



**THE CASE FOR INVESTMENT
IN PREVENTION AND CONTROL OF
NON-COMMUNICABLE DISEASES IN
BAHRAIN**



مجلس الصحة
لدول مجلس التعاون
Gulf Health Council



UN INTERAGENCY
TASK FORCE ON NCDs



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World Health
Organization





THE CASE FOR INVESTMENT IN PREVENTION AND CONTROL OF NON-COMMUNICABLE DISEASES IN **BAHRAIN**

Prepared by

Ministry of Health Bahrain
Gulf Health Council
United Nations Development Programme
World Health Organization
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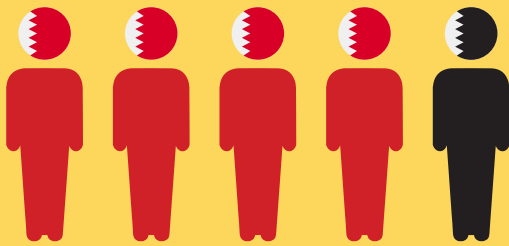
Why invest?



AROUND 2,000 BAHRAINIS DIE EVERY YEAR FROM NON-COMMUNICABLE DISEASES (NCDs), WHICH CAUSE

75%

OF ALL DEATHS IN BAHRAIN.



NEARLY ONE IN FIVE ADULTS DIES FROM NCDs BEFORE THE AGE OF 70.

<70 YEARS



NCDs COST BAHRAIN BD 534 MILLION (USD 1.4 BILLION) EVERY YEAR, EQUIVALENT TO

3.8% OF GDP IN 2019.

THIS IS SIMILAR TO THE FORECASTED ECONOMIC CONTRACTION IN BAHRAIN DUE TO COVID-19 (3.6% IN 2020).

OF THE MAIN NCDS,
CARDIOVASCULAR DISEASE
CAUSES THE MOST DEATHS IN
BAHRAIN EVERY YEAR.



49%

FOLLOWED BY
CANCER ...



18%

AND DIABETES



3%

Investing now

IN FOUR PROVEN AND HIGHLY COST-EFFECTIVE POLICY AND
CLINICAL INTERVENTIONS WILL

PREVENT NEARLY

15,000

DEATHS AND AVERT

**BD 636
million**

OR (USD 1.67 BILLION) IN ECONOMIC LOSSES BY 2034.



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ABBREVIATIONS

BD	Bahraini dinar
BDF	Bahrain Defence Force
BMI	body mass index
COPD	chronic obstructive pulmonary disease
COVID-19	coronavirus disease
CRD	chronic respiratory diseases
CVD	cardiovascular disease
DALY	disability-adjusted life-year
FAO	Food and Agriculture Organization of the United Nations
ICA	Institutional Context Analysis
IMF	International Monetary Fund
I-SEHA	National Health Information System
GCC	Gulf Cooperation Council
GHC	Gulf Health Council
GDP	gross domestic product
GATS	Global Adult Tobacco Survey
GYTS	Global Youth Tobacco Survey
KPI	Key performance indicators
MENA	Middle East and North Africa
MI	myocardial infarction
MOH	Ministry of Health
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]
NASC	National Anti-Smoking Committee
NCD	non-communicable disease
NRT	nicotine replacement therapy
PHC	primary healthcare
ROI	return on investment
SSBs	sugar-sweetened beverages
STEPS	WHO STEPwise approach to surveillance
UNDP	United Nations Development Programme
WHO	World Health Organization
UNIATF on NCDs	United Nations Inter-Agency Task Force on Non-communicable Diseases

EXECUTIVE SUMMARY

The four main NCDs – cancer, cardiovascular diseases, diabetes and chronic respiratory diseases – cause 75% of deaths in Bahrain, and nearly one in five adults dies from NCDs before the age of 70. The premature death, morbidity and disability associated with NCDs are more than a health issue – they negatively affect socio-economic development and long-term fiscal sustainability of government and public services.

Overview

As in many parts of the world, NCDs in Bahrain are causing a surge in costs expended by the government to provide healthcare, early retirement benefits, social care and welfare support. Moreover, NCDs contribute to reduced economic productivity when people in the workforce die prematurely and work at lower capacity due to illness. NCDs are exacerbated by COVID-19 and vice versa. NCDs and their risk factors – behavioural, environmental, and metabolic¹ – increase, to varying degrees, susceptibility to COVID-19 infection and the likelihood of severe and fatal outcomes. NCDs therefore contribute to worse outcomes from COVID-19 including overwhelmed health systems, which, in turn, threaten to disrupt access to life-saving NCD services.

This report results from Bahrain's engagement in 2017 with the United Nations Inter-Agency Task Force on the Prevention and Control of Non-communicable Diseases which resulted in recommended actions to implement United Nations Political Declaration on NCDs. Bahrain's Ministry of Health made it a priority to conduct the NCD investment case presented here, which provides evidence that NCDs reduce economic output and that Bahrain would benefit from investing in four policy intervention packages that reduce exposure to behavioural risk factors (tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity). It also examines investments in key clinical interventions for the most prevalent NCDs – cardiovascular diseases and diabetes. The findings show that addressing NCDs is a matter of urgency to ensure significant social and economic returns.

Beyond the four policy packages modelled, the investment case discusses a range of issues that affect health and sustainable development in Bahrain. These include air pollution, the food system and urban design (see **Box 3** and **Recommendations #4**), implementation of other cost-effective interventions such as bans on trans fats and health taxes on sugar (see **Table 2**) and other health-harming products, and integrated responses to NCDs and COVID-19 (see recommendations and **Annex 1**). The policy and clinical interventions analysed in this investment case represent critical first actions needed to fundamentally reverse NCD trends in Bahrain. The responsibility for action, as well as the benefits that come from it, fall beyond the health sector alone.

¹ This includes metabolic risk factors such as overweight and obesity, behavioural risk factors such as alcohol and tobacco use as well as physical inactivity, and environmental risk factors such as air pollution (Annex 1).

Main findings

1 NCDs cost the Bahrain economy 534 million BD (USD 1.4 billion), equivalent to 3.8% of its 2019 GDP.

These annual costs include a) 283 million BD (USD 745 million) in healthcare expenditures, and b) 251 million BD (USD 660 million) in lost productive capacities due to premature mortality, disability, and workplace losses. The productivity losses from current NCDs account for 47% of all NCD-related costs – indicating that NCDs impede development in Bahrain beyond health. Multisectoral engagement is required for an effective response, and other sectors benefit substantially from supporting NCD investments.

2 Cardiovascular disease had the greatest impact on the economic burden of NCDs in Bahrain, 59% of the total burden (316 million BD).

Indirect costs, including reduced workforce participation and loss in national productivity, contributed more than direct healthcare spending to the total CVD burden (72% and 28% respectively).

3 NCDs kill around 2,000 Bahraini citizens per year, with nearly one in five adults dying before the age of 70.

Cardiovascular disease is the leading cause of NCD deaths in Bahrain, accounting for 49% of all deaths in the country, followed by cancer (18%) and diabetes (3%).

By acting now, the Government of Bahrain can reduce the burden of NCDs. The investment case findings demonstrate that investing in four cost-effective and proven policy packages would, over the next 15 years:

1

Avert 636 million BD (USD 1.7 billion) in economic output losses.

The NCD prevention measures stimulate economic growth by ensuring that fewer people drop out of the workforce due to premature mortality and miss days of work due to disability or sickness.

2

Save 15,000 lives and reduce the incidence of disease.

Enacting the CVD and diabetes clinical intervention package would prevent the most deaths (6,161) followed by the salt reduction package (6,048). About 90% of the mortality averted for all interventions (14,977 deaths averted) would be premature deaths averted (13,539 of people <70 years of age).

3

Provide economic benefits (636 million BD) that significantly outweigh the costs (262 million BD) of implementation.

Each of the best-buy intervention packages demonstrates benefits that outweigh the costs. Salt reduction has the highest return on investment (7.2), followed by tobacco control (2.7), diet and physical activity awareness (1.7), and CVD and diabetes clinical interventions (1.4).

Recommendations

1 > Invest and scale up

Invest in new and scale up current cost-effective clinical and population-based interventions, enhancing efficiency in the health sector and public sector fiscal sustainability. Increase taxes on health-harming products (tobacco, alcohol, sugar-sweetened beverages) and shift subsidies from health-harming products (e.g. polluting fuels) to health-promoting ones.

2 > Engage and collaborate

Strengthen multisectoral, whole-of-government and whole-of-society action on NCDs and increase public awareness of NCDs and their risk factors.

3 > Monitor and account

Strengthen monitoring and evaluation and accountability across sectors.

4 > Innovate

Implement novel policy approaches and test innovative solutions to increase utilization of existing services and incentivize healthy behaviour.

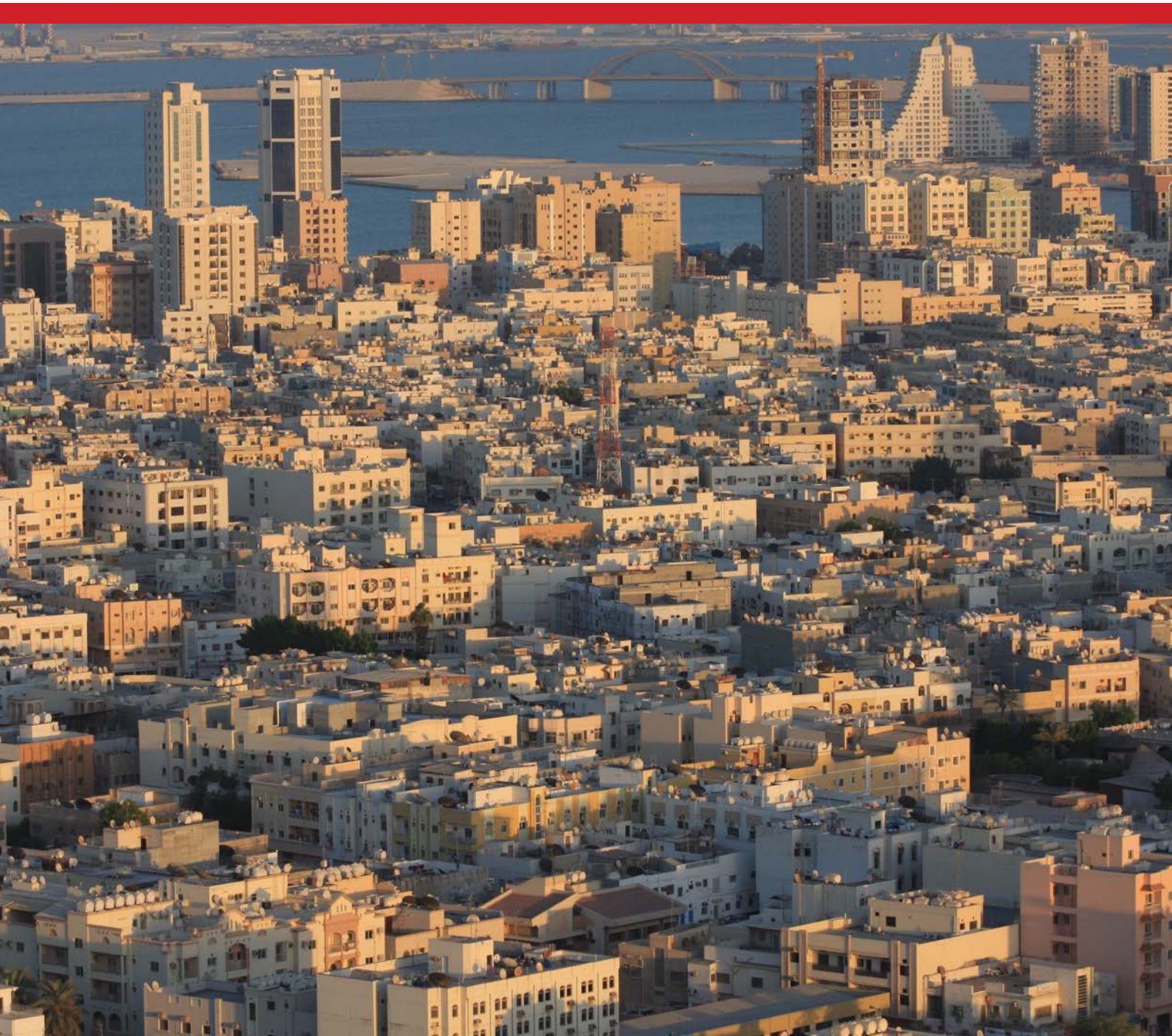
5 > Build back better

Ensure that prevention and control of NCDs is a central element of the COVID-19 response and recovery.



'It's therefore not a question of whether countries can afford to implement the best buys, but whether they can afford not to. We have all the pieces to save lives; we just have to put them into place. The question is, will we? It's a question we must answer with the decisions we make today, and every day.'

Tedros Adhanom Ghebreyesus,
Director-General, WHO





INTRODUCTION

This report provides an overview of the current context of NCDs in Bahrain, describes the model used to estimate the NCD burden and policy benefits, and offers recommendations to improve NCD prevention and control. It discusses current levels and patterns of tobacco and salt consumption, physical inactivity, dietary patterns, and the existing prevalence of metabolic risk factors within the population.

INTRODUCTION

Bahrain has made considerable progress in advancing the prevention and control of non-communicable diseases (NCDs) over the past several years. In recognition, Bahrain received the 2018 UNIATF Award under the category “Outstanding Ministries of Health” (see **Box 1**), and in 2019, His Royal Highness Prince Khalifa bin Salman Al Khalifa received the World Health Organization Director-General’s Health Leaders’ recognition for his political leadership in advancing health. [1] Still, NCDs remain the leading cause of mortality in Bahrain and their prevalence continues to rise. NCDs harm not only health in Bahrain but also the country’s sustainable development, including the government’s general directives on fiscal balance, economic growth, and “sustainability and quality of social, educational, health and housing services, maintaining high indicators to promote the government expenditure on these services”. [2]

The Joint Mission of the United Nations Inter-Agency Task Force on the Prevention and Control of Non-communicable Diseases (UNIATF on NCDs) to Bahrain in 2017 found that the four main NCDs – cancer, cardiovascular diseases, diabetes and chronic respiratory diseases – cause around 75% of all deaths in Bahrain; the modeling presented under this report finds similar numbers with NCDs accounting for 64% of all deaths in 2018. Cardiovascular disease causes nearly half (49%) of NCD deaths in Bahrain. The UNIATF Joint Mission in 2017 found that people in Bahrain have a 12% chance of dying prematurely – that is, before the age of 70 years – from one of the four main NCDs. [3] United Nations Sustainable Development Goals Target 3.4 aims to reduce premature mortality from NCDs by one third by 2030.

The impact of NCDs on human health is clear, but this is only one part of the story. NCDs also result in high healthcare costs as well as productivity losses. When individuals die prematurely, the labour output they would have produced in their remaining working years is lost. In addition, people who have a disease are more likely to miss days of work (absenteeism) or to work at a reduced capacity while at work (presenteeism). Globally, NCDs are estimated to cost over USD 30 trillion from 2011 to 2030, representing 48% of 2010 Global GDP. [4] For individuals and governments, spending to treat health problems that could otherwise have been prevented can mean significant opportunity costs, including reduced investment in education, transport projects or other forms of human or physical capital that can produce long-term returns.

The COVID-19 pandemic is exacerbated by NCDs in Bahrain as elsewhere, adding to the urgency with which they must be addressed. Cases of COVID-19 are increasing in Bahrain with over 40,000 cases as of the 5 August in 2020. [5] In response to the pandemic, the Ministry of Health of the Kingdom of Bahrain has provided information and updates on COVID-19 to the public. [6] His Royal Highness Prince Khalifa bin Salman Al Khalifa, the Prime Minister of Bahrain, was commended by WHO on his approach to the COVID-19 pandemic to unify the community to create widespread momentum to end the pandemic as soon as possible. [7]

NCDs and their risk factors – behavioural, environmental and metabolic² – increase both susceptibility to infection and the likelihood of severe symptoms and death. People living with NCDs are also at risk of adverse health due to disruption of prevention and clinical services for NCDs. The prevention and control of NCDs must therefore be a central element of the COVID-19 response and recovery.

Annex 1 briefly discusses interactions between NCDs and COVID-19 with integrated actions that Bahrain government can take.

The 2017 UNIATF visit to Bahrain resulted in recommended actions in line with the Framework for Action to implement the United Nations Political Declaration on NCDs of the WHO Regional Committee for the Eastern Mediterranean. **Annex 5** outlines the recommendations made during the 2017 UNIATF visit and Bahrain's progress. As part of the 2017 mission, WHO and the Ministry of Health discussed the value of investigating the economic case for NCD action in Bahrain. Bahrain included conducting an NCD investment case as a specific activity under its NCD Action Plan 2019-2030,³ [8] and a joint United Nations (WHO, UNDP, UNIATF) visit to Manama was undertaken in November 2019 to initiate the investment case (more information in the **Methods** section).

Box 1. Bahrain receives the 2018 UNIATF Award for “Outstanding Ministry of Health”

In 2018, Bahrain was awarded by the UN Inter-Agency Task Force on NCD Prevention and Control for achievements in multisectoral action on NCDs. Chaired by Minister of Health Faeqa bint Saeed Al Saleh and headed by Assistant Undersecretary for Public Health Dr. Mariam Ebrahim Al-Hajeri, the National Non-communicable Disease Control Committee that coordinates Bahrain's multisectoral NCD response has overseen the increase in investments that focus on NCD prevention and result in long-term savings.

Since receiving the award, the Ministry of Health and its NCD Control Committee have overseen new investments in prevention and population-based measures including a new anti-tobacco campaign for primary schools, a new life skills programme for adolescents, and a periodic school-screening programme for student risk behaviours. The Health Promotion Directorate has also started a new Healthy Workplace initiative which sets standards for workplaces around physical activity, healthy nutrition, tobacco control, mental health and occupational health. Further, Bahrain has introduced measures to improve diet and consumption patterns of its citizens, including voluntary salt reduction programmes, and limits on trans-fat content. Bahrain is considering refining a sugar-sweetened beverages tax, which would be another major step forward.

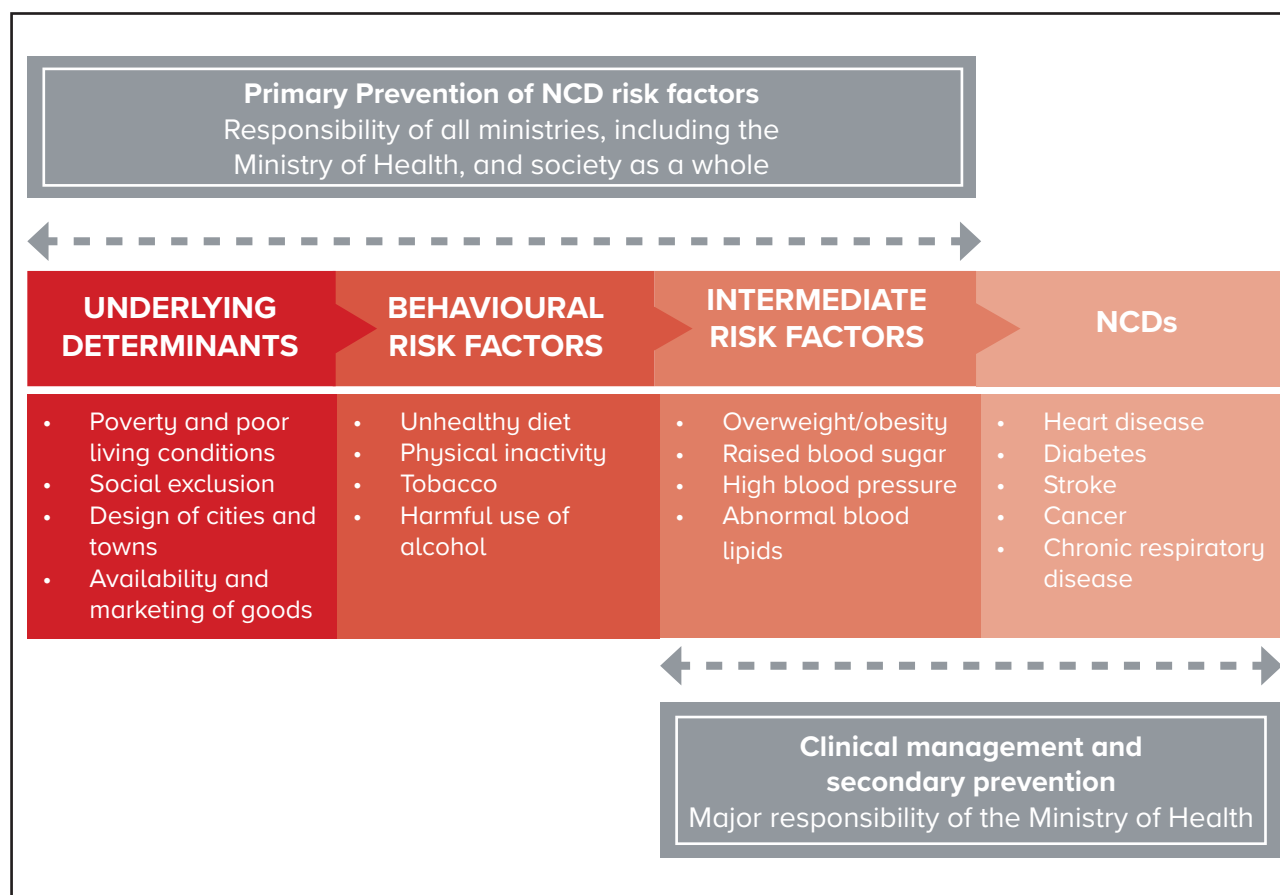
² This includes metabolic risk factors such as overweight and obesity, behavioural risk factors such as alcohol and tobacco use as well as physical inactivity, and environmental risk factors such as air pollution.

³ The National Action Plan for Control and Prevention of NCDs (2019-2030) can be accessed here: [https://extranet.who.int/ncdcs/Data/BHR_B3_National%20NCD%20action%20plan%20objectives%2019032019%20\(final%20draft%20pic\)%20.pdf](https://extranet.who.int/ncdcs/Data/BHR_B3_National%20NCD%20action%20plan%20objectives%2019032019%20(final%20draft%20pic)%20.pdf)

High human and economic costs of NCDs highlight the need to reduce their burden in Bahrain. The risk of developing NCDs can be reduced by modifying four types of behaviour (tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity) and metabolic risk factors such as high blood pressure and cholesterol. According to the World Health Organization, at least 80% of premature heart disease, stroke, and diabetes and 40% of cancers can be prevented by eliminating risk factors. [9] Reducing risk for NCDs is possible through a healthy diet, regular physical activity and avoidance of tobacco products. Reducing people's exposure to environmental risks, such as outdoor air pollution, can also reduce deaths and disability from NCDs. Bahrain has made fuel subsidy reform a priority under the National Renewable Energy Action Plan that is projected to save the government 13 million BD. [10] Reducing fossil fuel subsidies can help reduce exposure to air pollution, while financing policies discussed in this report.

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.

Fig. 1 Determinants of NCDs and responsibilities for response



WHO developed a menu of highly cost-effective policy options, referred to as “best buys”, and an additional set of cost-effective interventions to assist Member States to reduce the NCD burden. These interventions are laid out under the Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2030. These best buys were updated at the 2017 World Health Assembly 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. [11]

Despite the strong evidence of their cost-effectiveness, WHO best buys remain under-implemented globally. This is partly due to the hidden costs of NCDs (i.e. the economic impact) often being overlooked. Therefore, quantifying the costs of interventions to prevent and control NCDs, as well as their returns on investment, has been a high-priority request from Member States. Investment cases are designed to help countries make their own economic rationale for action to prevent and control NCDs.

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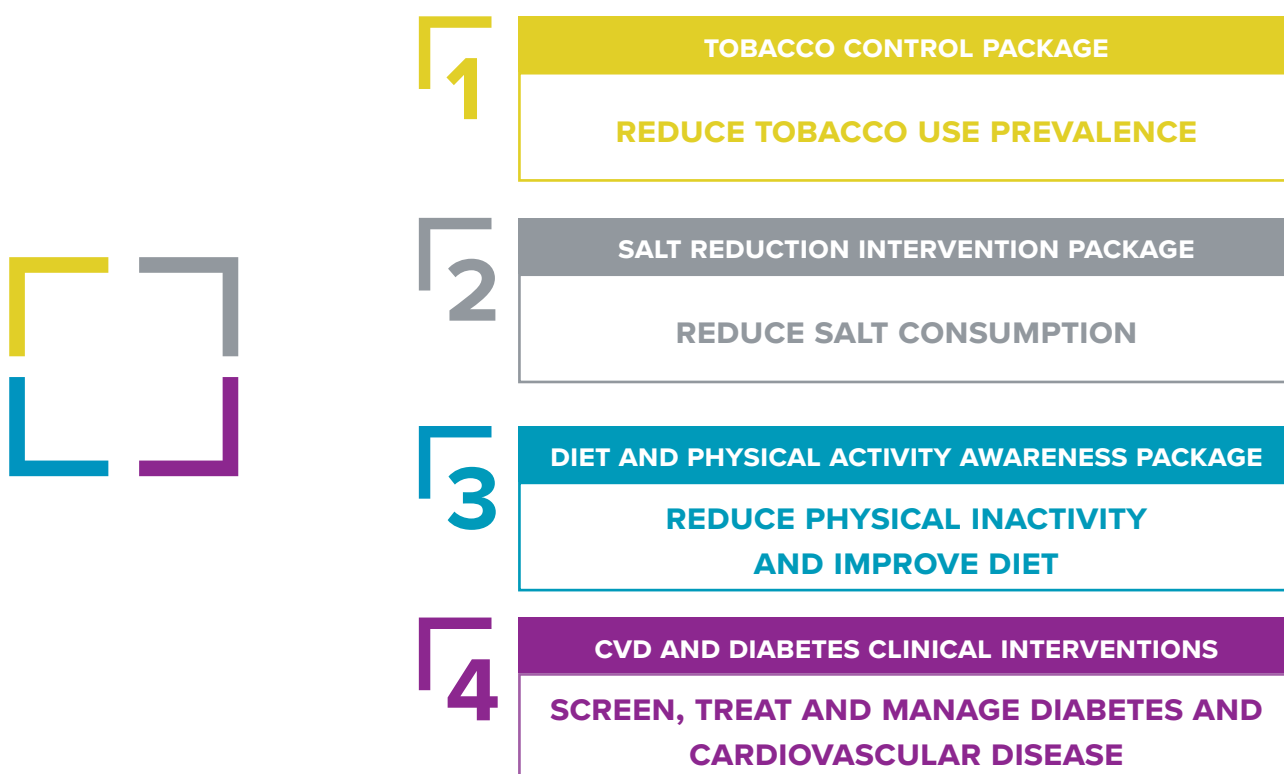


The investment case models the health and economic costs of NCDs as well as the potential gains from scaled-up action, over five and 15 years. It compares two scenarios:

1. the **STATUS QUO**, in which no new policies are implemented, and current coverage levels remain in place, and
2. the **INVESTMENT SCENARIO**, where cost-effective policies and clinical interventions are scaled up over the next 15 years.

The investment case estimates the economic and health benefits from implementing the four recommended policy packages over five and 15 years. The analysis uses the WHO OneHealth Tool, an epidemiology-based population model developed by United Nations partners.

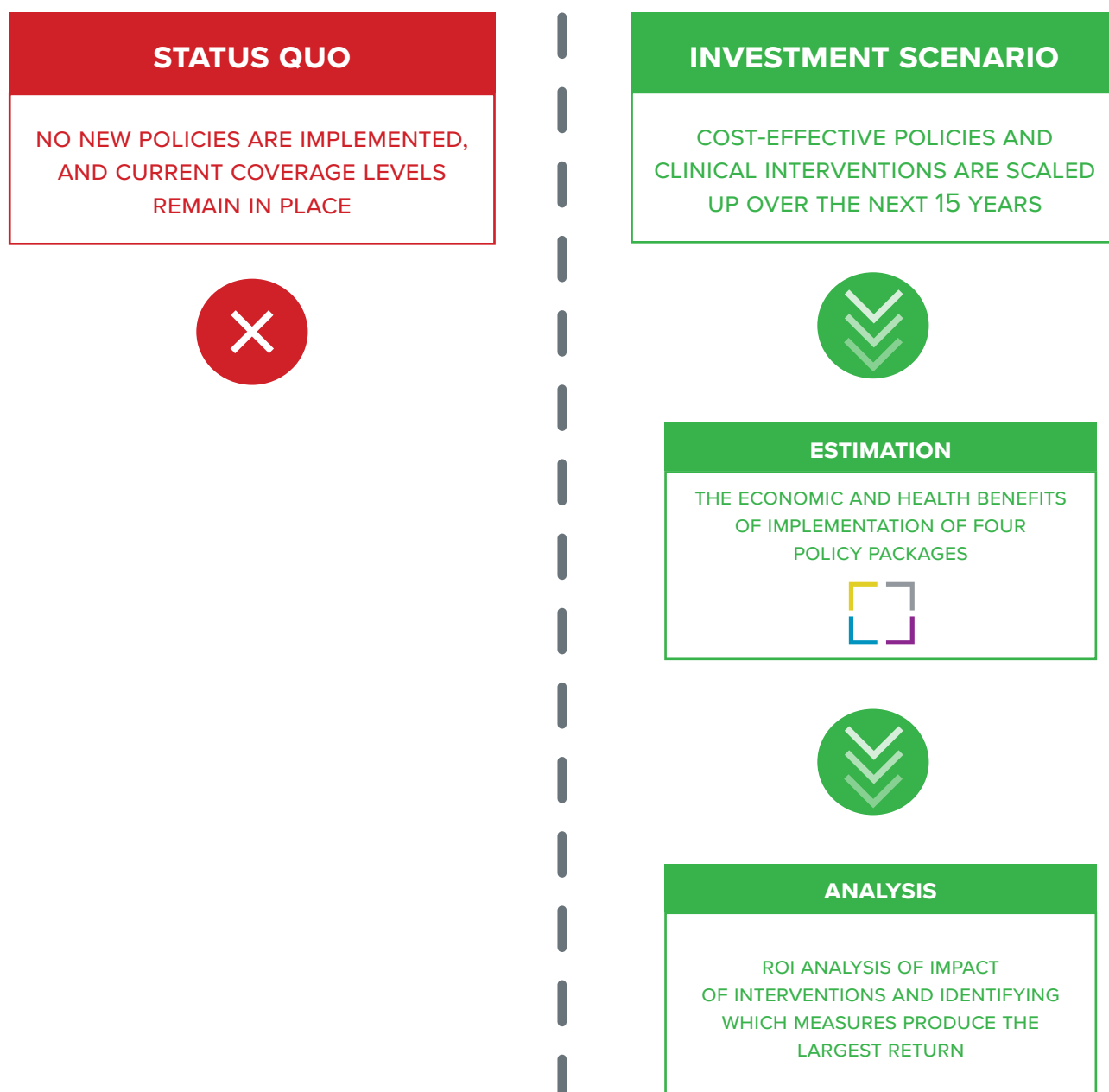
The investment case identifies which measures can produce the largest health and economic returns for Bahrain. It analyses the following four packages of interventions and policies:



The **Situation Analysis** outlines the health system and institutional arrangements in Bahrain and details the current implementation level of evidence-based policies and clinical interventions. The **Methods** section describes the development of the model, how it estimates NCD burden and how it predicts the economic and health benefits of policy implementation. The **Results** section describes the outcomes of the model, while the **Conclusion** section further discusses the findings and the **Recommendations** section offers suggestions specific to the context of Bahrain. The report also includes **five annexes** to provide further guidance on effective NCD prevention and control measures to support Bahrain sustaining improvements in population health.

The investment case model

The investment case models the health and economic costs of NCDs as well as the potential gains from scaled-up action, over five and 15 years. It compares two scenarios:





We need to be clear – the Ministry of Health can help lead but cannot be alone in this effort to reduce the burden of NCDs. This has never been more clear than now during the global COVID-19 pandemic where we've needed to join hands as a government, as a society, working together to stem the pandemic.

Minister of Health, H.E. Faeqa bint Saeed Al Saleh



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NCDS AND RISK FACTORS IN BAHRAIN

This section provides an overview of the most prevalent behavioural risk factors for NCDs in Bahrain: tobacco use, high salt intake, poor diet and physical inactivity. It also discusses the prevalence of metabolic risk factors, including raised blood pressure, high cholesterol, obesity and diabetes; and reviews environmental risk factors as well.

NCDS AND RISK FACTORS IN BAHRAIN

NCDs such as cardiovascular diseases, diabetes, chronic respiratory diseases and cancer have risen dramatically in Bahrain over the past several decades. They now account for an estimated 75% of all deaths in the country. The leading cause of NCD deaths in Bahrain is cardiovascular disease, which accounts for 49% of all deaths in the country, followed by cancer and diabetes, which account for 18% and 3% of deaths respectively. Around 400 people die of cancer each year in Bahrain – the most prevalent being lung, breast and colorectal cancers. [12]

Bahrainis are exposed to multiple behavioural risk factors for NCDs, particularly unhealthy diet, physical inactivity, and tobacco use. This results in high rates of hypertension, diabetes, CVD, and obesity.⁴ In Bahrain, 33.6% of adults have high blood pressure and 15% are diabetic (compared to worldwide diabetes prevalence of 8.5%). The majority of the population in Bahrain is either overweight or obese (76%). [13]

Tobacco use

According to the most recent WHO STEPwise approach to surveillance (STEPS) survey conducted in Bahrain in 2018, 17.8% of adult Bahrainis (aged 18 and over) smoke tobacco daily, and 15%



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of the total adult population, including non-Bahrainis, are daily smokers. This data suggests a slight decrease in tobacco usage over time, as the previous STEPS survey in 2007 found that 19.9% of adults smoked tobacco. [14] Usage is much higher among males (23.5%) than females (3.3%). Shisha smoking is also prevalent in Bahrain with 28% of Bahraini tobacco users using shisha and more females smoking shisha (54.4%) than males (25.1%).

According to results from the Global Youth Tobacco Survey (GYTS) in 2015, 17.7% of 13- to 15-year-olds used tobacco products (25% of boys and 10.1% of girls). Nearly half of Bahraini youth are exposed to secondhand smoke in enclosed public space (46.6%), and 25% said they were exposed to secondhand smoke at home. Students acknowledged the risks of smoking, with 60.7% aware that secondhand smoke is harmful and 75.5% in favour of banning

⁴ Although diabetes is a non-communicable disease itself, it is also a risk factor for other NCDs, such as cardiovascular disease and cancer.

smoking in enclosed public spaces. [15] Findings from the Joint Mission of the United Nations Inter-Agency Task Force on the Prevention and Control of NCDs in Bahrain in 2017 also found that there is “a worrying increase in tobacco and shisha smoking amongst youth”.

According to a 2019 economic impact assessment of smoking and secondhand smoke in Bahrain, tobacco consumption leads to substantial economic losses in Bahrain. Total direct and indirect economic losses due to smoking and secondhand smoke combined were estimated to cost USD 951 million PPP,⁵ or about 1.4% of GDP annually, which is the second highest burden among Gulf Cooperation Council (GCC) countries. [16]

Physical inactivity

Physical activity is defined as any bodily movement that requires energy expenditure. Physical inactivity (lack of physical activity) has been identified as the fourth leading risk factor for global mortality (6% of deaths globally). Moreover, physical inactivity is estimated to be the main cause for approximately 21–25% of breast and colon cancers, 27% of diabetes and approximately 30% of ischaemic heart disease burden. [17]

The 2018 STEPS survey in Bahrain found that 50.9% of the Bahraini population and 51.9% of the non-Bahraini population reported insufficient physical activity (insufficient being less than 150 minutes of exercise per week). [18] Bahraini women were less likely to engage in physical activity compared to men, with 37% and 59.6% reporting sufficient exercise, respectively. The same trend was found in the non-Bahraini population in Bahrain with 40.1% of women reporting sufficient exercise compared to 52.3% of men. [19]

Dietary risk factors

Dietary risk factors include but are not limited to high consumption of salt and sugar, consumption of trans fats, and low consumption of fruits and vegetables. WHO recommends reducing sugar intake to no more than 10% of total energy intake for both adults and children and suggests a further reduction to 5%.⁶ [20] Based on the FAO



Photo credit: © World Bank via Flickr

⁵ Purchasing power parity

⁶ On a 2,000-calorie daily diet, 10% would be 50g of sugar per day and 5% would be 25g of sugar per day (1 gram of sugar has 4 calories).

Nutrition Country Profile for Bahrain, sugars contributed more than 20% of energy intake in the Bahraini diet in 2002. [21] In Bahrain in 2016, each person on average consumed more sugar-sweetened beverages than the average amounts consumed both in Asia and globally. [22] Furthermore, research on the diets of children in Bahrain shows that sugar consumption is higher than the daily recommended value in the UK and consumption increases with age. [23]

Excess salt consumption also poses a severe health risk as it contributes to high blood pressure and increases risk for heart disease and stroke. For these reasons WHO recommends no more than 5g of salt per day. WHO Member States set a goal to reduce the global population's salt intake by 30% by 2025. [24] In 2010, each adult (20+) in Bahrain consumed 14g per day of salt on average (14g for men and 13g for women), nearly three times the WHO recommendation. [25]

Trans fats are detrimental to health and should not be consumed or produced in any manner. Consumption of trans fats is estimated to lead to 500,000 annual deaths globally from cardiovascular disease. In 2018, WHO released a plan to eliminate trans fats from the food supply. [26] As part of the GCC Standardization Organization, Bahrain adheres to a regulation on trans fats where only minimal quantities are permitted in the food supply and they must be declared on the label. [27] The Ministry of Health in Bahrain is also implementing a voluntary programme to eliminate trans fats, in which popular bakeries in Bahrain have volunteered to participate. This programme aims to lead to lasting legislation in Bahrain that will remove trans fats from the food system. [28]

WHO recommends five servings of fruits and vegetables per day (at least 400 grams). [29] Fruits and vegetables are part of a healthy diet for many reasons, one being they are a good source of fibre, an essential nutrient that helps improve cholesterol levels to reduce the risk of NCDs. Data from the 2018 STEPS survey showed that 85% of respondents reported having insufficient (fewer than five servings) daily intake of fruits and vegetables. Older age groups consume more fruits and vegetables than younger ones, with 12% of 18- to 30-year-olds reporting sufficient intake compared to 29% of 70- to 80-year-olds. [30]

Metabolic risk factors

High levels of metabolic risk factors – such as raised blood pressure, raised body mass index (BMI) related to overweight and obesity, and raised blood lipid levels – significantly increase the risk of having a cardiovascular event.

The 2018 STEPS survey found that 72.4% of the total population in Bahrain is either overweight (35.5%) or obese (36.9%). There is a higher prevalence of overweight and obesity in the Bahraini population (76%) than the non-Bahraini population (65.5%). There is a higher prevalence of overweight males (38.7%) than females (30.9%), but obesity is more common among females (42.5%) than males (33%) in the total population. [31] Obesity and overweight have increased in Bahrain since the previous STEPS survey in 2007, which found that 69%

of the population was overweight or obese. [32] WHO data in 2016 indicates that 35.3% of children and adolescents (age five to 19) were overweight, and 17.2 % of adolescents were obese. [33]

According to the 2018 STEPS survey, 33.6% of the total population had hypertension (high blood pressure), with higher rates among Bahraini nationals (40.5%) than among non-Bahrainis (27.5%) and among males (38.7%) than females (26%). High cholesterol levels were found in 31% of the total population (33.5% of males and 27.8% of females). [34]

Data from the 2018 STEPS survey in Bahrain indicate that 15% of all adults (aged 18+) in Bahrain had diabetes, with similar rates among males (17.1%) and females (10.7%). This is higher than the global prevalence rate of diabetes at 8.5%. [35] Bahraini nationals were more than twice as likely to have diabetes than non-Bahrainis (15.4% vs 6.9%). [36] The UNIATF joint mission found that diabetes causes 3% of NCD-related deaths in Bahrain. [37] Bahrain is also among the top five countries with the highest age-adjusted diabetes prevalence⁷ in 16 countries of the Middle East and North Africa (MENA) region. Diabetes prevalence in the MENA region is projected to more than double by 2045. [39] Overweight and obesity are the strongest risk factors for type 2 diabetes, putting the 72.4% of the population in Bahrain that is overweight or obese at higher risk.

Environmental risk factors

Climate conditions: Bahrain is a challenging setting for outdoor physical activity and workplace environments due to high summer temperatures for six to seven months of the year, reaching 50 degrees Celsius. In 2019, Bahrain recorded the hottest temperatures for June since 1902 with temperatures on 20 days exceeding 40 degrees Celsius. [40] Exposure to high temperatures, especially for long periods of time, causes physiological stress and may amplify pre-existing conditions and even cause premature death or disability. [41]

Ramadan during the summer months poses the need for further health considerations, considering individuals are fasting throughout the day.



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⁷ The age-adjusted diabetes prevalence in Bahrain is 16.3%. The other four countries are Saudi Arabia (17.7%), UAE (17.2%), Egypt (16.8%) and Qatar (16.3%).

Working in high temperature environments, such as industrial environments, increases risk for heat stress and illness. [42] Physical activity is also a challenge and potential health risk in the hot weather during Ramadan. There is risk of sudden death while engaging in sport, especially for those with underlying heart conditions. [43] The Hamad Medical Corporation recommends exercising in an air-conditioned environment and at a convenient time, ideally not during daytime when it's the hottest temperature, which may not be feasible for all. [44]

Air pollution: Air pollution is a mixture of pollutants of which the fine fraction of particulate matter [PM2.5] is the prime concern for health. Increased exposure to air pollution is related to an increased risk for certain NCDs, such as ischaemic heart disease, stroke, chronic obstructive pulmonary disease, and cancers. [45] Currently, Bahrain is fluctuating around the unhealthy range of air quality based on the high level of particles in the air. [46] Data from the WHO Platform on Air Quality and Health states that PM2.5 exposure is more than six times the limit WHO recommends as safe in the capital, Manama. It also suggests that exposure to air pollution kills more than 200 people each year in Bahrain. [47] PM2.5 exposure is strongly associated with mortality and morbidity including impaired lung function in children. It may also affect birth outcomes. [48]

With a combination of renewable energy technologies and urban designs suitable for Bahrain's environment, PM2.5 concentration can be reduced and a healthier environment for citizens achieved. [49] Bahrain's National Renewable Energy Action Plan will reduce greenhouse gas emissions and promote a healthier environment. The GCC high-speed rail link project [50] can reduce vehicle use and emissions. Commuting to the train can promote physical activity including through urban designs, such as indoor walkways considering temperatures in Bahrain.

Availability and affordability of nutritious foods: Bahrain's food security is dependent on imports and citizens' diets have changed rapidly over the past several years, coinciding with Bahrain's economic development. In the Eastern Mediterranean region, food consumption patterns have shifted towards more processed foods and animal products, and fewer fruits and vegetables. This coincides with a decrease in fibre intake and an increased intake in sugar, sodium, and unhealthy fats (saturated fats and trans fats). [51]

The Ministerial Committee for Development and Infrastructure Projects of Bahrain emphasized the importance of food security while acknowledging the need to increase advancements in the agriculture sector and raise local production of foods, especially local vegetables. [52] In recent decades Bahrain has seen a growth in vegetable production, as evidenced by the increase in vegetable production in the early 2000s when it more than doubled from 2005 at 7,558 tonnes to 17,229 tonnes in 2008. [53]

Bahrain is working to develop food diversification, support the sustainable development of the aquaculture sector and eradicate animal diseases. [54] However, the desert climate, competition of cheap imports, and the amount of government resources and private investments pose certain challenges. [55] The National Initiative for Agriculture Development in Bahrain has ongoing projects to encourage workers in the agriculture field; increase trees, greenhouses, and parks; and spread awareness of agricultural culture to increase education and skills development. [56]

Other innovative approaches such as encouraging local food markets align with Bahrain's food system goals. Recategorizing value-added tax (VAT) exemptions so only healthy options such as fruit and vegetables are exempt may promote healthier food choices.

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SITUATION ANALYSIS

This section reviews Bahrain's institutional and governmental arrangements to combat NCDs and summarizes national efforts to implement WHO-recommended best-buy and cost-effective interventions to reduce the burden of NCDs.

SITUATION ANALYSIS – HEALTH SYSTEM AND REFORMS

Bahrain has a universal healthcare system and is implementing health system reforms, with ongoing efforts to ensure NCD prevention and control are included under universal health coverage and in local action plans and programmes. As part of the National Health Plan (2016–2025), Bahrain is implementing a National Health Insurance Programme, with key objectives including to improve the quality of healthcare and to give citizens and residents the freedom to choose their health provider. These reforms are headed under the Supreme Council for Health and aim to increase quality as well as efficiency.

In addition, Bahrain is rolling out a new healthcare IT system in 2020, which will track all claims by doctors and payments made under the health insurance system, including a drug utilization review system which digitally tracks medicines from origin to the patient. The system enables clinicians in any facility to access and update patient medical records, and is expected to positively impact on referrals, patient recall and continuity of care. It also allows for monitoring costs and the quality of services centrally.

There is a well-established NCD infrastructure in the Ministry of Health with strong commitment to NCD prevention and control. NCD management is well integrated at the primary healthcare level in line with WHO recommendations. The government is expanding its range of preventive health programmes, focusing on behaviour change to reduce population risk of NCDs, including scaling up awareness campaigns and health promotion.

The general public health law, passed in June 2018, provides regulations for health-harming products like tobacco and unhealthy food and beverage products, better control of food in schools, pharmaceuticals and the work of the private sector in healthcare.

Bahrain is improving its screening and referral system. With the Choose your Doctor Project patients coming to local health centres for treatment receive preventative services, including screening for CVD and cancer, and are referred for early management. The King Hamad Cancer Center, Bahrain, is focusing increasingly on early detection and has introduced special performance indicators that are measured yearly to assess progress in the detection rate especially for breast, colon and prostate cancer. Bahrain is also updating breast screening guidelines for its primary health care (PHC) programme to be in line with WHO recommendations, and has released updated guidelines for mental health. Psychiatrists are providing training to family physicians for screening, and mental health clinics have seen an increase in adolescent and adult service utilization.

NCD GOVERNANCE

Multisectoral coordination

Bahrain has instituted a multisectoral national coordination mechanism (NCM) on NCDs with 12 sectors represented, led by the Ministry of Health and convening every three months. Two main committees have been approved, one on NCD legislation and policies, and a second on NCD awareness and media coverage. The committee is implementing Bahrain's multisectoral and costed national strategy, meets on a regular basis and is following an annual workplan with clear terms of reference of participant sectors. Bahrain is thus following best practice guidelines in NCD governance. However, some sectors are very involved in NCD-related policy while others could be further sensitized to their potential roles and be more engaged.

Bahrain is a member of the Gulf Health Council which has a specific committee established to address non-communicable diseases, including two sub-committees — one for diabetes and one for cancer. Bahrain established a national coordination mechanism for tobacco control, the National Anti-Smoking Committee (NASC). Sectors represented on the NASC include education, youth and sport, information, commerce, industry, environment, civil society and local governments. The NASC adopted a national tobacco control strategy in 2018 which includes raising awareness, increasing taxes, and implementing plain packaging as priorities under the action plan.

Strategy and planning

The government has demonstrated sustained leadership in developing and implementing national NCD strategies, plans and programmes. The National Strategy for Control and Prevention of Non-communicable Diseases in Kingdom of Bahrain 2014–2025 has an overall long-term goal to achieve a “25% relative reduction in risk of premature mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases among adults (age 30–70 years) during the next 15 years”, and aims to reduce the premature mortality rate from 65% in 2010 to 48.8% in 2025. The strategy aims to achieve these goals, in part, through important targets including, by 2025, to halt the rise in obesity and diabetes; reduce the mean intake of salt among the population by 30%; reduce intake of fat, as indicated by saturated fat intake; increase consumption of vegetable servings per capita; and reduce the relative prevalence of insufficient physical activity by 10%. [58] Furthermore, Bahrain has a National NCD Action Plan 2019–2030, aligned with the SDGs and the WHO Global Action Plan. It has six main objectives including one on “reducing modifiable risk factors and underlying social determinants”. NCD target indicators are adapted from SDG 3 indicators, and the NCD investment case is a related activity. [57] The Kingdom of Bahrain and United Nations Strategic Partnership Framework 2018–2022 includes the “enhanced prevention and treatment of NCDs” as one of the partnership results. [59]

Bahrain's Government Action Plan 2019–2022 [60] is the country's path to achieving its Economic Vision 2030 of a globally competitive economy enjoyed by Bahrainis who with good living standards, increased productivity and high-wage jobs. The Economic Vision 2030 document mentions promoting and encouraging a healthy lifestyle as a path to improving the health system. [61]

Box 2. Update from UNIATF mission (see Annex 5)

From 15–17 May 2015 the UN Inter-Agency Task Force on NCDs completed a Joint Programming Mission in Bahrain. Representatives from UNDP, UN Environment and WHO led the mission. After assessment of NCD prevalence, risk factors, prevention and control measures, and goals, UNIATF gave recommendations of actions to the Kingdom of Bahrain. These recommendations are outlined in **Annex 5**, along with the status of each. In summary, Bahrain is making considerable improvements scaling up national NCD control. For example, the roles of each sector are now provided within the NCD Committee for better multisectoral NCD coordination and national health policies, strategies and plans are almost fully aligned with the National Economic Vision 2030. The Kingdom of Bahrain continuously revisits NCD goals and strategies, updating them to ensure adherence with public health recommendations that will lead to a healthy future for the people of Bahrain.

Local government

Despite the small size of Bahrain, governorates play a significant role in materializing the NCD response at local level. Bahrain is pursuing the WHO Healthy City certification for cities in all governorates. The Manama Healthy City project was launched in 2017. Through this project along with coordination with the Ministry of Health and the Capital Governorate, Um Al Hassam city, a neighbourhood within the capital Manama, received certification as a “Healthy City” in November 2018. [62]

The country has also expanded its healthy malls initiative to a total of 35 participating malls, and municipalities are thinking about how urban design can be optimized for healthy lifestyles (see **Box 3**).

Box 3. Better urban design for healthy lifestyles

Purposeful urban planning can incentivize people to form healthier habits. For instance, by strengthening access to urban/community gardens and fresh food markets governments can make it easier for citizens to enjoy balanced and nourishing diets, including fruits and vegetables and less salt and sugar. [63] The WHO European Healthy Cities “Active City” Framework aims to increase physical activity through mobility systems and built environments that encourage walking and cycling for practical purposes (e.g. work, school and leisure). [64] Bahrain has taken an important step towards a health-enabling urban landscape with the creation of Khalifa Town in the Southern Governorate.

As highlighted by Housing Minister Eng. Bassim bin Yaqoob Al Hamar, Khalifa Town boasts “beaches, public gardens, and advanced networks of bridges” which are highly conducive to physical activity. [65] Bahrain has taken other “built environment measures” such as the national network of public recreation areas (e.g. Al Hunainiya Public Park, Arad Bay Protected Area & Park, Arad Fort Walkway, Budaiya Walkway & Park, Khalifa Grand Park Riffa, Dohat Arad Park, Muharraq Corniche) and the creation of outdoors walking/exercising facilities in neighbourhoods (e.g., A’Ali, Safra, Madinat-Hamad). Such dedicated outdoor walking facilities in new residential areas can be developed in older neighbourhoods as well. [66]

Health financing

Bahrain spends about 5% of GDP per year on healthcare, or BD 500 (USD 1,300) per year for each citizen. Bahrain is establishing a national insurance fund, to be partially funded by patient co-payments and user fees. The government is currently defining basic mandatory and optional packages for the health insurance programme. Bahraini citizens will pay a fee for the optional packages and be covered free of charge under the basic package. Non-citizens will continue to be covered under their employer health insurance. The government is currently collecting costing data from private hospitals to inform the coverage package and pricing under the new insurance system.

Healthcare financing reforms are being driven through government directives emphasizing balanced economic growth, diversifying resources for project financing, and raising the efficiency and effectiveness of the government sector including in the healthcare sector. Actions to achieve these goals are laid out in the Government Action Plan 2019–2022.

Bahrain will implement zero-based budgeting for the next biennium and plans to link trends in the economy and all initiatives to the budget, including health initiatives.

IMPLEMENTATION STATUS OF MEASURES MODELLED UNDER THE INVESTMENT CASE

Tables 1 and 3 outline current implementation levels of interventions modelled under the investment case. These include WHO-recommended best buys, or highly cost-effective measures, as well as some cost-effective measures. The tables draw attention to areas that need to be strengthened and scaled up to achieve 100% coverage.

Table 1. Implementation status of population-based policies and interventions

TOBACCO	
Intervention	<i>Monitor tobacco use/prevention policies</i>
Current state of implementation	Bahrain conducts representative and periodic surveys for both youth and adults. Recent tobacco use prevalence data among adults is available through the latest 2018 STEPS survey. Bahrain plans to conduct a Global Youth Tobacco Survey (GYTS) in 2020 and GCC will do a regional Global Adult Tobacco Survey (GATS). Recent data on youth smoking rates is available from a 2016 School-Based Student Health Survey.
Intervention	<i>Protect people from tobacco smoke</i>
Current state of implementation	Although the tobacco law on controlling smoking and all forms of tobacco set in 2009 bans smoking in virtually all closed public spaces, designated smoking areas are permitted under the law. [67] These are reportedly difficult to enact because of weather conditions. Noncompliance to the ban is punishable by fines to the smoker and the establishment.
Intervention	<i>Offer to help quit tobacco use: Brief intervention</i>
Current state of implementation	Some nicotine replacement therapy (NRT) products can be purchased without medical prescription and are refundable. Bupropion and varenicline can be purchased without medical prescription, though they are not covered under national health insurance. Cessation support is available in three clinics — Al Hoora, Hamad Kanoo and the Bank of Bahrain and Kuwait. NRT in these clinics is covered by the National Health Insurance plan.

TOBACCO

Intervention *Offer to help quit tobacco use: mCessation*

Current state of implementation

There is no national toll-free Quitline or similar service offered through messaging platforms/SMS accessible for free.

Intervention *Warn about danger: Warning labels*

Current state of implementation

Health warnings are legally mandated and must cover 50% of both the front and rear of packaging. [68] The law does not specify that the warnings should be placed at the top of the principal display areas. While the use of misleading terms that tone down the harmful effects of tobacco, such as “low tar” or “ultra-light”, is prohibited, packaging is still permitted to contain figurative signs that act as substitutes to these terms, as well as descriptors for flavours.

Intervention *Warn about danger: Mass media campaign*

Current state of implementation

A national mass media campaign was aired on television and radio between 1 July 2016 and 30 June 2018, although prior to the campaign there was no research conducted on who the campaign should be targeted towards to be the most effective. There was no impact assessment conducted at the end of the campaign either. [67]

Intervention *Enforce bans on tobacco advertising*

Current state of implementation

Bahrain bans most forms of tobacco advertising, promotion and sponsorship, except for advertising at point of sales and internet sales of tobacco products. Compliance is reportedly high. [69]

TOBACCO

Intervention *Enforce youth access restriction*

Current state of implementation

The UNIATF on NCDs Joint Mission in 2017 noted that components of the tobacco legislation are not fully enforced, including sales of tobacco to children and adolescents. It is not clear whether enforcement issues have been corrected since 2017. The legal age of purchasing tobacco products in Bahrain is currently 18, which could be raised to 21.

Intervention *Raise taxes on tobacco*

Current state of implementation

Bahrain taxes cigarettes at 64.5% of retail price, below the WHO recommended 75%. [69] There is an import duty of 100% of cost, insurance and freight on cigarettes [70] or USD 54 per 1,000 cigarettes, whichever is higher. In accordance with a 2016 Gulf Cooperation Council agreement, Bahrain implemented an excise tax on tobacco at a rate of 100% in December 2017. In January 2019, Bahrain introduced a 5% VAT applicable to tobacco products. [71] All tobacco products are included in the excise tax except for devices such as water pipes. There are no tax stamps or other such markings applied to the packaging of taxed products.

Intervention *Plain packaging of tobacco products*

Current state of implementation

Bahrain is considering implementation of plain packaging. The Kingdom of Saudi Arabia (KSA) has adopted plain packaging legislation.

PHYSICAL INACTIVITY

Intervention *Awareness campaigns to encourage increased physical activity*

Current state of implementation

The Ministry of Youth and Sports is running campaigns to educate youth on healthy behaviours through their broader engagement in sports, e.g. marathons and organising national sports days to increase physical activity among both youth and adults. Ministry of Health (MOH) social media accounts promote healthy lifestyle and physical activity. Bahrain has had national health promotion campaigns, and the WHO Non-communicable Diseases Progress Monitor 2020 found Bahrain had partially achieved the indicator on public education and awareness campaigns on physical activity. [72]

Intervention *Brief advice as part of routine care*

Current state of implementation

There are individual programmes aimed at providing advice, including nutrition clinics, located in local health centres which motivate people to change behaviours to reduce risk of becoming overweight or obese. Since 2005, the Ministries of Health and Education have led a health-promoting schools programme, which incorporates teaching about the importance of being physically active. The Bahrain National School Health Programme prioritizes the importance of physical activity and includes a daily physical education component. [73]

DIET

Intervention *Surveillance*

Current state of implementation

MOH is establishing a monitoring system to take samples from bakeries and analyse them for salt and fat content, as well as appropriate nutrition labelling. Products that meet certain criteria for trans fats are to be labelled as “no trans fat”. The monitoring system will expand to include a survey of the 200 most consumed items to assess the nutritional profile of what people are eating in Bahrain and to be imported into a database. This initiative is still in the pilot phase and can be expanded based on effectiveness.

Intervention *Adopt standards: Front-of-pack labelling*

Current state of implementation

Bahrain is adopting front of pack labelling as part of its pilot surveillance project listed above. It is yet to be implemented.

DIET

Intervention *Harness industry for reformulation***Current state of implementation**

As bread is the leading staple food source in the Eastern Mediterranean Region, [74] the Ministry of Health led a voluntary programme to reduce salt content in bread by 10%, and is currently aiming to decrease salt content further by 30%. [75] Six large main bakeries in the country take part in this initiative and the MOH has assisted by providing workshops to bakeries, restaurants and food suppliers.

Intervention *Adopt standards: Strategies to combat misleading marketing***Current state of implementation**

There are no strategies in place to combat misleading marketing. There are currently no regulations in place to limit food and drink advertising in Bahrain.

Intervention *Knowledge: Education and communication***Current state of implementation**

There are no integrated education and communication strategies to raise awareness about the health risks and dietary sources of salt and ultimately change behaviour. A number of sectors and ministries have promoted initiatives to educate and raise awareness on the benefits of healthy eating. This includes the Ministry of Education programme on healthy schools and the media campaign with health messages undertaken by the Ministry of Information in collaboration with the Ministry of Health.

In addition, the updated **Appendix 3** to WHO's Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2020 contains two effective interventions (with cost-effectiveness ratios >100 international dollars per DALY averted in low- and middle-income countries) on trans fats and sugar, respectively. Though these are not modelled under the investment case, **Table 2** shows the current state of implementation for trans fats and sugar-related policies.

Table 2. Current state of policies for trans fats and sugar in Bahrain

TRANS-FAT	
Intervention	<i>Eliminate industrial trans fats by developing legislation to ban their use in the food chain</i>
Current state of implementation	The Ministries of Industry, Commerce and Tourism laid out technical regulations on trans fats in 2016. It determined the maximum level of trans fats in foods and labelling criteria. In 2015 the GCC Standardization Organization also released a regulation on trans fats. [76] No more than 2% of total fat is permitted in oils and margarine spreads and no more than 5% in other foods, including those sold to restaurants. Trans fats are also required to be declared on the nutrition label and the quantity must be identified.
SUGAR	
Intervention	<i>Reduce sugar consumption through effective taxation on sugar-sweetened beverages</i>
Current state of implementation	The government has imposed a 50% tax increase on carbonated high-calorie drinks applicable to sodas and other Sugar-sweetened beverages (SSBs) and a 100% tax increase on energy drinks. The GCC is considering how to modify the design of the tax on SSBs to be more effective (e.g. UK tax on sugar content).

The WHO's Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2020 lists multiple clinical interventions for cardiovascular diseases and diabetes.

Table 3 lists a selection of those most relevant to this analysis and these are included in the modelling.

Table 3. Implementation status of clinical interventions for cardiovascular disease and diabetes

SCREENING	
Intervention	<i>Screening for risk of cardiovascular disease and diabetes</i>
Current state of implementation	More than 50% of primary healthcare centres report offering CVD risk stratification. [77] A hypertension early detection programme is in place to identify those with undiagnosed hypertension, by referral at their local health centre. Health practitioners test blood pressure among patients at high risk for hypertension (e.g. due to tobacco use, obesity or physical inactivity) and provide anti-hypertensive treatment and behavioural advice to those diagnosed positively. For public sector employees, the MOH has conducted the Protect Your Heart Campaign since 2010 which targets healthy employees. The aim is to detect risk factors early, encourage employees to use healthy behaviours in the workplace, and, if necessary, refer those with multiple risk factors to PHC for consultation and management. Referred patients are not followed up so the programme has not been able to measure impact. Private companies with more than 50 employees are required to have a nurse and doctor to perform regular screening for their employees, or agree with MOH for screening at public health facilities.
CARDIOVASCULAR DISEASE	
Intervention	<i>Diabetic retinopathy screening and foot care to avoid complications</i>
Current state of implementation	In Bahrain, there are specialized clinics in all health centres including central diabetes clinics covered by a diabetes specialist and a specialized nurse. The clinic provides preventive medical services, such as vaccinations, retina screening and foot screening. [77] Management guidelines for patients with diabetes in primary care is developed and updated every four years.

CARDIOVASCULAR DISEASE

Intervention *Provision of drug therapy and counselling to individuals who have had a heart attack or stroke and to people with high risk ($\geq 30\%$) of a fatal or non-fatal cardiovascular event in the next 10 years*

Current state of implementation

According to the WHO NCD Progress Monitor 2020, guidelines to manage the four main chronic diseases, including cardiovascular diseases, have been partially implemented at this point. [77] The Gulf Committee for Control of Cardiovascular Diseases released a plan for 2009–2019 which included an objective to improve the quality of health services to patients with cardiovascular diseases, as well as a goal to strengthen the means of monitoring and evaluation of cardiovascular diseases. [81]

A goal in the National Strategy for Control and Prevention of Non-communicable Diseases in Kingdom of Bahrain 2014–2025 included that “at least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes”. [79]

Intervention *Treatment of new cases of acute myocardial infarction with either acetylsalicylic acid (found in aspirin) and clopidogrel (blood thinners) or thrombolysis (therapy to dissolve blood clots) or primary percutaneous coronary interventions (also known as coronary angioplasty or stent)*

Treatment of acute ischaemic stroke with intravenous thrombolytic therapy (treatment to dissolve blood clots)

Current state of implementation

According to the WHO NCD Progress Monitor 2020, guidelines to manage the four main chronic diseases, including cardiovascular diseases, have been partially implemented at this point. [80]

Intervention *Glycaemic control*

Current state of implementation

Treatment and care for people with Type 2 Diabetes are primarily managed through 28 primary health centres distributed across the five regions of the country. The centres are geographically located so that there is a health centre within a 20-minute drive of all residents' homes. [82] The 2014–2025 National Strategy for Control and Prevention of NCDs in Bahrain aims for at least 50% of eligible people to receive drug therapy, including glycaemic control. [83]



METHODS

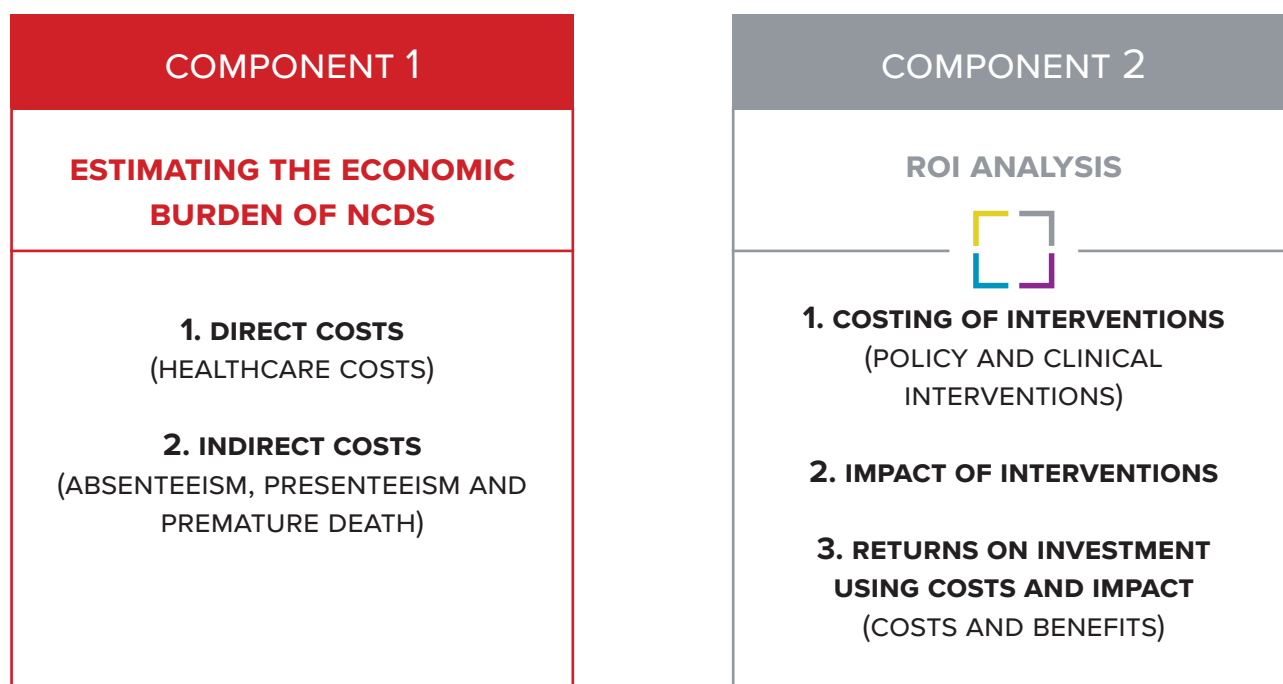
This section outlines the different methods and economic models applied at different stages of the economic analysis.

METHODS

A multiagency, multidisciplinary team comprising staff from WHO (headquarters, WHO Regional Office for the Eastern Mediterranean and WHO Desk Office for Bahrain), the United Nations Inter-Agency Task Force on the Prevention and Control of Non-communicable Diseases, the United Nations Development Programme (UNDP) and Gulf Health Council of the Cooperation Council for the Arab States of the Gulf undertook initial data collection and analysis in Bahrain from 4–7 November 2019 to complete a three-tier economic NCD investment case, complemented by an institutional and context analysis. The team consisted of health economists, epidemiologists and social development and public health experts. Intensive follow-up work (described below) was undertaken as part of the methods for collecting and analysing data.

The approach consisted of a desk review of materials, interviews with policymakers across sectors and institutions, and collation and analysis of data. Further data analysis took place over subsequent months. This NCD investment case is one of six to be carried out in Gulf Cooperation Council countries from 2019–2020. The work also benefited from a peer review and a methodological review by Research Triangle Institute International, as well as a quality assurance review by David Tordrup (Triangulate Health Ltd).

Economic analysis



1. Component 1: Estimating the economic burden of NCDs

The starting point for the investment case is an analysis to determine the current and projected economic burden of NCDs. This requires assessing both the direct and indirect costs of NCDs using a cost of illness approach. The cost of illness component reveals the extent to which NCDs are affecting Bahrain economic growth, by calculating the cost of illness as a share of gross domestic product (GDP) which was lost due to NCDs in 2019. Direct and indirect costs are calculated independently of each other, then added to calculate the total cost of NCDs to the Bahrain economy. WHO and UNDP developed the NCD economic burden model, which provides estimates of the current direct and indirect costs of NCDs.

a. Calculating the direct costs

Direct costs are those in the health system. These are represented by government and private health spending on medical staff salaries, equipment and procedures such as diagnosis and distribution of treatment for cardiovascular diseases, cancers, diabetes mellitus, and chronic respiratory diseases. The total health expenditure on each of these four NCDs was calculated by multiplying the estimated average medical cost per patient by the estimated number of patients using the health services. The average medical cost per patient for each of the four NCDs include the cost of consultations, diagnostics, and medications and it was estimated based on the local and international literature and adjusted to current prices using the Bahrain consumer price index. The number of patients using the health services was estimated based on the data from health information system I-Seha and Bahrain Health Statistics 2018 (Table 4).

Table 4. Data used for calculating the direct costs of NCDs in Bahrain in 2019

NCDs	Average cost per patient in 2019		Estimated number of patients using the health services in Bahrain in 2019	
	Cost BD	Data source	Number	Data source
Diabetes	1,236	(Rabha, 2019)	96,809	PHC 2018 MOH statistics
CVD	2,558	BDF* 2016 cost data	34,602	Bahrain Health Information System I-Seha
Cancer	1,713	BDF 2016 cost data	21,834	Bahrain Health Information System I-Seha
Chronic respiratory diseases	852	(Guarascio, 2013)	43,921	Bahrain Health Information System I-Seha

Sources: [84, 85, 86]

* Bahrain Defence Forces

b. Calculating the indirect costs

In our analysis, indirect costs are those associated with reduced workforce participation and the resulting reduction in national productivity, i.e. the costs of absenteeism, reduced capacity at work and the economic losses due to premature deaths caused by NCDs. These costs were computed with the human capital approach, where there is a monetary value on the loss of health or life of an individual based on the loss of economic productivity. [87] The indirect costs were computed as follows:

Missed working days and working at reduced capacity

In this section, we estimate the productivity losses due to absenteeism (missed working days) and presenteeism (working at reduced capacity) due to NCDs with the human capital approach. The fraction of the workforce in Bahrain with NCDs was estimated by applying the prevalence rates of the diseases to population figures and relevant economic indicators, such as unemployment rates and labour force participation rates. Then, the number of less productive days worked was determined by applying rates of productivity loss derived from the academic literature.

The lost economic output to the Bahrain economy as a consequence of absenteeism and presenteeism was estimated as below:

- ^ First, we estimated the number of people of working age (15–64 years) with NCDs based on data collected from National Health Information System (I-Seha), Bahrain Ministry of Health, King Hamad University Hospital, Bahrain Defence Force Hospital, and Bahrain STEPS survey 2018.
- ^ We then multiplied the size of the working-age population with NCDs by the rate of participation in the labour force and employment to determine the prevalence of NCDs in workers. Similarly, the number of deaths from NCDs was multiplied by the rate of participation in the labour force and employment to estimate the number of workers who died from NCDs. The number of deaths was subtracted from the number of workers with prevalent NCDs to estimate the number of workers who survived despite their illness.
- ^ The figures for productivity losses associated with specific diseases (**Table 5**) were multiplied by the number of surviving workers to estimate the total number of less productive days that resulted from NCDs.
- ^ In the final step, GDP per worker was multiplied by the total number of less productive working days.

Table 5. Rates of absenteeism and presenteeism due to common health complications associated with the four main NCDs

	Absenteeism rate* Reduction in working days (%)	Presenteeism rate Working at reduced capacity	Labour force participation rate reduction
Hypertension	0.6% (Mitchell RJ, 2011)	3.7% (Wang PS, 2003)	2% (Barnay, 2006)
Stroke	6.3% (Mitchell RJ, 2011)	3.7% (Wang PS, 2003)	18% (Barnay, 2006)
Acute MI	1.3% (Mitchell RJ, 2011)	3.7% (Wang PS, 2003)	11% (Barnay, 2006)
Diabetes	0.3% (Salman, 2019)	0.5% (Bommer C, 2017)	10% (Barnay, 2006)

*Based on the number of days worked per year in Bahrain (212 days)

Sources: [88, 89, 90, 91, 92]

Premature deaths

The loss of GDP due to premature death of workers from NCDs was estimated using the human capital approach. 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. In this method, all future potential income lost by a worker who dies during his or her working lifetime is calculated from the number of working years lost between the age at death and the age at which the deceased employee would have reached the average retirement age. Productivity losses due to premature deaths were calculated as the product of the total working years lost in all age groups multiplied by the labour force participation rate, age-specific employment rate and GDP per worker.

2. Component 2: Return on investment analysis

Step 1: Estimating the costs of policy and clinical interventions

The return on investment is a performance measure used to evaluate the efficiency of healthcare investment. It compares the magnitude and timing of benefits from health interventions 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 analyzed. The method used is the NCD return on investment model developed in 2015 for use by the UNDP/WHO Joint Programme on NCD Governance, using the OneHealth Tool and WHO Costing Tool. More detail on the use of these tools is available from the OneHealth Tool Manual [93, 94] and is discussed in detail in the UNDP/WHO guidance note for investment cases for preventing and controlling NCDs. [95]

Costs of policy and clinical interventions were calculated using the WHO Costing Tool for NCD prevention and control. [93] This identifies, quantifies and values each resource required for the intervention as follows:

- ^ For each policy intervention, the WHO Costing Tool costs human resources, training, external meetings, mass media campaigns (e.g. television and radio time, newspaper ads) and other miscellaneous equipment needed to enact policies and programmes.
- ^ Each policy intervention 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 costs of clinical interventions were calculated using the WHO Costing Tool, which has built-in functionality that works out expected costs of interventions.
- ^ For each clinical intervention, the WHO Costing Tool estimates the cost of primary care visits, ancillary care visits, lab and diagnostic tests, and drugs for the total number of NCD cases expected to be covered each year.
- ^ Current and target coverage of clinical interventions was estimated based on the WHO estimated value in the WHO database. In general, current coverage was estimated to be 5% and expected to reach 80% by 15 years. [149]
- ^ For each clinical intervention, the WHO Costing Tool considers input data points such as the salaries of medical staff and the quantities of drugs and supplies needed, as well as their prices.
- ^ Each clinical intervention contains assumptions, set by WHO experts, about the quantity of inputs required to provide it. The unit costs for resource items are taken from the WHO-CHOICE database and from available local data.
- ^ In the absence of local data, default data based on global estimates was used for the computations.

Step 2: Estimating the impact of interventions

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

- ^ The OneHealth Tool was used to assess the benefits of implementing and scaling up policy and clinical interventions by modelling the number of disease cases averted, healthy life-years gained, and lives saved over 15 years. Local data from the STEPS in Bahrain fed into the tool to determine the prevalence of risk factors disaggregated by age and gender.
- ^ 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 Bahrain 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.
- ^ Following Stenberg et al [96], we estimated the social benefit of improved health by applying a value of 0.5 times GDP per capita to each healthy life-year gained from the interventions to estimate the intrinsic value of longevity. We used the net present value approach to future social value, with 3% discounting.

Step 3: Calculating the returns on investment

The return on investment for Bahrain was reached by comparing the impact (avoided costs) 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.

Institutional context analysis

The economic analysis was complemented by an institutional context analysis conducted by the investment case team during a UN mission to Bahrain from 4–7 November 2019. The institutional context analysis was based on discussions with representatives of the following institutions:

- ^ Ministry of Health
- ^ National NCD Committee and Key Sector Representatives
- ^ Gulf Health Council (GHC)
- ^ Supreme Council of Health
- ^ Shura Council

During these meetings, members discussed how NCDs impact the Government Action Plan 2019–2022, the priorities of various sectors and stakeholders and how these could support a strengthened whole-of-government NCD response in the Kingdom of Bahrain including implementing investment case findings. The valuable insights gained from these discussions are incorporated throughout this report and informed its findings and conclusions.



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.

RESULTS

1. Economic burden assessment

a. Direct costs

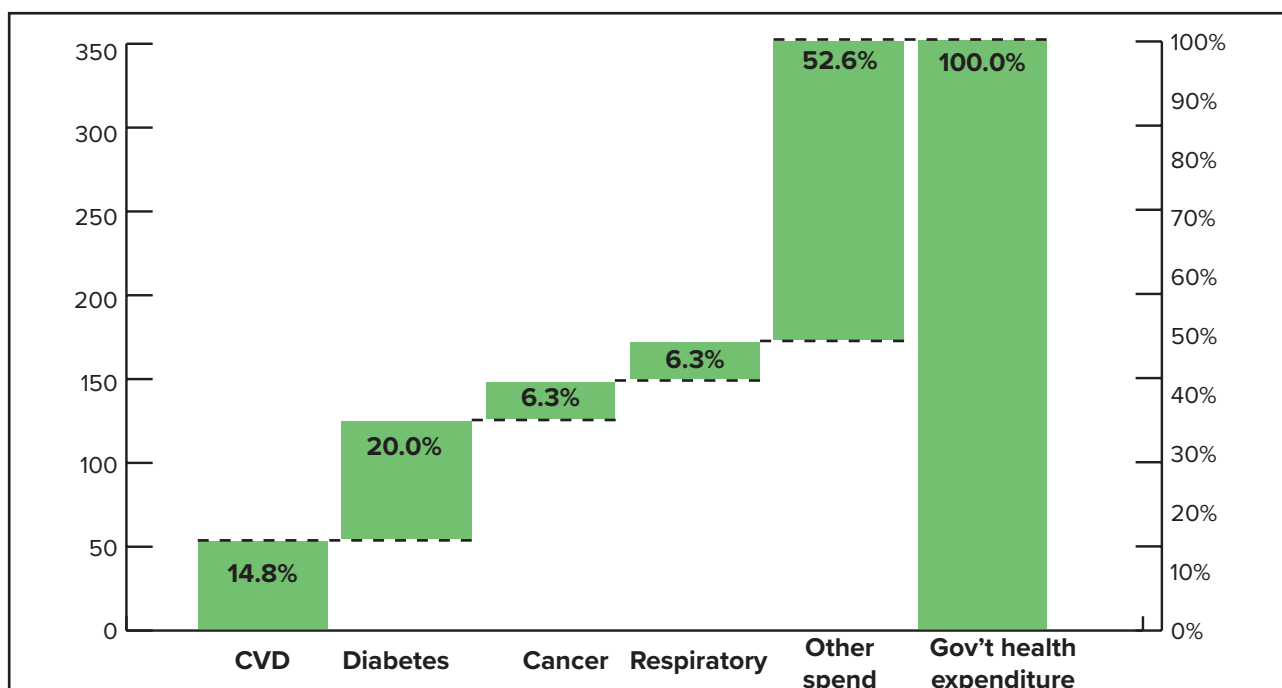
The estimate of the direct costs of the economic burden considered the total health expenditure which includes the government healthcare expenditure and the private healthcare expenditure (out-of-pocket, voluntary and other health insurance schemes), and excluded non-healthcare costs such as transport.

Total healthcare expenditure for Bahrain in 2017 was BD 597,277,900 (USD 1.57 billion). Government health expenditure was BD 342,154,242 (USD 0.9 billion) and accounted for 57.3% of the total healthcare expenditure.

National Health Account data in Bahrain are not available at the disease subgroup account level by NCD. Our estimates suggest that the government spent BD 162,135,210 (USD 426.5 million) on the four major NCD groups under study, so that more than 47.4% of all government health expenditure is attributable to the four disease groups. We estimated that private healthcare costs of the four major NCD is BD 120,894,388 (USD 318.5 million). The total direct cost on these four major NCD groups is BD 283,029,598 (USD 745 million). This proportion is quite different to other international estimates which, based on average numbers from nine countries, found that the four major NCDs were responsible for 30% of healthcare expenditure. [97]

Diabetes accounted for the major share (20% of total health expenditure in Bahrain in 2019), at BD 119,691,395 (USD 315 million), followed by CVD which accounted for 14.8% of total

Fig. 2 Bahrain government health expenditure in 2019 on the four major NCD groups



health expenditure, at BD 88,511,916 (USD 233 million). Total spending on chronic respiratory diseases and cancers was estimated at BD 37,424,645 (USD 98 million) (6.3%), and BD 37,401,642 (USD 98 million) (6.3%), respectively.

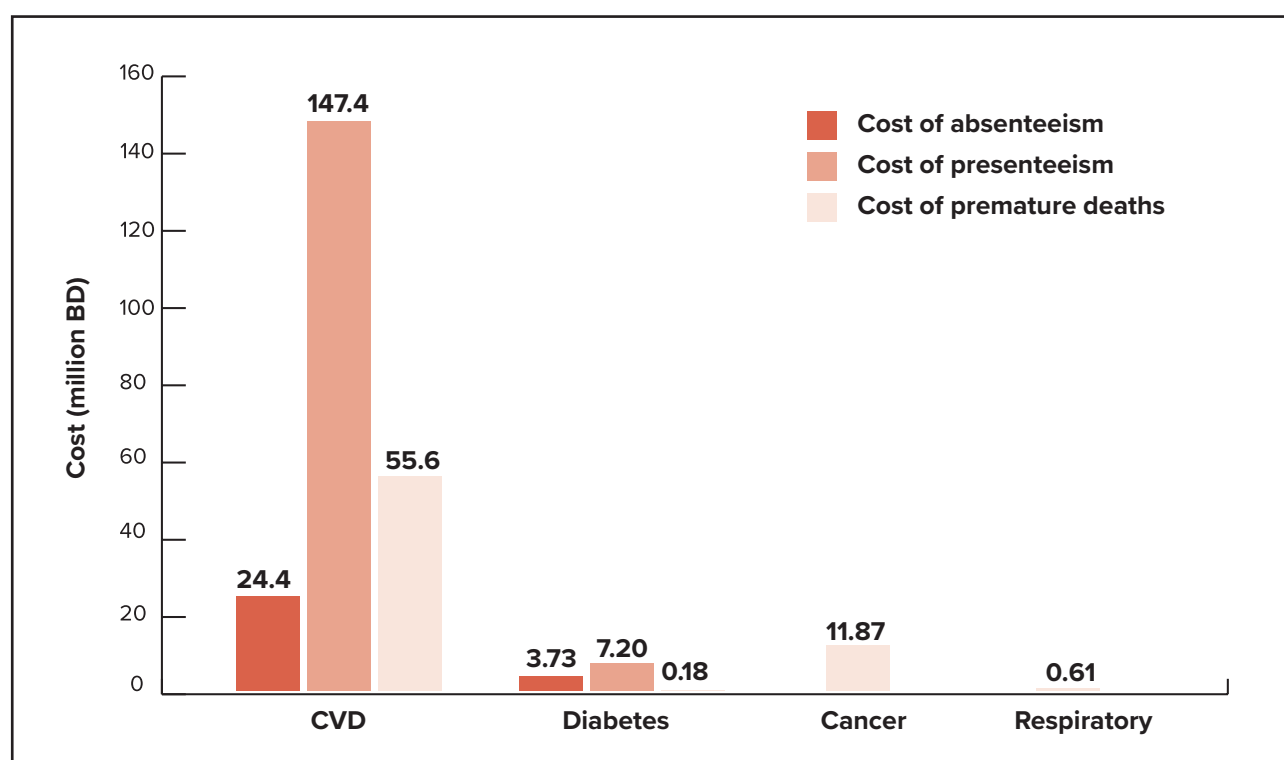
b. Indirect costs

For Bahrain, 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 2019. 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 BD 24,357,631 (USD 65 million). For presenteeism, the corresponding calculation found that the burden is BD 147,376,906 (USD 388 million). For diabetes, the cost of absenteeism was an estimated BD 3,734,232 (USD 10 million). For presenteeism, the corresponding calculation found that the burden is BD 7,196,884 (USD 19 million).

The cost of premature deaths was computed by considering the total output that would have been generated by workers during their lives before retirement. The total cost of premature deaths was estimated to be BD 68,283,538 (USD 180 million). The loss was the highest for cardiovascular diseases, at BD 55,629,308, followed by cancer, at BD 11,865,614.

Fig. 3 Cost of absenteeism, presenteeism and premature death due to NCDs in Bahrain, 2019

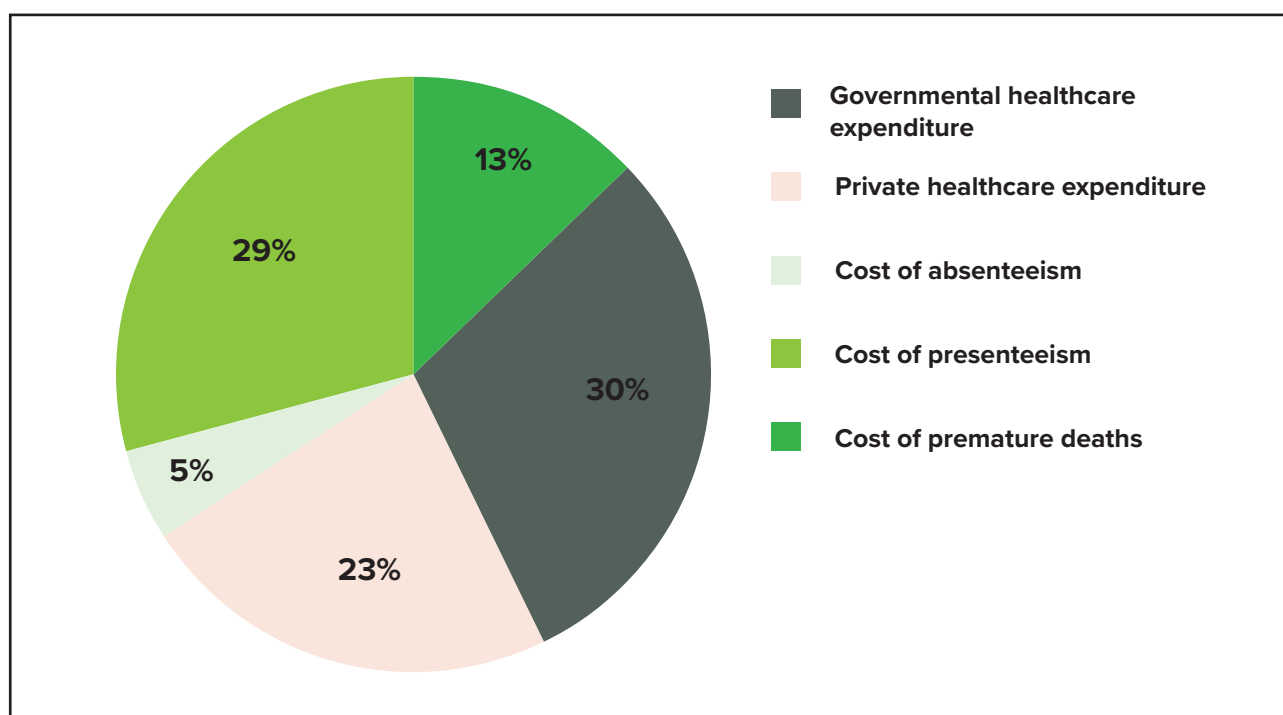


c. Total economic costs

Table 6 summarizes the total direct and indirect costs of NCDs in Bahrain. The total healthcare spending on the four main NCDs in 2019 was already BD 283,029,598 (USD 745 million) but additional losses to the economy (absenteeism, presenteeism, premature deaths) brought the total economic burden of NCDs to BD 533,978,790 (USD 1.4 billion), of which 53% was direct costs and 47% indirect costs. This would be even larger if the costs of absenteeism and presenteeism could be estimated for cancer and chronic respiratory diseases. The estimated total burden of NCDs on the economy of Bahrain is equivalent to 3.8% of GDP in 2019.

Table 6. Economic burden of NCDs in Bahrain in 2019 Bahraini Dinar

Cost	Cardiovascular diseases	Diabetes	Cancer	Chronic respiratory diseases	Total	Per GDP
Direct cost						
Government	50,704,584	68,565,936	21,425,756	21,438,933	162,135,210	1.14%
Private	37,807,332	51,125,459	15,975,886	15,985,712	120,894,388	0.85%
Total direct cost	88,511,916	119,691,395	37,401,642	37,424,645	283,029,598	1.99%
Indirect cost						
Absenteeism	24,357,631	3,734,232	No data	No data	28,091,863	0.20%
Presenteeism	147,376,906	7,196,884	No data	No data	154,573,790	1.09%
Premature death	55,629,308	175,405	11,865,614	613,212	68,283,538	0.48%
Total indirect cost	227,363,844	11,106,522	11,865,614	613,212	250,949,192	1.77%
Total burden	315,875,760	130,797,917	49,267,256	38,037,857	533,978,790	3.8%

Fig. 4 Structure of the economic burden of NCDs in Bahrain, 2019

2. Return-on-investment analysis

a. Costs of intervention

The costs of intervention were estimated for the period 2020–2034. **Table 7** shows the costs for each of the first five years of this period and the five-year and 15-year totals.

The cardiovascular disease clinical interventions produced the largest estimated costs. Treating people who have cardiovascular diseases and diabetes costs BD 1,244,216 (USD 3 million) in the baseline year and increases to BD 7,631,640 (USD 20 million) in 2024. Implementing the entire cardiovascular disease and diabetes clinical intervention package over the five-year scale-up period would cost BD 21,720,592 (USD 5.7 million).

The total costs for the tobacco package based on MPOWER guidelines are BD 10,707,542 (USD 28 million) for five years and BD 30,141,136 (USD 79 million) for 15 years. At five years, the salt reduction package would cost an estimated BD 16,803,171 (USD 44 million) and the diet and physical activity awareness interventions BD 9,239,279 (USD 24 million).

Table 7. Estimated costs of policy and clinical interventions, 2020–2034

Intervention package	2020	2021	2022	2023	2024	Total for 5 years	Total for 15 years
Policy interventions							
Tobacco control	2,248,732	2,177,862	2,046,330	2,188,288	2,046,330	10,707,542	30,141,136
Salt reduction	3,848,787	3,394,803	3,238,596	3,160,493	3,160,493	16,803,171	48,691,238
Diet and physical activity awareness	1,202,013	2,000,943	1,969,510	2,009,712	2,057,101	9,239,279	34,821,509
Clinical interventions							
CVD and diabetes clinical intervention	1,244,216	2,695,234	4,251,376	5,898,126	7,631,640	21,720,592	224,924,544
Total	8,543,748	10,268,842	11,505,812	13,256,618	14,895,563	58,470,583	338,578,427

b. Health benefits

All interventions significantly reduce the number of lives lost to causes related to cardiovascular diseases over 15 years (**Table 8**). Salt interventions and cardiovascular disease and diabetes clinical interventions have the greatest impact in terms of mortality averted (6,048 and 6,161 lives saved, respectively), followed by tobacco control interventions (1,627 lives saved) and diet and physical activity awareness (1,141 lives saved). More than 90% of these mortality averted are premature mortality (<70 years).

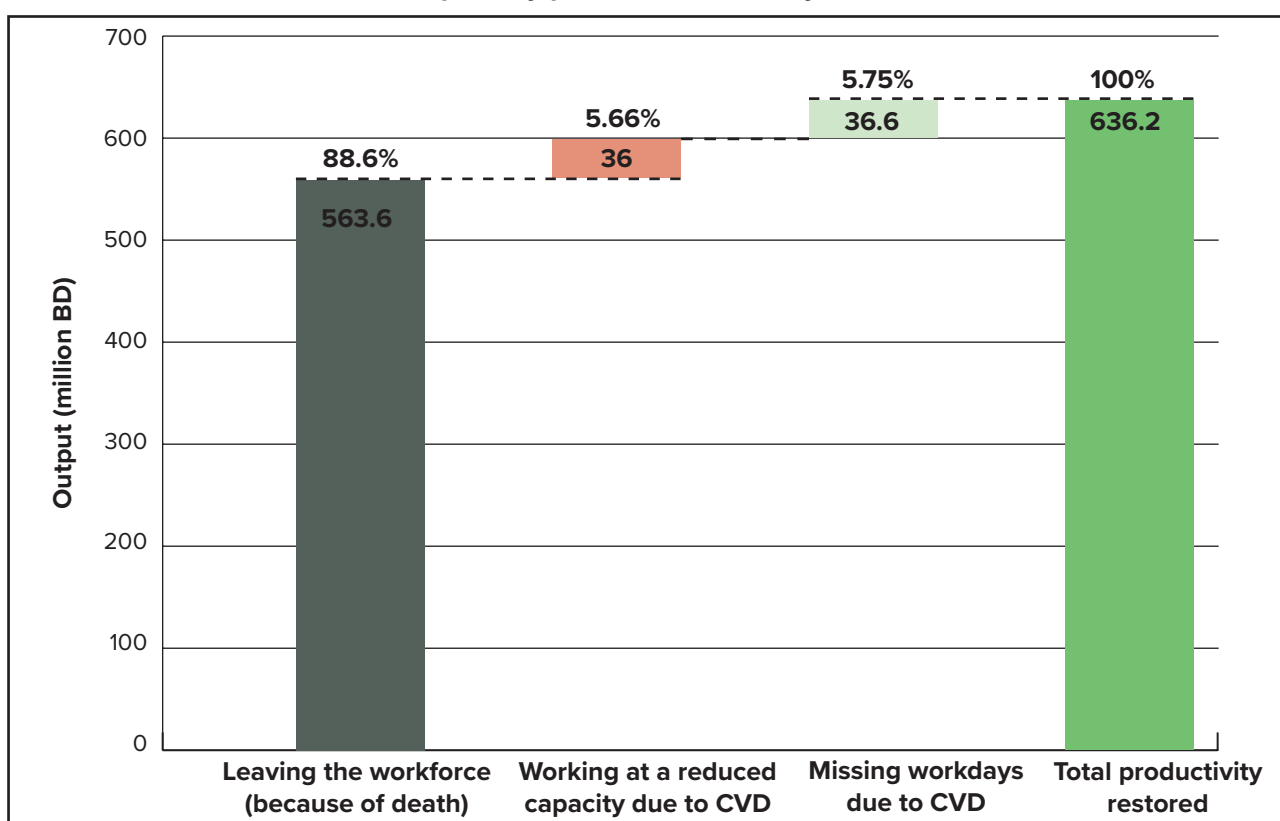
Each set of interventions also adds healthy life-years to the population. The cardiovascular disease clinical interventions and tobacco and salt reduction packages prevent strokes and cardiovascular events, and thus individuals avoid disabling states (such as partial paralysis from stroke) that can increase pain and suffering, reduce mobility and impair speech and thought. The largest gains in healthy life-years are achieved with the salt reduction intervention (44,023 healthy life-years gained), followed by the cardiovascular disease and diabetes clinical interventions (23,535 healthy life-years gained), the tobacco control interventions (11,150 healthy life-years gained), and the diet and physical activity awareness interventions (8,291 healthy life-years gained).

Table 8. Estimated health benefits over a 15-year time horizon, 2020–2034

Intervention package	Strokes averted	Acute IHD averted	Mortality averted	Mortality averted (premature deaths)	Healthy life-years gained
Tobacco control	2,064	1,343	1,627	1,471	11,150
Salt reduction	7,588	4,472	6,048	5,467	44,023
Diet and physical activity awareness	1,504	1,010	1,141	1,031	8,291
CVD and diabetes clinical intervention	2,648	1,534	6,161	5,570	23,535
Total	13,804	8,359	14,977	13,539	86,999

c. Economic benefits

The NCDs included in this analysis reduce the labour workforce and productivity through premature deaths, fewer days of work (absenteeism) and reduced productivity while at work (presenteeism). **Fig. 5** demonstrates the labour productivity gains that would result from the prevented deaths and disease cases over 15 years, described in **Table 8**. The combined recovered economic output from both the clinical and the policy intervention packages in net present-value terms would be BD 636,209,381 (USD 1.67 billion) in labour productivity gains over the 15-year period or equivalent to 4.5% of Bahrain's 2019 GDP over 15 years.

Fig. 5 Recovered economic output expected from interventions for tobacco, physical inactivity, salt and cardiovascular diseases primary prevention over 15 years

The highest labour productivity gains are from reduced premature deaths (88.6% of recovered economic output), followed by reduced absenteeism and reduced presenteeism (5.75% and 5.66% of recovered economic output, respectively).

d. Social benefits of increased years of healthy life

Healthy life-years gained is a health economics measure that expresses the additional number of years of life a person lives in a healthy condition as a result of receiving a treatment or avoiding a disease. It is a health expectancy indicator that combines information on mortality and morbidity. When estimating the benefits of improved health, it is common to put a value on being alive. We estimated that the combined social value from both the clinical and the policy intervention packages in net present-value terms would be BD 288,299,533 (USD 758 million) over the 15-year period.

The highest social benefits are derived from the monetary value of healthy life-years gained as a result of full implementation of the salt reduction package.

Table 9. Social value of the investment over 5 and 15 years

Intervention package	5 years		15 years	
	BD	USD	BD	USD
Tobacco control package	1,540,910	4,055,026	36,753,427	96,719,545
Salt reduction package	8,881,327	23,371,914	146,926,973	386,649,928
Diet and physical activity awareness	1,297,485	3,414,433	27,391,778	72,083,628
CVD and diabetes clinical interventions	2,906,640	7,649,053	77,227,354	203,229,880
Total	14,626,362	38,490,427	288,299,533	758,682,980

e. Return on investment

Comparing the costs and benefits of each package of interventions shows that all the NCD prevention interventions at the population level for risk behaviours included in the analysis – for tobacco control, salt reduction and increasing physical activity – have returns on investment greater than 1 BD for each 1 BD invested over 15 years (**Table 10**).

Table 10. Costs, benefits and return on investment at 5 and 15 years, by intervention package (in BD, not including social value)

Intervention package	5 years			15 years		
	Total discounted costs	Total productivity benefits	ROI	Total discounted costs	Total productivity benefits	ROI
Tobacco control package	10,112,754	1,670,166	0.17	24,848,665	67,599,860	2.72
Salt reduction	15,897,754	10,085,251	0.63	40,106,910	286,794,969	7.15
Diet and physical activity awareness	8,668,007	1,357,692	0.16	27,835,116	48,169,698	1.73
CVD and diabetes clinical interventions	20,046,512	7,602,351	0.38	169,143,816	233,644,854	1.38
Total	54,725,027	20,715,460		261,934,507	636,209,381	

The salt reduction package has the highest return on investment of any intervention: for BD 1 invested in the salt reduction package, the expected return is BD 7.15 for 15 years. The tobacco control package also produces a high return on investment over 15 years (2.72), as does the physical activity package (1.73).

The package of clinical interventions is estimated to provide the lowest return on investment of BD 1.38 per BD 1 invested. This is frequently the case in health economics because of the high costs of medical treatment necessary under clinical interventions. Further, these treatment options (treatment, secondary prevention after acute events and other) have low potential to increase labour force participation after stroke, myocardial infarction and diabetes. Nevertheless, the clinical interventions package still provides an ROI >1 under this analysis, while also resulting in most lives saved (5,570 premature deaths averted, see **Table 8**), contributing to SDG Target 3.4.

Adding the values of social benefits due to increased years of healthy life to the total productivity values increases the return on investments as described in **Table 11**.

Table 11. Costs, benefits and return on investment at 5 and 15 years, by intervention package (including social value)

Intervention package	5 years			15 years		
	Total discounted costs	Total productivity + social benefits	ROI	Total discounted costs	Total productivity + social benefits	ROI
Tobacco control package	10,112,754	3,211,076	0.32	24,848,665	104,353,288	4.20
Salt reduction	15,897,754	18,966,578	1.19	40,106,910	433,721,941	10.81
Diet and physical activity awareness	8,668,007	2,655,177	0.31	27,835,116	75,561,476	2.71
CVD and diabetes clinical interventions	20,046,512	10,508,992	0.52	169,143,816	310,872,209	1.84
Total	54,725,027	35,341,823		261,934,507	924,508,914	



The fiscal gains can be reinvested in education, awareness raising campaigns, trainings, medical waste management, and other prevention initiatives, while contributing to the COVID-19 response and improving future preparedness. Since the start of the COVID-19 we have learned that we need multidimensional interventions that simultaneously engage different stakeholders, sectors, and population groups. In addition to the direct health linkages between NCDs and the COVID-19 virus, some of the socio-economic effects of the pandemic – including social isolation, work insecurity, demands from home schooling, caretaking of elderly and disabled, less exercise – can generate physical and psychological conditions that may affect propensity for NCDs illnesses. For that reason it is key that national COVID-19 response and recovery plans integrate interventions that address NCDs.

Stefano Pettinato,
UNDP Bahrain Resident Representative



CONCLUSION & RECOMMENDATIONS

Investing in four proven and cost-effective intervention packages (best buys) can significantly reduce the burden of cardiovascular disease as well as cancer, chronic respiratory disease, and diabetes.

CONCLUSION

The four major NCDs impede Bahrain's efforts to increase efficiency in the health sector, which should help achieve fiscal balance. They also hinder the country's broader development priorities of increasing human capital and strengthening inclusive economic growth. NCDs are a leading health and development challenge in Bahrain, and they are making the COVID-19 pandemic worse and vice versa. Addressing NCDs and COVID-19 together can reduce the health and economic burdens of both.

The findings from the economic model show that NCDs cost the Bahrain economy BD 534 million (USD 1.4 billion) in economic losses, equivalent to 3.8% of GDP in 2019. Cardiovascular disease contributes the most to the economic burden of NCDs in Bahrain, 59% (BD 315,875,760) with 28% attributable to direct healthcare spending and 72% due to indirect costs including reduced workforce participation and loss in national productivity. Cardiovascular disease is followed by diabetes, cancer and chronic respiratory diseases. Government healthcare spending was equal to 30% of the total economic burden, followed by presenteeism (29%), private health expenditure (23%), premature death (13%) and absenteeism (5%). These results suggest that a policy approach that highlights cardiovascular disease prevention and associated risk factors while reducing government healthcare spending would be of benefit. Investing in four proven and cost-effective intervention packages (best buys) can significantly reduce the burden of cardiovascular disease as well as cancer, chronic respiratory disease, and diabetes.

Furthermore, these best buys can increase people's life expectancy and quality of life while decreasing the burden on the national economy and accelerating economic growth. Thus, these investments contribute to the overall socio-economic development of the country.

The investment case assessed the four cost-effective intervention packages of best buys within the Bahraini context: three policy packages to reduce the prevalence of behavioural risk factors for NCDs – tobacco use; physical inactivity and improving diet; and reducing excessive salt consumption – and one clinical intervention package related to cardiovascular diseases and diabetes.

Prioritizing investing in the salt reduction and tobacco control packages would lead to the greatest return. Even these strong returns outlined in this report understate the case for increased investment, as they consider only the economic benefits of improved health outcomes. They do not account for the significant additional revenue that would come from the recommended increases in excise tax rates on health-harming products including tobacco, alcohol and sugar-sweetened beverages, that could be significantly higher than the costs needed to implement the recommendations (see **Annex 3**).

Summary of main findings

The economic modelling considers baseline coverage levels for each intervention and assumes a significant but realistic scale-up of coverage levels. The main findings regarding the intervention packages are as follows:

OVER 15 YEARS, INVESTING IN ALL FOUR COST-EFFECTIVE INTERVENTION PACKAGES WOULD ...

 PREVENT NEARLY
15,000
DEATHS

 ADD ALMOST
87,000
HEALTHY LIFE-YEARS TO
PEOPLE IN BAHRAIN

OVER 15 YEARS, THE PACKAGES TO PREVENT NCDs, SALT REDUCTION AND TOBACCO CONTROL HAVE THE HIGHEST RETURNS ON INVESTMENT (ROI)

	YIELD FOR EVERY BD	TOTAL COST OF POLICY PACKAGE (MILLION BD)	TOTAL BENEFIT (MILLION BD)
SALT REDUCTION INTERVENTION	7.15	40	287
TOBACCO CONTROL	2.72	25	68
DIET & PHYSICAL ACTIVITY AWARENESS	1.73	28	48
CVD & DIABETES CLINICAL INTERVENTIONS	1.38	169	234

RECOMMENDATIONS

The analysis drew attention to specific areas that need to be strengthened and scaled up to implement the WHO-recommended cost-effective NCD preventive and clinical interventions. The following actions would help Bahrain reap significant health and economic benefits from scaled-up investments to reduce NCDs:



A. Invest in new and scale-up current cost-effective clinical and population-based interventions, enhancing efficiency in the health sector and overall public sector fiscal sustainability.

Since the packages to reduce tobacco and salt consumption largely provide the greatest return on investment, scaling up tobacco control and effective salt reduction initiatives should be of high priority.

To reduce salt consumption, Bahrain can extend its voluntary salt (and trans fats) reduction programme to products beyond baked goods. It can also adopt standards for labelling of nutritional content in food, including salt content, and for marketing of foods high in salt content. Implementing the food nutrition labelling system currently under consideration will have a large impact on Bahraini citizens' ability to make informed decisions around nutrition and their ability to adhere to nutritional guidelines. Bahrain can also take initiatives to the next level: to reduce salt consumption, Bahrain can extend its voluntary salt (and trans fats) reduction programme, or phase in mandatory reductions (and complete elimination in the case of trans fats), including additional products beyond baked goods.

To strengthen tobacco control, Bahrain needs to ban tobacco advertising, promotion and sponsorship comprehensively, including sports sponsorship and different event sponsorship and Corporate social responsibility as well as ban point-of-sale advertising and promotion and internet sales of tobacco products. Though difficult to implement given weather conditions, Bahrain would create a strong disincentive for smokers to continue if it banned designated smoking areas in all public places and workplaces. Bahrain should move ahead with implementing plain packaging, following the successful example of the Kingdom of Saudi Arabia. Australia's experience in defeating the tobacco industry's attempts to block plain packing shows that the industry has – at best – a weak case for litigation. [98] Considerations for e-cigarette regulations should also be carried out. As a Party to the WHO Framework Convention for Tobacco Control, Bahrain should aim for full implementation of the Convention. In line with the above it is important that Bahrain continues its surveillance activities for both youth and adults on a regular basis, to be able to regularly monitor the epidemic and the impact of different tobacco control policies on prevalence.

Increasing taxation of tobacco products is a highly effective strategy Bahrain can implement. At a current rate of around 64% of retail price, Bahrain has room to increase tobacco taxes to at least the WHO-recommended 75% of the retail price of the most sold brand of cigarettes with an excise tax component of at least 70%. Bahrain can also harmonize prices across

tobacco products to reduce the likelihood of consumers substituting premium cigarette brands (BD 2 for most sold brand in 2018) for cheaper brands (BD 0.8 for the cheapest brand). Bahrain should also reconsider plans to introduce tobacco (mu'assel) production; doing so may bring employment and government revenue but at substantial cost (e.g. increased potential for illicit trade, increased shisha consumption and marketing, and increased tobacco-related deaths and disease among the island nation). In line with that Bahrain needs to join the WHO FCTC Protocol to Eliminate Illicit Trade in Tobacco Products to ensure adequate protection from illicit trade while they raise taxes in a harmonized manner with neighbouring countries.

Interventions to increase physical activity are crucial, especially considering that half of the Bahraini population does not engage in sufficient physical activity. Bahrain should continue to scale up its national and local awareness programmes, school programmes, and sports initiatives and ensure that physicians are trained to provide brief advice as part of routine physician care. Beyond these two WHO best-buy interventions included in the economic model, Bahrain can strive to implement additional policy options under the WHO's Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2020. [99] The Government of Bahrain should also expand its partnerships with private sector business and civil society to promote and increase physical activity across all ages (e.g. walkathons at malls, [100] School Sports Center Project, [101] the Grow up Boys-Girls programme, Istijaba, annual sports day, healthy schools/cities/malls programmes, among others). To help promote a healthy diet, the Food Wealth Committee at the Bahrain Chamber of Commerce and Industry has an important role. Price stability and affordability of food commodities was ensured by the head of the committee after local markets in Bahrain experienced a drop in fruit and vegetable prices in April 2020 due to imports of fruits and vegetables. [102] It is important that these prices of health promoting foods remain stable and affordable in Bahrain.

Finally, although the package of clinical interventions has the lowest ROI, they are still cost-effective and are important interventions in fulfilling the right to health. Indeed, this package of interventions would save the most lives (averting an estimated 6,161 deaths over a 15-year period). Bahrain has one of the highest diabetes prevalence rates in the region, and cardiovascular disease remains the leading cause of NCD deaths. While these chronic conditions cannot be reversed in most cases, early detection and effective management can extend life expectancy and dramatically increase well-being. Bahrain was awarded the UNIATF on NCDs award in 2018 for its progress and leadership in prioritizing action against NCDs. Bahrain has implemented a number of initiatives that could be scaled to achieve greater impact. This includes Bahrain's community-level screening Protect Your Heart Campaign, which can be scaled up and expanded to include other community settings, such as workplaces and places of worship. The breast screening programme guidelines can be updated as planned to ensure it meets WHO recommendations. Bahrain can also ensure the new integrated IT health registry is comprehensive and reports on effective coverage (e.g. percentage of people screened, treated, controlled), thereby positively impacting referrals, patient recall and continuity of care.

B. Increase taxes on health-harming products (tobacco, alcohol, sugar-sweetened beverages) and shift subsidies from health-harming products (e.g. polluting fuels) to health-promoting ones. Using fiscal measures to address NCDs, whether by increasing tax rates on health-harming products or reducing subsidies for them, represents a promising approach to finance scaled-up action on NCDs. Increasing taxes on health-harming products is one of the most effective measures a government can take. Doing so reduces the consumption of such products, thereby improving population health and reducing associated costs, while increasing government revenue for national development priorities. Effective “health taxes” require the ministries of finance and health to work together and benefit from broader whole-of-government support. Beyond tobacco taxation, Bahrain can also strengthen taxes on alcohol and sugar-sweetened beverages, and shift subsidies from unhealthy items and fossil fuels towards health-promoting foods.

The Kingdom of Bahrain recently implemented a 50% excise tax on carbonated drinks and a 100% excise tax on energy drinks. This commendable initiative will help reduce SSB consumption and associated health and economic costs. This is similar to the Kingdom of Saudi Arabia who implemented the GCC excise tax on carbonated beverages at 50% and energy drinks at 100% in 2017. [103] A recently published paper examined the impact of the tax finding a decrease in sales volume of soft drinks. [104] However, because the tax in Bahrain is based on price alone, consumers are likely to choose cheaper options instead of healthier ones. WHO recommends an excise tax based on sugar content or volume. [105] Modifying the tax structure to the amount of sugar or size of the beverage may support consumers to choose smaller beverages with less sugar, while still generating revenue.⁸

Certain food categories are heavily subsidized in Bahrain, including meat (accounting for 80% of all food subsidies in 2014, according to stakeholder interviews). Subsidies on products such as meat, sugar, salt, and palm oil could be shifted towards health-promoting products such as fresh fruits and vegetables. Additionally, certain unhealthy basic food items are exempt from the 5% value-added tax in Bahrain including sugar, salt and meats. Recategorizing so that only healthy options such as fruit and vegetables are exempt may promote healthier food choices. Bahrain is implementing transportation fuel and electricity consumption subsidy reforms projected together to save the government BD 13 million (USD 34.4 million) from 2016–2025, and a 14% reduction in electricity use by 2025 compared to use in 2009–2013. [106] These reductions in fossil fuel subsidies can help to finance full implementation of the recommended policies discussed in this report. Doing so can also be expected to deliver additional health benefits from reduced exposure to air pollution.

The Gulf Cooperation Council (GCC) makes tax decisions as a regional bloc. The GCC is inclined towards health taxes and considering how to design and implement a tax on sugar-sweetened beverages. Bahrain can present the GCC with evidence on the fiscal and health benefits of health taxes, defending proposals for tax increases that would align those in Bahrain to more impactful levels. Earmarking revenue from excise taxation for health systems

⁸ The UK has successfully introduced a tiered excise tax structure based on the sugar content of beverages to discourage consumers from purchasing drinks with high quantities of sugar.

strengthening and/or the SDGs broadly increases public support for such measures and has become standard practice in many countries. The Philippines, for instance, earmarks excise tax revenues from health-harming products for universal health coverage [107] and Egypt allocates tax revenue from tobacco products to health insurance schemes for students. [108]



Engage and collaborate by strengthening multisectoral, whole-of-government and whole-of-society action on NCDs and increasing public awareness of NCDs and their risk factors.

As the cause and effects of NCDs are not limited to health, the health sector should not be the only sector to respond to these chronic ailments. A whole-of-government and whole-of-society approach is needed for effective prevention and control of NCDs and their risk factors. The health sector in coordination with representation from sectors such as urban planning, education, finance, industry, tourism, interior, labour, oil and gas, revenue, youth and sports, justice and Islamic affairs, along with policymakers, will make implementation of NCD prevention and control strategies more successful. Bahrain should strengthen these relationships through their National NCD Committee to ensure beneficial coordination.

Bahrain can also put in place and track key performance indicators for the national action plan, ensuring there are monitoring and reporting mechanisms in place that hold different sectors accountable. As Bahrain is planning a budget reform to integrate economic trends and all initiatives into the budget, including health- and NCD-related initiatives, this is a great opportunity to co-finance NCD-related initiatives across ministries and incentivize action on NCDs. Bahrain can also facilitate collaboration outside government with academia to increase NCD-related research. The Government of Bahrain could also increase international and regional collaboration, by documenting progress (e.g. through annual progress reports) and sharing good and innovative practice across the GCC and beyond.

Bahrain can increase media campaigns to spread awareness of NCD prevalence in Bahrain and how reducing NCD risk factors can help minimize risk for development and complications of NCDs. Engage civil society in the progress of NCD policies and share success stories with the public to strengthen support. Involve organizations and the public in the development and dispersal of media campaigns and other outlets to share NCD information. Keep the public updated on the status of NCD prevention and control programmes by updating government websites and sharing through social media platforms. Reduce the spread of misinformation by tagging false information that is spreading on the internet about NCDs and provide accurate information through trustworthy sources.



Strengthen monitoring and evaluation and accountability across sectors.

Bahrain should follow up on plans to conduct the Global Youth Tobacco Survey (GYTS) and help GCC conduct a regional Global Adult Tobacco Survey (GATS). The Ministry of Health (MOH) in Bahrain should continue to monitor the salt content in breads to reach a target of a 30% reduction and expand to cheese products as planned. MOH should also expand their system of monitoring trans fats in bakeries to other food products and ensure quantities meet the established regulations set by the minister of Industry, Commerce

and Tourism on trans fats. MOH should also monitor and evaluate implementation of trans fats guidelines in restaurants.

In general, Bahrain should monitor implemented NCD policies and campaigns on a continual basis to evaluate for effectiveness and indicate areas for improvement. This includes but is not limited to the tobacco campaign in primary schools Generations Without Smoking, in collaboration with anti-tobacco clinic groups in the Grown Up Boys-Girls school programme, Ministry of Youth and Sports campaigns educating youth on healthy behaviours, Ministry of Health and Ministry of Education's health-promoting schools programme, the Healthy Workplaces project and the Choose Your Doctor project. Taxation on health-harming goods, such as sugar-sweetened beverages, should be monitored as well for changes in consumption patterns and in revenue. Finally, to strengthen accountability for these programmes, each should establish and monitor key performance indicators (KPIs) and report annually to the National Committee.

4 >

Implement novel policy approaches and test innovative solutions to increase utilization of existing services and incentivize healthy behaviour.

In addition to adopting the best-buys and modelled interventions, Bahrain can benefit from applying innovations in key areas:

- ^ **Urban planning to promote health:** Purposeful urban planning can incentivize healthier habits (e.g. through access to urban/community gardens and fresh food markets and mobility systems which encourage walking and/or cycling). Khalifa Town in the Southern Governorate is an important step towards creating a health-promoting urban landscape, as are other “built environment measures” such as the national network of public recreation areas and the creation of outdoor walking/exercising facilities in neighbourhoods. Bahrain should evaluate such investments for impact and expand successful ones in both new and older neighbourhoods.
- ^ **Improving air quality:** Bahrain should continue to reduce emissions and air pollution by pursuing its National Renewable Energy Action Plan, the GCC high-speed rail link project, and setting even more ambitious targets.
- ^ **Behavioural nudges towards healthy choices:** Under the Ministry of Education's leadership, public schools can adopt innovative measures (see **Annex 4**) such as pre-ordering for school meals with embedded nudges to prompt children to consume healthier food. Changing food placement and labels in school cafeterias to encourage healthy eating has been shown to work. The government can run a pilot in public schools that can later be a model for private schools.
- ^ **Food environment:** Addressing access and availability to healthy food is key within a holistic approach to health but is a relatively new concept in Bahrain. Bahrain can continue to prioritize the agriculture sector, ensuring food security while promoting local food production of health-promoting foods. Other innovative approaches such as encouraging local food markets and incentivizing consumption of health-promoting foods align with Bahrain's food system goals.

5

Build back better to ensure that prevention and control of NCDs is a central element of the COVID-19 response and recovery (see Annex 1 for more details). [148] COVID-19 is another major reason to address NCDs urgently.

NCDs and their risk factors, to varying degrees, increase susceptibility to both COVID-19 infection and more severe outcomes. At the same time, impacts from the pandemic on health systems and prevention approaches threaten to stall progress on NCDs. People living with or at risk of NCDs face significant disruptions in access to prevention and treatment services for NCDs. The NCD-COVID-19 double pandemic is a major cost to health and well-being as well as to the economy, with each issue causing similar economic devastation.⁹

There are initial steps Bahrain can take to ensure NCDs and COVID-19 are addressed together, both in the immediate response and in longer-term efforts to rebuild. These include:

- ^ Ensure NCDs and NCD health and development experts are represented on COVID-19 taskforces [109] to support sensitization of actors and integration of NCDs into immediate and longer-term responses.¹⁰ Ensure COVID-19 experts are represented on NCD coordination mechanisms in turn.
- ^ Integrate NCDs into the country's National COVID-19 Strategic Preparedness and Response Plan, especially around Pillar 9: maintaining essential services. Refer to WHO's Maintaining essential health services: operational guidance for the COVID-19 context interim guidance.¹¹
- ^ Optimize regional and global coordination and information sharing on the nexus of NCDs and COVID-19, leveraging existing key platforms for example the GCC joint operations room for COVID-19.
- ^ Different sectors review the WHO and UNDP NCD sectoral briefs to analyse how their COVID-19 response and recovery can be sensitive to NCDs and to further integrate NCDs into longer-term development work including efforts for universal health coverage and the SDGs (see Annex 1 of this document for further details).

9 3.8% of GDP burden due to NCDs, and 3.6% GDP contraction forecasted due to COVID-19 according to the International Monetary Fund, Real GDP growth, IMF Data Mapper.

10 For example, many governments have been cognizant of the implications of social isolation on physical and mental health and have allowed people to take exercise outside for a short period during the movement restriction.

11 Available here: <https://www.who.int/publications/i/item/covid-19-operational-guidance-for-maintaining-essential-health-services-during-an-outbreak>



ANNEXES

ANNEX 1: NCDS AND COVID-19

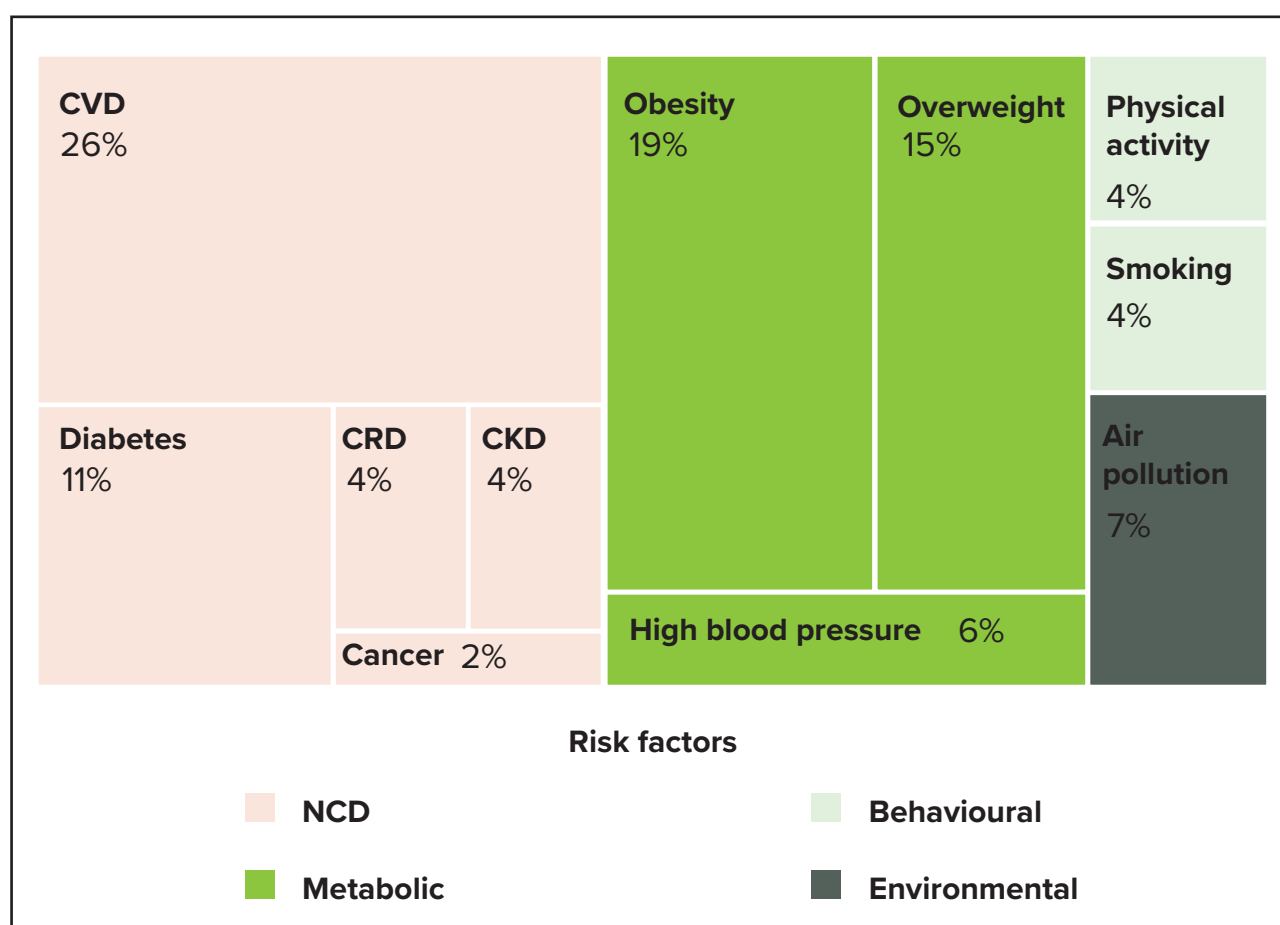
Prevention and control of NCDs is of increased importance during the COVID-19 pandemic. [148] In addition to an increased vulnerability to severe outcomes from COVID-19, patients with NCDs suffer from disruption of or limited access to NCD prevention and treatment services. [110] A recent WHO survey across 155 countries found that the majority of countries are encountering disruptions to the delivery of NCD services, correlating with the severity of the COVID-19 outbreak. [111] Bahrain initiated a nationwide lockdown in March at the start of the pandemic. [112] Although restrictions have eased since then, with cases rising and projected future outbreaks, another lockdown is possible.

Interactions between NCDs and COVID-19

People with NCDs are more vulnerable to developing severe illness of or dying from COVID-19, with diabetes, cancer, chronic respiratory disease or cardiovascular diseases being key risk factors for adverse outcome. [113, 114] In addition, smoking, [115] alcohol consumption, [116] obesity, [117] and exposure to air pollution. [118] This strong interconnection between NCDs and COVID-19 highlights the necessity to integrate considerations for NCDs into the pandemic response on all levels.

Bahrain scores **5.78** in the UNDP-developed **NCD/COVID-19 Vulnerability Index**, indicating a vulnerability to COVID-19 due to NCDs and risk factors higher than the global median. The Index is a weighted average of the normalized prevalence indicators for a set of NCDs and risk factors with established links to COVID-19.

The key NCD-related factors driving vulnerability to COVID-19 in Bahrain, indicated in the Index Breakdown (**Fig. 6**), are cardiovascular diseases, obesity and overweight, and diabetes. This suggests that while Bahrain may fare better relatively to other GCC countries in the factors linked to cardiovascular function, the prevalence of these conditions is nevertheless high and puts Bahrainis at increased risk for COVID-19. The vulnerability to COVID-19 caused by these conditions is compounded by the fact that men — who are about twice as likely as women to suffer from severe COVID-19 — make up over 64% of the Bahraini population, according to the World Bank.

Fig. 6 NCD-driven COVID-19 Vulnerability Index – breakdown of risks

Recommendations and governance strategy

Addressing NCDs as risk factors for COVID-19 contraction and severity is crucial for reducing the pandemic's strain on the healthcare system and economy. Bahrain should communicate the elevated vulnerability of affected individuals. The government of Bahrain should also devise policies to encourage a healthy lifestyle and reduce exposure to factors linked to development of NCDs including smoking, alcohol use, physical inactivity, and air pollution.

An effective and sustainable COVID-19 response requires an intersectional, multifaceted, whole-of-society and whole-of-government approach. The main building blocks are:

- ^ An **interdisciplinary task force** should devise policies and response strategies. This should consider and meet the needs of all groups of society, with a particular focus on those that are most vulnerable.
- ^ **Coordinate with global and regional efforts** to allow for exchange of ideas and ensure the selection of most suitable approaches on all levels of society.
- ^ **Integrate considerations** for NCDs into COVID-19 responses, including identification of essential NCD services, and the need for service delivery adaptations to maintain essential services. Prioritize NCD patients for COVID-19 testing and early care, and protect supply chains for NCD medicines and technologies.

- ^ **Leave no one behind.** Identify vulnerable groups at risk for COVID-19, including marginalized population groups with high rates of NCDs and including migrant workers. Incorporate their needs into the COVID-19 response plan. [119]
- ^ **Implement multisectoral action.** COVID-19 action is not confined to the health sector alone, but requires cooperation from a multitude of sectors to ensure that the pandemic response and recovery is sensitive to NCDs.

Other innovative COVID-19 policy solutions

In addition, Bahrain can incorporate more innovative approaches to help reduce risk factors for NCDs and COVID-19 infection and complications. Advanced technological approaches can be used to identify vulnerable groups at risk for severe disease. For example, finding geographical groups at higher risk of severe symptoms of COVID-19 by mapping areas of high prevalence of certain pre-existing conditions or areas of high levels of pollution. [120]

Contact tracing apps are becoming a commonly used tool to help contain the spread of COVID-19 and Bahrain [121] has joined an ongoing list of countries implementing this technology. [122, 123, 124] Bahrain's app titled BeAware provides COVID-19 information to the public, notifies individuals when they come in close contact with someone suspected to have COVID-19 and even displays coronavirus test results. The tracing functions and alerts of the app should emphasize vulnerable groups, such as people with NCDs, by prioritizing these groups when contact tracing and offering useful information on the interaction between NCDs and COVID-19 on the app.

Photo credit: iGA BeAware app screenshot/via Gulf Insider



As mentioned, government efforts to promote physical activity and mental health, to reduce alcohol use, exposure to air pollution and tobacco usage are of critical value. The Ministry of Health of the Kingdom of Bahrain has taken initiative to provide the public with useful up-to-date accurate information on COVID-19. Notably, the health minister released a message to promote awareness of the harmful effects of smoking and its link to COVID-19. [125] These efforts could be further expanded with media campaigns, apps and other forms of technology that could be utilized to communicate scientifically backed information about the novel coronavirus as well as suggestions on how to maintain a healthy lifestyle during times of self-isolation and quarantine. For example, Bahrain can implement resources on healthy diet [126] and exercise [127] on their Ministry of Health website or the BeAware app in addition to the provided information on COVID-19 symptoms, prevention, testing, and tracking. These initiatives help address concerns of both NCD and COVID-19 prevention.

Photo credit: © Zsuzsanna Schreck



ANNEX 2: ESTIMATED CURRENT COVERAGE OF NCD INTERVENTIONS TO BE COSTED WITHIN THE ONEHEALTH TOOL

	Current implementation levels	Modelled implementation levels in 2030
Tobacco use		
<i>Monitor tobacco use and prevention policies</i>	Level 2	Level 4
<i>Protect people from tobacco smoke</i>	Level 2	Level 4
<i>Offer to help quit tobacco use: mCessation</i>	Level 3	Level 4
<i>Warn about danger: warning labels</i>	Level 3	Level 4
<i>Warn about danger: mass media campaign</i>	Level 4	Level 4
<i>Enforce bans on tobacco advertising</i>	Level 2	Level 4
<i>Enforce youth access restriction</i>	Level 4	Level 4
<i>Raise taxes on tobacco</i>	Level 3	Level 4
<i>Plain packaging of tobacco products</i>	Level 3	Level 4
Physical inactivity		
<i>Public awareness campaigning on physical activity</i>	Level 2	Level 4
<i>Brief advice</i>	Level 1	Level 4
High salt consumption		
<i>Surveillance</i>	Level 2	Level 4
<i>Harness industry for reformulation</i>	Level 2	Level 4
<i>Adopt standards: front-of-pack labelling</i>	Level 1	Level 4
<i>Adopt standards: strategies to combat misleading marketing</i>	Level 1	Level 4
<i>Knowledge: education and communication</i>	Level 1	Level 4
<i>Environment: salt reduction strategies in community-based eating spaces</i>	Level 1	Level 4
Clinical interventions: cardiovascular diseases		
<i>Screening for risk of cardiovascular diseases and diabetes</i>	5%	80%

<i>Treatment for those with high absolute risk of cardiovascular diseases and diabetes (>30%)</i>	5%	80%
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<i>Treatment of new cases of acute myocardial infarction with aspirin</i>	5%	80%
--	----	-----

<i>Treatment of cases with established ischaemic heart disease and post-myocardial infarction</i>	5%	80%
--	----	-----

<i>Treatment for those with established cerebrovascular disease and post-stroke</i>	5%	80%
--	----	-----

Clinical interventions: diabetes

<i>Standard glycaemic control</i>	5%	80%
--	----	-----

<i>Retinopathy screening and photocoagulation</i>	5%	80%
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<i>Neuropathy screening and preventive foot care</i>	5%	80%
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ANNEX 3: HEALTH TAX MODELLING

Health taxes are considered the most effective policy measure to reduce consumption of health-harming products. Additionally, they generate revenue and reduce the burden on the health system. The Addis Ababa Action Agenda on Financing for Development [128] recognizes price and tax measures on tobacco as an important revenue stream for financing for development, and the WHO Global Action Plan for SDG 3 – to ensure healthy lives and promote well-being at all ages – emphasizes the role of taxes on cigarettes, tobacco, and sugar in improving population health while reducing healthcare expenditures and increasing government revenue.

There is a consensus among the 194 United Nations Member States to promote fiscal measures to reduce the main risk factors for NCDs and promote healthy diets and lifestyles. [129] Health taxes are a fiscal measure that can help finance the health systems across lower-middle-income countries whose funding levels for health are currently insufficient to sustain progress towards SDG3. [130] Summan and Laxminarayan estimated that a tax on tobacco, alcohol, and sugar-sweetened beverages (SSBs) that increases retail prices by 50% could “avert over 50 million premature deaths while raising over USD 20 trillion of additional revenues worldwide over the next 50 years.” [131] Identifying and increasing sustainable domestic revenue streams is more important now than ever, with COVID-19 causing economic contraction worldwide [132] and placing an additional strain on health systems.

While health taxes hold great potential, they remain under-implemented, including in Bahrain. While the country has implemented taxes on tobacco, alcohol and SSBs, these products remain either very affordable or the tax structure could be improved. Increasing the excise tax on these products and altering the alcohol and SSB tax structures to be specific to the alcohol and sugar content is an effective means to reduce consumption and prevent NCDs in Bahrain. **Fig. 7** displays estimates for potential additional government tax revenue that Bahrain could receive from increasing excise tax rates on tobacco, sugar-sweetened beverages and alcohol. Estimates are based on an economic model of three scenarios:

- **High increase scenario:** 75% increase in tobacco retail prices, 50% increase in prices for SSBs and alcoholic beverage retail prices.
- **Medium increase scenario:** 50% price increase for tobacco, 20% for SSBs and alcoholic beverage retail prices.
- **Low increase scenario:** 30% for tobacco and 10% price increases for SSBs and alcoholic beverage retail prices.

Fig. 7 Cumulative excise health tax revenue by 2024 (in million BD) per category

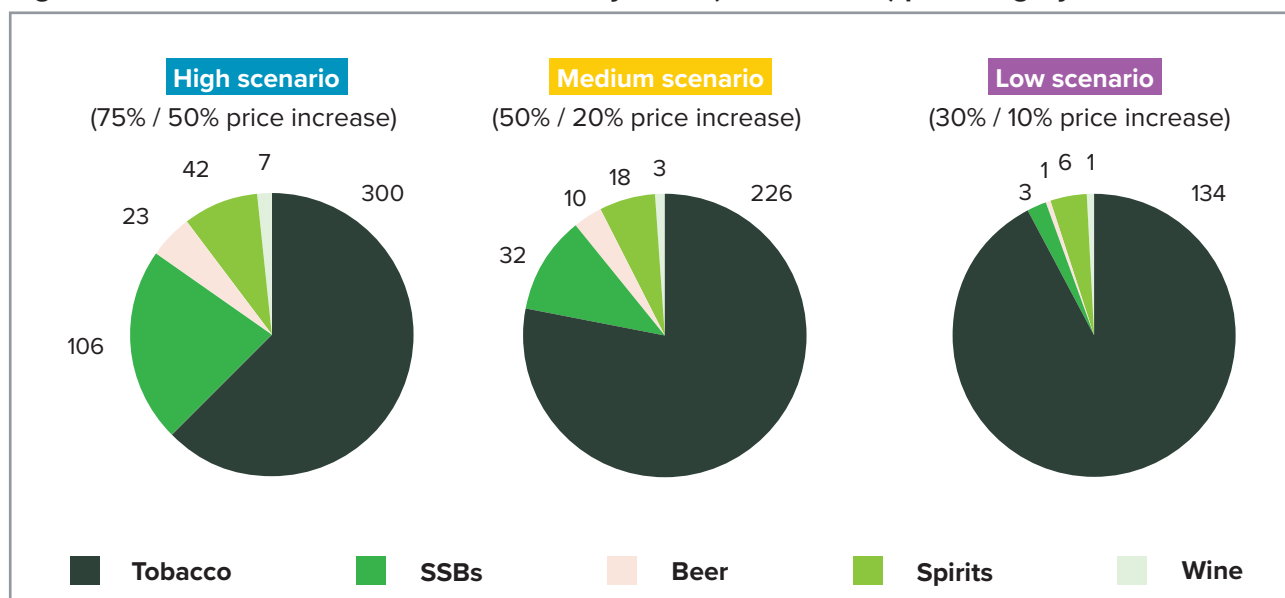
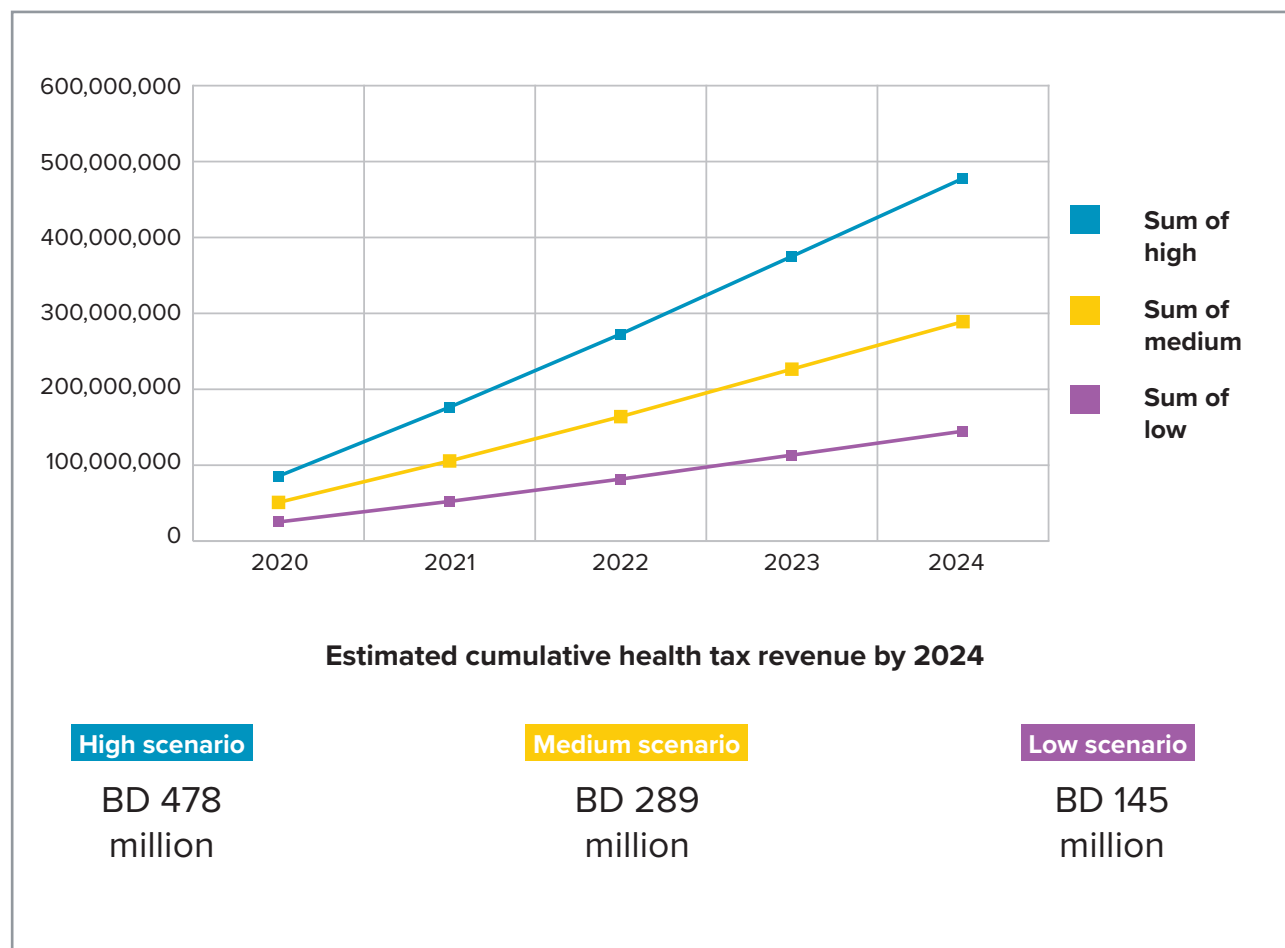


Fig. 8 shows the cumulative health tax revenue that can be gained under the three scenarios by 2024.

Fig. 8 Estimated cumulative health tax revenue by 2024, in Bahraini Dinar



ANNEX 4: INNOVATIVE POLICY SOLUTIONS TO ENHANCE DIETS IN BAHRAIN

Fruits and vegetables are important components of a healthy diet. Insufficient intake is linked to poor health and increased risk of NCDs. An estimated 3.9 million deaths worldwide were attributable to inadequate fruit and vegetable consumption in 2017. [133] WHO recommends that an adequate intake of fruit and vegetables is about 400g of fruit and vegetables. [134] Four or five servings of fruits and vegetables is typically recommended to reach the 400g recommendation. Data from the 2018 STEPS survey in Bahrain however, showed that 85% of respondents reported having insufficient intake (less than five servings) of fruits and vegetables per day. [135] The following table reviews a number of innovative interventions, including subtle “nudge solutions”, to increase fruit and vegetable consumption to help prevent NCDs.



SCHOOLS



Foster healthy dietary habits in schools



Photo credit: © The California Endowment via Flickr

Children form the core of their dietary preferences in the places where they spend most of their time – at home and school. Some schools have successfully experimented with innovative “nudge” interventions that prompt children to make (and internalize) healthier choices. [136] In one such intervention, researchers from the University of Florida created a software program that children could use to preorder their school meals. While some children simply placed their orders as usual, others were given a “tweaked” version of the software with gentle cues, such as showing a screen with a smiley face when children choose all five foods recommended by the US Department of Agriculture, or designing on-screen buttons that make the healthy choices more natural. Another experiment, carried out by researchers at Cornell University, found that children were more inclined to order foods with appetizing or even quirky descriptors such as “tender grilled chicken” (instead of simply “grilled chicken”) or the more over-the-top “X-ray vision carrots”.



Integrating nutrition policies in school canteens



Photo credit: © Zsuzsanna Schreck

Changing the food offered or shifting the menus may help promote healthier options. Bahrain can encourage healthy choices in schools by shifting subsidies towards fruits and vegetables, similar to Finland where milk subsidies exclude products high in fat or salt. Bans on salty snacks in schools and banning sugary beverages in schools and shops around schools may help deter unhealthy purchases. In California in the United States, state legislation bans the sale of SSBs on school campuses. [137]

SCHOOLS

**> Innovative approaches
in primary schools**



Photo credit: © Zsuzsanna Schreck

Parental involvement, taste testing and games are simple ways to encourage healthy eating in children. In England, children who attended schools where parents were involved in efforts to promote fruits and vegetables ate more vegetables compared to schools that did not have a high parental involvement. [138] In the United States, an evaluation of a nutrition education programme that utilizes a taste testing component found that adding taste testing to the programme resulted in higher student consumption rates of fruits and vegetables compared to without taste testing. [139] In Utah in the United States, a school used a game-based approach by promising rewards when the school met a fruit or vegetable consumption goal. Results showed that students and teachers enjoyed the game and fruit and vegetable consumption increased when it was played. [140]

**> Reduce salt, sugar, and
trans fats in school meals**



Photo credit: © Zsuzsanna Schreck

Countries have made initiatives to reformulate foods to reduce trans fats, added sugar and salt in processed foods. Tunisia has demonstrated a successful public-private partnership to achieve food reformulation. [141] Given biscuits are commonly consumed in schools in Tunisia, sweet biscuits filled with jam were reformulated to reduce fat, salt and sugar and eliminate trans fats.¹¹

12 WHO Regional Office for the Eastern Mediterranean, "NCD prevention and control in the Eastern Mediterranean Region Country Case study, Tunisia", presentation given at the High level EMR Policy Dialogue in preparation of the 3rd High-level Meeting of the United Nations General Assembly on the Prevention & Control of Noncommunicable Diseases, Cairo, Egypt, July 2018.

REFORMULATING FOODS AND BEVERAGES



Reduce sugar in soft drinks



In the United Kingdom, the government set a goal for the food industry to reduce sugar content in food by 20% by 2020 and implemented a tiered tax on sugar-sweetened beverages in 2018, encouraging reformulation of products. These policies were accompanied by awareness campaigns. Sugar sold per capita coming from soft drinks decreased by 30% between 2015 and 2018. [142]

Photo credit: © World Bank via Flickr

GROCERY SHOPPING



Front-of-pack (FOP) labelling



As discussed in this report, Bahrain is adopting front-of-pack labelling, but it is yet to be implemented. While limited, FOP nutrition labelling schemes, such as traffic light labelling, Nutri-score, and health or endorsement logos, are in use or under development in the WHO Eastern Mediterranean region. For example, Saudi Arabia and the United Arab Emirates have introduced traffic light labelling systems to indicate healthiness of nutrient levels by colour (red, amber or green), Morocco is developing a Nutri-score system which gives an overall rating of a food on a scale from A to E, and Tunisia uses a healthy logo to indicate healthier foods. [143]

Photo credit: © Betarice Murch via Flickr

GROCERY SHOPPING


Highlight healthy foods through strategic positioning

A well-established environment nudge for increasing consumer propensity for buying healthy foods involves placing healthy foods next to the cash register (or at the desk) while keeping unhealthy foods elsewhere on the premises. This intervention has been found to increase sales of healthy products (although not necessarily to curb sales of unhealthy products). [144]



Photo credit: © I r via Flickr


Shopping cart designs and product placement in supermarkets

In a pilot experiment led by a researcher at the New Mexico (US) State University College of Business, shopping carts were decorated with a yellow tape and a sign, indicating a space reserved for fruit and vegetables. The research found that this simple intervention made shoppers more inclined to buy more fruit and vegetables. Evidence suggests that customers could be further incentivized by making the cart even more appealing (e.g. by including pictures of fresh fruit). [145]



Photo credit: © Hyacinth50 via Flickr


Increasing local markets

In Montreal, a seasonal outdoor fruit and vegetable market receiving funding from the Public Health Department was placed in a disadvantaged neighbourhood near a subway station. [146] Integrating alternative food sources, such as local markets, in disadvantaged areas offers a useful strategy to promote consumption of fruits and vegetables while addressing health inequalities. Additionally, placing these markets on travel routes may help increase awareness and access.



Photo credit: © WHO

RESTAURANTS



Making healthy meals the rule with default menus



Photo credit: © WHO

In some cities, restaurants have tried to nudge consumers towards choosing more nutritious and less caloric meals by presenting healthy foods as the default option on their menus. This could entail, for instance, swapping the French fries for a salad as the default side dish for a protein. Here, the government can play a coordinating role in engaging with restaurants and offering workshops on how to design healthier default menus.

MEDIA



Mass media campaigns



Photo credit: © Chelsey Badlock via Flickr

Providing nutrition information through various outlets may help promote fruit and vegetable consumption. Adolescents in Austria report television most often as a source of nutrition information. However, those who used newspaper articles, booklets and the internet as a source were more likely to consume fruit and vegetables. [147] This highlights the importance of using a variety of media when developing a public health nutrition campaign.

ANNEX 5: 2017 JOINT PROGRAMMING MISSION RECOMMENDATIONS AND PROGRESS

GOVERNANCE	
2017 Joint Mission Recommendations	Progress Update
<i>Multisectoral NCD coordination is further elevated to the highest possible level of the Government, including operationalizing the National NCD Committee.</i>	The National Multisectoral NCD Committee is operationalized and meeting on a regular basis. There is the opportunity to enhance coordination through more regular meetings. More sectors have been included under the NCD Committee in 2018 and two main NCD coordination sub-committees have been approved, one on NCD legislation and policies, and one on NCD awareness and media coverage. Terms of reference for sectors are in place providing the roles of each sector. Following the meeting of the Joint UN Task Force with the cabinet sub-committee on NCDs, recommendations for costing and implementation were developed. Actions to achieve the targets set out in the strategic plan are ongoing.
<i>Multisectoral costing action plan is developed to operationalize National NCD Strategy.</i>	A costing multisectoral action plan is in place.
<i>Fully align national health policies, strategies and plans with the National Economic Vision 2030, and with strategic plans of the sectors involved in the NCD plan, including matching of the KPIs.</i>	Ongoing.
<i>Ensure that NCDs are incorporated into the governorates and local action plans and programmes in place.</i>	
<i>Integrate a proposed costing breakdown into the NCD plan, to ensure adequate resource allocation to all proposed initiatives.</i>	A costing multisectoral action plan is in place.

GOVERNANCE

2017 Joint Mission Recommendations

Progress Update

Develop an NCD investment case to better understand the burden of NCDs on the national economy and further advocate for increased finance for NCD prevention and control.

Ongoing.

Realign funding distribution to focus on NCD prevention as a cost-saving mechanism, thus resulting in long-term savings on primary, secondary and tertiary care in relation to NCDs.

No update available.

Ensure NCD prevention and control and universal health coverage are embedded into the health service reform.

Ongoing.

PREVENTION AND REDUCTION OF RISK FACTORS

TOBACCO

2017 Joint Mission Recommendations

Progress Update

Fully implement WHO FCTC MPOWER package.

Yes, most MPOWER measures are fully implemented. Bahrain can strengthen implementation of MPOWER by a) expanding the ban on TAPS to include advertising at point of sales and internet sales of tobacco products, b) banning designated smoking areas, c) implementing plain packaging, which Bahrain is considering, and d) increasing taxes to at least 75% of the retail price of the most sold brand of cigarettes with an excise tax component of at least 70% (tax rate is currently at 64%).

Consider appropriate responses to emerging challenges, in line with international guidance and policy recommendations e.g. e-cigarettes and shisha.

Regulations of e-cigarettes are being considered. Shisha is regulated like other tobacco.

PREVENTION AND REDUCTION OF RISK FACTORS

Consider joining the WHO FCTC Protocol on Illicit Trade of Tobacco.

Under consideration by the cabinet.

Consider scaling up graphic health warnings and plain packaging.

Graphic health warnings are compliant with WHO FCTC Article 11 guidelines.

Scale up school and adolescent interventions for smoking prevention.

Bahrain started a new campaign for primary schools under the title Generations Without Smoking to increase the awareness of primary school students aged 10 about tobacco use hazards on health and to strengthen their life skills.

Bahrain increased the number of lectures to raise the awareness of adolescents about health risk behaviours such as smoking.

The Grown-Up Boys-Girls school programme covers part of the required life skills for adolescents. There is an ongoing collaboration with anti-tobacco clinic groups.

Bahrain conducts a periodic school screening programme for school students in middle and high school for early detection and successful intervention. The programme contains an education component with eight modules about health risk behaviours.

NUTRITION

2017 Joint Mission Recommendations

Progress Update

Salt: continue gradual reduction in the main food products.

Bahrain has so far reduced the salt content in breads by 5% and with a further target of 10 and 30% in the future. If the initiative on bread is effective, the Ministry of Health plans to extend this to cheese producers.

Sugar: introduce taxes on sugary sweetened beverages, remove subsidies.

The government has imposed a 50% tax on carbonated high-calorie drinks and 100% on energy drinks. The GCC is considering how to design and implement a tax on SSBs (e.g. UK tax on sugar content).

PREVENTION AND REDUCTION OF RISK FACTORS

NUTRITION

2017 Joint Mission Recommendations

Trans fatty acids: finalize national strategy on trans fats, including guidance for food industry.

Progress Update

The MOH is implementing a voluntary programme to reduce/remove trans fats (three of the six main bakeries in the country volunteered). MOH to use this experience to advance legislation on trans fats, following WHO guidance.

The MOH has published guidelines for restaurants and have done workshops for bakeries on replacement techniques.

The MOH is establishing a monitoring system where around 50 samples are taken per month from bakeries and analysed for salt and fat content. The monitoring first took place in 2019 and will inform a broader initiative to increase nutrition labelling of foods.

The minister of Industry, Commerce and Tourism established a technical regulation on trans fats in 2016 which determined the maximum level of trans fats in foods and labelling criteria.

Consider legislative action on TV and radio advertizing of unhealthy food and drink products.

As per articles (16) and (17) in the child law no. (37) of 2012, the advertizing of unhealthy food and drink products to children is prohibited.

PHYSICAL ACTIVITY

Accelerate physical activity and sports promotion, mainly through media.

Bahrain conducts a half-day sports day every February. The initiative Istijaba aims to increase investments into the sports sector and form a committee for the development of the youth and sports sectors. There is political encouragement and national-level showcasing and acknowledgment of competitive sports and achievements, including ironman participation (long distance triathlon) and a national women's football team. MOH social media accounts promote healthy lifestyles and physical activity.

PREVENTION AND REDUCTION OF RISK FACTORS

PHYSICAL ACTIVITY

2017 Joint Mission Recommendations

Integration of physical activities and sport in the relevant various settings (schools, work places, social centres and other natural community gathering areas).

Progress Update

The Ministry of Youth and Sports is running campaigns to educate youth on healthy behaviours through their broader engagement in sports, e.g. marathons, and organizing national sports days to increase physical activity among both youth and adults.

A number of park areas and walking paths have been developed throughout the country.

Since 2005, MOH and MOE have led a health-promoting schools programme, including 1km walks for the students, the development of indoor sports facilities in many schools, and teaching about the importance of being physically active.

Some companies have weight-loss and other health-promoting programmes (e.g. at Bahrain Petroleum). The Healthy Workplaces project is one of the initiatives of the Health Promotion Directorate. The participating workplaces work in collaboration with the Health Promotion Directorate to fulfil the project standards and requirements which are mainly related to physical activity, healthy nutrition, tobacco control, mental health and occupational health.

Expand and multiply healthy settings projects (healthy cities, healthy malls, etc.).

Healthy malls initiative expanded from 15 last year to 26 healthy malls certified in 2019. Bahrain is pursuing healthy city certification for cities in all governorates. Um-alhassam received certification in November 2018 and Manama is ready for the final evaluation by WHO.

Share findings from School Health Programme with other GCC countries.

PREVENTION AND REDUCTION OF RISK FACTORS

ENVIRONMENT

2017 Joint Mission Recommendations

Integrate environment as a pillar into planning to improve the quality of life and achieve healthy, resilient cities.

Progress Update

Ongoing proposal for a comprehensive national action plan for the environment. There is a mandatory environmental impact assessment for new construction projects.

Consider engaging the community, civil societies, media and other stakeholders with targeted campaigns and programmes to change consumers' consumption habits towards more sustainable options.

Bahrain celebrates National Environment Day with public events.

SURVEILLANCE, MONITORING AND EVALUATION

2017 Joint Mission Recommendations

Conduct and finalize STEPS survey by the end of 2017 to ensure that Bahrain can report on all the NCD targets and indicators.

Progress Update

Bahrain conducted a DHS survey in 2018, which includes the STEPS questionnaire.

Consider undertaking a nationally representative 24-hour urine study by the end of 2017.

No update available.

Strengthen civil registration and vital statistics in order to improve the quality of its mortality data.

Ongoing.

Align national NCD-related targets and indicators with emerging global and regional commitments in the area of sustainable development.

Ongoing.

SURVEILLANCE, MONITORING AND EVALUATION

2017 Joint Mission Recommendations

Expand achievements of the integrated healthcare IT system i-Seha, through centralized analysis of all primary, secondary and tertiary care data, for quality assurance, monitoring and evaluation of NCD diagnosis and treatment.

Progress Update

A new system has been developed, which will be launched early 2020. The new IT system will expand the patient medical database to include private medical centres, and it will track all claims by doctors and payments made under the health insurance system, be accessible to all doctors in Bahrain, and include a Drug Utilization Review System which digitally tracks drugs from origin to patient. The system enables clinicians in any facility to access and update patient medical records, and is expected to positively impact on referrals, patient recall and continuity of care. It also allows for monitoring costs and the quality of services centrally. New indicators can be added electronically through the new system.

Scale up NCD-related research by Bahraini academia through provision of grant funding and international recognition of academic achievements.

Work in progress and ongoing.

HEALTHCARE

2017 Joint Mission Recommendations

Consolidate NCD and mental health integration in primary healthcare, ensuring that sufficient supply is available to meet population-level service demand.

Progress Update

Bahrain integrated school mental health clinics (6- to 18-year-olds) in two health centres as a central clinic that receives referrals from all the governorates. Utilization of the mental health clinics has increased, from 1,054 in 2017 to 1,364 in 2019.

There is a training programme for family physicians to provide mental health services in health centers.

There are four regional clinics, one in each governorate, covered by a psychiatrist. The number of referrals to adult mental health clinics has increased.

Bahrain has updated its guidelines for mental health. Mental health clinics in primary care serve all the health centres.

Align national efforts on cancer with new emerging regional WHO guidance on cancer prevention and control.

Work is in progress to issue a ministerial act on assigning a working committee on the framework for action on cancer control in the WHO Eastern Mediterranean region.

HEALTHCARE

2017 Joint Mission Recommendations

Focus on cancer early diagnosis, which is a more effective and cost-effective method of early detection than population-level screening programmes.

To carefully review the breast screening programme by the Ministry of Health, to ensure it is in line with current WHO recommendations in terms of screening test and population age range, as outlined in the WHO Eastern Mediterranean region's policy statements on early detection of cancer.

Scale up community approaches for early CVD diagnosis, such as the Protect Your Heart Campaign, scaling up cardiovascular risk stratification and management at a primary healthcare level, using WHO tools such as those recently developed by the WHO Global Hearts initiative.

Utilize the systematic (call/recall) approach for early detection of NCDs such as hypertension and diabetes through the primary healthcare centres, and consider systematic risk stratification for early detection of CVDs.

Develop pathways and lifestyle interventions for pre-diabetic patients and scale up referral pathways for diabetic patients to ensure a high uptake rate at diabetes clinics and reduce admissions.

Progress Update

The Choose your Doctor project is implemented in local health centres in primary healthcare for the early detection of cancer with special performance indicators that are measured yearly to assess the progress in the detection rate especially for breast cancer, colon cancer and prostate cancer.

In collaboration with King Hamad University Hospital, there is a new early detection program for colon cancer.

Work is in progress to update breast screening guidelines to be in line with WHO recommendations. There is a well-established breast screening programme in primary care, and in collaboration with secondary care.

Ongoing campaigns support the new Choose your Doctor project in local health centres for early detection of CVD risk factors.

The Choose your Doctor project is a newly implemented project in local health centres for early detection of CVD risk factors.

NCD services are available in all LHCs and provided by qualified family physicians, where national guidelines are applied. CVD risk is estimated and communicated to the patients and they are treated accordingly.

There are well-established central diabetic clinics in all health centres managed by diabetes specialists and specialized nurses.

Management guidelines for patients with diabetes in primary health care are developed and updated every four years.

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