | Total for five years | Total for 15 years |
|--|---------|----------|----------|----------|----------|----------------------|--------------------|
| Tobacco control package  | 525.7   | 506.1    | 513.4    | 539.6    | 552.6    | 2 637.4              | 10 004.1           |
| Alcohol control package  | 355.6   | 614.8    | 553.0    | 555.8    | 553.0    | 2 632.2              | 8 444.6            |
| Physical activity awareness package                                | 209.7   | 347.0    | 172.8    | 173.8    | 174.9    | 1 078.3              | 3 482.8            |
| Salt-reduction package   | 137.3   | 311.9    | 293.4    | 294.5    | 295.5    | 1 332.5              | 4 956.2            |
| All policy interventions, total                                    | 1 607.5 | 2 240.1  | 2 038.1  | 2 123.7  | 2 200.2  | 10 209.5             | 51 994.1           |
| Cardiovascular diseases and diabetes clinical intervention package | 7 176.0 | 10 512.0 | 13 984.8 | 17 603.9 | 21 378.1 | 70 654.8             | 530 704.8          |

### Health benefit assessment

All interventions significantly reduce the number of lives lost to cardiovascular diseases and diabetes-related causes. Salt-reduction interventions have the greatest impact (164 251 lives saved) followed by tobacco interventions (71 130 lives saved). The physical activity interventions save 58 397 lives, the and alcohol interventions 57 872 lives and the cardiovascular diseases and diabetes clinical interventions 43 327 lives (Table 3).

**Table 3. Estimated health benefits over 15 years**

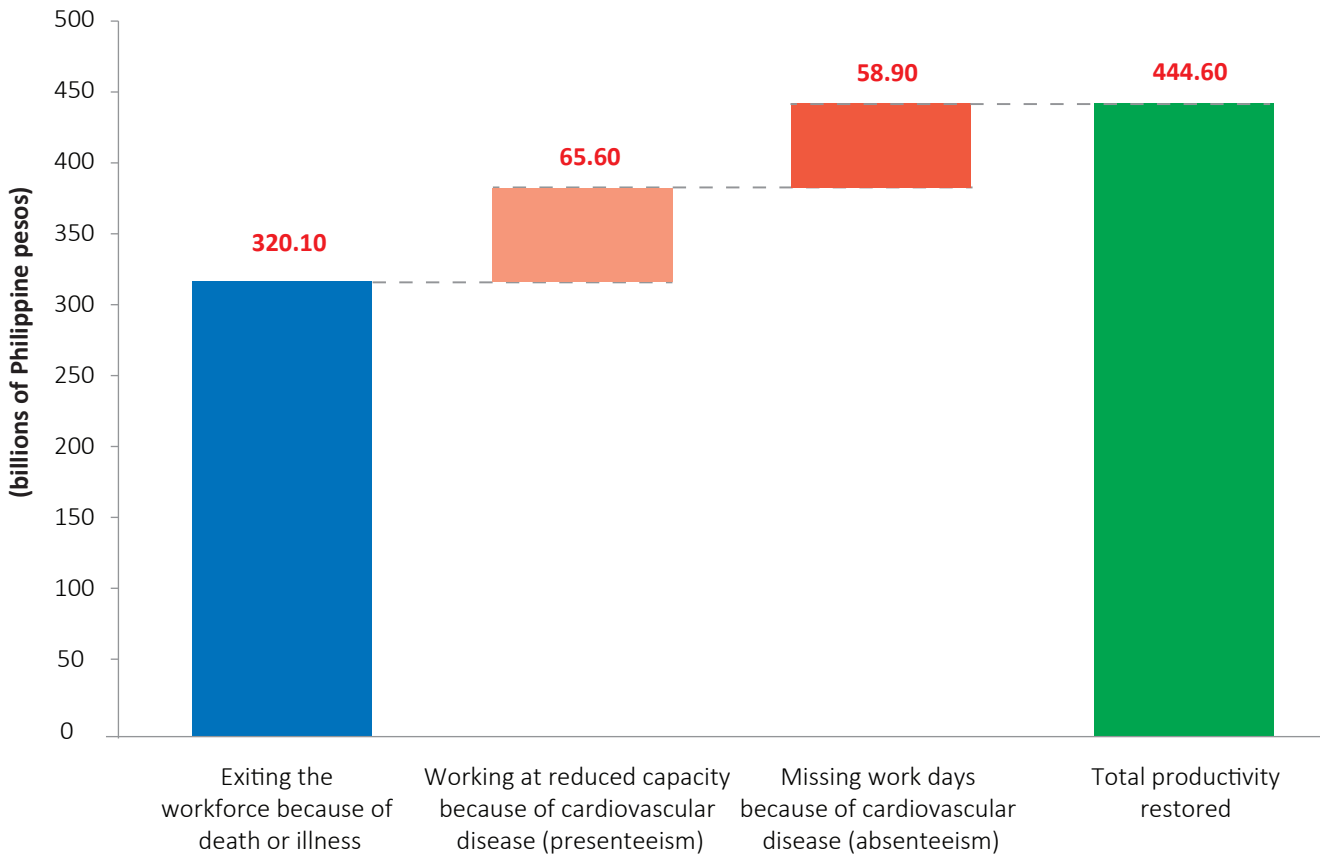
| Intervention package  | Strokes averted | Acute ischaemic heart disease cases averted | Deaths averted | Healthy life-years gained |
|---|-----------------|---|----------------|---------------------------|
| Cardiovascular diseases and diabetes clinical interventions | 6 001           | 5 188                                       | 43 327         | 146 578                   |
| Tobacco interventions                                       | 16 891          | 20 482                                      | 71 130         | 1 419 418                 |
| Alcohol interventions                                       | 5 343           | 4 067                                       | 57 872         | 728 348                   |
| Physical activity interventions                             | 5 505           | 4 863                                       | 58 397         | 136 601                   |
| Salt-reduction interventions                                | 125 661         | 122 010                                     | 164 251        | 1 173 866                 |

Each set of interventions also increases the number of healthy life-years in the population.

### Economic benefit assessment

The NCDs included in this analysis are associated with a reduction in the labour workforce and productivity due to premature mortality, fewer days of work (absenteeism) and reduced productivity while at work (presenteeism). Fig. 6 demonstrates the labour productivity gains that result from the prevented deaths and disease cases over 15 years, described in Table 4.

**Fig. 6. Recovered economic output from tobacco, physical activity, salt-reduction and cardiovascular diseases primary prevention interventions over 15 years**



Reduced mortality provides the greatest positive impact on productivity (72% of total productivity gains), followed by reduced presenteeism (15%) and absenteeism (13%). The policy packages and cardiovascular diseases and diabetes clinical interventions in primary care result in a total net present value of PHP 444.6 billion in labour productivity gains over 15 years (equivalent to 2.8% of the 2017 GDP of the Philippines of PHP 15 806.4 billion).

### Return on investment assessment

Comparing the costs and benefits of each package of interventions shows that all the NCD prevention interventions included in the analysis – for tobacco control, salt reduction and increasing physical activity – have positive returns on investment over 15 years (Table 4).

**Table 4. Costs, benefits and return on investment at five and 15 years, by intervention package (billions of Philippine pesos)**

| Intervention package                           | Five years  |                             |                      | 15 years    |                             |                      |
|--|-------------|-----------------------------|----------------------|-------------|-----------------------------|----------------------|
|  | Total costs | Total productivity benefits | Return on investment | Total costs | Total productivity benefits | Return on investment |
| Tobacco  | 2.6         | 6.2                         | 2.6                  | 10.0        | 97.8                        | 8.8                  |
| Alcohol  | 2.6         | 3.7                         | 1.5                  | 8.4         | 67.0                        | 7.0                  |
| Physical activity                              | 1.1         | 3.3                         | 3.0                  | 3.5         | 49.8                        | 12.7                 |
| Salt reduction                                 | 1.3         | 14.6                        | 11.5                 | 5.0         | 163.1                       | 29.9                 |
| Cardiovascular diseases clinical interventions | 70.7        | 6.1                         | 0.1                  | 530.7       | 67.0                        | 0.1                  |

Salt-reduction interventions have the highest return on investment of any intervention: for every Philippine peso invested in the package of salt interventions, the expected return is PHP 11.5 over five years and PHP 29.9 over 15 years. The tobacco package also has substantial returns on investment over both five and 15 years, as do the alcohol and the physical activity packages. The policy packages demonstrate substantial growth in the return on investment in the long term.

The package of clinical interventions does not provide a positive return on investment. This is frequent in health economics owing to the high costs associated with medical treatment. The costs of managing hypertension, high cardiovascular risk, acute ischaemic heart disease and stroke are relatively high compared with the relatively low benefit in terms of strokes, ischaemic heart disease and mortality averted.

The policy packages (salt-reduction, tobacco and alcohol control and physical activity packages) are the clear best buys, offering the highest returns on investment over 15 years.

## 6. Conclusion and recommendations

The investment case findings underscore the economic, social and sustainable development toll NCDs impose on the population of the Philippines every year. NCDs pull people into poverty, widen gender disparities and increase inequalities. This report sets out the case for further investment in the response to NCDs. It assesses the economic burden of NCDs for the country and the costs of specific interventions and presents a cost-benefit analysis for five intervention packages to demonstrate their economic value.

In 2015, NCDs cost the economy of the Philippines PHP 756.5 billion, equivalent to 4.8% of GDP annually. Only 10% of this is from direct health expenditure; the biggest share, 75% of the total burden, is caused by premature mortality, at an equivalent cost to the economy of PHP 565 billion. In addition to premature death, the analysis quantified lost productivity through the absenteeism (absent work days) and presenteeism (reduced efficiency of workers in the workplace) of people with cardiovascular diseases and diabetes, which further burden the economy by PHP 8.5 billion and PHP 92.2 billion respectively.

Although the investment case confirms that the Philippines faces an urgent epidemic of NCDs, it also shows an alternate path forward. The results show that investments in five proven and cost-effective intervention packages (best buys) can significantly reduce the burden of NCDs, increasing people's life expectancy and quality of life while reducing the burden on the national budget. Thus, these investments contribute to the overall socio-economic development of the country, exerting positive ripple effects across society and accelerating development.

The investment case assessed five cost-effective intervention packages of best buys in the Philippines: four policy packages to reduce the prevalence of behavioural risk factors for NCDs – tobacco use, harmful use of alcohol, physical inactivity and excessive salt consumption – and one clinical intervention package related to cardiovascular diseases and diabetes. The economic modelling considered existing national efforts and interventions. The main findings regarding the five packages are as follows.

- Investing in all five policy packages would save more than 394 977 lives over 15 years.
- Over 15 years, the packages to reduce salt consumption and increase physical activity result in the highest returns on investment.
- For the salt-reduction package, every Philippine peso invested yields PHP 29.9 in return. The overall cost is PHP 4.96 billion.
- For every Philippine peso invested in increasing physical activity among the population, the Philippines receives 12.7 in return. The overall cost is PHP 3.48 billion.
- The next highest returns on investment are for the tobacco (8.8) and alcohol packages (7.0). The investment packages would cost PHP 10 billion and PHP 8.44 billion, respectively.
- The cardiovascular diseases and diabetes clinical package would cost PHP 530.7 billion and yields a return on investment of PHP 0.1 per Philippine peso invested.

The analysis focused on specific areas that need to be strengthened and scaled up to implement the WHO-recommended cost-effective NCD preventive and clinical interventions. Since the packages to reduce salt consumption and increase physical activity provide the greatest returns on investment, scaling up effective salt-reduction initiatives and awareness campaigns to increase physical activity should be given priority. The government should also strengthen alcohol and tobacco control, since both still yield high returns on investment. Scaling up cardiovascular diseases and diabetes clinical interventions should not be neglected either, since introducing these packages could avert 43 327 deaths over a 15-year period. The following section lists five steps the government can take to strengthen NCD prevention and control.

### **Raise awareness of the true costs of NCDs and the enormous development benefits of investing in the five intervention packages of proven, cost-effective best-buys**

- Policy-makers across sectors are encouraged to share the investment case findings broadly among all sectors of government, Congress of the Philippines, civil society, the general public, development partners and academic institutions. Doing this will strengthen public and political support for NCD prevention and control. An advocacy strategy with key messages, such as how the interventions analysed here can support economic growth and improve population health, can assist policy-makers in disseminating the message. To help stem the NCD epidemic, the Philippines must raise awareness among the public, especially among young people.

## **Adopt a comprehensive set of salt-reduction policies, regulations and interventions**

- The government could adopt salt-reduction targets for industrially produced foods (such as bread, meat products, savoury snacks and drinks) by setting maximum limits through regulation, as has been done in many countries. Government officials can draw on the WHO modelling study, which provided significant insight on how much sodium needs to be reduced in various food categories (WHO, 2018d). The regulation would apply to all foods available on the market, including in supermarkets, and thus ensure equal treatment. This should not undermine other initiatives, such as salt iodization, which should be universal and in accordance with WHO policies.
- In addition, the government could make a concerted effort to ensure mandatory labelling of sodium and introduce a front-of-package labelling system that makes evaluative judgement about the sodium content (such as high, medium or low). The government could introduce mandatory restrictions on marketing foods high in salt (in addition to fat and sugar), and a new law should be passed to ban trans-fat in all food. Finally, the literacy of the population about the importance of salt reduction could be improved through communication campaigns and by training primary health care personnel to provide advice to patients.

## **Promote physical activity through national-level, mass public awareness campaigns and increase leadership to ensure that health is central to urban planning**

- The government can promote the new global action plan on physical activity 2018–2030 that was launched in June 2018 (WHO, 2018e) by developing local campaigns, including fun runs, triathlons and mass cycling events. This will help counter the rapid increase in the prevalence of overweight in the Philippines, which has doubled in the past 20 years from 14.5% in 1993 to 31.1% in 2013, with a dramatic increase in obesity among children and adolescents. In addition to mass campaigns and physical activity initiatives, the government should strengthen multisectoral action to incorporate healthy and age-friendly principles within urban development. Rapid urbanization together with unplanned urban expansion is posing a significant challenge to population health.
- The government should take measures to hold all levels of government accountable for their responsibilities in healthy urban design and development. Provincial governments should ensure health-friendly transport infrastructure and new urban subdivision planning. Municipal and local governments should ensure that all urban planning and development includes policies to promote healthy cities and age-friendly cities. This means increasing the availability of public transport, green spaces, cycle paths and other urban infrastructure that enables physical activity and reduces exposure to air pollution.

## **Strengthen tobacco control measures and enforcement**

- The Government of the Philippines is committed to fully implementing the WHO Framework Convention on Tobacco Control and has made notable progress in national tobacco control policies. The government could further increase the benefits of tobacco control measures by: (a) expanding the ban on tobacco advertising, promotion and sponsorship to include point-of-sale advertising and corporate social responsibility; (b) fully enforcing the ban on smoking in public places; (c) increasing tobacco excise taxes, with a predominantly specific excise tax component; and (d) implementing new measures such as mass-media campaigns and plain packaging. Several of these policies have low cost and high returns, including package warning labels and plain packaging, bans on tobacco advertising, promotion and sponsorship and raising taxes. To strengthen the enforcement of tobacco control policies, the government could increase awareness among local government units and provide incentives, tools and advocacy together with close monitoring, as appropriate.

- Given the economic benefits of tobacco control demonstrated in this investment case, the government should consider additional measures, such as increasing the minimum age for purchasing tobacco products to 21 years, banning the sale of single-stick cigarettes and regulating electronic cigarettes and other novel products. Finally, the government should strengthen the Inter-Agency Committee – Tobacco, charged with overseeing the implementation of the Tobacco Regulation Act. The tobacco industry representative should be removed from the committee, consistent with the commitment of the Philippines to the Framework Convention on Tobacco Control and Joint Memorandum Circular No. 1 of 2010, which provides a code of conduct for all government officials in relation to the tobacco industry. The government could further strengthen coordination by establishing a national tobacco control unit within the Department of Health, sufficiently staffed and including a designated, full-time tobacco control focal point.

## **Develop a comprehensive approach to sin taxes, resulting in increasing the tobacco and alcohol excise taxes and allocating revenue towards NCD prevention and control**

- The government’s latest tax reform package (Tax Reform for Acceleration and Inclusion (TRAIN)) increased excise taxes on cigarettes to PHP 35 per pack in 2018, and further annual increases will be phased in through the end of 2023, with annual 4% increases thereafter. To ensure the effectiveness of tobacco taxation, the Philippines should ensure that taxes comprise 75% of the retail price, as recommended by the WHO Framework Convention on Tobacco Control and as modelled by the investment case. In addition, the Ministry of Health can work with the Ministry of Finance to create an enabling environment for an effective tax structure: one that emphasizes a specific tax component and taxes all tobacco products similarly to reduce consumers substituting cigars, or chew or roll-your-own (loose-leaf) tobacco. The tax rate on alcoholic beverages remains low, at 22% of the retail price.
- Increasing taxes on health-harming products is one of the most effective measures a government can take to reduce their consumption, improving population health while increasing government revenue for national development priorities.<sup>9</sup> In the Philippines, revenue from sin taxes could fund components of the national multisectoral plan and Department of Health strategic action plan for NCD prevention and control 2017–2025, the 2017–2022 national tobacco control strategy or other key development priorities. Further, the government should revise its allocations of tax revenue currently incentivizing tobacco cultivation and shift allocation towards alternative livelihoods to tobacco growing, tobacco control and/or NCD prevention and control.

## **Strengthen national coordination and planning for preventing and controlling NCDs**

The investment case demonstrates that NCDs pose a sustainable development challenge for the Philippines with implications for the Departments of Finance, Education, Labor and Employment, Agriculture and Trade and Industry, other sectors, civil society and members of the Congress of the Philippines. An effective response to NCDs requires a whole-of-government approach involving nongovernmental actors throughout all sectors of society. A national coordination mechanism is an effective tool for mobilizing whole-of-government and whole-of-society responses.

Although the Philippines has developed several multisectoral policies and strategies linked to different areas of NCD prevention and control, it does not have a multisectoral mechanism for coordination, priority-setting and monitoring and evaluation of impact to improve policies. Establishing a national coordination mechanism for NCDs would enable the government to clarify the roles and responsibilities of different sectors, strengthen policy coherence and effectively cost, fund and operationalize strategies and programmes promoting health. The

<sup>9</sup> The 2015 Addis Ababa Action Agenda on Financing for Development, the global financing framework for sustainable development agreed by United Nations Member States, specifies price and tax measures on tobacco as an important and underutilized revenue stream to finance national development efforts (United Nations, 2015).

National Nutrition Council is a good example of successful multisectoral collaboration and may provide a model for a broader control national coordination mechanism for NCD prevention and control.

Such a coordinating mechanism needs to operate under agreed terms of reference, must be protected from the vested and commercial interests of the tobacco, alcohol and food industries and should create technical working groups on programmatic areas, as necessary. Given the decentralized governance structure, the government should ensure that national-level commitments are put into operation at the local level. The government should consider efforts to financially support the NCD Coalition, previously very active in support of NCD prevention and control, and include representation for this broad coalition in the national coordination mechanism.

## References

Anesetti-Rothermel A, Sambamoorthi U (2011). Physical and mental illness burden: disability days among working adults. *Popul Health Manag.* 14:223–30.

Avenir Health (2017). One Health Tool [website]. Glastonbury, CT: Avenir Health (<http://www.avenirhealth.org/software-onehealth.php>, accessed 5 July 2019).

Bloom DE, Cafiero ET, Jané-Llopis E, Abrahams-Gessel S, Bloom LR, Fathima S et al. (2011). The global economic burden of non-communicable diseases, Geneva: World Economic Forum (<http://apps.who.int/medicinedocs/en/d/Js18806en>, accessed 5 July 2019).

Chisholm D, Mendis S, Abegunde D (2012). Costing Tool – user guide. Geneva: World Health Organization ([https://www.who.int/ncds/management/c\\_NCDs\\_costing\\_estimation\\_tool\\_user\\_manual.pdf?ua=1](https://www.who.int/ncds/management/c_NCDs_costing_estimation_tool_user_manual.pdf?ua=1), accessed 5 July 2019).

Department of Health (2015). Global School-Based Student Health Survey (GSHS), Philippines 2015, country report. Manila: Department of Health ([https://www.doh.gov.ph/sites/default/files/publications/2015GSHS\\_PHL\\_FinalCountryReport\\_0.pdf](https://www.doh.gov.ph/sites/default/files/publications/2015GSHS_PHL_FinalCountryReport_0.pdf), accessed 5 July 2019).

Department of Health (2018). AHEAD-HPSR Urgency of another sin tax reform. Manila: Department of Health ([https://www.doh.gov.ph/sites/default/files/health\\_magazine/WHT4.2%20Sin%20Tax.pdf](https://www.doh.gov.ph/sites/default/files/health_magazine/WHT4.2%20Sin%20Tax.pdf), accessed 5 July 2019).

Epidemiology Bureau, Department of Health (2015a). Global Adult Tobacco Survey, Philippines 2015, country report. Manila: Epidemiology Bureau, Department of Health ([https://www.who.int/tobacco/surveillance/survey/gats/phl\\_country\\_report.pdf?ua=1](https://www.who.int/tobacco/surveillance/survey/gats/phl_country_report.pdf?ua=1), accessed 5 July 2019).

Epidemiology Bureau, Department of Health (2015b). Global Youth Tobacco Survey (GYTS), Philippines 2015, country report. Manila: Epidemiology Bureau, Department of Health ([https://www.doh.gov.ph/sites/default/files/publications/2015GYTSFinalFactSheet\\_1.pdf](https://www.doh.gov.ph/sites/default/files/publications/2015GYTSFinalFactSheet_1.pdf), accessed 5 July 2019).

Food and Nutrition Research Institute, Department of Science and Technology (2015a). Philippine nutrition facts and figures, 2015: updating of the nutritional status of Filipino children and other population groups. Manila: Food and Nutrition Research Institute, Department of Science and Technology ([http://enutrition.fnri.dost.gov.ph/site/preview.php?xx=%20uploads/2015\\_CLINICAL\\_AND\\_HEALTH\\_SURVEY.pdf](http://enutrition.fnri.dost.gov.ph/site/preview.php?xx=%20uploads/2015_CLINICAL_AND_HEALTH_SURVEY.pdf), accessed 5 July 2019).

Food and Nutrition and Research Institute, Department of Science and Technology (2015b). National nutrition survey. Manila: Food and Nutrition and Research Institute, Department of Science and Technology.

Garg CC, Evans DB (2011). What is the impact of noncommunicable diseases on national health expenditures: a synthesis of available data. Geneva: World Health Organization (NCD discussion paper no. 3; <http://www.who.int/healthsystems/NCDdiscussionpaper3.pdf>, accessed 5 July 2019).

Government of Malaysia (2019). Alliance for Healthy Cities Global Conference and General Assembly 2018 [website]. Kuching: Government of Malaysia (<https://afhc2018.sarawak.gov.my>, accessed 5 July 2019).

Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet*. 380:219–29.

Philippine Statistics Authority (2016). Death statistics. Manila: Philippine Statistics Authority (<https://psa.gov.ph/sites/default/files/attachments/crd/specialrelease/2016%20Death%20Statistical%20Tables.pdf>).

Powles J, Fahimi S, Micha R, Khatibzadeh S, Shi P, Ezzati M et al. (2013). Global, regional and national sodium intakes 1990 and 2010: a systematic analysis of 24h urinary sodium excretion and dietary surveys worldwide. *BMJ Open*. 3:e003733.

RTI International (in press). The investment case for noncommunicable disease prevention and control: technical appendix. Geneva: World Health Organization.

United Nations (2015). Financing for development. In: Addis Ababa Action Agenda of the Third International Conference on Financing for Development. New York: United Nations.

Wang PS, Beck A, Berglund P, Leutzinger JA, Pronk N, Richling D et al. (2003). Chronic medical conditions and work performance in the health and work performance questionnaire calibration surveys. *J Occup Environ Med*. 45:1303–11.

WHO (2012). Sodium intake for adults and children: guideline. Geneva: World Health Organization ([http://www.who.int/nutrition/publications/guidelines/sodium\\_intake/en/](http://www.who.int/nutrition/publications/guidelines/sodium_intake/en/), accessed 5 July 2019).

WHO (2013). Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: World Health Organization (<http://apps.who.int/medicinedocs/en/m/abstract/Js21446en>, accessed 5 July 2019).

WHO (2017a). Noncommunicable diseases progress monitor 2017. Geneva: World Health Organization (<http://apps.who.int/iris/bitstream/handle/10665/258940/9789241513029-eng.pdf;jsessionid=EBA7ADB0E-1D6055EEED386BEA8B406A6?sequence=1>, accessed 5 July 2019).

WHO (2017b). WHO report on the global tobacco epidemic, 2017. Geneva: World Health Organization ([http://www.who.int/tobacco/global\\_report/2017/en](http://www.who.int/tobacco/global_report/2017/en), accessed 5 July 2019).

WHO (2017c). “Best buys” and other recommended interventions for the prevention and control of noncommunicable diseases. Geneva: World Health Organization (<http://www.who.int/ncds/management/best-buys/en>, accessed 5 July 2019).

WHO (2017d). Philippines – WHO Country Cooperation Strategy (2017–2022). Geneva: World Health Organization (<http://iris.wpro.who.int/bitstream/handle/10665.1/13584/WPRO-2017-DPM-003-eng.pdf>, accessed 5 July 2019).



- WHO (2018a). Global status report on alcohol and health. Geneva: World Health Organization ([https://www.who.int/substance\\_abuse/publications/global\\_alcohol\\_report/en](https://www.who.int/substance_abuse/publications/global_alcohol_report/en), accessed 5 July 2019).
- WHO (2018b). Noncommunicable diseases country profiles 2018: Philippines. In: World Health Organization [website]. Geneva: World Health Organization ([https://www.who.int/nmh/countries/2018/phl\\_en.pdf?ua=1](https://www.who.int/nmh/countries/2018/phl_en.pdf?ua=1), accessed 5 July 2019).
- WHO (2018c). Joint Mission of the United Nations Interagency Task Force on the Prevention and Control of Noncommunicable Diseases, Philippines, 7–11 May 2018. Geneva: World Health Organization (<https://apps.who.int/iris/handle/10665/279817>, accessed 5 July 2019).
- WHO (2018d). Using dietary intake modelling to achieve population salt reduction – a guide to developing a country-specific salt reduction model. Copenhagen: WHO Regional Office for Europe (<http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/2018/using-dietary-intake-modelling-to-achieve-population-salt-reduction-a-guide-to-developing-a-country-specific-salt-reduction-model-2018>, accessed 5 July 2019).
- WHO (2018e). Global action plan on physical activity 2018–2030: more active people for a healthier world. Geneva: World Health Organization (<https://apps.who.int/iris/handle/10665/272722>, accessed 5 July 2019).
- WHO (2019a). WHO Framework Convention on Tobacco Control [website]. Geneva: World Health Organization (<http://www.who.int/fctc/en>, accessed 5 July 2019).
- WHO (2019b). Types of healthy settings: healthy cities. Geneva: World Health Organization ([http://www.who.int/healthy\\_settings/types/cities/en](http://www.who.int/healthy_settings/types/cities/en), accessed 5 June 2019).
- WHO (2019c). Towards an age-friendly world. Geneva: World Health Organization (<http://www.who.int/ageing/age-friendly-world/en>, accessed 5 July 2019).
- WHO (2019d). Age-friendly world [website]. Geneva: World Health Organization (<https://extranet.who.int/agefriendlyworld>, accessed 5 July 2019).
- WHO (2019e). Cost–effectiveness and strategic planning (WHO-CHOICE) [online database] (2019). Geneva: World Health Organization (<http://www.who.int/choice/cost-effectiveness/en>, accessed 5 July 2019).

# Annex 1. Data used for calculating the burden of NCDs

Table A1. Share of major NCDs in total health care expenditure

| Category                         | Australia | Canada | Czechia | Germany | Estonia | France | Georgia    | Hungary | India      | Republic of Korea | Netherlands | Slovenia | United States of America |
|----------------------------------|-----------|--------|---------|---------|---------|--------|------------|---------|------------|-------------------|-------------|----------|--------------------------|
| World Bank income group          | High      | High   | High    | High    | High    | High   | Low-middle | High    | Low-middle | High              | High        | High     | High                     |
| Cardiovascular diseases          | 8.6%      | 9.0%   | 9.2%    | 16.2%   | 22.0%   | 12.0%  | 0.8%       | 18.4%   | 15.6%      | 13.4%             | 11.1%       | 13.6%    | 17.0%                    |
| Cancer (neoplasm)                | 4.7%      | 3.1%   | 5.5%    | 7.9%    | 9.4%    | 7.1%   | 1.9%       | 8.2%    | 4.7%       | 7.7%              | 5.5%        | 6.7%     | 7.2%                     |
| Endocrine and metabolic diseases | 4.4%      | 2.1%   | 2.0%    | 4.0%    | 5.4%    | 3.9%   | 0.0%       | 6.1%    | 4.8%       | 4.1%              | 2.7%        | 2.4%     | 4.4%                     |
| Respiratory diseases             | 4.8%      | 4.5%   | 3.2%    | 5.4%    | 7.2%    | 7.3%   | 0.4%       | 5.8%    | 8.9%       | 10.8%             | 4.9%        | 6.2%     | 6.6%                     |
| Total for four NCDs              | 22.5%     | 18.7%  | 19.9%   | 33.5%   | 44.0%   | 30.3%  | 3.1%       | 38.5%   | 34.0%      | 36.0%             | 24.2%       | 28.9%    | 35.2%                    |

Source: Garg CC, Evans DB. What is the impact of noncommunicable diseases on national health expenditures: a synthesis of available data. Geneva: World Health Organization; 2011 (NCD discussion paper no. 3; <http://www.who.int/healthsystems/NCDdiscussionpaper3.pdf>; accessed 5 July 2019).

**Table A2. Productivity data**

| Disease   | Parameter value | Year | Source of data  | Details of data source  |
|---|-----------------|------|---|---|
| <b>Labour force participation rate reduction</b>          |                 |      |   |   |
| Hypertension  | 11.0%           | 2009 | Institute for Research and Information in Health Economics  | Barnay T, Debrand T (2006). Effects of health on the labour force participation of older persons in Europe. Questions d'économie de la Santé. 109 ( <a href="http://www.irdes.fr/english/2006/issues-in-health-economics.html">http://www.irdes.fr/english/2006/issues-in-health-economics.html</a> ), accessed 5 July 2019).   |
| Stroke  | 11.0%           | 2009 | Institute for Research and Information in Health Economics  | Barnay T, Debrand T (2006). Effects of health on the labour force participation of older persons in Europe. Questions d'économie de la Santé. 109 ( <a href="http://www.irdes.fr/english/2006/issues-in-health-economics.html">http://www.irdes.fr/english/2006/issues-in-health-economics.html</a> ), accessed 5 July 2019).   |
| Acute myocardial infarction                               | 11.0%           | 2009 | Institute for Research and Information in Health Economics  | Barnay T, Debrand T (2006). Effects of health on the labour force participation of older persons in Europe. Questions d'économie de la Santé. 109 ( <a href="http://www.irdes.fr/english/2006/issues-in-health-economics.html">http://www.irdes.fr/english/2006/issues-in-health-economics.html</a> ), accessed 5 July 2019).   |
| Type 2 diabetes   | 11.0%           | 2009 | Institute for Research and Information in Health Economics  | Barnay T, Debrand T (2006). Effects of health on the labour force participation of older persons in Europe. Questions d'économie de la Santé. 109 ( <a href="http://www.irdes.fr/english/2006/issues-in-health-economics.html">http://www.irdes.fr/english/2006/issues-in-health-economics.html</a> ), accessed 5 July 2019).   |
| <b>Reduction in full-time hours caused by absenteeism</b> |                 |      |   |   |
| Hypertension  | 0.5%            | 2011 | Population Health Management  | Mitchell RJ, Bates P (2011). Measuring health-related productivity loss. Popul Health Manag. 14: 93–8.  |
| Stroke  | 5.5%            | 2011 | Population Health Management  | Mitchell RJ, Bates P (2011). Measuring health-related productivity loss. Popul Health Manag. 14: 93–8.  |
| Acute myocardial infarction                               | 1.1%            | 2011 | Population Health Management  | Mitchell RJ, Bates P (2011). Measuring health-related productivity loss. Popul Health Manag. 14: 93–8.  |
| Type 2 diabetes   | 0.3%            | 2011 | Population Health Management  | Mitchell RJ, Bates P (2011). Measuring health-related productivity loss. Popul Health Manag. 14: 93–8.  |
| <b>Reduction in productivity caused by presenteeism</b>   |                 |      |   |   |
| Cardiovascular diseases and stroke                        | 3.7%            | 2011 | Wang PS, Beck A, Berglund P, Leutzinger JA, Pronk N, Richling D et al. (2003). Chronic medical conditions and work performance in the health and work performance questionnaire calibration surveys. J Occup Environ Med. 45:1303–11. |   |
| Diabetes  | 11%             | 2011 | Holden L, Scuffham PA, Hilton MF, Ware RS, Vecchio N, Whiteford HA (2011). Which health conditions impact on productivity in working Australians? J Occup Environ Med. 53:253–7.  |   |
| Time it takes to replace workers (percentage of a year)   | 20%             | 2012 | Center for American Progress  | Boushey H, Glynn SJ (2012). There are significant business costs to replacing employees. Washington (DC): Center for American Progress ( <a href="https://www.americanprogress.org/issues/labor/report/2012/11/16/44464/there-are-significant-business-costs-to-replacing-employees">https://www.americanprogress.org/issues/labor/report/2012/11/16/44464/there-are-significant-business-costs-to-replacing-employees</a> , accessed 5 July 2019). |

## The WHO Western Pacific Region

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Western Pacific is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

### Member States of the WHO Western Pacific Region:

American Samoa (USA)  
Australia  
Brunei Darussalam  
Cambodia  
China  
Cook Islands  
Fiji  
French Polynesia (France)  
Guam (USA)  
Hong Kong SAR (China)  
Japan  
Kiribati  
Lao People's Democratic Republic  
Macao SAR (China)  
Malaysia  
Marshall Islands  
Micronesia, Federated States of  
Mongolia  
Nauru  
New Caledonia (France)  
New Zealand  
Niue  
Northern Mariana Islands,  
Commonwealth of the (USA)  
Palau  
Papua New Guinea  
Philippines  
Pitcairn Island (UK)  
Republic of Korea  
Samoa  
Singapore  
Solomon Islands  
Tokelau (New Zealand)  
Tonga  
Tuvalu  
Vanuatu  
Viet Nam  
Wallis and Futuna (France)



© World Health Organization 2019.

Development of this investment case was coordinated by a joint WHO and UNDP team. This investment case report is for advocacy purposes and provides a set of options for action to reduce the burden of the noncommunicable diseases in the Philippines.

WHO/UHC/CD-NCD/19.90