

# Brunei Darussalam National Multisectoral Action Plan for the Prevention and Control of Noncommunicable Diseases (BruMAP-NCD) 2013–2018



*JOINT EVALUATION*



**World Health  
Organization**

Representative Office  
for Malaysia, Brunei Darussalam,  
and Singapore



کمنتريڠ کصیحتن  
**KEMENTERIAN KESIHATAN  
MINISTRY OF HEALTH**



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KEMENTERIAN KESIHATAN  
MINISTRY OF HEALTH**

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# ABBREVIATIONS

<b>BMI</b>	body mass index
<b>BNSRC</b>	Brunei Neuroscience, Stroke and Rehabilitation Centre
<b>BP</b>	blood pressure
<b>BruHIMS</b>	Brunei Healthcare and Information Management System
<b>BruMAP-NCD</b>	Brunei National Multisectoral Action Plan for the Prevention and Control and Control of Noncommunicable Diseases 2013–2018
<b>CVD</b>	cardiovascular disease
<b>DBP</b>	diastolic blood pressure
<b>DM</b>	diabetes mellitus
<b>EDCP</b>	Early Detection and the Cancer Prevention
<b>ECG</b>	electrocardiogram
<b>FIT</b>	faecal immunochemical test
<b>GJPMC</b>	Gleneagles Jerudong Park Medical Centre
<b>GSHS</b>	Global School-based Student Health Survey
<b>GYTS</b>	Global Youth Tobacco Survey
<b>HC</b>	health centre
<b>HIB</b>	Health Information Booklet
<b>KAP</b>	knowledge, attitudes and practices
<b>KAPSNCD</b>	Knowledge, Attitudes and Practices Survey on NCDs
<b>MAP</b>	multisectoral action plan
<b>MSTFH</b>	Multisectoral Task Force for Health
<b>NCD</b>	noncommunicable disease
<b>NHANSS</b>	Second National Health and Nutritional Status Survey
<b>NHSP</b>	National Health Screening Programme
<b>NNSS</b>	National Nutritional Status Survey
<b>PEN</b>	Package of Essential Noncommunicable Disease Interventions
<b>PCI</b>	percutaneous coronary intervention
<b>PJSC</b>	Pantai Jerudong Specialist Centre
<b>RIPAS</b>	Raja Isteri Pengiran Anak Saleha
<b>SARA</b>	Service Availability and Readiness Assessment
<b>SBP</b>	systolic blood pressure
<b>SD</b>	standard deviation
<b>SOP</b>	standard operating procedure
<b>SSB</b>	sugar-sweetened beverages
<b>STEPS</b>	STEPwise Approach to Surveillance
<b>TBCC</b>	The Brunei Cancer Centre
<b>WHO</b>	World Health Organization



# EXECUTIVE SUMMARY

Brunei Darussalam demonstrated a strong commitment to preventing and controlling non-communicable diseases (NCDs) while implementing the *Brunei National Multisectoral Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2018* (BruMAP-NCD). In pursuit of its goal to reduce premature mortality from NCDs by 18% between 2012 and 2018 (i.e. “18 by 18”), the country took several significant steps to reduce the practice of unhealthy behaviours and to improve primary health care and NCD management. Some of the more notable achievements included a powerful policy response to restricting tobacco, the effective promotion of physical activity participation by Bruneians, a tax on sugar-sweetened beverages (SSBs), consistently high availability of essential medicines and basic equipment, excellent emergency hospital-based care, and the adoption of a “one patient, one record” electronic patient record. Furthermore, in 2019, the Government accelerated initiatives to screen for cardiovascular risk factors, diabetes, breast cancer and colorectal cancer. Additionally, policy-makers have nurtured a strong culture of collaboration across the health sector and have created efficiencies with regard to multisectoral policy engagement.

Although overall premature mortality from NCDs appears to have peaked, the country’s goal of “18 by 18” has not yet been achieved. Cardiovascular diseases (including diabetes) are responsible for a substantial and rising proportion of mortality, and diet-related risk factors have worsened. This is partly due to the long time-horizon over which population health outcomes respond to policies that prevent, screen for, manage and treat NCDs and/or their risk factors, as well as a number of challenges in achieving full implementation of BruMAP-NCD as planned.

This joint evaluation identified several opportunities that would more effectively prevent and control NCDs:

- ◇ Adopt a multi-country response to the illicit trade of tobacco to Brunei Darussalam.
- ◇ Disincentivize adolescent uptake of tobacco use and vaping, and strengthen the effectiveness of tobacco cessation services across the country.
- ◇ Systematically alter policies and regulations related to food environments such that the consumption of healthy food is incentivized over less healthy alternatives.
- ◇ Create environments that are more conducive to physical activity participation, particularly by encouraging greater engagement in “incidental activity” by the population, and supporting regulated environments to facilitate more opportunities to exercise.
- ◇ Scale up and integrate the national screening programmes into a single person-centric programme, with multiple convenient and opportunistic entry points, and streamlined processes for both the individuals who undergo screening and the health screening workers.
- ◇ Unify the cardiovascular pathway for screening and effective outpatient management.
- ◇ Build on and strengthen the Brunei Healthcare and Information Management System (BruHIMS) by expanding coverage and enhancing functionality, thus reducing health worker time and effort.
- ◇ Build on task-shifting by strengthening nurse-led clinics.



# 1. INTRODUCTION

## to Brunei Darussalam National Multisectoral Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2018 (BruMAP-NCD)

Brunei Darussalam’s *Wawasan Brunei 2035* identifies health improvement as a key priority for the Government.<sup>1</sup> Furthermore, the prevention and control of noncommunicable diseases (NCDs) is a leading priority in the country’s *Strategic Plan for Health (2019–2023) (1)*, under the vision “Together Towards a Healthy Nation”. The Plan’s strategic goals include “noncommunicable diseases are prevented, treated, managed, and their risk factors controlled” and “improved human capital that contributes to knowledge and health of the population”. The Plan calls for increased stewardship and leadership for NCDs, and strengthened multisectoral collaboration to reduce modifiable risk factors and address underlying social determinants of NCDs. It calls on the country to adopt stronger monitoring, evaluation and research strategies, to scale up effective NCD screening and treatment, and to support self-care. The Plan outlines ways that Brunei Darussalam will improve the food environment and conduct communication campaigns that promote better dietary practices. Healthy schools and workplaces are identified as key settings in which to promote physical activity, offer healthier food choices and reduce tobacco exposure (Figure 1).

**Figure 1. BruMAP-NCD framework**



Source: BruMAP-NCD (2).

1. *Wawasan Brunei 2035*, or Brunei Vision 2035, is available at: <http://www.pmo.gov.bn/SitePages/Vision,%20Mission%20and%20Strategy.aspx>.

The *Brunei Darussalam National Multisectoral Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2018* (BruMAP-NCD) (2) was adopted in 2012 under the auspices of the National NCD Prevention and Control Strategic Planning Committee. BruMAP-NCD sets an ambitious target of an 18% relative reduction in premature mortality from NCDs by 2018 (i.e. “18 by 18”).

BruMAP-NCD outlines detailed strategies to reduce modifiable risk factors in Brunei Darussalam (e.g. smoking, unhealthy diets, insufficient physical activity and obesity) and prioritizes identification and management of the four leading NCDs (i.e. cardiovascular diseases, cancers, diabetes and chronic respiratory diseases). It outlines a comprehensive range of activities (summarized in Table 1), as well as a complementary research agenda to inform actions to prevent and control NCDs.

**Table 1. Overview of BruMAP-NCD strategies**

<b>OBJECTIVE 1</b>	<b>To reduce tobacco use</b>
ACTIVITIES	<ul style="list-style-type: none"> <li>» Tobacco-free mass media campaign and evaluation</li> <li>» KAP survey on tobacco prevalence, awareness and tobacco dependence treatment</li> <li>» Scale up of smoking cessation services</li> <li>» Environmental surveillance by enforcement unit</li> <li>» KAP survey on the increased size of pictorial health warnings on smokers quit rate</li> <li>» Surveillance of smoke-free public places</li> </ul>
<b>OBJECTIVE 2</b>	<b>To promote balanced, healthy diet</b>
ACTIVITIES	<ul style="list-style-type: none"> <li>» Mass media campaigns on healthy diet and evaluation</li> <li>» School canteen survey</li> </ul>
<b>OBJECTIVE 3</b>	<b>To increase physical activity</b>
ACTIVITIES	<ul style="list-style-type: none"> <li>» KAP surveys of employers on workplace physical activity initiative</li> <li>» Evaluation of pedometer use</li> </ul>
<b>OBJECTIVE 4</b>	<b>To identify people at risk of NCDs and manage effectively</b>
ACTIVITIES	<ul style="list-style-type: none"> <li>» Early identification and management of individuals at risk of key NCDs through national screening initiatives</li> <li>» Strengthening of national smoking cessation initiatives</li> <li>» Strengthening of CVD risk identification and management based on the WHO PEN Protocol</li> <li>» Strengthening of screening and management guidelines and standard operating procedures (SOPs) of key NCDs, including common cancers</li> </ul>
<b>OBJECTIVE 5</b>	<b>To improve the quality of care and outcome of NCD management</b>
ACTIVITIES	<ul style="list-style-type: none"> <li>» SARA survey on the availability of essential medicines, equipment and SOPs for NCD management</li> <li>» Audit of adherence to the use of SOPs and clinical guidelines including the WHO Package of Essential Noncommunicable Disease Interventions (PEN) protocol</li> <li>» Audit of rehabilitative and palliative care services</li> <li>» Health facility surveys</li> </ul>

CVD, cardiovascular disease; KAP, knowledge, attitudes and practices; NCD, noncommunicable disease; PEN, Package of Essential Noncommunicable Disease Interventions; SARA, Service Availability and Readiness Assessment; SOP, standard operating procedure; WHO, World Health Organization

Source: BruMAP-NCD (2).

BruMAP-NCD specified that it would be implemented under the auspices of the Deputy Permanent Secretary (Professional) as chairperson of the National NCD Prevention and Control Strategic Planning Committee at the Ministry of Health, with oversight by existing multisectoral mechanisms, including the National Committee on Health Promotion and the National Tobacco Control Committee. Recognizing that NCD risk factors are mostly influenced by sectors outside of health, BruMAP-NCD identified specific roles and contributions from a range of stakeholder groups.

BruMAP-NCD has reached the end of its original time frame. Policy leaders initiated this evaluation process in preparation for the next phase of national NCD prevention and control. Achievements and lessons from this evaluation process can then be applied to the development of BruMAP 2.0 (2020–2025) and contribute to the Government of Brunei Darussalam’s 2035 vision of “Together Towards a Healthy Nation”.

Adopting technically sound policies and programmes to address NCDs is essential, but operationalizing them is a complex and ongoing process. Adopting policy approaches into systems, and maintaining the political, resourcing and technical commitments required to achieve the intended outcomes is challenging (3–5). Policy officers and implementers may struggle to translate political commitment into concrete plans and activities, constrained by systemic and organizational capacity issues. The implementation of NCD prevention policies requires the commitment and mobilization of most other government sectors and a wide range of stakeholders and communities. These groups of people may face competing priorities and interests. They may have limited capacity (e.g. resources, knowledge and skills) to implement and sustain policy strategies.

The purpose of this evaluation is to assess progress against national NCD targets, and to inform policy-makers of the factors affecting sustained policy activity. This information will be valuable for improving policy design and adherence for NCD prevention and control in the future.

## 2. THE BruMAP JOINT EVALUATION

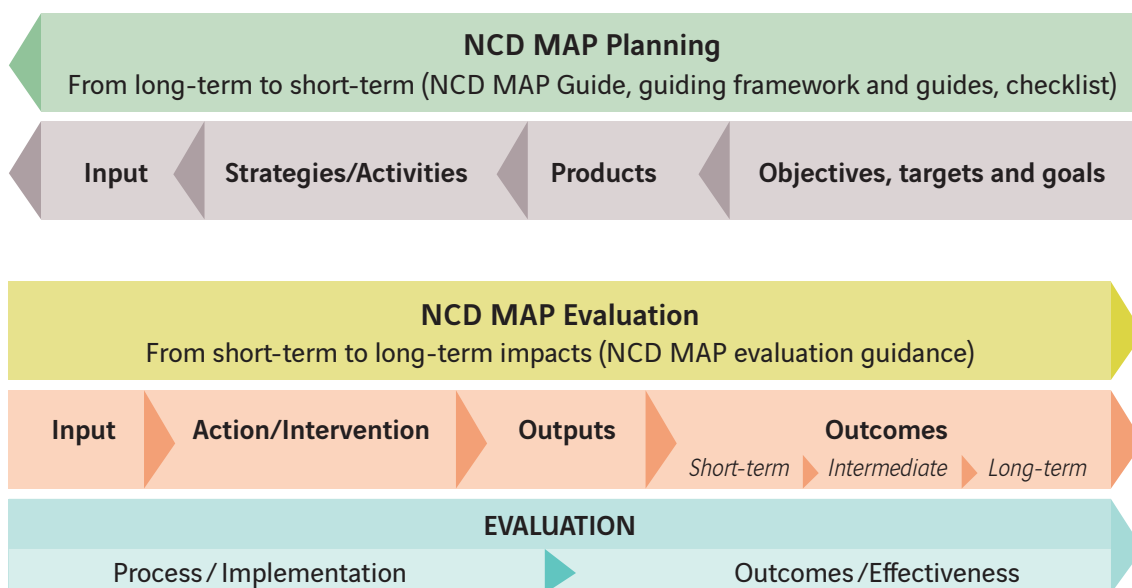
### 2.1 Methodology

This joint evaluation was conducted in collaboration by the World Health Organization (WHO), the Ministry of Health of Brunei Darussalam, Deakin University’s Institute for Health Transformation, and an independent medical consultant. The process involved substantial communication, collaboration and information sharing between all partners over a nine-month period between August 2019 and April 2020.

The comprehensive monitoring and evaluation framework outlined in BruMAP-NCD formed the basis of the evaluation process. The evaluation process was aligned to WHO’s NCD MAP framework (Figure 2), which encouraged examination of the way in which policy processes are executed to achieve desired objectives, and the impacts and outcomes associated with those, specifically:

- > the status of NCDs and associated major risk factors in Brunei Darussalam;
- > the activities carried out in order to achieve the objectives, including how they were executed, and the way in which different stakeholders were supported or incentivized to engage in the process; and
- > the outcomes that can be measured in order to evaluate impact (e.g. policy, behavioural and health-related targets).

Figure 2. WHO’s framework for NCD multisectoral action plan (MAP) planning and evaluation



MAP, multisectoral action plan; NCD, noncommunicable disease

Source: <https://apps.who.int/nmh/ncd-map-toolkit/evaluating/tool-framework.html>.

The evaluation process began with a desk review of published surveys and reports to summarize the available evidence related to NCD risk factors and NCD health and treatment outcomes (September–November 2019). Key data sources included reports of the Second National Health and Nutritional Status Survey (NHANSS) of Brunei Darussalam conducted in 2010–2011.

The Phase 1 report outlined the health and nutrition statuses of children aged 0–5 years (NHANSS 2013), and the Phase 2 report detailed outcomes related to children and adults aged 5–75 years (NHANSS 2014). Another important data source was the STEPwise Approach to Surveillance (STEPS) Population Survey of Noncommunicable Diseases and Risk Factors in Brunei Darussalam conducted in 2015–2016 (STEPS 2016) (6). Though the STEPS 2016 presented weighted prevalence and the NHANSS 2014 reported crude prevalence, both surveys adopted multistage sampling methodologies to obtain population-representative sample groups.

The review also drew heavily on health administrative data, including mortality data from the Brunei Healthcare and Information Management System (BruHIMS), as collated into annual Health Information Booklets (HIB) (7).

The desk review also included a policy analysis that sought information on policy prioritization, implementation progress and leading influences on policy effectiveness. Key sources of information included reports generated by the Ministry of Health, the Health Promotion Centre, academic institutions and other implementing partners, as well as records from several years' worth of committee meetings focused on health promotion and NCDs.

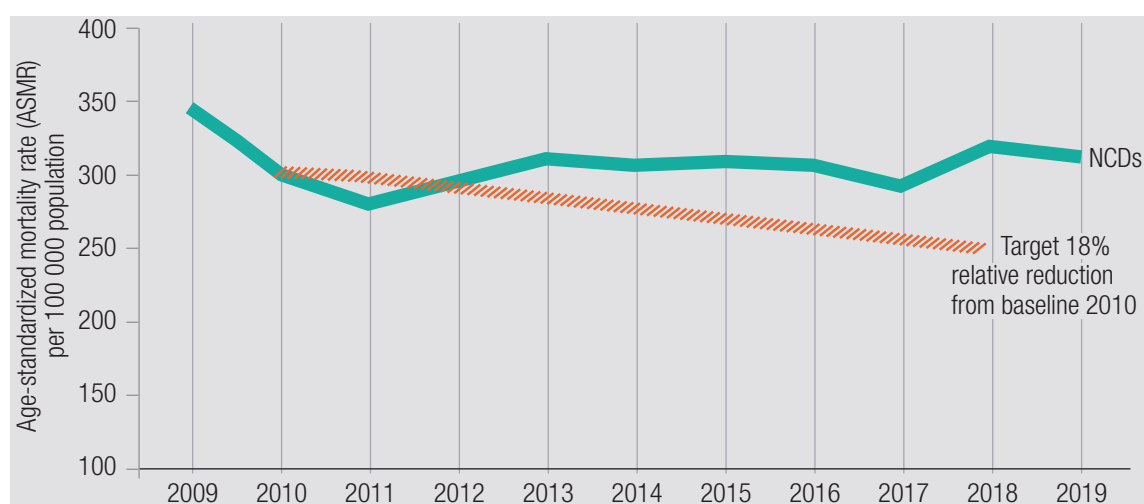
The second stage of the evaluation process was conducted in Brunei Darussalam on 18–23 November 2019. This process involved cross-sectoral consultations, meetings and presentations with technical teams from the Health Promotion Centre and the Ministry of Health, and site visits to clinics, hospitals and health promotions sites. The consultation process engaged more than 100 interviewees from across the health sector and several key non-health sectors (see Consultation list, Annex 2).

## 3. THE STATUS OF NCDs IN BRUNEI DARUSSALAM

### 3.1 Premature mortality from NCDs

Data generated from the HIB 2017 suggest that between 2011 and 2018 the probability of premature deaths from NCDs may have peaked in 2013, and then begun to plateau (7). However, the total age-standardized premature mortality rate from NCDs such as cancer, cardiovascular diseases and diabetes mellitus (DM) did not decrease overall in that time (Figure 4), suggesting that Brunei Darussalam’s target of “18 by 18” has not yet been realized.

**Figure 3.** Progress towards the “18 by 18” goal



Sources: HIB 2017 (revised January 2019) (7), correspondence with Ministry of Health officials, and authors’ calculations for the “18 by 18” goal.

**Table 2.** Age-standardized premature mortality rate per 100 000 population (aged 30–69 years) for NCDs, 2011–2017

	Mortality rate (deaths per 100 000 population)						
	2011	2012	2013	2014	2015	2016	2017
<b>Male</b>	302.3	323.4	330.1	347.8	319.8	367.7	334.1
<b>Female</b>	260.9	266.2	293.1	264.9	303.2	254.2	262.3
<b>Total</b>	<b>281.3</b>	<b>295.3</b>	<b>312.1</b>	<b>307.4</b>	<b>311.7</b>	<b>307.4</b>	<b>296.3</b>

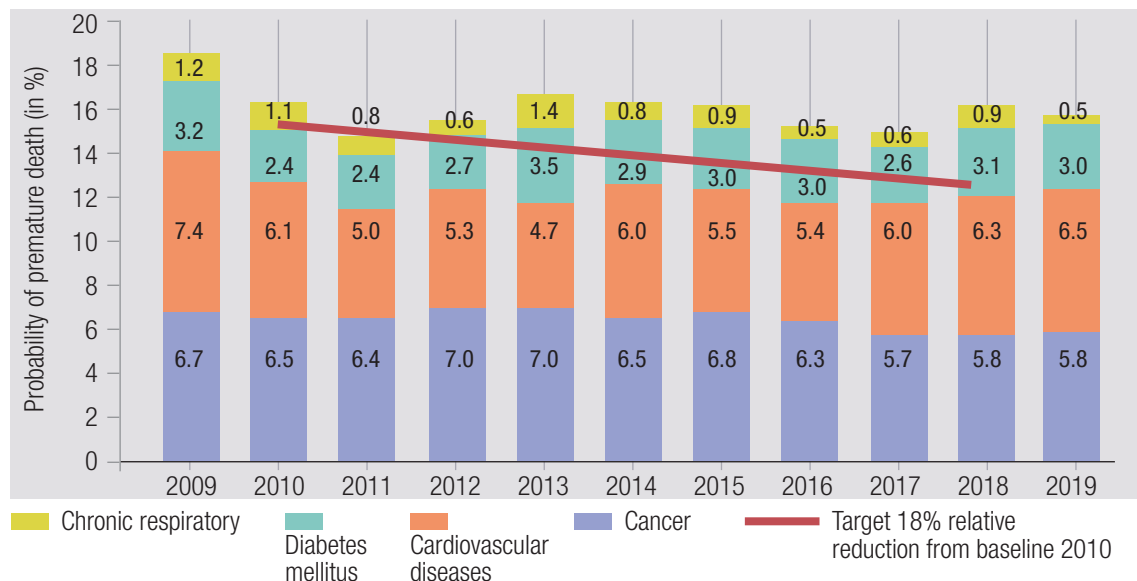
Source: HIB 2017 (revised January 2019) (7).

Women in Brunei Darussalam are less likely to die prematurely from NCDs than men, a gap that has been widening over time.



According to the HIB 2017, cardiovascular diseases were responsible for the greatest share of age-standardized premature mortality from NCDs in 2017, followed by cancer (Figure 4) (7). Diabetes is a major risk factor for cardiovascular disease. Mortality attributable to cardiovascular diseases and diabetes between 2011 and 2017 increased from 145 to 174 per 100 000 population, indicating a relative increase of 20% over just six years, and offsetting a decline from overall age-standardized mortality from cancers.

**Figure 4.** Age-standardized premature mortality from NCDs, by cause of death



Sources: HIB 2017 (revised January 2019) (7), correspondence with Ministry of Health officials, and authors' calculations for the "10% reduction by 2018" target.

There are concerns that the increase in premature deaths due to cardiovascular diseases and diabetes may be a result of "competing risks" of death (e.g. premature mortality due to cardiovascular diseases or diabetes before cancer could fully manifest). The same competing risks may also account for the decline in age-standardized premature deaths from chronic respiratory disease – from 15 per 100 000 in 2011 to 11 per 100 000 in 2017 (7).

## 3.2 NCD risk factors in Brunei Darussalam: trends and concerns

### Overweight and obesity in adults

Overweight and obesity is a key health risk to the population of Brunei Darussalam. The NHANSS 2014 found that more than one third (33.4%) of adults (aged 18–75 years) were overweight, with a body mass index (BMI) of 25–29.9 kg/m<sup>2</sup>, while a further 27.1% were obese (BMI > 30 kg/m<sup>2</sup>), totalling 60.5% of the population (Table 3) (8). Prevalence of overweight was higher in males, while obesity was more prevalent in females. Those experiencing the greatest risk of overweight and obesity were in the 50- to 59-years age group.

**Table 3. Proportion of overweight and obesity among adults (aged 18–75 years)**

BMI category	Male	Female	Total
Percentage overweight or obese (%) BMI > 25 kg/m <sup>2</sup>	61.6	59.8	60.5
Percentage obese (%) BMI > 30 kg/m <sup>2</sup>	27.1	27.3	27.1

Source: NHANSS 2014 (8).

In comparison, the STEPS 2016 reported a prevalence of 62.8% overweight and obesity in adulthood (18–69 years of age) (6). Consistent with the NHANSS 2014, prevalence of overweight was higher in males, while obesity was more prevalent in females (Table 4).

**Table 4. Proportion of overweight and obesity among adults (aged 18–69 years)**

BMI category	Male	Female	Total
Percentage overweight or obese (%) BMI > 25 kg/m <sup>2</sup>	63.2	62.5	62.8
Percentage obese (%) BMI > 30 kg/m <sup>2</sup>	26.9	29.5	28.2

Source: STEPS 2016 (6).

## Overweight and obesity in children

Overweight and obesity in childhood is of significant concern because of the levels at which poor behavioural habits are carried through to adulthood, and the increased NCD risk experienced throughout the life cycle. At the time of NHANSS Phase 1 (2013), around one third of Bruneian children (5–19 years) were classified as overweight or obese (33.5%), and children aged 10–14 years were at the highest risk (41.6%) (Table 5) (9). Male children were much more likely to suffer from overweight and obesity (37.2%) than female children (29.9%).

**Table 5. Anthropometric measurements among children aged 5–19 years**

Indicator	Nutritional status	Age (years)	Male (%)	Female (%)	Total (%)
<b>BMI-for-age &gt; +1 standard deviation (SD)</b>					
Overweight		5–9	30.5	26.3	28.3
		10–14	46.9	35.2	41.6
		15–19	32.0	29.1	30.4
		<b>Total</b>	<b>37.2</b>	<b>29.9</b>	<b>33.5</b>
<b>BMI-for-age &gt; +2 standard deviation (SD)</b>					
Obese		5–9	19.5	12.4	15.8
		10–14	28.9	17.1	23.6
		15–19	16.0	12.8	14.3
		<b>Total</b>	<b>22.4</b>	<b>14.0</b>	<b>18.2</b>

Source: NHANSS Phase 1, 2013 (9).

Anthropometric data collected from routine school-based BMI surveillance suggest that rates of overweight and obesity in schoolchildren have been fairly consistent over an eight-year period (2011–2018) (Table 6).

**Table 6. School population anthropometric status, 2011–2018**

Year	Number of students	Overweight (%)	Obese (%)
2011	29 586	11.8	17.4
2012	34 135	11.7	16.1
2013	28 041	13.3	16.9
2014	27 239	14.4	17.1
2015	27 071	14.8	18.0
2016	26 684	15.2	19.4
2017	18 583	13.9	18.9
2018	19 961	14.3	18.2

Source: Annual report on school health services provided to authors, classification unknown.

### Hypertension in adults

According to the NHANSS 2014, around one third (33.8%) of adults aged 20–75 years had hypertension. Hypertension was more prevalent in males (36.5%) than in females (31.6%), and prevalence increased with age, affecting 84.5% of adults aged over 60 years (Table 7) (8).

The STEPS 2016 found hypertension to be prevalent in 28% of adults (aged 18–69 years), with men carrying a significantly higher risk of hypertension than females (Table 8). Of concern, close to half (48.9%) of all respondents found with high blood pressure were not currently being managed for it (6).

**Table 7. Hypertension in adults (aged 20–75 years)**

Blood pressure status	20–29 years	30–39 years	40–49 years	50–59 years	60–75 years	All ages (20+)
Percentage (%) with raised BP (SBP $\geq$ 140 and/or DBP $\geq$ 90 mmHg) OR currently on medication for raised BP	11.5	25.7	43.3	68.9	84.7	33.8

BP, blood pressure; DBP, diastolic blood pressure; SBP, systolic blood pressure – Source: NHANSS 2014 (8).

**Table 8. Hypertension in adults (aged 18–69 years)**

Blood pressure status	Male	Female	Both sexes
Percentage (%) with raised BP (SBP $\geq$ 140 and/or DBP $\geq$ 90 mmHg) OR currently on medication for raised BP	30.2	25.8	28.0
Percentage (%) with raised BP (SBP $\geq$ 140 and/or DBP $\geq$ 90 mmHg) who are NOT currently on medication for raised BP	58.7	37.6	48.9

BP, blood pressure; DBP, diastolic blood pressure; SBP, systolic blood pressure – Source: STEPS 2016 (6).

Though the NHANSS 2014 and STEPS 2016 surveys are not directly comparable, the trend between them suggests that rates of hypertension may be reducing over time in Brunei Darussalam, which is a significant achievement.

## Hypercholesterolaemia in adults

The NHANSS 2014 found that 40.5% of Bruneian adults had elevated cholesterol levels, a rate that was slightly higher in males (41.8%) than in females (39.5%) (8). The STEPS 2016 found that over half of the adult population had elevated cholesterol levels (51.3%) (Table 9). Though these surveys are not directly comparable, their consistency across other indicators suggests that hypercholesterolaemia may have climbed significantly over a five-year period.

**Table 9. Elevated cholesterol in adults**

<b>Blood cholesterol</b>	<b>Male</b>	<b>Female</b>	<b>Both sexes</b>
<b>Percentage (%) of adults aged 18–69 years with raised total cholesterol</b> ( $\geq 5.0$ mmol/L or $\geq 190$ mg/dl) OR currently on medication for raised cholesterol	51.6	51.0	51.3

Source: STEPS 2016 (6).

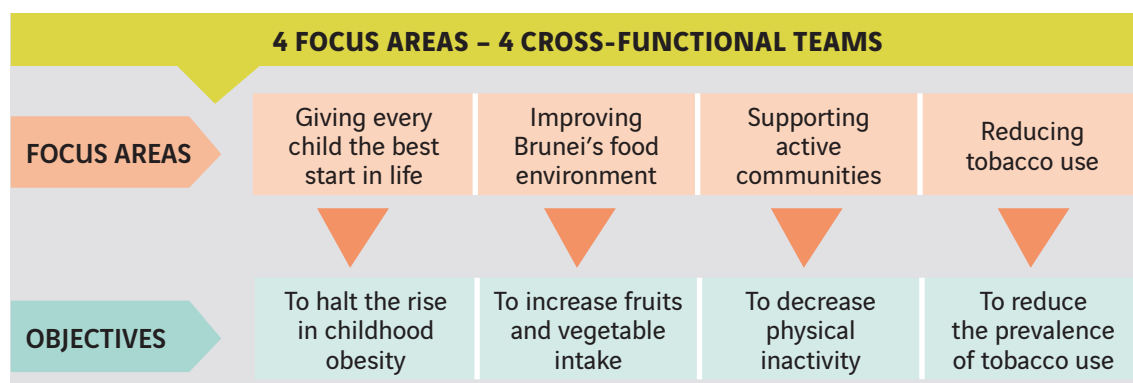
# 4. GOVERNANCE AND COORDINATION IN BRUNEI DARUSSALAM

## 4.1 Governance and coordination for BruMAP-NCD

BruMAP-NCD was developed in 2013 under the auspices of the National NCD Prevention and Control Strategic Planning Committee chaired by the Deputy Permanent Secretary of the Ministry of Health. A number of bilateral meetings and dialogues have been held with key active sectors, including the Ministry of Education, Ministry of Culture, Youth and Sports and the private sector. In order to strengthen the implementation of multisectoral collaboration, a high-level Multisectoral Task Force for Health (MSTFH) was established in 2017 to oversee a whole-of-government approach to significant health issues. It was initially set up in response to the Zika virus and has since adopted responsibility for the NCD response, in an effort to streamline multisectoral health governance. The MSTFH is chaired by the Minister for Health and comprises permanent secretaries and selected heads of departments from most government ministries. Its functions are:

1. to assess and ensure the appropriateness of community participation strategies in (relevant) health interventions;
2. to ensure effective communication between agencies and provide accurate information that is reliable and easily understood by the public;
3. to serve (members) as health champions or leaders in individual agencies, particularly, in relation to community involvement and communication; and
4. to provide strategic guidance to and support relevant national (health) action plans (such as BruMAP-NCD).

**Figure 5. High-level multisectoral health priorities by the MSTFH**

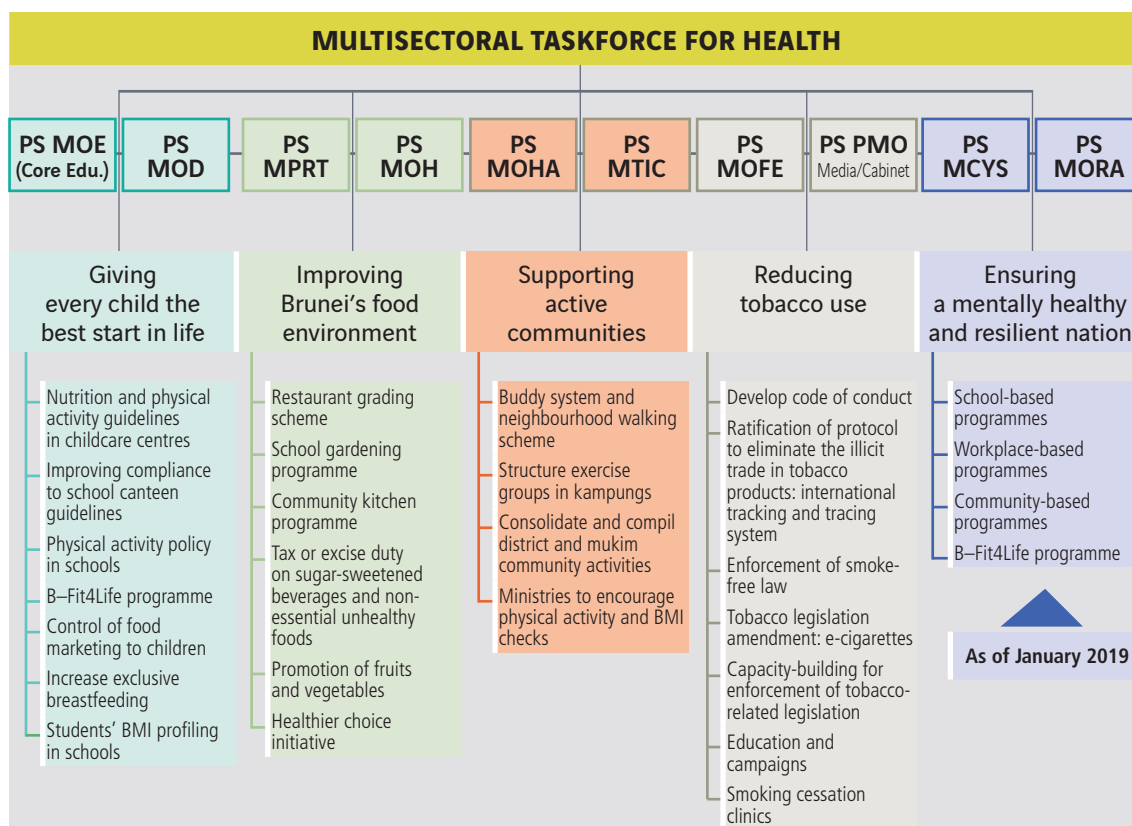


Source: MSTFH planning documents.

The MSTFH identified four key priority areas for shared policy action based on the requirement for strong multisectoral engagement (Figure 5). Among these functional areas are supporting active communities, reducing tobacco use, improving the food environment and giving every child the best start in life. Mental health was added as a fifth priority more recently (not pictured). Each functional area is supported by a policy officer, and co-chaired by leaders from relevant ministries.

Focal area leads provide progress updates at every MSTFH meeting to ensure accountability against their commitments, with a traffic-light dashboard used to report progress against a new set of priority policies. These focal areas are aligned to BruMAP’s original objectives and include a range of additional policies beyond those agreed in BruMAP-NCD (Figure 6).

Figure 6. Functional area priorities



PS, Permanent Secretary; MOE, Ministry of Education; MOD, Ministry of Development; MPRT, Ministry of Primary Resources and Tourism; MOH, Ministry of Health; MOHA, Ministry of Home Affairs; MTIC, Ministry of Transport and Infocommunications; MOFE, Ministry of Finance and Economy; PMO, Prime Minister's Office; MCYS, Ministry of Culture, Youth and Sports; MORA, Ministry of Religious Affairs

Source: MSTFH planning documents.

We reviewed records of multisectoral committees held to discuss NCDs since 2014. These records reflected a transition in 2017 towards more targeted, in-depth discussions centred on progress against each of the committed activities. This suggests that absorption of NCD prevention into the auspices of the MSTFH has elevated NCD prevention as a priority issue. The meetings appear to have been widely attended by high-level policy-makers from relevant sectors, and policy commitments were identified by the group at each meeting.

Though the MSTFH has created efficiencies with regard to policy engagement in multisectoral health issues, challenges remain in ensuring that policy leaders drive progress within their respective ministries. According to informants, commitment to NCD prevention and control by sectors other than health tended to be dependent on individual leaders. Additionally, the NCD strategy did not require that formal commitments be made by partner agencies, and they have not been held accountable to policy priorities. Lastly, the MSTFH has been inconsistent in both its membership and representation. For instance, permanent secretaries may send alternative representation when they cannot attend meetings, and a number of the ministries have experienced leadership turnover since the establishment of the MSTFH.

## **4.2 Opportunities**

There is an opportunity to establish a more comprehensive accountability mechanism that can be used as the basis for MSTFH meetings. The engagement of a high-level, cross-sectoral policy champion, such as the leader of a central agency (e.g. Prime Minister's Office), may help to drive action.

# 5. OBJECTIVE 1: TO REDUCE TOBACCO USE

## 5.1 Evidence of impact against BruMAP-NCD targets

### Public places are smoke-free

We did not find data directly correlated to this target; however, Brunei Darussalam has mandated that government buildings (e.g. offices, schools, health centres) and indoor and enclosed spaces (e.g. cinemas, retail environments, cars) be smoke-free.

There are indications that tobacco policy in Brunei Darussalam has been effective at disincentivizing the trade and retail sale of tobacco products. Between 2011 and 2014, applications for licences to import or retail tobacco (new and renewals) diminished until 2014, when there were no tobacco licences (Table 10).

**Table 10.** Reduction in tobacco licences in Brunei Darussalam, 2011–2014

Year	Type of licence	New	Renewal
2011	Retail	24	309
	Import and wholesale	0	6
2012	Retail	10	236
	Import and wholesale	1	2
2013	Retail	2	32
	Import and wholesale	0	1
2014	Retail	nil	nil
	Import and wholesale	nil	nil

Source: HIB 2013, and government stakeholders reported nil licences by 2014.

### Prevalence of tobacco use in adults (> 15 years) and young people

Smoking prevalence has remained relatively high in Brunei Darussalam despite the adoption of significant tobacco policy measures. According to a Knowledge, Attitudes and Practices Survey on NCDs (KAPSNC) (2015), 18% of the adult population were current smokers, with men (32.6%) being 14 times more likely to smoke than women (2.3%) (10). The STEPS 2016 reported a similar smoking prevalence rate for adults, with close to one fifth (19.9%) of the adult population (aged 18–69 years) recorded as current smokers (6). According to the STEPS 2016, men were close to 10 times more likely to smoke (36.3%) than women (3.7%), suggesting that the gender gap in smoking prevalence could be declining (Table 11).



**Table 11. Proportion of adult smokers in Brunei Darussalam**

	<b>NHANSS 2014</b> (conducted 2011–2012)	<b>KAPSNCD 2015</b> (conducted 2013)	<b>STEPS 2016</b> (conducted 2015–2016)
<b>Current smokers (% total)</b>	18.4	18.0	19.9
<b>Male (% total)</b>	35.5	32.6	36.3
<b>Female (% total)</b>	4.0	2.3	3.7

Source: NHANSS 2014 (8), KAPSNCD Survey 2015 (Tobacco Factsheet) (10) and STEPS 2016 (6).

Surveys have reported troubling high rates of tobacco use among Bruneian adolescents. In the Global Youth Tobacco Survey (GYTS) conducted in 2013 (11), close to one tenth of Bruneian students aged 13–15 years (10.2%) self-reported to be current tobacco users. This finding is consistent with that in the 2014 Global School-based Student Health Survey (GSHS): 9.8% of students aged 13–15 years used tobacco during the past 30 days (12). In both surveys, adolescent males were close to three times more likely than adolescent females to smoke (Table 12).

**Table 12. Tobacco use by young people in Brunei Darussalam**

<b>Global Youth Tobacco Survey 2013</b>			<b>Global School-based Student Health Survey 2014</b>								
<b>Youth</b>			<b>Students</b>								
<b>aged 13–15 years</b>			<b>aged 13–15 years</b>			<b>aged 16–17 years</b>			<b>aged 13–17 years</b>		
<i>Current tobacco users (in %)</i>											
Overall	Male	Female	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female
10.2	15.0	5.1	9.8	15.2	4.8	18.4	27.0	7.6	12.3	18.9	5.5

Source: GYTS 2014 (11) and GSHS 2015 (12).

Though the country does not yet have available results from the 2019 GYHS and GYTS surveys, there are suggestions that smoking prevalence in Brunei Darussalam is still significant. Most stakeholders we interviewed for this evaluation reported that they regularly see evidence of people smoking, particularly in parking lots, markets, stairwells and other discreet places.

## 5.2 Implementation of tobacco control interventions

Brunei Darussalam has taken a strong stance against tobacco. It ratified the WHO Framework Convention on Tobacco Control in 2004 and banned smoking in most public places. Most notably, the country incrementally increased tobacco excise taxes until the price had reached 200%. Increases in tobacco licencing fees, in conjunction with excise taxes, led to the discontinuation of licencing applications by tobacco importers and retailers. Plans to adopt plain packaging were abandoned because tobacco production and imports ceased, but it can be reconsidered should this ever change.

A twofold increase in the number of offences being reported against Tobacco Order 2005 between 2011 and 2017 (from 219 to 532 offences) correlated with increased efforts by the Health Enforcement Unit at the Ministry of Health to enforce Tobacco Order 2005 (Table 13) (7).

**Table 13. Number of offences recorded against Tobacco Order 2005**

Year	Compound fines issued	Stern warning issued	Required to attend smoking cessation clinic	Cases transferred to Customs and Excise Department	Total number of offences	Number of offenders recorded
2011	177	40	0	3	219	216
2012	191	0	3	–	198	197
2013	306	9	14	–	329	322
2014	243	2	32	–	277	277
2015	325	1	50	–	376	375
2016	407	2	42	–	451	448
2017	437	1	95	–	532	525

Source: HIB 2017 (revised January 2019) (7).

The Government has significantly increased penalties for noncompliance with tobacco policies. For illegal imports, financial penalties for offences are now set at between eight and 30 times the duties that would have otherwise been payable (depending on the scale of the operation). Those caught smuggling tobacco into Brunei Darussalam can now be prosecuted and their offences compounded. The Royal Customs and Excise Department reported “closing” 90% of smuggling cases, resulting in a 50% reduction in illicit trade offences.

The Royal Customs and Excise Department has established a unit solely focussed on the enforcement of illicit tobacco operations, and is considering undertaking analysis on mechanisms and drivers for tobacco smuggling (e.g. personal consumption versus black market trade) to Brunei Darussalam. Efforts to prevent cross-border smuggling are supported by the Police and the Navy. Brunei Darussalam intends to ratify the Protocol to Eliminate Illicit Trade in Tobacco Products in 2020.

Efforts to enforce tobacco policies have been complemented with initiatives aimed to influence tobacco consumption behaviours in Bruneians. Among the initiatives is a comprehensive suite of awareness-raising activities to disincentivize tobacco consumption, including at public events, in mainstream media and social media, and through collaboration with other stakeholders to reinforce health messages. More recently, according to education officials, the Ministry of Education has initiated a multidimensional tobacco prevention programme in schools with the highest adolescent smoking rates.

Comprehensive smoking cessation services are available throughout the country, promoted with posters and pamphlets, and through brief interventions offered by a large number of trained health workers. Despite these services being widely available, surveys have shown that many smokers are not receiving brief interventions or referrals to cessation services, and that cessation services are an underutilized service. The success rate of smoking cessation services is in decline, and the quit rate (at six months) has reduced significantly from 25% in 2013 to 16% in 2018.<sup>2</sup>

2. Smoking cessation quit rates as stated in a presentation entitled “Smoking Cessation Clinic” given by Ministry of Health officials to the evaluation team.

It has been suggested that this decline is related to several factors, including an erratic supply of related pharmacotherapy products, and the perceived receptiveness of patients to cessation services that are increasingly delivered by nurses instead of doctors. A Quitline service was introduced by the Health Promotion Centre in March 2014, but it was discontinued at the end of 2016 because of underutilization.

### 5.3 Barriers to reducing tobacco use

Barriers include the following:

- > Uptake of tobacco use and vaping by adolescents.
- > Sophistication of methods used by smugglers in the Illicit trade of tobacco in Brunei Darussalam.
- > Ineffectiveness of some cessation services.

### 5.4 Alignment to best practice

**Table 14.** Alignment of Brunei Darussalam’s policies to WHO “Best Buys”

Reduce tobacco use	Alignment to policy commitments <sup>d</sup>
<b>WHO “Best Buys”<sup>a</sup></b>	
> Increase excise taxes and prices	☑
> Plain/standardized packaging	n/a
> Comprehensive bans on tobacco advertising and promotion	☑
> Eliminate exposure to second-hand tobacco smoke indoors and in transport	☑
> Effective mass media campaigns that educate the public about the harms of smoking/tobacco use	☑
<b>Effective interventions<sup>b</sup></b>	
> Cost-covered, effective and population-wide support for tobacco cessation to all those who want to quit	☑
<b>Other recommended interventions from WHO guidance<sup>c</sup></b>	
> Implement measures to minimize illicit trade in tobacco products	☑
> Ban cross-border advertising, including using modern means of communication	Needs further work
> Provide mobile phone-based tobacco cessation services for all those who want to quit	☑ Quitline ceased due to low utilization

a. “Best Buys”: Effective interventions with cost-effectiveness analysis (CEA) ≤ I\$100 per disability-adjusted life year (DALY) averted in lower- and middle-income countries (LMICs)

b. Effective interventions with CEA > I\$100 per DALY averted in LMICs

c. Other recommended interventions from WHO guidance (CEA not available)

d. BruMAP-NCD and associated policies and guidelines

Source: World Health Organization (13).

## 5.5 Opportunities to strengthen tobacco control in Brunei Darussalam

There are opportunities to further address the illicit trade of tobacco products by ratifying the Protocol to Eliminate Illicit Trade in Tobacco Products, and then undertaking systematic multi-stakeholder gap analysis of the supply chain for smuggled tobacco products (including vaping), supported by international experts and partners in tobacco control. Designing and implementing a tracking and tracing regime in collaboration with neighbouring countries is a challenging but necessary next step.

There is a need to adopt more effective prevention messages to disincentivize tobacco use among adolescents, perhaps employing hard-hitting social marketing involving high-profile celebrities or graphically illustrating the impact of tobacco on families and lives.

There is an opportunity to incentivize health workers at all primary health-care services (including maternal and child health) to increase their brief interventions with referrals to cessation services, and to examine why cessation programmes have not been as effective as previously. This may involve scaling up the engagement of doctors in the cessation programmes, or rebranding programmes such that they become more appealing and effective.

Brunei Darussalam may also want to consider sharing its achievements in reducing tobacco use in published literature (research pieces) and reflecting on the mobilization required to address the remaining challenges, which have substantial relevance for other countries.

Photo 1. Tobacco cessation clinic consultation



Photo 2. Tobacco cessation group counselling



Photo 3. Anti-tobacco exhibition during World Stroke Day 2018



## 6. OBJECTIVE 2: TO PROMOTE BALANCED, HEALTHY DIETS

### 6.1 Evidence of impact against BruMAP-NCD targets

#### Regular sugar-sweetened beverage (SSB) consumption by adults and children

According to the NHANSS, around one quarter of Bruneian adults (25.6%) were consuming SSBs on a daily basis (Table 15) (8). Of concern, consumption was much higher among children and adolescents than it was in adults, with around 38% of children aged 5–9 years and 30% of children aged 10–14 years consuming SSBs on a daily basis. Adults were consuming a larger share of instant drinks than children, which in many cases are sugar-sweetened.

**Table 15.** Daily consumption of sugar-sweetened beverages and instant drinks

Age group (years)	Sugar-sweetened beverages		Instant drinks	
	Male (%)	Female (%)	Male (%)	Female (%)
5–9	39.1	38.4	7.0	6.5
10–14	35.9	24.8	11.0	10.5
15–18	30.7	23.3	17.3	10.5
19–59	23.0	23.6	29.4	26.9
60+	13.2	1.7	20.8	19.0
<b>Total</b>	26.7	24.4	23	21.3

Source: NHANSS 2014 (8).

Brunei Darussalam’s GSHS (2014) found that 46.4% of students aged 13–17 years consume carbonated beverages daily, though daily consumption was significantly higher for males (52.1%) than it was for females (40.4%) (12).

#### Fruit and vegetable consumption by children and adults

WHO recommends that adults consume a minimum of 400 g ( $\approx$  5 servings) of fruit and vegetables daily. The NHANSS 2014 reported that 91.8% of Bruneian adults were not consuming the recommended amount of fruit and vegetables (8). This finding was consistent with the STEPS 2016, which reported that 91.7% of respondents did not eat the recommended five or more servings of fruit and/or vegetables daily (6). Both surveys found that male respondents were on average consuming slightly less fruit and/or vegetables than female ones (Table 16).

**Table 16. Fruit and vegetable consumption by adults**

<b>Fruit and vegetable intake</b>	<b>Male (%)</b>	<b>Female (%)</b>	<b>Both sexes (%)</b>
<b>Percentage of adults consuming less than 5 servings of fruit and/or vegetables on average per day</b>	92.3	91.0	91.7

Source: STEPS 2016 (6).

### Mean population intake of sodium/salt

Brunei Darussalam is largely import-dependent for food, with imports dominated by packaged and processed foods from surrounding countries. WHO recommends that adults consume less than 5 g of salt per day in order to maintain good health. The STEPS 2016 reported the mean intake of salt by Bruneians to be double that at 10 g per day, with men consuming significantly more salt (11.5 g) than women (8.5 g) (Table 17) (6). Around one fifth (21.8%) of people add salt and salty sauces when cooking, while a further 19.5% frequently consume salty processed foods.

**Table 17. Mean salt intake of adults**

<b>Salt intake of adults aged 18–69 years</b>	<b>Male (%)</b>	<b>Female (%)</b>	<b>Both sexes (%)</b>
Mean intake of salt per day (in grams)	11.5	8.5	10.0
Percentage (%) of respondents who always or often add salt or salty sauce to their food before eating or as they are eating	22.8	20.9	21.8
Percentage (%) of respondents who always or often eat processed foods high in salt	21.4	17.7	19.5

Source: STEPS 2016 (6).

According to a 2015 study, over 51% of packaged foods contained higher levels of sodium than recommended by benchmarked guidelines (14). Bruneians reportedly consume 61% of their salt intake from sauces and salt, and 39% from processed foods.

### Number of school canteens selling SSBs with over 6 g/100 ml sugar

Nil data found.

### Number of workplaces with healthy workplace programmes in place

Nil data found.

### Exposure to marketing of junk food in children

Nil data found.

### Trans fat content of foods

Nil data found.

## 6.2 Implementation of interventions aiming to improve nutrition

The MSTFH has nominated healthy food environments as a priority policy area for Brunei Darussalam, and new strategies were selected as policy priorities in 2018.

### Policy frameworks

The country's *Public Health Food Regulations 2000* require that food labels display energy, fat, carbohydrates, protein, and any nutrients against which a food claim has been made. However, the Regulations do not require labelling for sodium, sugar or trans fatty acids, a factor that may limit the application and monitoring of food policies that reduce the intake of those nutrients. The country now has a scientific laboratory that can analyse the nutrient content of food, though this may not be useful for routine monitoring of food policy compliance, which usually involves in-store compliance audits.

The country has the National Dietary Guidelines 2000 in place, and a new set of guidelines are set to be launched in 2020, with complementary health promotion materials being distributed across schools, workplaces and public events.

A *Maternal, Infant and Young Child Nutrition Strategy* was adopted in 2014 to mitigate NCD risk factors that develop early in life, by promoting appropriate feeding practices in early childhood, including breastfeeding, and mitigating excessive weight gain during pregnancy. Breastfeeding guidelines were adopted in 2012 and revised periodically since then, and a code of practice to restrict the marketing of breastmilk substitutes was formally developed in 2019.

According to policy-makers, breastfeeding initiatives have been successful, in part, because their implementation and enforcement rely largely on actors from the health sector, with little cross-sectoral engagement.

In 2017 the county put in place a tax of BND 0.40/L (increase of 21%) on SSBs (Figure 7). According to data generated by the Royal Customs and Excise Department, this tax led to a 7.8% reduction in the consumption of SSBs, and a 42% reduction in the local production of SSBs. A two-fold increase in consumption of bottled mineral water was reported. According to the Ministry of Finance, taxes applied to confectionery and chocolates have had a similar impact on reducing their consumption. An internal evaluation by Ministry of Health staff found a 50% increase in the number of available beverages with a "lower" sugar-threshold (as per Figure 7) between 2015 and 2019, indicating that industry had responded by making available more "lower" sugar alternatives.<sup>3</sup>

According to the Ministry of Finance, the Government has had in place price controls on foods including sugar, rice, flour and cooking oil. These price protections may counter efforts to restrict the consumption of those foods, where they are linked to greater NCD risk, e.g. sugar and oil.

Food policies are in place in childcare centres and schools. The *National Nutrition and Physical Activity Guidelines for Child Care Centres in Brunei Darussalam* were recently adopted in 2019 to regulate the provision of food to children in early learning settings. Though a monitoring system is not yet established, it is planned that these standards would be integrated into quality assurance processes for all childcare establishments.

Food and nutrition standards for education institutions (*Panduan Penjualan Makanan dan Minuman Sihat Di Kantin Sekolah*) were adopted in 2000 and revised in 2017. The 2017 iteration has been simplified and includes a comprehensive list of menu ideas to guide implementation.


3. Changes in sugar content of commercially available beverages in Brunei Darussalam, Nur Haszwany Bte Mahadi, Hj Zakaria Hj Kamis, Dr Siti Rohaiza Ahmad.



Figure 7. Nutrient criteria for SSB tax in Brunei Darussalam

**POLICY COHERENCE:**  
**Aligning the SSB Excise Duty and the Nutrient Criteria of Foods and Beverage with the Healthier Choice Logo**

The Nutrient Criteria of Foods and Beverages with the Healthier Choice logo (2017)



Category	Total sugar (g/100 ml)	
Malted or chocolate drink	≤ 8.0	Lower in sugar
Soy milk / Beverage	≤ 7.0	Lower in sugar
Fruit juice (at least 60% of fruit juice)	No added sugar	No added sugar
Sweetened drink:		
> non-carbonated drink /Asian drink	≤ 6.0	Lower in sugar
> isotonic drink	≤ 6.0	Lower in sugar
> juice drink (at least 10% of fruit juice)	≤ 6.0	Lower in sugar
> carbonated drink	≤ 6.0	Lower in sugar

Source: Slide provided by the Ministry of Health through consultations.

This version is underpinned by a set of nutrient thresholds for identifying healthier food and beverage options.

According to health officials, improving compliance has been an ongoing challenge. Compliance with the standards remains low at just 20%, despite ongoing promotion by the Health Promotion Centre and the Ministry of Education, and food vendors being trained. According to some stakeholders, vendors report that children do not like healthy food and are concerned about their profit margin given excessive rents paid to the schools.

Officials have found it very difficult to enforce school food policy with school food vendors, who are contracted vendors of the Ministry of Education. The Health Promotion Centre has tried to support schools to undertake their own self-assessment; however, many principals do not see nutrition as a priority and do not engage in self-assessment and management. While the Ministry of Education has mandated adherence to food and nutrition standards in vendor contracts, and issues warnings for noncompliance, they confirmed that they would not be discontinuing vendor contracts on that basis.

The Health Promotion Centre, in partnership with the Ministry of Education, has initiated a range of school-based initiatives to promote healthy dietary behaviours in children. A *Drink Water Policy* designed to encourage children to consume water throughout the school day was adopted in 2017, supported by mass media campaigns. According to education officials, the policy is being implemented at all schools, but according to health officials, it has not been well adhered to (partly due to concerns about spillage).

The Government of Brunei Darussalam maintains control of a significant amount of marketing space, for example, on and around public transport (ferry, airport and bus terminals), on television and radio, and around public spaces, offering significant potential to regulate that space to restrict marketing of unhealthy food and beverages to children. The evaluation found stakeholders from the Prime Minister’s Office and the Ministry of Communications (among others) supportive of potential restrictions, though this has not been operationalized due to concerns by some Government leaders of the negative impact on advertising revenue, and for SSB manufacturers.

The Health Promotion Centre views industry engagement in policy-making negatively. They have developed a code of conduct whereby industry is only consulted in the implementation phase of policy-making. This practice is aligned with the global best practice to reduce the influence of industry on public policy.

### Programmes to influence consumption

Information dissemination activities for promoting healthy consumption have been widespread and substantial. The Health Promotion Centre has developed and disseminated a large number of educational tools and resources, and has contributed to curriculum reviews by the Ministry of Education. It has promoted nutrition during World Health Days, public events and in community and public spaces. It has led mass communication campaigns that promote healthy eating via the radio, television and social media. The Health Promotion Centre has led a number of campaigns and competitions, and in 2016, it delivered community outreach roadshows in six locations. However, education-oriented approaches are very resource intensive, and there are concerns that these efforts cannot be sustained. Evaluations of these activities by the Health Promotion Centre have suggested that these activities may not have changed dietary behaviours significantly.

The Health Promotion Centre has long offered a workplace health programme to public service agencies, entailing health promotion messaging, risk-factor assessments, physical activity programmes and catering guidance. Workplace programmes have enormous opportunity to influence health outcomes; however, very few ministries have fully adopted the programme, and their engagement is inconsistent and ad hoc. Though the Health Promotion Centre has distributed catering guidelines for workplaces, catering for publicly funded meetings and events is not regulated, and sweet snacks, desserts, SSBs and packet biscuits are commonplace. The Centre has put significant human resources into delivering workplace programmes, but those workplaces that have successfully engaged in the programmes attributed their success to an internal group of leaders or champions with the motivation to carry forward activities internally.

Brunei Darussalam has adopted an indicative food labelling system, called “Healthier Choice”, in an effort to assist consumers in identifying healthier food options. The Healthier Choice nutrient criteria is a positive step because a range of food policies (taxes, school foods) can now be pinned to nutrient thresholds. However, the Healthier Choice logo is designed to influence consumer choices, which can rarely have impact without structural policy changes to the food environment.

The logo is underpinned by a set of nutrient criteria that were adapted from Singapore and aligned to Malaysia. However, surveys suggest that the system needs to be refined and more fully promoted so that consumers can use it to inform healthier consumption.<sup>4</sup> For instance, the Ministry of Education applies these criteria in determining which foods to include in the school feeding programme, which distributes a daily snack to all primary schoolchildren across the country. As a result, this daily, publicly procured snack includes a (Healthier Choice-compliant) malted or sugar-sweetened flavoured milk together with a (compliant) white bun or sweetened biscuits. A risk with

4. Evaluation of Healthier Choice, Nurul Atikah binti Mohamad, Siti Munawwarah binti Awang Tarif.

indicative food labels is their promotion of processed packaged foods over those most required for healthy consumption (but not bearing a health logo), e.g. fruit, water and milk.

As an extension of this, the Health Promotion Centre has adopted initiatives that promote healthier food choices in supermarkets and restaurants, though the effect of these initiatives on sales and consumption has not yet been assessed. The supermarket-based initiative has seen the 13 partner supermarkets adopt indicative shelf labelling that encourages the purchase of fruit and vegetables as well as foods with the Healthier Choice logo. A Healthier Restaurants programme has seen the participation of 12 restaurants since 2014, including the display of nutrient content on menu boards, and the display of Healthier Choice logos on menus and boards. An additional programme called Healthier Partners was established in 2016 to engage with fast-food restaurants.

Health workers undertake annual BMI profiling in schools to monitor body weights and offer the B-Fit4Life programme to children found to be overweight/obese to help them lose weight. This six-month intervention programme includes educational and motivational talks, as well as monthly exercise sessions, and training for teachers. The Health Promotion Centre has trained a team of focal teachers to deliver the programme; however, many of them have not conducted it or are not given time to do so.<sup>5</sup> For those children who have participated in the programme, survey results suggest that it may be effective in reducing BMI for some children, but these results are unlikely to be sustained over time. Results from 2018 suggest that many children continued to put on weight over the time of the programme.

The evaluation found that most food and nutrition initiatives are fully reliant on the resources of the Health Promotion Centre to deliver, and approaches to improve food consumption emphasize education and behaviour change. While education and literacy are important components towards addressing food and nutrition security, it will be equally important to address the structural issues that ultimately shape the way in which consumers make decisions about food and diets. The issues needing more extensive planning and support are those that will ultimately translate to relative improvements to the proximity, promotion and pricing of healthy foods and beverages.

### 6.3 Barriers to promoting balanced, healthy diets

Barriers include the following:

- > Excessive consumption of ultra-processed foods high in sodium, fat and sugar.
- > Vendors in canteens in workplaces and schools sell and promote unhealthy FNAB, despite the adoption of nutrition guidelines.
- > Nearly all nutrition-related initiatives are fully reliant on the Health Promotion Centre to deliver, with a lack of priority being assigned by other sectors to nutrition promotion and policy change.
- > A strong emphasis on behaviour change and education, which are generally less effective and sustainable than interventions that shape the food environment longer term (15).

5. Report B-Fit4Life programme Report, Health Promotion Centre.

## 6.4 Alignment to best practice

**Table 18.** Alignment of Brunei Darussalam’s policies to WHO “Best Buys” and “Ending Childhood Obesity”

To promote balanced and healthy diet	Alignment to policy commitments <sup>c</sup>
<b>WHO “Best Buys”<sup>a</sup></b>	
> Reduce salt intake through food reformulation	☑
> Reduce salt intake in public institutions such as hospitals, schools, workplaces	☑
> Reduce salt intake through behaviour change communication	☑
> Reduce salt intake through the implementation of front-of-pack labelling	☑
<b>Effective interventions<sup>b</sup></b>	
> Eliminate industrial trans fats through legislation to ban their use in the food chain	☑
> Reduce sugar consumption through SSB taxation	☑
<b>Ending Childhood Obesity (not listed in “Best Buys”)</b>	
> SSB taxation	☑
> Restrict marketing of foods and non-alcoholic beverages to children	☑
> Mandate healthy food environments in schools, childcare settings, children’s sports facilities and events	☑
> Increase access to healthy foods in disadvantaged communities	☑
> Provide clear guidance and support to caregivers to avoid specific categories of food	☑
> Incorporate food education into the curriculum in formal childcare settings or institutions	☑

a. “Best Buys”: Effective interventions with cost-effectiveness analysis (CEA)  $\leq$  I\$100 per disability-adjusted daily life (DALY) averted in lower- and middle-income countries (LMICs)

b. Effective interventions with CEA  $>$  I\$100 per DALY averted in LMICs

c. BruMAP-NCD and associated policies and guidelines

Source: World Health Organization (13).

## 6.5 Barriers to promoting balanced, healthy diets

There are opportunities to adopt a strong and fully enforceable set of policies to shape the food environment. The development of a set of nutrient criteria in Brunei Darussalam has provided a basis on which to pin a range of policies, including:

- > Mandatory labelling of nutrition content for sodium, total/added sugar, saturated fat and trans fatty acids, with warning labels for unhealthy products (see examples from Chile).
- > Legislated restrictions around the marketing of unhealthy foods in public spaces and on television before 21:00.

- > Fiscal policies that incentivize the consumption of minimally processed foods, including:
  - subsidies for fresh fruit and vegetables;
  - lifting of price protections and subsidies being applied to flour and sugar; and
  - taxes applied to unhealthy processed foods – particularly those high in sodium and sugar, and those containing partially hydrogenated vegetable oils.
- > A set of minimum standards on fruit and vegetable content of publicly procured foods in schools (including feeding programmes), hospitals, childcare services and workplaces (e.g. catering for meetings, events).
- > Stronger enforcement of policies governing food vendors in school, early childhood services and Government workplaces, with incentives for compliance, so that enforcement is integrated into the regulations governing these settings, and their enforcement carries the weight of the Food Act and the Tobacco Act – including that vendors not complying are removed or have their business licences revoked.
- > A review of school feeding programmes so that minimally processed foods (fruit, vegetables, plain milk and water) become the basis of provided meals.
- > Innovative approaches that incentivize food producers to formulate, market and distribute nutrient-rich locally processed foods and incentivize importers, wholesalers and retailers to prioritize and promote them.

There are also opportunities to engage political leaders to adopt a stronger stance on the food environment, given this has been successful in driving tobacco policy forward.

Photo 4. Launching of the Healthy Dining Programme



Photo 5. Launching of Healthy Supermarket Programme by Deputy Permanent Secretary, Ministry of Health



Photo 6. Healthy eating exhibition during Community Outreach Programme



# 7. OBJECTIVE 3: PHYSICAL ACTIVITY

## 7.1 Evidence of impact against BruMAP-NCD targets

### Prevalence of physical activity/inactivity – across ages

WHO recommends that adults (aged 18–64) participate in physical activity for at least 150 minutes per week, or at least 75 minutes of vigorous activity.

At the time of the NHANSS 2014, around 35% of all adults were not participating in the recommended levels of activity (< 150 minutes of moderate activity per week). Physical activity levels were significantly different for males and females, with around 41.5% of females and 28.3% of males being insufficiently active (Table 19) (8).

**Table 19.** Percentage of adults not meeting physical activity recommendations

Age group		Male (%)	Female (%)	Total (%)
19–59 years	Percentage (%) of respondents with insufficient levels of physical activity	26.8	41.5	34.8
> 60 years	Percentage (%) of respondents with insufficient levels of physical activity	47.2	41.4	44.1
19–75 years	Percentage (%) of ALL respondents with insufficient levels of physical activity	28.3	41.5	35.5

Source: NHANSS 2014 (8).

The STEPS 2016 reflected a slightly higher level of participation in physical activity by Bruneians. The percentage of adults who were insufficiently active had dropped to 25.3%, though females were still significantly less likely to participate in recommended amounts of physical activity (33.0%) compared with males (17.5%) (Table 20) (6).

**Table 20.** Physical activity status of adults

Physical activity status of adults aged 18–69 years	Male	Female	Total
Percentage (%) of respondents with insufficient levels of physical activity	17.5	33.0	25.3
Median time spent in physical activity on average per day (minutes) (presented with inter-quartile range)	78.6 min	38.6 min	60.0 min
Percentage (%) of respondents not engaging in vigorous activity	36.5	71.2	54.0

Source: STEPS 2016 (6).

According to the GSHS 2014 (Table 21), only 12.7% of adolescents (aged 13–17 years) participate in 60 minutes of physical activity each day (12).

**Table 21. Physical activity status of students**

<b>Physical activity status of students aged 13–17 years</b>	<b>Male (%)</b>	<b>Female (%)</b>	<b>Total (%)</b>
Percentage of students who were physically active for a total of at least 60 minutes per day on all seven days during the past seven days	19.7	5.5	<b>12.7</b>
Percentage of students who went to physical education class on three or more days each week during this school year	25.2	21.7	<b>23.5</b>
Percentage of students who spent three or more hours per day during a typical or usual day doing sitting activities	54.7	58.0	<b>56.3</b>

Source: GSHS 2014 (12).

## 50% of all workplaces having established a healthy workplace programme to promote physical activity

Nil data found.

## 7.2 Implementation of interventions aiming to increase physical activity

Bruneians face a number of barriers in relation to exercise. The nature of everyday life, and the climatic conditions, restrict opportunities for physical activity. The country has not mainstreamed measures that promote physical activity into infrastructure development. For instance, few roads have pedestrian and cycling facilities, and those that do are not well connected or widespread.

The Bruneian Government has taken a series of steps to incrementally introduce public spaces that enhance opportunities for physical activity. For instance, more than 27 public parks are being maintained across the country for use by members of the public. The Ministry of Development, Ministry of Home Affairs, Ministry of Parks and Recreation, and Ministry of Home Affairs encourage communities to build hiking trails with the support of public-private partnerships. Each *mukim* has a multipurpose hall that can be utilized for community sports, and each district has a sporting facility with running tracks, playing fields and a pool. Public schools reportedly have some infrastructure for physical activity, though these are closed to the public outside of school hours.

The Government hosts a number of annual public events that promote physical activity. For instance, the Ministry of Culture, Youth and Sport runs large annual running and bicycling events, and the Ministry of Home Affairs and the Health Promotion Centre deliver programmes that support community leaders to promote sports and physical activity among their populations. One of the more successful public initiatives has been the *Bandarku Ceria* (car-free day) in the city of Bandar Seri Begawan. Delivered as a collaboration between eight different ministries, the city is closed to vehicles every Sunday morning to allow pedestrians and cyclists to move about freely. This event has also created economic opportunities for local businesses, though around 75% of them are selling



food and beverages that may not be healthy.<sup>6</sup> Thousands of people visit the city to participate in the weekly event to enjoy walking, exercise classes, health promotion activities and stalls.

High participation rates at public events suggest that there is a demand for community physical activity opportunities in Brunei Darussalam, particularly in cities. Additionally, we noted a strong interest from people wishing to be able to cycle more safely. Barriers being cited include road safety, inappropriate infrastructure, and challenges with road and cycleway connectivity. Stakeholders from the Ministry of Transport and Info-Communication spoke about a high-level policy dialogue on cycling safety, held in 2019, which recommended addressing the road hierarchy to improve pedestrian and cycle safety, and promote cycling opportunities.

A number of high-level policy initiatives have been adopted to reduce sedentary behaviour by Bruneians. For instance, *National Physical Activity Guidelines* were adopted in 2011 and are being updated. These standards outline recommended levels of physical activity for different population groups. The country also adopted *National Nutrition and Physical Activity Guidelines for Child Care Centres* to provide guiding principles for childcare centres in maintaining a supportive environment for infants and young children. It is planned that these standards will be integrated into quality-assurance processes for all centres, though preliminary feedback suggests that childcare centres are looking for more guidance on physical activity for young children.

The Ministry of Education promotes physical activity throughout the curriculum and encourages children to be active. It is mandatory for students of public schools to be provided with two to three physical education lessons each week, depending on their year level. Additionally, children found to be overweight or obese are encouraged to participate in the B-fit4Life programme, which includes physical activity sessions and motivational lessons.

However, many children are still sedentary at school. According to some policy-makers, Brunei Darussalam is thought to be “exam oriented”, with schools prioritizing subjects that contribute to academic performance. Many schools are not complying with the physical education policy. Physical education lessons are not always active and do not provide the amount of physical activity recommended for children and young people. However, there are opportunities to increase physical activity around schools even where there are time constraints. Stakeholders have suggested setting up physical activity workout stations around schools, mainstreaming of 3–5 minutes of high-intensity exercise between lessons, and encouraging students (and their parents) to walk or bike to school, where feasible or within a 2 km radius.

Sedentary behaviour by office workers is a key challenge for policy-makers, with workers reportedly preferring the less active option (e.g. riding the elevator instead of climbing the stairs). In response to this, the Health Promotion Centre delivers a workplace health programme that encourages sedentary workers to engage in physical activity. This programme falls within an integrated workplace health initiative that includes NCD risk-factor screening, planning meetings, healthy workplace canteen guides and health promotion lectures. The Health Promotion Centre has trained workplace health leads from 25 workplaces (12 public services and 13 private sectors). Though efforts by policy-makers to advocate the mandatory adoption of the programme by the public service workplaces have not been successful, a number of workplaces still engage with the programme, and there are ongoing requests for support. The programme has been most successful in workplaces where a proactive group of employees has taken ownership of it. This is important, as a key limitation of the programme is the Health Promotion Centre’s lack of resources to deliver it.

The Health Promotion Centre invests significant energy in delivering knowledge-based campaigns that aim to increase motivation and public appetite for physical activity. This includes campaigns, health days, training for community and village leaders, and the ongoing promotion of physical

6. Evaluation of Bandarku Ceria by Dr Mohammad Fathi Alikhan and Dk Nur Duratul Ain Bte Pg Saripuddin.

activity through social and the mainstream media. Similarly, as with other health promotion programmes, it is difficult to assess their impact. Though they are important for shifting the culture towards physical activity, they are not usually impactful in isolation.

### 7.3 Alignment to best practice

**Table 22.** Alignment of Brunei Darussalam’s policies to WHO “Best Buys” and “Ending Childhood Obesity”

To reduce physical inactivity	Aligns to Brunei Darussalam’s policy commitments <sup>c</sup>
<b>WHO “Best Buys”<sup>a</sup></b>	
> Community-wide public education and awareness campaign for physical activity	<input checked="" type="checkbox"/>
<b>Effective interventions<sup>b</sup></b>	
> Provide physical activity counselling and brief intervention as a part of routine primary health-care services	<input checked="" type="checkbox"/>
<b>Ending Childhood Obesity (not listed in “Best Buys”)</b>	
> Mandate physical activity into the daily routine in childcare settings or institutions	<input checked="" type="checkbox"/>

a. “Best Buys”: Effective interventions with cost-effectiveness analysis (CEA)  $\leq$  I\$100 per disability-adjusted life year (DALY) averted in lower- and middle-income countries (LMICs)

b. Effective interventions with CEA  $>$  I\$100 per DALY averted in LMICs

c. BruMAP-NCD and associated policies and guidelines

Source: World Health Organization (13).

### 7.4 Barriers to promoting physical activity

Barriers include the following:

- > Lack of physical activity-promoting infrastructure in building and road design.
- > Limited opportunity to exercise around prayer, school and working hours.
- > Cultural perspectives, including that it is too hot to exercise.

## 7.5 Opportunities to increase the physical activity levels of Bruneians

There are two key opportunities to lift physical activity levels of Bruneians:

### 1. Creating opportunities for the integration of physical activity into everyday life

- > Building safeguards for physical activity into the transport master plan.
- > Mandating the inclusion of safe pedestrian footways and bikeways in the planning and construction of new roads.
- > Designing new buildings so that opportunities for “incidental activity” are increased (e.g. central staircases that are generous and naturally lit, with small and less obvious elevators).
- > Adopting car-free days at schools and workplaces.
- > Offering 10-minute physical activity breaks for office employees.
- > Offering subsidies to employees for fitness memberships, and encouraging their use during lunch breaks.
- > Making school grounds accessible outside of school hours, so that families can access them on a daily basis.

### 2. Continuing to build the public appetite’s for physical activity

- > Incentivizing doctors and general practitioners to provide patients with prescriptions for physical activity, in addition to those for drugs, for managing NCD risk factors.
- > Undertaking campaigns that promote athleticism and strength as key assets, especially for women and young people, and link physical activity to a range of health outcomes.
- > Promoting opportunities for small amounts of physical activity throughout the day that increasingly contribute to physical activity (i.e. incidental activity), such as regular use of active transport to meetings and on lunch breaks.
- > Promoting the use of public health facilities (e.g. civil service gym facilities).

Photo 7. Exercise session conducted by Physical Activity Ambassadors in Mukim Pengkalan Batu



Photo 8. Family fun day conducted by Health Ambassadors in Kampong Bebuloh



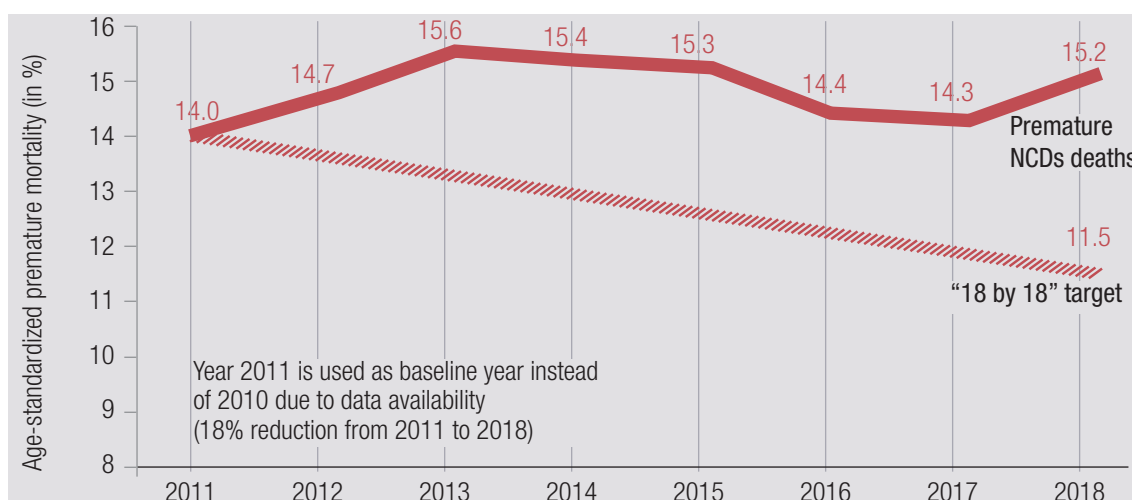
# 8. OBJECTIVES 4 AND 5: IMPROVING HEALTH BY ENHANCING THE CONTINUUM OF CARE FOR NCDs

## 8.1 Evidence of impact against BruMAP-NCD targets

### Long-term outcomes

The national target for the long-term outcome for Objectives 4 and 5, which is a “10% reduction in CVD [cardiovascular diseases], cancer and DM [diabetes mellitus] mortality in hospitals, other health centres and clinics”, had not been achieved by 2018 (also see note in Figure 8 for a clarified definition of this outcome indicator and its target). Premature NCD mortality (excluding chronic respiratory disease) was still on the rise and reached a level of 305 deaths per 100 000 in 2018, an increase from 266 per 100 000 in 2011. The premature mortality rates quoted and used to define the target were age-standardized in order to obviate the effect of ageing, which is an unmodifiable risk factor for NCDs. The overall 2018 target was an age-standardized premature NCD (excluding chronic respiratory disease) mortality rate of 240 per 100 000 people.

**Figure 8.** Age-standardized premature mortality from cardiovascular diseases, DM and cancer “18 by 18” Goal



Note: The year 2011 is used as baseline year instead of 2010 due to data availability – 18% reduction from 2011 to 2018.

Sources: HIB 2017 (revised January 2019) (7), correspondence with Ministry of Health officials, and authors’ calculations for the “10% reduction by 2018” target.

## Intermediate outcomes

Objective 4 of the BruMAP-NCD monitoring framework is “to identify people at risk for NCDs and manage effectively”. Data, either in the form of surveys or from administrative sources (i.e. health information systems such as the BruHIMS platform), were not available at the baseline, end-line, or anytime in between to meaningfully confirm progress on the intermediate outcome variable for Objective 4 – “50% of eligible people (aged 40 years and older with a 10-year cardiovascular risk  $\geq 30\%$ , including those with existing cardiovascular disease) receive drug therapy and counselling (including glycaemic control) to prevent heart attack and stroke”. However, the STEPS 2016 provides one data point for the denominator (but not numerator) for this intermediate outcome variable. In 2015/16, 8.9% of respondents age 40–69 years had a 10-year cardiovascular risk of  $\geq 30\%$  or had pre-existing cardiovascular disease. To contextualize this denominator, the Brunei Darussalam population of people aged 40 years and older in 2018 was 148 500;<sup>7</sup> hence, at least 13 217 people in this population have a 10-year cardiovascular risk of  $\geq 30\%$  and should be on appropriate treatment to prevent heart attack and stroke (see Table 25). Although progress on this intermediate outcome cannot be confirmed in a quantified manner, a discussion and estimation of progress is provided in the section on NCD Care as a Continuum.

Objective 5 of the BruMAP-NCD monitoring framework is “to improve the quality of care and outcomes of NCDs management”. The intermediate outcome variable for this objective is “an 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities”. Unsurprisingly for a high-income country like Brunei Darussalam, this outcome indicator had been easily surpassed by the second year of BruMAP-NCD 2013–2018. A Service Availability and Readiness Assessment (SARA) conducted in 15 government health centres in 2014 found that service readiness was 99% for basic equipment and 94% for essential medications. There were, however, some weaknesses in the availability of clinical guidelines and training of doctors in NCD emergencies, and the availability of emergency drugs. However, private general practitioner clinics were not included in this survey.

## Short-term outcomes

A further seven short-term outcomes are included in the BruMAP-NCD monitoring framework for Objectives 4 and 5, including two pertaining to population knowledge, attitudes and practices; two pertaining to audits on health professionals and their adherence to standardized practices; two pertaining to rehabilitation and palliative care; and one being a health facility survey (Table 24).

## Supplementary indicators

The following supplementary indicators are not part of the formal BruMAP-NCD monitoring framework for Objectives 4 and 5, but they are helpful to contextualize and elucidate progress in enhancing the continuum of care for NCDs.

7. The population size of people aged 40–69 is not published and hence an exact estimate is not possible.  
Source: Brunei Darussalam Key Indicators 2018.

**Table 23. Progress towards achieving long-term and intermediate outcomes for Objectives 4 and 5**

Goal / Outcome	2010 Baseline	2018 Target	2013	2014	2015	2016	2017
<b>INDICATOR:</b> 18% relative reduction in premature mortality from NCDs by 2018 ("18 by 18")							
Goal	N/A for 2010, 14.0% in 2011	11.5% <sup>1</sup>	15.6% (Peak)	15.4%	15.3%	14.4%	14.2%
<b>INDICATOR:</b> 10% reduction in cardiovascular disease (CVD), cancer and diabetes mellitus (DM) mortality in hospitals, other health centres, and clinics <sup>2</sup>							
Long-term outcome for Objectives 4 and 5	N/A for 2010, 266 per 100 000 in 2011	240 per 100 000	290 per 100 000	291 per 100 000	295 per 100 000	299 per 100 000	294 per 100 000
<b>INDICATOR:</b> 50% of eligible people (aged 40 years and older with a 10-year cardiovascular risk $\geq$ 30%, including those with existing CVD) receive drug therapy and counselling (including glycaemic control) to prevent heart attack and stroke							
Intermediate outcome for Objective 4	N/A	50%	N/A	N/A	N/A	N/A	N/A
<b>INDICATOR:</b> 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities							
Intermediate outcome for Objective 5	N/A	80%	N/A	99% for basic equipment and 94% for essential medication <sup>3</sup>	N/A	N/A	N/A

1. The year 2011 was used as the baseline instead of 2010 due to data availability. Hence, the "18 by 18" target was adjusted as 18% reduction from 2011 to 2018.
2. Due to data availability, the target was reinterpreted as 10% reduction in age-specific premature mortality due to CVD, cancer and DM from 2011 to 2018.
3. 2014 Service Availability and Readiness Assessment (SARA) conducted in 15 government health centres.

Source: A survey on affordable basic technologies and essential medicines required to treat major NCDs in primary health care in Brunei Darussalam by Dr Pg Sirajul Adli Pg Haji Jamaludin and Dr Ahmad Adam Moh Isa., Health Promotion Centre.

**Table 24. Progress towards achieving short-term outcomes for Objectives 4 and 5**

Number	Progress and comments
1	<b>SHORT-TERM OUTCOME</b> Increased awareness among the population of the risk factors associated with NCDs
2	<b>SHORT-TERM OUTCOME</b> Increased awareness among the population that it is possible to reduce personal risk of NCDs by practising a healthy lifestyle and adhering to therapy
	<p>A household survey was conducted in 2014–2015 (10) to evaluate the effectiveness of health promotion communication strategies. Though no time series information was available to allow a comment on changes in awareness over time, there are nevertheless some indicators that relate to the short-term indicators.</p> <p>Selected survey findings are as follows:</p> <ul style="list-style-type: none"> <li>&gt; 74.4% of respondents stated that they took action to “Make Exercise Part of Your Life” and 82.0% correctly recalled the recommended amount of exercise (5 or more times a week).</li> <li>&gt; 95.0% of respondents who were on medication stated that they took the medication as directed.</li> </ul> <p>Clinicians interviewed in the course of the evaluation continued to raise patient behaviours, particularly non-compliance and wastage of prescribed medications, as a continued challenge in managing NCDs.</p> <p>Systems are in place at government health centres for patients to be given health education, including at nurse-led triage stations and nurse-led clinics.</p>
3	<b>SHORT-TERM OUTCOME</b> Audit on adherence to the use of SOPs and clinical guidelines
	No specific audits were done of adherence to SOPs and clinical guidelines, but multiple primary health care-level audits and re-audits (to assess changes in local practice) implicitly audited aspects of treatment protocols such as whether blood pressure measurements were taken, specific risk factors were documented, etc.
4	<b>SHORT-TERM OUTCOME</b> Clinical audit on all health-care professionals who are adopting WHO PEN and conducting CVD risk assessment, management and referral
	<p>Multiple relevant audits<sup>1</sup> of primary health care practice were done.</p> <p><i>CVD Risk Assessment</i> – A small audit on “whether CVD risk assessment tools [were] used in primary prevention in Seria Clinic” from January 2016 to December 2017 (N = 85) was presented at the 6th Clinical Audit Symposium in 2018. No specific risk CVD risk calculator was defined – i.e. any of the CVD risk calculators could be used. The audit found that only 7% of patient encounters used a CVD risk calculator. A re-audit of the “Management of Hypertension in Muara health centre” found that the percent of patients who were assessed for 10-year CVD risk increased from 0.3% to 54.0%.</p> <p><i>CVD Management</i> – Multiple relevant audits have been conducted at the local (i.e. within a particular health centre) level. For example:</p> <ul style="list-style-type: none"> <li>&gt; Hypertension: 70.3% of DM patients (N = 300) achieved the blood pressure target of &lt; 140/80 at Berakas health centre in June–August 2016.</li> <li>&gt; Glycaemic control: 42.4% of DM patients (N = 150) achieved the HbA1c target of &lt; 7.4% in January 2017–March 2018 at Kuala Belait health centre.</li> </ul> <p><i>Note:</i> These audits are not and cannot be used to infer performance at the population level.</p> <p><i>CVD Referral</i> – No relevant audits specific to CVD referrals were done.</p>
5	<b>SHORT-TERM OUTCOME</b> Clinical audit of rehabilitative and palliative care services
	At the hospital level (rehabilitative and palliative care services are organized from hospitals), an audit of pain documentation has been done. See also the section on Rehabilitation.



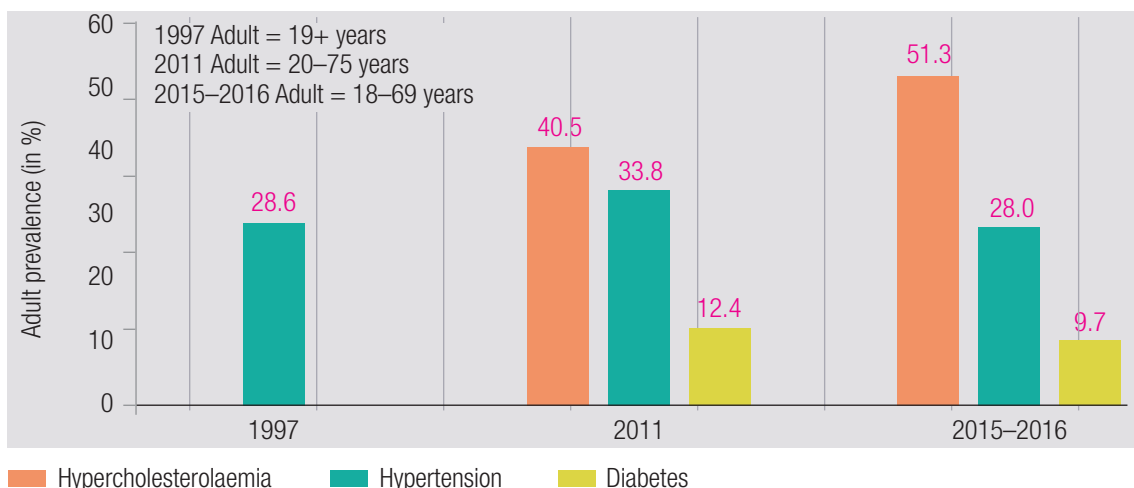
<b>6</b>	<b>SHORT-TERM OUTCOME</b> Audit of palliative services reaching 80% of the target population
	<p>A formal audit of the population coverage of palliative care services has not been done.</p> <p>However, from interviews and discussions with clinicians, the structure and processes of palliative care would strongly suggest that palliative care services in terms of symptom control would be widely (probably universally) available to oncology patients who have received care at hospitals (Raja Isteri Pengiran Anak Saleha hospital and The Brunei Cancer Centre), including in the form of home-based palliation and the use of opiates for pain management. See also the section on Palliative Care.</p>
<b>7</b>	<b>SHORT-TERM OUTCOME</b> Health facility survey
	A Service Availability and Readiness Assessment (SARA) was conducted in 2014 at government health centres. Private general practitioner clinics were not included.

1. During interviews and discussions with clinicians, a challenge was noted in conducting audits at the primary health care level using BruHIMS. Although standard rule-based extraction and queries of structured data from BruHIMS were intended, they could not be done in an automated manner. Instead, the auditor/doctor would have to bring up the electronic case records of each patient being audited individually to manually extract the indicator of interest. This activity requires a lot of human resources and limits the scalability and routinization of these audits, which are critical to determine adherence to standards of practice and treatment-to-target.

## Prevalence and incidence of selected NCDs

Due to changes in the definition of adults and other potential changes in survey methodologies, biochemical tests used or thresholds used, NCD trends may not be fully reflective of what is happening in the population. The prevalence of diabetes mellitus (DM) – a key NCD diagnosis – appears to have decreased by an impressive 22% in just four to five years from a prevalence of 12.4% to 9.7% even though DM is typically a lifetime diagnosis. It is unclear if such a decrease reflects what is happening in the population. Even if there were no new diagnoses of DM during those years, existing DM cases were likely to persist (unless reduced substantially in number due to mortality). It is more likely that further survey trend data are needed to elucidate true population-level trends. If a subsequent survey finds that the prevalence of DM has increased from 9.7%, this could be explained by an earlier measurement error. As risk factors for DM have not peaked,

**Figure 9.** Progress on reduction of NCDs in adults



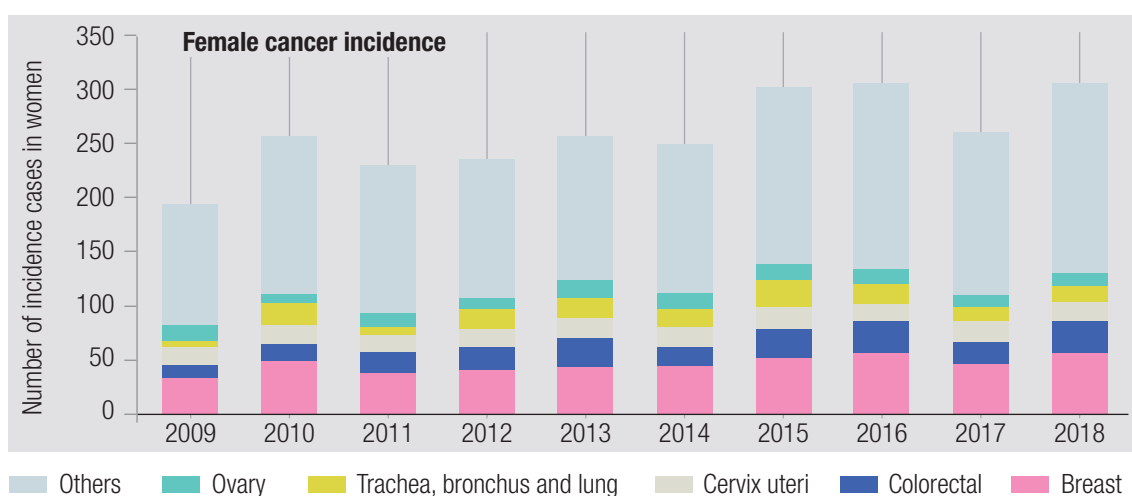
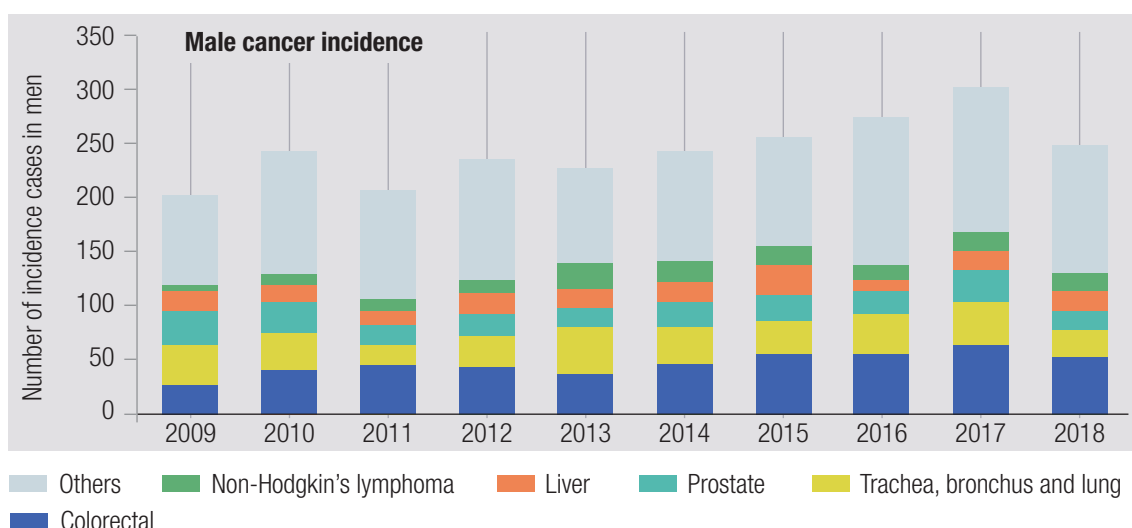
Sources: National Nutritional Status Survey 1997, NHANSS 2011, STEPS 2015-2016.

the prevalence of DM is expected to continue to rise in the coming years. The prevalence of hypertension has remained relatively static in the last two decades, having peaked around 2011. The prevalence of hypercholesterolaemia (total cholesterol above 5 mmol/L) has increased – more than half of Bruneian adults have hypercholesterolaemia.

Meanwhile, there have been notable changes in the epidemiology of cancers in Brunei Darussalam:

- > Colorectal cancer incidence in males and females has risen and is now the predominant cancer type. A new colorectal screening programme is planned for launch in late November 2019 (see the section on Screening).
- > Breast cancer incidence has risen and is the predominant cancer type among women. A new breast cancer screening programme is planned for launch in late November 2019 (see the section on Screening).
- > Lung cancer incidence has decreased among males and increased among females.
- > Cervical cancer incidence is trending downwards.

**Figure 10. Male and female cancer incidence**



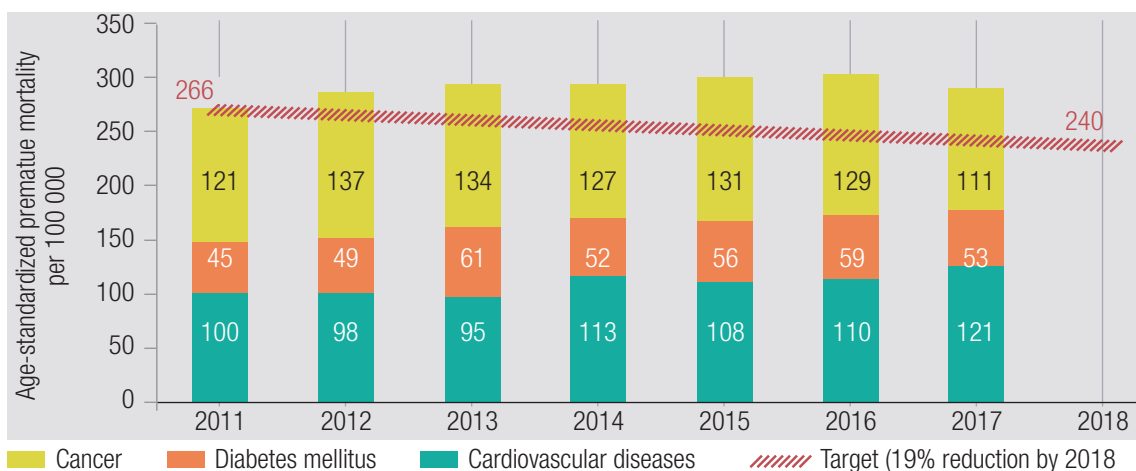
Source: Brunei Darussalam Cancer Registry, Ministry of Health.

### Disaggregation of premature NCD mortality

As summarized in Section 3, the increase in age-standardized premature NCD mortality has been driven by cardiovascular disease and diabetes mellitus (a major risk factor for cardiovascular disease), which increased by 20% from 145 to 174 per 100 000 from 2011 to 2017, respectively. However, this increase has been offset by a decline in premature cancer mortality, from 121 to 111 deaths per 100 000 from 2011 to 2017, respectively (Figure 11). Deaths from cardiovascular disease have not peaked, and if they continue to rise substantially, overall premature NCD deaths may be expected rise once again. If this increase does occur, it does not necessarily mean there has been a deficiency in the Government’s efforts at combatting NCDs, as there will be a long lag time between the reduction in NCD risk factors and reduction in NCD mortality.

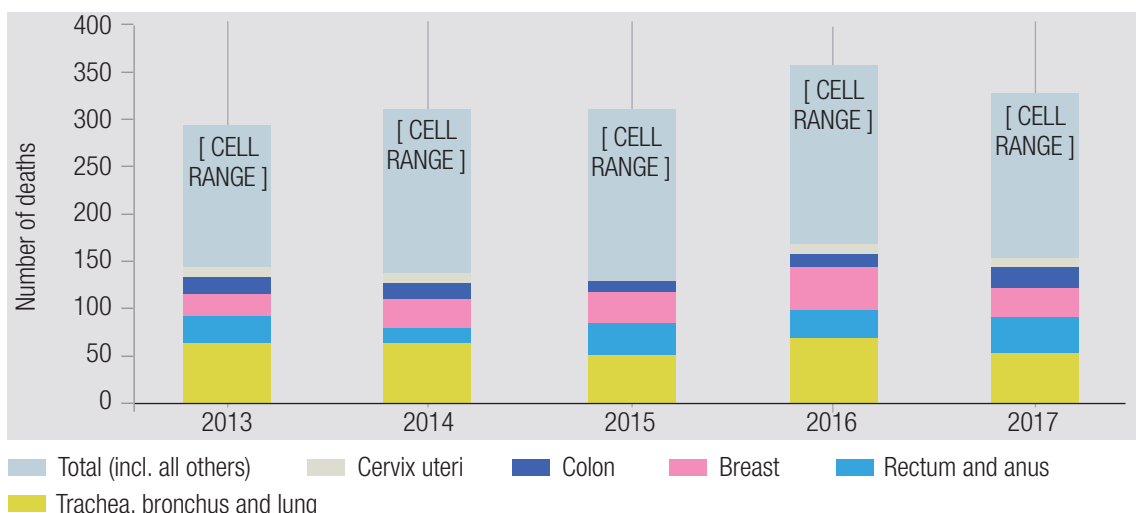
Non-age-standardized cancer deaths have been relatively static (Figure 12) over the period 2013–2017 though the trends in cancer incidence are mirrored – an increase in colorectal and breast cancer mortality (16); a decrease in cervical (noting the National Cervical Screening Programme that has been implemented for 10 years) and lung cancer mortality.

**Figure 11. Breakdown of age-standardized premature mortality from cardiovascular diseases, diabetes mellitus and cancer**



Sources: HIB 2017 (revised January 2019) (7), correspondence with Ministry of Health officials, and authors’ calculations for the “10% reduction by 2018” target.

**Figure 12. Cancer mortality**



Source: HIB 2017 (revised January 2019) (7).

## NCD care as a continuum: the cascade of care

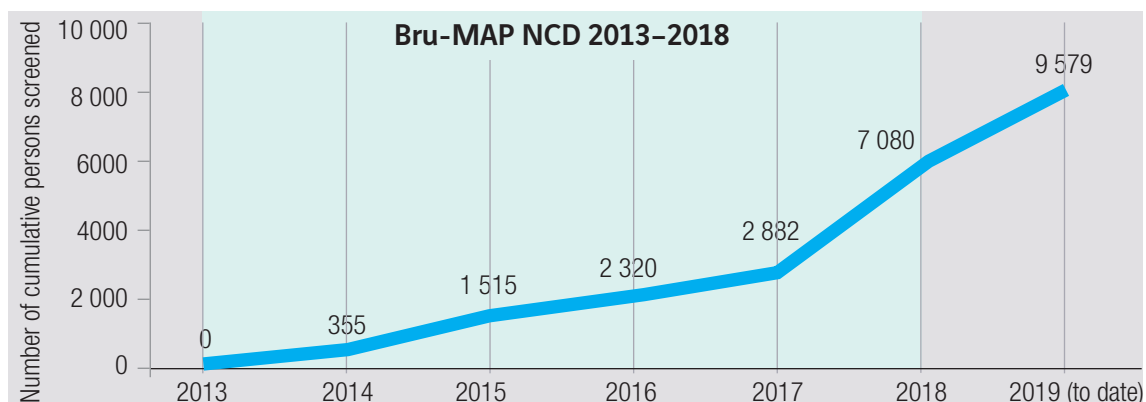
Objectives 4 and 5 are about improving health through enhancing the continuum of care for NCDs. At the population level, this continuum of care can be represented as a cascade of care, beginning with the identification of an at-risk population and ending with treatment outcomes. As mentioned earlier, data for the intermediate outcome indicator – “50% of eligible people (aged 40 years and older with a 10-year cardiovascular risk  $\geq$  30%, including those with existing cardiovascular disease) receive drug therapy and counselling (including glycaemic control) to prevent heart attack and stroke” – are not available. To assist with structuring this evaluation, we will divide the continuum of NCD care into four stages to allow a mini-diagnostic of where bottlenecks are. The intent of this section is not to provide accurate quantitative estimates of the performance of each stage but to make logical and qualitative deductions about where the main bottlenecks are.

### 1. Identifying and screening people at risk of NCDs

The pace of screening activities in Brunei Darussalam has accelerated since 2018 (Figure 13), reflecting concerted efforts at addressing Objective 4 of BruMAP-NCD. In 2019, three new screening initiatives were launched to screen for cardiovascular risks and diseases, breast cancer, and colorectal cancer, which are commendable and appropriately reflect the burden of NCDs and priorities. However, continued acceleration in screening activities will be needed in order to achieve the scale required (Figure 14) to achieve the targets (70 000 screened through the National Health Screening Programme assuming about 40% uptake among those eligible) and to reach the remaining (60% of the eligible who are not expected to take up the screening programme). Only about 7.6% of the population aged 40 and older who do not know their DM status have been screened since 2013.<sup>9</sup> Furthermore, nearly half (48.9%) of adults found to have raised blood pressure (28%) in the STEPS 2016 were neither previously diagnosed nor on antihypertensive medication, and hence potentially half of the adult population remains to be screened for hypertension or to be treated.

A further consideration is the age at which cardiovascular risks are screened. There are approximately 3859 people aged 30–39 who are not aware that they have underlying DM (Table 25). Discussions with emergency department clinicians and cardiologists indicate that an increasing proportion of young people in their early 40s are presenting with the endpoints of cardiovascular risk – i.e. heart attacks and strokes.

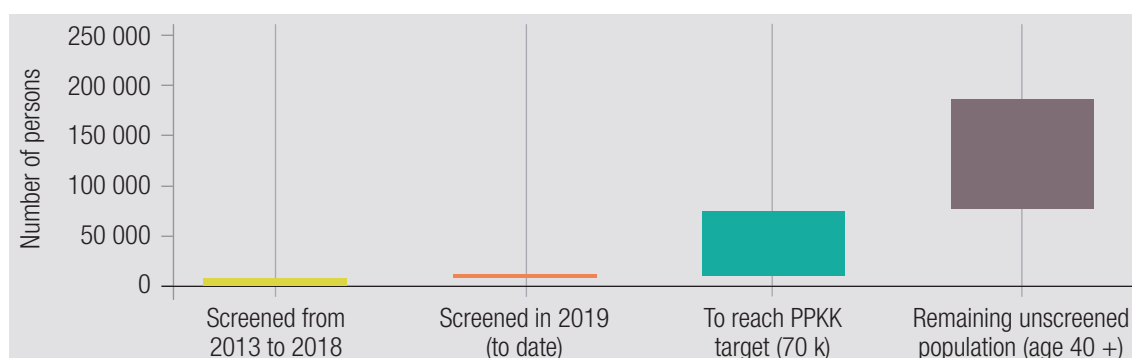
**Figure 13. Cumulative persons screened**



APPROXIMATE ESTIMATION ONLY. Includes both workplace and health facility-based screening programmes. Different forms of screening may be involved. Persons screened may not be unique individuals (same person can be screened more than once).

Source: HIB 2017 (revised January 2019) (7).

9. Approximately 9579 persons have been screened from 2013 to 2019. Population aged 40 and older who do not know their diabetic status is estimated at 126 169 (Population aged 40 and above [148 500] MINUS those already known to have DM [22 331]). See Table 25.

**Figure 14. Scaling up screening**

PPKK, Program Pemeriksaan Kesehatan Kebangsaan

Source: Correspondence with Ministry of Health officials.

**Table 25. Estimates of the population with diabetes mellitus (DM)<sup>1</sup>**

Age group	Population in 2018	Source			
		NHANSS 2011 (as reported in 2014)		2018 (assume same proportion as 2011)	
		Previously unknown DM (%)	Already known DM (%)	Previously unknown DM	Already known DM
60+	35 400	7.6	27.4	2 690	9 700
50–59	46 500	11.3	19.0	5 255	8 835
40–49	66 600	7.0	5.7	4 662	3 796
30–39	80 400	4.8	4.6	3 859	3 698
20–29	84 200	2.3	1.2	1 937	1 010
20+	313 100	5.9	8.6	18 403	27 040
30+	228 900	7.2	11.4	16 466	26 029
40+	148 500	8.5	15.0	12 607	22 331
Age group	Population in 2018	Percentage age 40–69 years with a 10-year CVD risk $\geq$ 0% or with existing CVD		Estimated population with a 10-year CVD risk $\geq$ 30% or with existing CVD	
40+	148 500	8.9		13 217	

1. “Previously unknown DM” persons were diagnosed during the survey but previously unaware of their condition. Proportions for “previously unknown DM” and “already known DM” status were derived from the NHANSS 2011 (as reported in 2014) and applied, assuming no change to age-specific proportions, to population estimates by age group in 2018.

Sources: NHANSS 2014 (8), STEPS 2016 (6), Vital Indicators 2018.

## 2. Initiating NCD treatment

Systematic data on the diagnosis of new cases at screening and subsequent initiation of pharmacological and non-pharmacological treatment for CVD risk factors should ideally be extracted from BruHIMS and monitored through the National Health Screening Programme registry. However, anecdotal and initial data points suggest that the screened population is healthier than the

population at large – i.e. individuals who voluntarily participate in health facility-based screening tend to have a lower prevalence of NCDs than the general population because they are more health conscious – and hence diagnosis rates (and by implication, initiation of NCD treatment) may be lower than expected. For example, 11% and 30% of the 1064 people aged 40 and above screened in 2013–2015 opportunistically (*Program Pemeriksaan Kesehatan*), respectively, had high blood pressure and were overweight or obese. These rates are lower than the expected prevalence rates measured through population surveys. However, those screened at the workplace appear more closely to reflect the health of the general population. For example, 19% and 62% of the 1064 people aged 40 and above screened in 2015–2016 at workplaces (*Program Perkesankan Pemeriksaan Kesehatan*), respectively, had high blood pressure and were overweight or obese.

Systematic data on the initiation of treatment for CVD risk factors such as hypertension, diabetes and hypercholesterolaemia should ideally be extracted from BruHIMS. For workplace-based screening programmes, the referral rates appear to be very low. For example, 81 (or 2%) of 4198 workplace health programme participants were referred. This provides an opportunity for improved connectivity between screening programmes and primary health care.

### 3. Effective long-term management of NCDs

At the population-level, systematic data on treatment-to-target outcomes are not available. There is one helpful data point available from the SARA survey conducted at 15 government health centres in 2014. The availability of basic equipment (99% availability) and essential medications (94%) is high. This does not mean to say that patients are systematically being treated to target, but it does imply that unavailability of medicines and equipment is an unlikely cause of deficiencies (if any). Clinical audits at the primary health-care level also provide some inference of care at the local level among patients who are known to the health services, but not of overall care, including among the population who rarely encounter the health-care system.

### 4. Reducing mortality and/or palliating the complications of NCDs

Systematic data on the coverage of emergency care for heart attacks and stroke at the population-level, or on the coverage of palliative care, are not currently available.

## 8.2 Implementation of interventions to enhance the continuum of care for NCDs

There has been a major acceleration in the implementation of activities related to Objectives 4 and 5 since 2018. Several new and substantive initiatives have been or shortly will be launched in 2019 and are included due to their salience.

### Prevention

The human papillomavirus (HPV) vaccination programme, which involves the routine vaccination (two doses) of females aged 11–13 years at school, began in January 2012.

*NOTABLE ACHIEVEMENTS* – Coverage rates are reported to be 86% (17).

## Screening

### 1. National Cervical Cancer Screening Programme

Cervical cancer is the third most common cancer among females in Brunei Darussalam and was responsible for 11 deaths in 2017. The National Cervical Screening Programme, implemented since 2011, is arguably the country's most mature cancer screening programme. Women aged 20–65 years are invited by letter to participate in the screening. Their details and addresses are obtained through the Immigration Department (responsible for the national identity database). Women who participate in this screening programme are routinely screened by pap smear every three years (unless abnormalities are found). Consultations, pap smear sampling and follow-up visits take place at well-woman clinics at government health centres, but pathology specimens are sent to *Raja Isteri Pengiran Anak Saleha* (RIPAS) hospital.

**NOTABLE ACHIEVEMENTS** – Since 2011, 40 000 women have been screened for cervical cancer (uptake is 40%), and 30 cases of malignant cervical cancer have been detected (18). Ascertaining if cervical cancer cases are detected at earlier stages will be a helpful measure of the screening programme's strengths.

**CHALLENGES** – Lessons from the National Cervical Cancer Screening Programme are important for informing the design and scale up of other national screening programmes.

- > *Invitations and suboptimal uptake rate.* The implementation team raised concerns about the effectiveness of invitation letters sent by post. They noted that there could be problems with residential addresses being inaccurate or out of date (as the population is mobile and may not be staying at their permanent address all the time). More than 1000 invitation letters have been returned to the Ministry of Health each year.
- > *Lack of integration with other screening programmes.* In the past (prior to September 2016), both cervical cancer screening and opportunistic cardiovascular risk screening were part of the well-woman clinics, but these programmes have since been delinked. Cardiovascular risk screening was reintroduced in all government health centres from February 2019 as part of the National Health Screening Programme, which will be bolstered with further screening for colorectal and breast cancer from late November 2019 onwards. However, screening for cervical and breast cancer and screening for cardiovascular risks and colorectal cancer will remain separate, with the former under the well-woman clinics and the latter under the primary health care clinics.
- > *Lack of integration with data systems.* The data system for the cervical cancer screening programme – the “Paptest” registry – was developed before BruHIMS and is separate from BruHIMS. Pathology results from the pap smears hence need to be manually entered into the Paptest registry, placing an unnecessary burden on health worker time and introducing the possibility of errors, including errors of omission and missed follow-up of abnormal results. Hence, there is a disconnect between the cervical cancer screening programme and the Paptest registry, the pathology labs, other national screening programmes and BruHIMS.

### Breast Cancer Screening Programme

The breast cancer screening programme was being piloted at the time of the evaluation. Prior to this pilot, breast cancer screening was conducted in an opportunistic manner. Women aged 40–69 are to be screened by mammogram every three years. The initial consultation and assessment are conducted at well-woman clinics, but the mammogram is done at RIPAS hospital. If the results of

the mammogram are abnormal, women will be followed up at RIPAS hospital, not at the well-woman clinic. If results are normal, women will be followed up at the well-woman clinic. BruHIMS, which is seamless between government health centres and hospitals, will be used to store clinical records for this screening programme, although BruHIMS currently does not have a picture archiving and communication system for mammograms.

The breast cancer screening programme pilot will be relaunched as a national programme in November 2019. The frequency of breast and cervical cancer will be synchronized for the convenience of patients.

### **National Health Screening Programme (NHSP) or *Program Pemeriksaan Kesehatan Kebangsaan (PPKK)***

This programme was launched in February 2019 to screen for cardiovascular risks and will be expanded in November 2019 to provide national breast cancer and colorectal cancer screening programme.

This screening programme defines the at-risk subpopulation as adults, male and female, age 40 and above. An estimated 70 000 individuals (assuming an expected uptake of 40%) are expected to be screened. These individuals are invited through mass media (newspapers, television and radio), social media, roadshows, and a NCD screening website (<http://ppkk.gov.bn/>) to register for this programme. There are three ways an interested individual can be registered – walk-in<sup>10</sup> to any of the 16 government health centres, online registration using e-Darussalam, and e-mailing a scanned registration form. The registration form includes basic demographic and contact details, but not a basic questionnaire on the health profile of the person. Nurses will subsequently call registered patients to arrange an appointment for fasted blood tests (fasting blood glucose and fasting lipid profile) and a separate appointment for a nurse-led, protocol-based consultation with the results of the blood tests. Blood pressure is measured and recorded in BruHIMS during encounters at the health centres. The nurse-led consultation includes a physical assessment (weight, height, waist circumference and blood pressure), a risk factor assessment based on the “NHSP Health Assessment Form”, cardiovascular risk scoring (generally based on WHO/ISH Cardiovascular Risk Prediction Charts for WHO epidemiological subregion WPR A), health education, and, if indicated, referral to the smoking cessation clinic, a primary health care doctor for further management, and/or other specific interventions to improve physical activity and dietary measures. Otherwise, an appointment in the next one to three years (as per the screening pathway) will be given. The specific screening protocol is the responsibility of the primary health care facility. Although screening clinical records are kept on BruHIMS, a separate Microsoft Excel-based screening registry is linked to each health centre over an intranet using SharePoint. This registry is monitored by the NCD Prevention Unit.

Colorectal cancer screening based on a Faecal Immunochemical Test (FIT) will be added to the NHSP from late November 2019 onwards. Prior to this pilot, colorectal cancer screening was conducted in an opportunistic manner. The at-risk population are adults, male and female, age 50–75 years. The added criteria for FIT testing is “No stool occult blood test within three years and no colonoscopy within 10 years”. Persons who screen negative using FIT will be given a two-year follow-up appointment. Persons who screen positive using FIT or who have a strong family history of colorectal cancer will be referred to see a gastroenterology clinic for colonoscopy (if indicated).

10. During visits to a government health centre, health workers described how they are able to opportunistically increase registrations – by opportunistically asking eligible people attending for the flu or general clinic to register, and by actively seeking out eligible people and relatives of patients attending chronic disease clinics. This is a local practice for this particular health centre – which was not practiced in all the health centres visited.



**NOTABLE ACHIEVEMENTS** – As of December 2019, a total of 1356 individuals have registered to be screened for cardiovascular risks since *Program Pemeriksaan Kesehatan Kebangsaan* began in February 2019, with a four-year target of 40 000 individuals (40% of eligible resident population age 40 and above). The screening programme is nurse led. The implementation team indicated that of the 862 individuals who had been screened, about 13% were found to have blood pressure above 140/90, 7% were found to have fasting blood glucose above 6 mmol/L, 67% had BMI above 25 kg/m<sup>2</sup> and 59% had cholesterol above 5 mmol/L – the prevalence of the abnormalities screened is within the expected range for the general population for fasting blood glucose and cholesterol, but below the expected range for hypertension.

#### CHALLENGES

- > *Suboptimal uptake of screening.* Voluntary uptake of NHSP is suboptimal given the appropriate goals that have been set and the remaining undiagnosed individuals within the population.
- > *High-risk population not fully captured.* As the screening programme is voluntary, there is some suggestion from preliminary data points that individuals who take up the programme are “health conscious” and are below average risk for NCD risk factors.
- > *Fragmentation in screening programmes, data systems and protocols.* The screening programme for colorectal cancer and cardiovascular risks is separate from the screening programmes for female cancers. Screening registries are not well integrated with BruHIMS and disease registries. Clinical practice guidelines used for screening and managing cardiovascular risks are separated into risk factors and diseases.
- > *High burden on health workers,* who encounter patients during multiple visits (for which appointments have also to be arranged), provide routine and repeated health education, and conduct routine risk assessments. As the screening programme reaches scale, this high burden will be a major constraint.

Photo 9. Launching of the National Health Screening Programme for CVD risk factors, 14 February 2019



Photo 10. National Cancer Screening Programme exhibition in conjunction with World Cancer Day celebration, 9 February 2020



Photo 11. National Cancer Screening Programme exhibition during Riadah Berbasikal Semangat Kebangsaan 2020, 1 March 2020, viewed by His Majesty Sultan Haji Hassanal Bolkiah Mu'izzaddin Waddaulah Ibni Al-Marhum, Sultan Haji Omar 'Ali Saifuddien Sa'adul Khairi Waddien, Sultan and Yang Di-Pertuan of Negara Brunei Darussalam and His Royal Highness Prince Haji Al-Muhtadee Billah ibni His Majesty Sultan Haji Hassanal Bolkiah Mu'izzaddin Waddaulah, the Crown Prince.



Photo 12. National Cancer Screening Programme exhibition in conjunction with World Cancer day roadshow at The Mall Gadong, 4–7 March 2020



### Other screening programmes

Several other important screening programmes have been conducted. Some of the initiatives are run by the Health Promotion Centre and are based in the workplace – at government ministries (i.e. Integrated Health Screening and Health Promotion Programme for Civil Servants in 2011 and *Program Perkesankan Pemeriksaan Kesihatan* in 2015) and ad-hoc screening roadshows at private companies. A recent partnership with a private cardiac centre, Gleneagles Jerudong Park Medical Centre (GJPMC), secured BND 120 000 in corporate social responsibility funding to promote healthy and active lifestyles at workplaces. There should be systematic planning, data collection and evaluation of these screening programmes to ensure effectiveness and sustainability of the programme. Some studies have found that workplace-based screening programmes are better able to pick up high-risk individuals (or at least individuals with a similar risk to the population in general as measured during health surveys) compared with opportunistic screening during ad hoc roadshows, which appear to pick up low-risk “health conscious” individuals.

Photo 13. Health screening activity as part of the Healthy Workplace Programme at Takaful Brunei conducted by the Health Promotion Centre



Photo 14. Ad hoc health screening in the community in collaboration with Fiziq Healthcare, a private medical equipment supplier



## Primary Health Care Management of NCDs

Most of the larger government health centres organize their clinics into general clinics, flu clinics and chronic disease clinics. NCDs are generally managed in chronic disease clinics that involve a nurse-led triage at the start (assessment of weight, blood pressure, etc.), followed by a review by doctors. For diabetic patients, Diabetic Nurse Educators conduct their own clinics and can review these patients more frequently than doctors, although doctor-led clinics are still required where major changes in medications (initiating new medications) are warranted.

Different pathways are used by different clinics – for example, some clinics have a WHO HEARTS-based management pathway for cardiovascular risks. An overall cardiovascular risk prediction strategy is the expected norm to guide treatment.

Audits and re-audits of clinical practice and management, including some that are related to NCD management (see Table 24) are a key performance indicator at health centres. Performance outcomes are variable and reflect practice at the health facility but do not offer a systematic view of population-level management.

## Hospital and emergency care

Based on brief visits to RIPAS hospital and *Pantai Jerudong Specialist Centre* (PJSC), the structure and processes for the emergency management of heart attacks and strokes are in place to provide optimal world-class management where affordable for the patient or covered by the government, i.e. for citizens and/or permanent residents.

Primary percutaneous coronary intervention (PCI) is the preferred treatment modality for heart attacks, and GJPMC is the designated centre for this procedure. Thrombolysis can also be administered at RIPAS hospital (although referral for primary PCI at GJPMC is preferred where affordable, i.e. for fee-paying non-citizens, and indicated clinically. Acute strokes can be thrombolysed at RIPAS hospital (with neurology input and where clinically indicated, including with a CT brain scan) but are generally referred to the PJSC because it has been purpose-built (e.g. with a CT scanner at the emergency department) to expedite the clinical pathway for stroke thrombolysis.

A strong partnership on cancer prevention and control has been established between the Ministry of Health and the Brunei Cancer Centre (TBCC) and Early Detection and Cancer Prevention Services (EDCP) at PJSC. The TBCC was established in 2009 and provides advanced cancer treatment modalities including radiotherapy and chemotherapy. EDCP Services was officially launched in November 2019 to provide cancer prevention, counselling and screening services to family members of cancer patients at the TBCC.

The diagnosis and initial assessment of heart attacks and strokes can be made at the primary health care level. Emergency ambulances are available and agreed processes are in place to send patients to the designated treatment centre directly (i.e. GJPMC for heart attacks and PJSC for strokes). However, thrombolysis for heart attacks cannot be initiated at the primary health care level under the current setup, even though medical officers and the necessary equipment for diagnosis (electrocardiogram [ECG] machines) and treatment are generally available. Findings from the 2014 SARA survey of health centres – which noted weaknesses in the availability of clinical guidelines, training of doctors in emergency NCD care – are in line with observations of government health centres.

## Palliative care

Palliative care services are organized from hospitals, particularly RIPAS hospital and TBCC, and are for historical and human resource reasons, closely linked to geriatric services. As palliative care specialists are in short supply, the main strategy has been to build the capacity of health workers (allied health and doctors) in general to be able to palliate symptoms. This is achieved through pain management clinical pathways, pain documentation, guidelines on the management of common symptoms in palliative care, an in-house diploma for caregivers, inclusion of palliative care in undergraduate and postgraduate medical curriculum, continuing medical education, and other informal and formal teaching opportunities.

Home-based palliative care services, including the use of opiates, is organized from hospitals rather than primary health care facilities.

## Rehabilitation

Rehabilitation services are organized from hospital (particularly the Brunei Neuroscience, Stroke and Rehabilitation Centre [BNSRC], which was established in 2010 as a result of an international collaboration with Krankenhaus Nordwest, Germany). Clinical leadership has since been transitioned to a team of local specialists. Rehabilitation facilities for physiotherapy, occupational therapy, speech therapy and convalescence are very comprehensive and modern, and are staffed by a multidisciplinary team.

Home-based rehabilitation and nursing services are organized from BNSRC rather than primary health care facilities.

## 8.3 Key success factors for implementation

The following success factors are common across the multiple interventions for achieving Objectives 4 and 5:

1. **Establishment of the NCD Prevention Unit**, in partnership with the relevant delivery units within the Ministry of Health, to initiate and coordinate relevant interventions across the Ministry while preserving joint responsibility and buy-in from the delivery units.
2. **A culture of innovation, quality and collaboration**, whereby local health centres are encouraged to innovate and try out, evaluate and disseminate new initiatives; regular audits and re-audits of clinical practices and performance are done at the primary health care level; internal knowledge is shared via the intranet; and health workers and other stakeholders willingly collaborate to address NCDs, has been critical.
3. **Task shifting and step-down care**. The deep involvement of primary health care nurses in screening and chronic disease clinics (Diabetic Nurse Educators) is a strength. Well-trained primary health-care nurses are able to develop close relationships with their diabetic patients to give regular advice, adjust medication dosages, provide diabetic education and assist with initiating insulin treatment. They are also able to monitor outcomes (e.g. treatment targets such as blood pressure, cholesterol and HbA1c) and complications (e.g. diabetic foot, diabetic retinopathy, diabetic nephropathy).

4. **One patient, one record (BruHIMS).** A common electronic health record that reaches across government health centres and links government health centres and hospitals allows health workers across facilities and clinics to base medical decisions on a patient’s record (e.g. nurse triage assessments, which include blood pressure, can be viewed across the system), thereby reducing duplication of tests and permitting an overall view of the prescribing and dispensing for each patient.
5. **Strong supply-side readiness,** with near universal availability of essential equipment and basic medications, as expected for a high-income country. The availability of medications is not a significant constraint for NCD management. However, from discussions with pharmacists as part of the evaluation, high wastage of medications provided for free (as part of the fee of one Brunei dollar for clinic visits) to patients was highlighted as a problem – this is a concern for sustainability and medication compliance.

## 8.4 Alignment to best practice

Table A.1 in Annex 1 summarizes applicable WHO “Best Buys” relevant to Objectives 4 and 5 and the alignment of current interventions in Brunei with these opportunities. These “Best Buys” are among the most cost-effective interventions for addressing NCDs.

## 8.5 Opportunities to enhance the continuum of care for NCDs

The following opportunities can be considered to improve interventions related to Objectives 4 and 5:

1. **Move from multiple fragmented national screening programmes to a single, person-centred screening programme.**
  - a. **Multiple entry points, with the person at the centre of the process.** The screening programme should not revolve around the structure and organization of the Ministry or its facilities, but around the patient – in order to maximize uptake, reduce inconveniences for the patient, and provide seamless integrated care. In addition to patient-initiated voluntary registration, which is currently used, extend the entry points of a single, person-centred programme to:
    - i. workplaces, both government and private sector, by working with employers to register, obtain blood specimens en masse, and provide group health education (Note: It is critical to preserve connectivity and involvement of the primary health care team for screening activities by outreach);
    - ii. other community settings, such as shopping malls and other areas frequented by the population at risk of NCDs – even if only a limited set of screening instruments, such as blood pressure monitors, is available;
    - iii. health centres, by intervening during the nurse-led triage for flu and general clinics (encourage eligible patients to participate and sample blood immediately), chronic disease clinics (encourage family members to participate and sample blood immediately) and dental clinics (encourage eligible patients to participate, noting that the risk factors for dental caries and NCDs overlap);

- iv. the existing BruHIMS database, by identifying unscreened patients who are eligible and/or are likely to be at high risk, and by flagging these patients for a screening intervention in any future interaction they may have with the health-care system and/or by sending personalized invitations to the programme; and
  - v. private general practitioners, if feasible.
- b. A single programme with an integrated screening pathway so that participants will have access to all the screening tests they are eligible for regardless of the entry point used, with a strong link with primary health care.**
- i. Nurses in general clinics may need to be trained to perform pap smears.
  - ii. Data systems used in the integrated screening programme will need to be harmonized.
  - iii. Screening encounters should be part of primary health care – recorded into BruHIMS and with a seamless pathway to health centres.
- c. Streamlined processes for both patients being screened and for health-care workers.**
- i. Minimize visits required of patients by merging registration and blood-taking visits assessing patient eligibility for mammography by phone so that a visit to a health centre to obtain an appointment for mammography is not needed and considering mobile mammography (and opportunistically combining with other relevant screening tests).
  - ii. Consider allowing non-fasted HbA1c and lipid profile, if in-country consensus among clinicians permits,<sup>11</sup> either as a substitute for fasted tests or as a non-fasted alternative for those presenting for a screening opportunity without having fasted.
  - iii. Reduce duplicated work done by health workers, particularly data entry (pathology results, maintaining a registry separate of BruHIMS, etc.), booking appointments (allow a BruHIMS patient portal to book or reschedule appointments), general health education (leverage recorded videos or interactive online tools), and general screening questions (allow patients to complete a health profile questionnaire before their appointment).
- 2. Unify the cardiovascular pathway for screening and effective outpatient management.** Given the prevalence of cardiovascular risk factors, this is a high throughput pathway. The pathway for screening and effective outpatient management (of all except the most complex cases) will level up the standard of care throughout health centres. As part of the development of this pathway:
- a. Merge and simplify related clinical practice guidelines** for other cardiovascular risks such as dyslipidaemia, hypertension and smoking cessation into a single non-specialist pathway.
  - b. Consider routinely screening for cardiovascular risks at an earlier age,<sup>12</sup>** in compliance with national guidelines that state “screening should begin at age 40 years, and be considered at an earlier age (e.g. 30 years) if any of the risk factors for diabetes is present”,<sup>13</sup> while taking note of the high prevalence of risk factors for diabetes such as overweight or obesity (approximately two thirds of residents), dyslipidaemia (approximately one half of residents) and family history of diabetes (one tenth of residents are diabetic).

11. Diagnostic criteria for DM includes HbA1c of  $\geq 6.5$ . National Health Screening Guideline on Noncommunicable Diseases (NCDs), Ministry of Health, Brunei Darussalam, May 2019.

12. The Minister of Health stated that the average age of first presentation of heart attacks is lower now (age 51) compared with a few years ago (age 58). Other clinicians met during this evaluation also mentioned that it is common for relatively young patients to have ischaemic heart disease.

13. National Health Screening Guideline on Noncommunicable Diseases (NCDs), Ministry of Health, Brunei Darussalam, May 2017.



- c. **Leverage in-country expertise and experience to further enhance existing cardiovascular risk prediction**, to incorporate into the model additional inputs such as low- and high-density lipoprotein cholesterol levels (already routinely tested) and BMI from international risk-prediction models, and to allow estimations for those under 40 years of age. Such a model can be further validated and modified based on empirical data from the Brunei population given the ubiquity of the “one patient, one record” BruHIMS, which records risk factors and cardiovascular endpoints, as well as death records including cause of death.
  - d. **Consider routinely intervening at a lower cut-off (e.g.  $\geq 20\%$ ) for 10-year cardiovascular risk**. The current norm is to intervene when 10-year cardiovascular risk is  $\geq 30\%$ . This cut-off excludes many moderate-risk individuals who contribute substantively to premature cardiovascular mortality.
  - e. **Include the prescribing of physical activity**, as a critical intervention carrying the full weight of a doctor’s recommendations, given that it is a critical aspect of NCD management.
  - f. **Place greater emphasis on patient counselling**, particularly with respect to compliance to medications and warning signs, so that patients present early for complications and emergencies.
3. **Build on and strengthen BruHIMS** by extending the coverage of BruHIMS and enhancing its functionality (particularly with regards to clinical decision support and analytics), interactivity with patients, and connectivity with the rest of the health system.
- a. **Extend the coverage of BruHIMS** to include private hospitals and primary health care facilities, as well as mobile teams (e.g. those performing screening and chronic disease management on an outreach basis to the community and workplaces).
  - b. **Enhance clinical decision support** to provide clinicians with automated aids such as automated cardiovascular risk prediction, flag issues (potential prescribing errors and prescribing suggestions), automated clinical management alerts (e.g. tests that are overdue), and automated information on dispensing (inference of patient compliance).
  - c. **Enhance analytics with automated audits of clinical practices and performance** (e.g. management of NCDs to treatment targets) to inform facility-level total quality management and as an input to a national-level performance dashboard, and to generate detailed health indicators.
  - d. **Enhance interactivity with patients by creating a patient portal for BruHIMS**, which would allow patients to update details, book and reschedule appointments, view salient test results (especially for chronic disease patients who should be empowered), respond to health profile questionnaires, and communicate with their primary health care team.
  - e. **Enhance connectivity in an automated manner** (hence manual data entry will no longer be needed), with the surveillance and public health functions of the Ministry, including disease and screening registries.
  - f. **Consider requiring patient registration** to a designated health centre or a multidisciplinary primary health-care team within a health centre, given that 95% of residents are already registered with BruHIMS.

- i. The purpose is not to exclude patients from seeking services at other health centres (this should be allowed for urgent/acute cases) but to ensure that every resident in Brunei Darussalam has a primary health care team responsible for their care all the time. Hence, some degree of choice of health centre (as the permanent address on the national ID system may not be up to date or patients may be mobile due to work or studies) may be allowed. Some patients may wish to opt out if they have a regular private general practitioner.
  - ii. The key purpose is to ensure that each health centre or primary health-care team has a list of patients for which they are responsible, including for reaching out to proactively screen them for NCDs. This clarifies responsibility and performance management.
- g. Reduce the time spent by health workers on BruHIMS.** Find ways to reduce the time required to complete tasks in BruHIMS by either eliminating unnecessary tasks or shifting front-line health worker tasks to other team members.

#### 4. Build on task-shifting by strengthening nurse-led clinics.

- a. **Raise the stature of nurses among the population**, as skilled and trained health professionals.
- b. **Integrate nurse-led clinics related to NCD screening and management**, including smoking cessation. As the unified pathway for cardiovascular screening and outpatient management matures further, consider elevating the role of nurses further within the pathway.
- c. **Remove inconsistencies.** Nurses triaging patients before general and flu clinics are authorized to request an ECG, blood sugar test and urinalysis, but cannot request a lipid profile, even though the core task of nurse-led screening clinics is to review fasting lipid profiles and fasting blood sugar.

Above all, persevere with the efforts and commitment evident by the launching of three new NCD screening programmes in 2019 and scale these programmes up rapidly, given the size of the population yet to be screened. Scaling up will require additional resources (noting that less than 10% of the Ministry budget is allocated to primary health care), human resources fit-for-purpose, investments in capacity (to design, implement, monitor, and evaluate programmes), and furtherance of the current culture of learning, adapting and innovating.

## 9. RESEARCH AND EVIDENCE INFORMED PRACTICE

Health agencies have formed partnerships with local academic groups to support policy-relevant research. For example, leaders at the Pengiran Anak Puteri Rashidah Sa'adatul Bolkiah Institute of Health Sciences of the University of Brunei Darussalam have conducted research aligned with the BruMAP-NCD goals, and with grants from the Ministry of Health, they have undertaken research and supervised masters students to perform evaluations, surveys and reviews.

There are opportunities to strengthen research and to improve the quality of research outputs that inform NCD-related policy implementation. For instance, the Ministry of Health could develop an annual list of research priorities to outsource across research partners with that specific expertise. They could facilitate the partnership of local academic groups with foreign universities to publish on some of their achievements in the peer-reviewed literature (e.g. tobacco taxation).

# ANNEX 1.

## Alignment of Objectives 4 and 5 interventions to WHO “Best Buys”

No.	WHO “Best Buy”	CEA #	Alignment
1	<p>Drug therapy (including glycaemic control for diabetes mellitus and control of hypertension using a total risk* approach) and counselling to individuals who have had a heart attack or stroke and to persons with high risk (<math>\geq 30\%</math>) of a fatal and non-fatal cardiovascular event in the next 10 years.</p> <p>Moderate to high risk (<math>\geq 20\%</math>)</p>	$\leq$ I\$ 100	<p>Total risk approach is the general norm and the WHO/ISH WPR A risk prediction chart is recommended in national guidelines. Cut-off used is “high risk” (<math>\geq 30\%</math>).</p> <p>In terms of actual practice, overall population coverage for drug therapy and counselling cannot be confirmed (see section on “Supplementary Indicators”).</p>
2	<p>Treatment of new cases of acute myocardial infarction** with either: acetylsalicylic acid, or acetylsalicylic acid and clopidogrel, or thrombolysis, or primary percutaneous coronary interventions (PCI).</p> <p>Treatment of new cases of acute myocardial infarction with aspirin, initially treated in a hospital setting with follow-up carried out through primary health care facilities at a 95% coverage rate.</p> <p>Treatment of new cases of acute myocardial infarction with aspirin and thrombolysis, initially treated in a hospital setting with follow-up carried out through primary health-care facilities at a 95% coverage rate.</p> <p>Treatment of new cases of myocardial infarction with primary percutaneous coronary interventions (PCI), aspirin and clopidogrel, initially treated in a hospital setting with follow-up carried out through primary health care facilities at a 95% coverage rate.</p>	$\leq$ I\$ 100	<p>YES. Primary PCI is the standard for Brunei Darussalam.</p>
3	Treatment of acute ischaemic stroke with intravenous thrombolytic therapy.	$\leq$ I\$ 100	<p>YES, for those referred to <i>Pantai Jerudong Specialist Centre</i>. Advanced facilities available assess and treat acute stroke, including immediate access to CT scans (and, if necessary, MRI), thrombolytic treatment, and HDU/ICU facilities.</p>
4	Primary prevention of rheumatic fever and rheumatic heart diseases by increasing appropriate treatment of streptococcal pharyngitis at the primary care level.	$\leq$ I\$ 100	Throat swabs not routinely done, but treatment with antibiotics is commonly available.
5	Secondary prevention of rheumatic fever and rheumatic heart disease by developing a register of patients who receive regular prophylactic penicillin.	$\leq$ I\$ 100	To confirm with paediatric cardiology department.

**ANNEX 1.** (continued)

## Alignment of Objectives 4 and 5 interventions to WHO “Best Buys”

No.	WHO “Best Buy”	CEA #	Alignment
6	Preventive foot care for people with diabetes (including educational programmes, access to appropriate footwear, multidisciplinary clinics).	≤ I\$ 100	YES. Provided by Diabetic Nurse Educator (health centre-based) or podiatrist (organized from hospitals but takes place at primary health care).
7	Diabetic retinopathy screening for all diabetes patients and laser photocoagulation for prevention of blindness.	≤ I\$ 100	YES. Organized from hospital but takes place at primary health-care level on a routine basis.
8	Effective glycaemic control for people with diabetes, along with standard home glucose monitoring for people treated with insulin to reduce diabetes complications.	≤ I\$ 100	PARTIAL. Comprehensive primary health-care level pharmacological and non-pharmacological glycaemic control (and other cardiovascular risk factors), including at nurse-led clinics (Diabetic Nurse Educator), but home glucose monitoring is not available to those who cannot afford to purchase glucose monitoring sticks out of pocket.
9	Vaccination against human papillomavirus (HPV) (2 doses) of 9–13-year-old girls.	≤ I\$ 100	YES. HPV vaccination programme began in January 2012. Routine vaccination of females age 11–13 years at school (2 doses).
10	Prevention of cervical cancer by screening women aged 30–49, either through: <ul style="list-style-type: none"> <li>— visual inspection with acetic acid linked with timely treatment of precancerous lesions;</li> <li>— pap smear (cervical cytology) every 3–5 years linked with timely treatment of precancerous lesions; and</li> <li>— human papillomavirus test every 5 years linked with timely treatment of precancerous lesions.</li> </ul>	≤ I\$ 100	YES. National Cervical Screening Programme in place since 2011.  WHO STEPS 2015/16 found that 67.5% of women aged 30–49 has had a screening test for cervical cancer done before. Uptake rate reported as 40% from administrative records.
11	Screening with mammography (once every 2 years for women aged 50–69 years) linked with timely diagnosis and treatment of breast cancer.	≤ I\$ 100	YES. National Breast Screening Programme involves the screening of women aged 40–69 years every 3 years using mammography launched in November 2019.
12	Treatment of colorectal cancer stages I and II with surgery +/- chemotherapy and radiotherapy.	≤ I\$ 100	YES
13	Treatment of cervical cancer stages I and II with either surgery or radiotherapy +/- chemotherapy.	≤ I\$ 100	YES

**ANNEX 1.** (continued)

## Alignment of Objectives 4 and 5 interventions to WHO “Best Buys”

No.	WHO “Best Buy”	CEA #	Alignment
14	Treatment of breast cancer stages I and II with surgery +/- systemic therapy.	≤ I\$ 100	YES
15	Basic palliative care for cancer: home-based and hospital care with multi-disciplinary team and access to opiates and essential supportive medicine.	≤ I\$ 100	YES
16	Symptom relief for patients with asthma with inhaled Salbutamol.	≤ I\$ 100	YES
17	Symptom relief for patients with chronic obstructive pulmonary disease with inhaled salbutamol.	≤ I\$ 100	YES
18	Treatment of asthma using low-dose inhaled beclomethasone and short-acting beta agonist.	≤ I\$ 100	YES

#, Cost-effectiveness Analysis (CEA) per disability-adjusted life year (DALY) averted in low- and middle-income countries (LMICs)

\*, Total risk is defined as the probability of an individual experiencing a cardiovascular diseases event (for example, myocardial infarction or stroke) over a given period of time, for example 10 years

\*\*, Costing assumes hospital care in all scenarios

WHO “Best Buys” based on the updated Appendix 3 of the WHO Global NCD Action Plan 2013–2020 (13).

# ANNEX 2.

## Consultation list

Photo 15. Group photos with the Honourable Minister of Health, Permanent Secretary, Deputy Permanent Secretaries of the Ministry of Health



### Contributors for the multisectoral interviews during the evaluation

Prime Minister's Office: Dr Awang Norfarizal bin Othman, Awang Haji Muhammad Suffian bin Haji Bungsu, Mohammad Ede Fadle bin Haji Shamsu, Hajah Noor Airah binti Haji Abdul Rahman, Siti Atikah binti Haji Abdul Rahman, Dayangku Moniri binti Pengiran Mohiddin, Muhammad Rahmat bin Hamid, Rodziah binti Haji Mohammad, Hajah Ilyasuriani binti Dato Paduka Haji Hamdani, Chief Inspector Kifli bin Haji Mohd Daud, Zahirah binti Osman, Azzyati Filzah binti Haji Jamain, Norsyamimi binti Ramli. Ministry of Development: Martina binti Haji Tamit, Hajah Sarbiah binti Haji Burut, Marsita binti Omar, Dr Hana Hafiza binti Haji Hamzah, Dk Noorul Hayaah binti Pg Haji Jasni. Ministry of Culture, Youth and Sports: Dr Essam Md Shaaban, Noorfaizah binti Haji Suboh, Hajah Normie binti Haji Ramli, Nurul Aziemah binti Haji Morni, Haswandi bin Haji Osman, Hajah Megasari binti Haji Mohd Hassan, Napisah binti Haji Tamin. Ministry of Transport and Infocommunication: Haji Mohammad Syafien bin Yandol Abdullah, Hajah Nurul Izni binti Merni, Haji Muhammad Zin bin Haji Yaakub. Ministry of Home Affairs: Nurhisham bin Haji Md Saini, Ampuan Noorirawaty binti Ampuan Abdul Rashid, Pengiran Ibrahim bin Pengiran Haji Tengah, Ahmad Fazil bin Zakaria, Ade Nurismah Azurine binti Haji Ismail, Arifin bin Haji Bujang, Muhammad Haazeq bin Arsad, Abdul Kahar bin Haji Yahya, Nazri bin Haji Jaidin, Yamin Ahmad bin Haji Abdul Razak. Ministry of Education: Haji Hairone bin Haji Abdul Rahman, Mohammad Hatta bin Haji Suhaili, Hafizan bin Hisham, Haji Muhammad Nazreen Haewan bin Haji Suani, Mohammad Taib bin Alikhan, Haji Muhammad Azrin bin Haji Aji, Jepriden bin Hajemi, Hajah Jamilah binti Ali, Hajah Razinahtul Hasyimah binti Haji Abdul

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