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**Department of Health**

## **PROPOSED NATIONAL PLAN TO HALT THE RISE IN OBESITY AND DIABETES**

*(updated 19 Oct 2017)*

### **RATIONALE**

#### **DIABETES AND OBESITY PREVALENCE**

The World Health Organization (WHO), international medical and scientific societies, now recognize obesity as a chronic progressive *disease* resulting from multiple environmental and genetic factors. The disease of obesity is costly not only in terms of economics, but also in individual and societal health, longevity, and psychological well-being. Due to its progressive nature, obesity requires life-long treatment and control. The prevalence of overweight and obesity (derived from *2014 STEPS Survey of Adults in Bermuda*) was estimated at **74.6% among adults**, making it the highest level of national prevalence worldwide.

The prevalence of diabetes in Bermuda (derived from *2006 Health Survey of Adults and Children in Bermuda* and reported in the *2011 Health in Review*) was estimated at **13.0% among adults aged 20-79 years**. The diabetes rate was twice the OECD average rate of 6.3%, and exceeded the prevalence in all OECD countries.

#### **BACKGROUND**

In 2000, an Arthur Andersen report referenced the 1996 healthcare review issued by Senator Alf Oughton in 1996, which detailed 104 recommendations to improve health care in Bermuda. Arthur Andersen's analysis distilled these recommendations into eight (8) initiatives, among which were the following:

- Promote the use of alternative and **preventive care services, sites and personnel**;
- Implement **disease management and prevention programmes**;
- Create a **central data repository for all health care data**;
- Provide mentoring, technical expertise, and **overall direction to all the healthcare system**.

In 2016, two decades later, these themes continue to apply to the situation regarding non-communicable disease management (from incipience of risk factors to development of disease and disability), and encompasses all settings of care, while placing a heavy emphasis on prevention and health maintenance.

#### **BERMUDA HEALTH STRATEGY AND ACTION PLAN, 2014-19**

Among the **Bermuda Health Strategy 2014-2019** Health Sector Goals, there are:

***“Goal 11: Implement a comprehensive approach to health promotion which encourages healthy lifestyles and involves health professionals and organizations to ensure the Well Bermuda population goals can be achieved.***

*...Health promotion and health education have been identified as priority areas to tackle these wholly preventable problems, which are placing unnecessary stress on limited healthcare resources.*

***Goal 13: Increase the access to interventions to prevent and manage non-communicable diseases and their risk factors, in order to reduce the burden of chronic non-communicable diseases to Bermuda.***

*The growth in non-communicable diseases (NCDs) globally is increasingly felt in Bermuda. NCDs such as cardiovascular disease, cancer, diabetes and kidney disease represent the greatest burden of mortality and healthcare costs. They are also largely caused by **preventable factors**, and **modifiable through better behaviours and interventions**. A range of strategies will be employed to ensure **persons with or at risk of chronic non-communicable diseases are identified and properly managed to secure better patient outcomes and reduce health costs**. Measures will address coverage, clinical guidelines, care pathways, and surveillance.”*

The **Bermuda Health Strategy 2014-2019**, is supported by the **Bermuda Health Action Plan 2014-2019**, which details the implementation objectives and timelines. Within the Health Priority Areas (Section A - Cost-effective disease control (non-communicable diseases (NCDs))), the Plan details the following Priority Actions and Responsible Party:

#### **Diabetes**

1. Develop a chronic disease register (priority – diabetes, hypertension, chronic kidney disease, heart disease) – Office of the Chief Medical Officer (OCMO)
2. Decrease the acuity of illnesses related to diabetes via education and appropriate clinical services – Bermuda Hospitals Board (BHB)
3. Halt the rise in obesity and diabetes in Bermuda with rates in adults no higher than 34.4% and 12.2% respectively – Department of Health (DOH)

#### **Non-communicable Diseases Care**

7. Develop enhanced care pilot to better manage chronic NCDs with a focus on reducing risk factors and realignment of reimbursement structure to provide incentives to providers for managed care delivery. Demonstrate reduction in hospitalizations and emergency department visits and improved clinical statistics by pilot participants – Health Insurance Department (HID)
8. Focus on reducing NCD risk factors – DOH/OCMO

The Health Strategy and Action Plan seek to ensure progress towards the health sector reform goals, using the Action Plan objectives and other assessment tools.

In the **2017 Throne Speech**, it was stated that *“the Government will engage all sectors of society in a coordinated, strategic plan to halt the rise in obesity and diabetes in Bermuda. The Government will lead the way in wellness by encouraging its employees to make healthy choices, and will contribute to their well-being by offering programmes, incentives and education to support the journey to a healthier public service. While unhealthy foods are often appealing due to their lower prices, the cost of treatment is significantly higher than the cost of prevention. Accordingly, the Government will begin a consultation for the introduction of a Sugar Tax on the sale of certain foods and beverages in Bermuda”*.

### **PROPOSED NATIONAL PLAN TO ADDRESS OBESITY AND DIABETES**

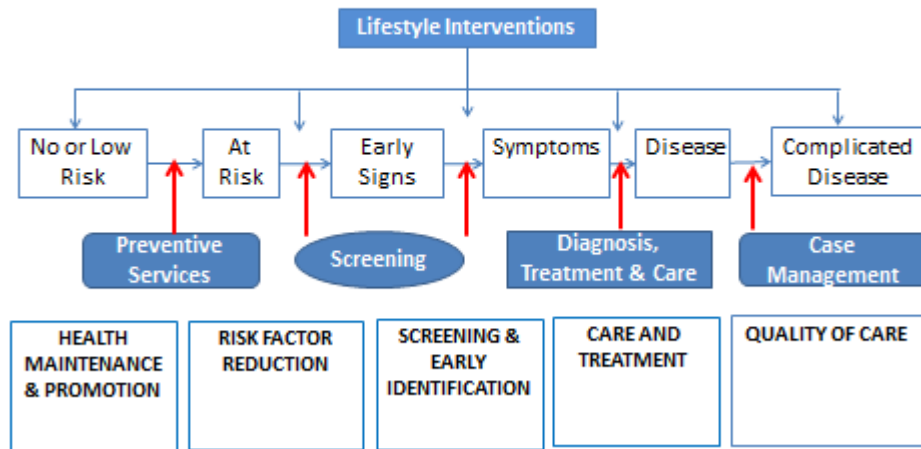
The Department of Health (DOH)’s Goal is *“to halt the rise in obesity and diabetes prevalence in adults to no higher than 34.4% and 12.2% respectively (Baseline data, STEPS 2014).*

With the focus on obesity and diabetes, the following proposed framework for a national management plan is presented to meet the requirements for prevention, screening and diagnosis, quality of care and monitoring and evaluation, and to achieve the goal, based on the disease continuum, public health & clinical interventions model.

The proposed interventions model(see **Figure 1**) is built around the continuum of disease (from no/low risk to complicated disease) and intervening at each transition point on the continuum, utilizing the prevention model (ranging from health promotion and maintenance through risk reduction, screening and diagnosis, treatment and care, and measurement and monitoring of quality of care indicators.

FIGURE 1: INTERVENTIONS MODEL

## INTERVENTION POINTS on THE DISEASE CONTINUUM



There are at least five (5) “transition points” in the natural history of obesity and diabetes mellitus that provide opportunities to reduce the health and economic burden (see **Table 1** below)

TABLE 1: TRANSITION POINTS AND THE INTERVENTIONS MODEL

DIABETES	OBESITY	HEALTH STRATEGY
“no risk factors” to “presence of precursor conditions & behaviours for development of modifiable risk factors” to “presence of modifiable risk factors”		Health Maintenance and Promotion
“no diabetes” to “diabetes”	“healthy weight/BMI” to “increasing BMI/overweight”	Risk Factor Reduction
“unrecognized diabetes” to “recognized diabetes”	“unrecognized weight issues” to “recognized obesity”	Screening and Early Detection
“no diabetes care” to “access to appropriate diabetes care”	“no weight management care” to “access to appropriate care for overweight & obesity”	Care and Treatment
“inadequate care” to “adequate care”.		Quality of Care

Each of these “transition points” can be applied along the **Life Course** continuum from gestational period (pregnancy/in-utero) through early childhood (*first 1,000 days of life*), childhood (*ages 2-18 years*), adulthood (*ages 18-64 years*) and elderly years (*age 65 years and older*).

The health strategies (to be applied at each intervention point) are also shown in **Table 1**.

## Risk Factors for Diabetes & Obesity

Among the known risk factors for diabetes mellitus are modifiable factors (indicated in Table 2 below) of diet, physical inactivity, overweight/obesity and active smoking.

**TABLE 2: RISK FACTORS FOR DIABETES MELLITUS TYPE 2 AND OBESITY**

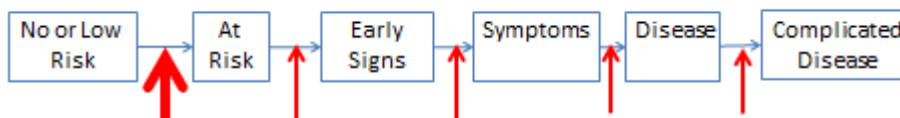
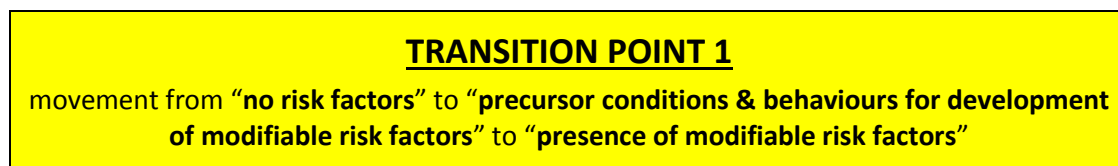
DIABETES MELLITUS TYPE 2	OBESITY (BMI over 30)
<b>Overweight and obesity</b>	<i>Most of these risk factors can be counteracted through diet, physical activity and exercise, and behavior changes.</i>
<b>Early childhood nutrition*</b>	
<b>Unhealthy diet</b>	<b>Unhealthy diet</b>
<b>Physical inactivity</b>	<b>Physical inactivity</b>
<b>Active smoking</b>	<b>Quitting smoking</b> (but of greater health benefit than continuing)
	<b>Lack of sleep</b> (causes hormonal changes that increase appetite and cravings)
<b>Ethnicity</b>	<b>Genetics</b>
<b>Family history of diabetes</b>	<b>Family lifestyle / behaviours</b>
<b>Previous gestational diabetes</b>	<b>Pregnancy</b>
<b>Older age (over 45 years)</b>	<b>Aging and its consequences</b> (hormonal, decreased physical activity)
	<b>Social and economic issues</b> (safe exercise areas, inability to cook healthy meals, inability to purchase healthier foods, family/social situation)
	<b>Medical problems</b> (e.g. Cushing's and Prader-Willi syndromes etc)
	<b>Certain medications</b> (e.g. anti-depressants, anti-seizure, diabetes, antipsychotic, steroids, beta-blockers)

**KEY:** Modifiable Risk Factors and Non-modifiable Risk Factors

Actions to address overweight and obesity (primarily through promotion of healthy diet and physical activity) are critical to preventing type 2 diabetes and ultimately reducing incidence and prevalence. Achieving the goal is highly dependent on the strategies of PRIMORDIAL PREVENTION & HEALTH PROMOTION (addressing social determinants) and PRIMARY PREVENTION (reducing risk factors).

## BASIS FOR INTERVENTION

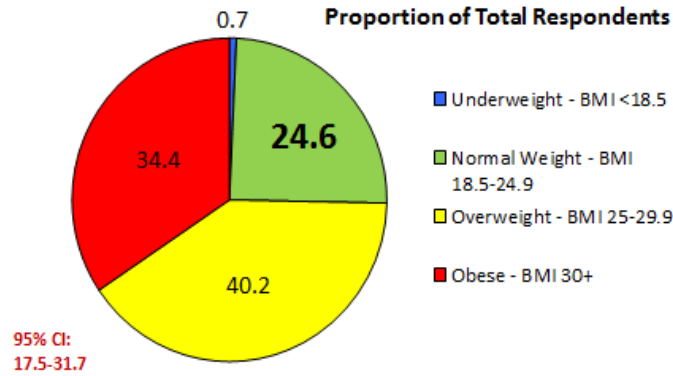
Evidence and data is provided to justify and support the need for action at each transition point. The expected outcome and development of targets at each transition point, follows below.



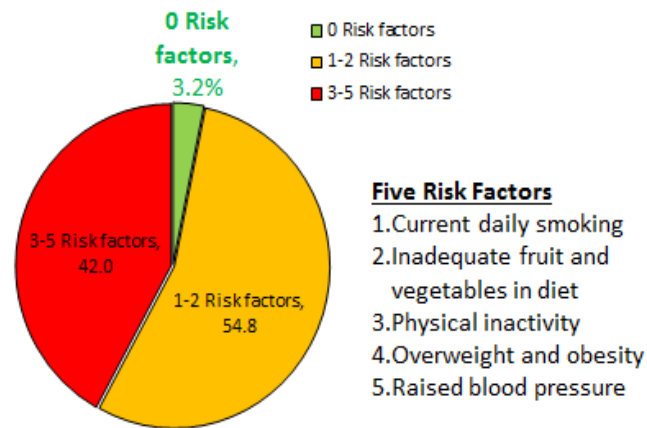
## Current Data

Only 24.6% of the Bermudian adult population had BMI measures within the normal range (18.5-24.9) – Figure 2; and only 3.2% had none of the five risk factors for non-communicable diseases under review in STEPS 2014, **Figure 3**.

**FIGURE 2: WEIGHT CATEGORIES OF ADULT BERMUDIANS, STEPS 2014.**

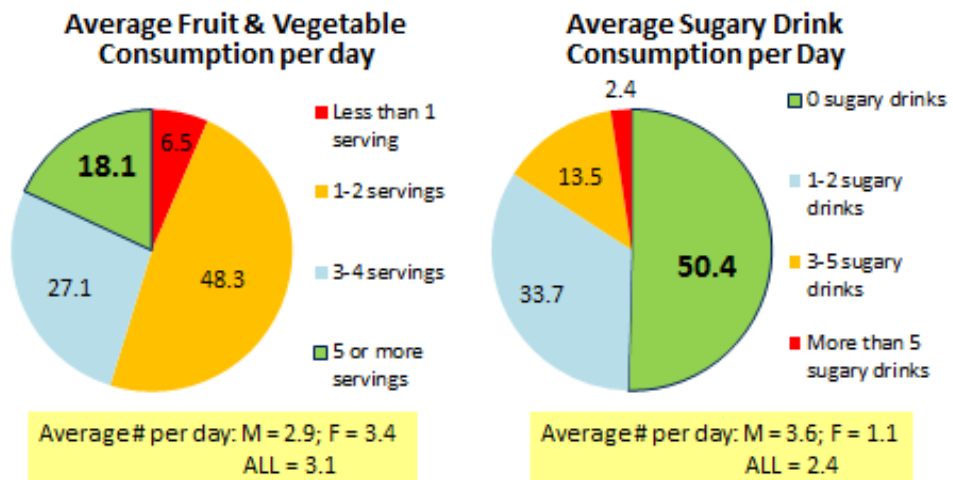


**FIGURE 3: COMBINED RISK FACTORS AMONG ADULT BERMUDIANS, STEPS 2014.**



Low prevalence of “good” dietary habits exist (**Figure 4**) and are also not optimal for promoting health and preventing non-communicable diseases. Only 18.1% of adult population reported adequate fruit and vegetable intake, and only 50% reported no daily consumption of sugary-sweetened beverages.

**FIGURE 4: POOR DIETARY HABITS**



**STRATEGY 1**

**PRIMORDIAL PREVENTION** addresses the population-level social determinants of health, and seeks ways to avoid the emergence and establishment of the social, economic and cultural patterns of living that are known to contribute to elevated risk of disease.

HEALTH PROMOTION is the process of enabling people to increase control over, and to improve, their health; **moving beyond a focus on individual behaviour** towards a wide range of social and environmental interventions.

Health promotion strategies include:

- **Building healthy public policies** - putting health on the agenda of policy-makers and ensuring that they consider the health implications of their decisions. Healthy public policy is policy that does not have the side effect of damaging health while seeking some other goal.
- **Creating supportive environments** - reflects an awareness of the impact of natural, built and social environments on health.
- **Strengthening community action** - requires community empowerment and involvement in setting priorities, planning and implementing strategies to achieve better health
- **Developing personal skills** - supports personal and social development through providing information and enhancing skills
- **Re-orienting health services** - health resources should be shifted towards a more equitable distribution between treating disease and preventing it. Health services should be expanded to include the 4 strategies above in addition to conventional medical care.
- **Creating alliances** (e.g. with the Media).

#### **EXPECTED OUTCOME 1:**

1. Increased prevalence of healthy weight and other health-promoting behaviours (e.g. healthy eating and active living).

**TARGET SETTING:** 5% improvement by 20??

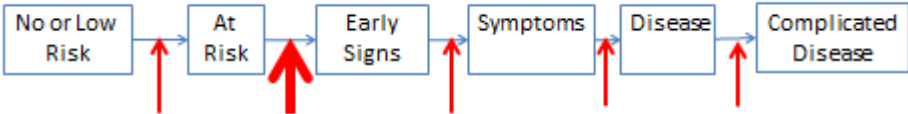
#### **Adults**

- 1.1 Increase the proportion of adults (18 years and older) who:
  - 1.1.1 are at a healthy weight (from 24.6% to ???)
  - 1.1.2 report consuming 5 or more servings of fruit and vegetables daily from 18.1% to ???.
  - 1.1.3 report participating in physical activity daily & meet the WHO guidelines from ???% to ???
  - 1.1.4 consume only water instead of sugar-sweetened beverages (or consume zero sugar-sweetened beverages daily) from 50.4% to ???.
- 1.2 Increase the proportion of adult non-daily smokers of tobacco from ???% to ???

#### **Children**

- 1.2 Increase the proportion of children (under 18 years of age) who:
  - 1.2.1 are at a healthy weight (from XX% to ???)
  - 1.2.2 report consuming 5 or more servings of fruit and vegetables daily from XX% to ???.
  - 1.2.3 report participating in physical activity daily & meet the WHO guidelines from ???% to ???
  - 1.2.4 consume only water instead of sugar-sweetened beverages (or consume zero sugar-sweetened beverages daily) from 50.4% to ???.

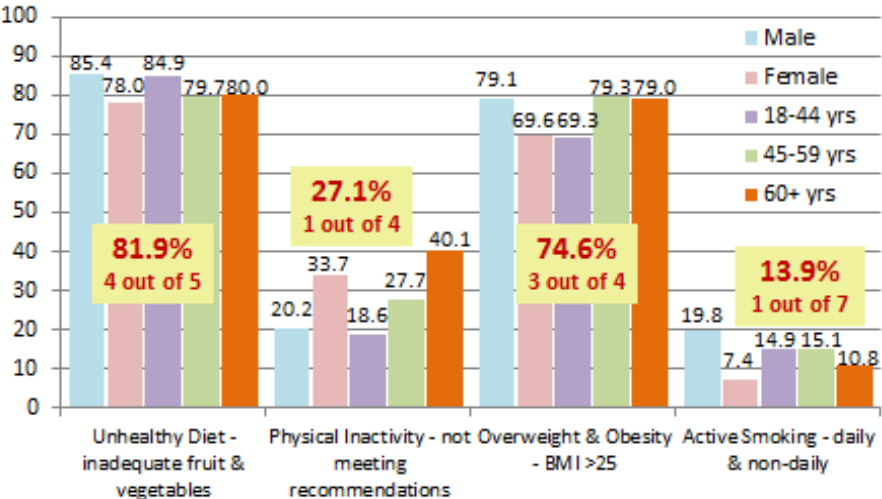
**TRANSITION POINT 2**  
 “no diabetes” to “(pre)diabetes”;  
 “healthy weight/BMI” to “increasing BMI/overweight”



**Current Data**

Among adult Bermudians, there are high prevalence levels of the risk factors for the non-communicable disease across age groups and gender (**Figure 5**) - inadequate fruit and vegetable intake (81.9%), physical inactivity (27.1%), overweight/obesity (74.6%), and tobacco smoking (13.9%) – SOURCE: STEPS 2014.

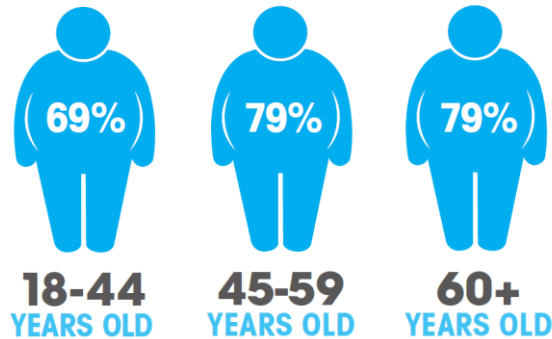
**FIGURE 5: MODIFIABLE RISK FACTORS AMONG BERMUDIAN ADULTS, STEPS 2014**



By the time Bermudians enter early adulthood (age-group 18-44 years), 69% are already overweight or obese. The highest prevalence of obesity (41.9%) occurs in the 45-59 year age group (who are also at increased risk of development of diabetes due to increasing age) – SOURCE: STEPS 2014. Overall, utilizing BMI measurements, 74.6% (1-in-4) of Bermudians are overweight or obese (**Figure 6**).

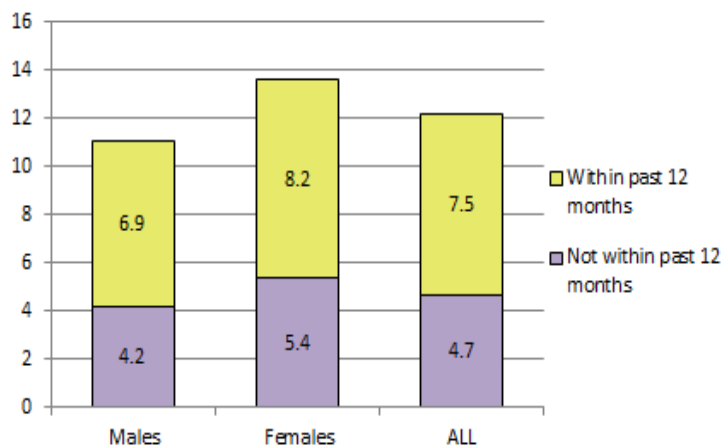
**FIGURE 6: BMI CATEGORIES OF ADULTS BY AGE GROUP, BERMUDA 2014**

**PERCENTAGE OF ADULTS WHO ARE OVERWEIGHT OR OBESE.**



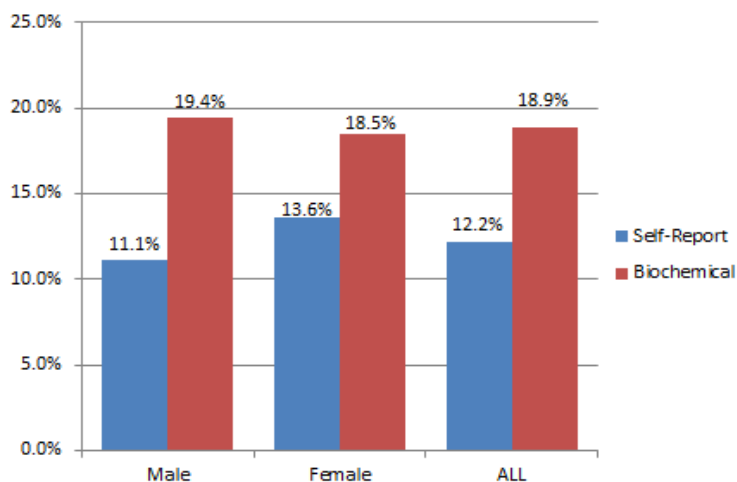
12.2% of adult Bermudians (11.1% of males and 13.6% of females) reported a previous diagnosis of diabetes. Two out of three of these previously diagnosed diabetics (i.e. 7.5% out of the 12.2%) reported a recent diagnosis (i.e. within past 12 months), SOURCE: *STEPS 2014*, see **Figure 7** below.

**FIGURE 7: SELF-REPORTED DIAGNOSIS OF DIABETES, BY DURATION IN ADULT BERMUDIANS (STEPS 2014)**



Elevated blood sugar (pre-diabetes or impaired glucose tolerance) can be detected by measuring the blood sugar. This elevated blood glucose can be addressed by lifestyle interventions, before the levels become high enough to support a diagnosis of diabetes. When self-reported diagnosis of diabetes was compared with actual biochemical measures of elevated blood glucose, the STEPS study revealed that an additional 6.7% of respondents had elevated blood sugar but were “unaware” (i.e. did not report this), shown in **Figure 8** below.

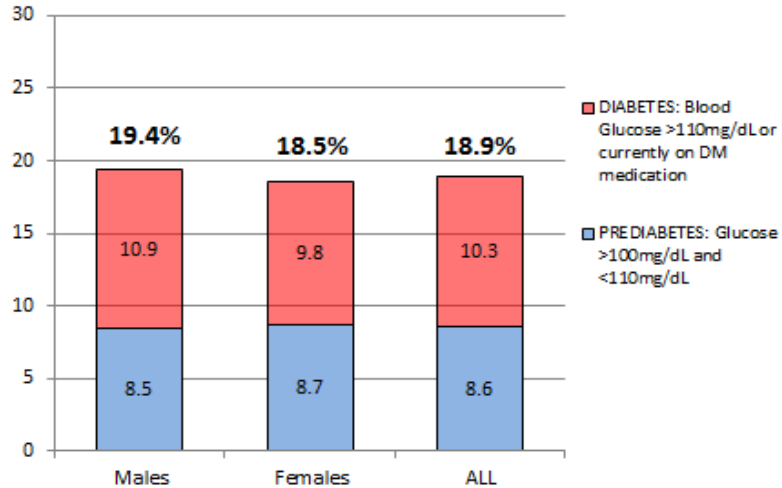
**FIGURE 8: SELF-REPORTED vs BIOCHEMICAL MEASURES OF RAISED BLOOD GLUCOSE OR DIABETES**



Of the STEPS survey respondents (see **Figure 9** below) 8.6% who had their blood sugar measured, had glucose levels in the “prediabetic” range (over 100 but less than 110 mg/dl), where studies have shown the possibility of reversal when managed by behavior and lifestyle changes.



**FIGURE 9: BIOCHEMICAL MEASURES OF BLOOD GLUCOSE**



**STRATEGY**

**PRIMARY PREVENTION** aims at preventing or averting the onset of disease, i.e. reducing the incidence of disease. Interventions are applied before there is any evidence of disease or injury. This includes **risk factor reduction**, i.e. reducing deleterious health behaviours and risk factors in persons with high risk.

**EXPECTED OUTCOME 2:**

- 2. Increase prevention behaviours in persons at high risk for diabetes and obesity (i.e. persons who are overweight, physically inactive, poor dietary habits, and with elevated blood glucose)

**TARGET SETTING:** 5% improvement

**Adults**

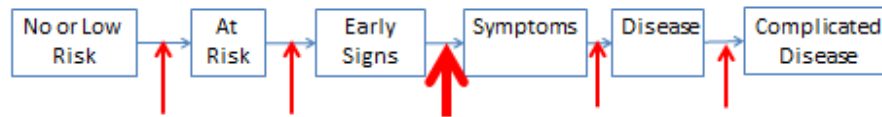
- 2.1 Reduce the proportion of adults who:
  - 2.1.1 are overweight from 40.2% to 38.2% by YYYY
  - 2.1.2 are physically inactive and lack vigorous physical activity from 57.6% to 54.7% by YYYY
  - 2.1.3 consume 3 or more sugar-sweetened beverages daily from 15.9% to 15.1% by YEAR.
- 2.2 Increase the proportion of adults who during last year:
  - 2.2.1 being overweight or obese, lost 5 or 7 or 10% of their body weight
  - 2.2.2 having elevated blood glucose, reduced and maintained blood glucose levels at normal levels from X% to Y%.
- 2.3 Reduce the prevalence of prediabetes from 8.6% to 8.2% by 2019.

**Children**

- 2.4 Reduce the proportion of children (0-18 years old) who:
  - 2.4.1 are overweight from XX% to ZZ% by YYYY
  - 2.4.2 are physically inactive and do not meet the guidelines for physical activity from XX% to ZZ% by YYYY
  - 2.4.3 consume 3 or more sugar-sweetened beverages daily from XX% to YY% by YEAR.
- 2.5 Increase the proportion of children (0-18 years old) who during last year:
  - 2.5.1 being overweight or obese, lost 5 or 7 or 10% of their body weight

### TRANSITION POINT 3

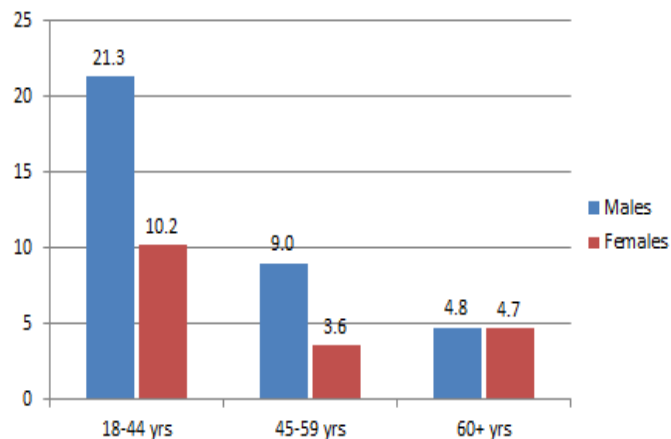
“unrecognized diabetes” to “recognized diabetes”  
“unrecognized weight issues” to “recognized obesity”



#### Current Data

Diabetes screening guidelines recommend routine annual screening for elevated blood glucose beginning at age 45 years, but earlier depending on the presence of other risk factors (e.g., among individuals over 45 years of age, ethnic and racial minorities). Despite high prevalence of risk factors among adult Bermudians, 14.2% reported never having their blood sugar measured, with age-group/gender rates ranging from 21.3% in the 18-44 year old Males, to 3.6% in the 45-59 year old Females – SOURCE: *STEPS 2014*, see **Figure 10** below.

**FIGURE 10: ADULT BERMUDIANS’ SELF-REPORT: NEVER HAD BLOOD SUGAR MEASURED**



As previously shown in **Figure 7**, 8.6% of persons who had their blood glucose measured, had blood glucose levels in the “prediabetic” range.

#### STRATEGY

**SECONDARY PREVENTION (TESTING/SCREENING AND EARLY DIAGNOSIS)** is concerned with detecting disease in its earliest stages before symptoms appear, and intervening to slow or stop its progression: i.e. “catching it early”.

#### EXPECTED OUTCOME 3:

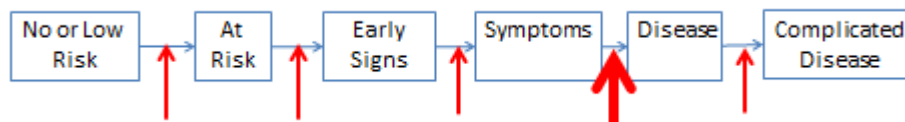
3. Early identification and appropriate management (education, lifestyle management and treatment & care) of:
  - pre-diabetes and diabetes
  - overweight and obesity.

**TARGET SETTING:** Baseline-setting or **5%** improvement

- 3.1 Increase the proportion of persons who have been screened & diagnosed with pre-diabetes & diabetes who report, within the past year, changing behaviours, on advice of health care professional to:
  - 3.1.1 increasing their levels of physical activity.

- 3.1.2 trying to lose weight.
  - 3.1.3 reducing the amount of sugar-sweetened beverages in their diet.
  - 3.1.4 receiving lifestyle advice
  - 3.1.5 being prescribed adequate treatment.
- 3.2 Increase the proportion of persons who have been screened & diagnosed overweight & obesity, who report within the past year, changing behaviours, on advice of health care professional to:
- 3.2.1 increasing their levels of physical activity.
  - 3.2.2 trying to lose weight.
  - 3.2.3 reducing the amount of sugar-sweetened beverages in their diet.
  - 3.2.4 receiving lifestyle advice
  - 3.2.5 being prescribed adequate treatment.
- 3.3 Reduce the **incidence** of diabetes (i.e. number of new cases per 1,000 population aged 18-84 years).
- 3.4 Reduce the **incidence** of obesity (i.e. number of new cases per 1,000 population aged 18-84 years).

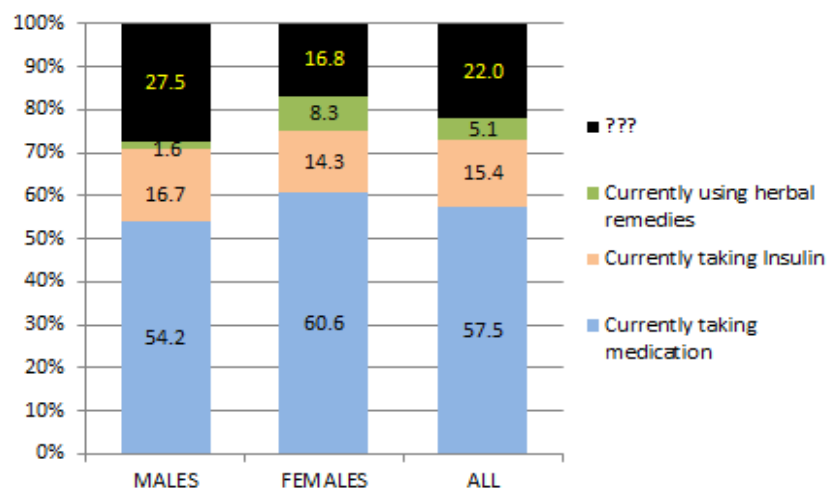
**TRANSITION POINT 4**  
 “no diabetes care” to “access to appropriate diabetes care”  
 “no weight management care” to “access to appropriate care for obesity”



**Current Data**

Among adult Bermudian diabetics, 57.5% reported taking prescription medication and 15.4% reported taking prescribed insulin. 5.1% reported using herbal remedies. SOURCE: STEPS 2014, see **Figure 11** below.

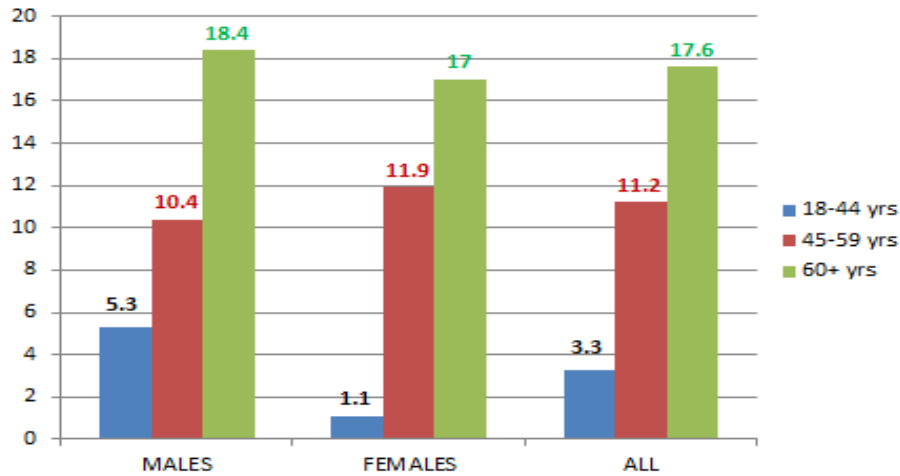
**FIGURE 11: SELF-REPORTED: DIABETES TREATMENT AMONG THOSE PREVIOUSLY DIAGNOSED**



7.4% of all STEPS 2014 survey respondents who had biochemical measurement of their fasting blood glucose, were currently on medication for diabetes within the prior two weeks. Among this group of diagnosed

diabetics taking medication, the fasting blood glucose levels revealed evidence of poor glycemic control (see Figure 10 below), with an average 10.3% having levels exceeding 110 mg/dl.

**FIGURE 11: RAISED BLOOD GLUCOSE (>110 MG/DL) OR CURRENTLY ON MEDICATION FOR DIABETES ON THE DAY OF THE BLOOD TEST MEASUREMENT)**



Assessment of long-term glycemic control may be done using HbA1C which is an indirect measure of average blood glucose levels, but this must take other factors into consideration that may impact hemoglobin glycation independently of glycemia (high blood glucose) including age, race & ethnicity, and anemia & hemoglobinopathies.

### **STRATEGY**

**SECONDARY PREVENTION (EARLY DIAGNOSIS & TREATMENT)** is concerned with detecting disease in its earliest stages before symptoms appear, and intervening to slow or stop its progression: “catching it early”.

**TERTIARY PREVENTION** refers to interventions designed to better manage acute and chronic conditions in order to:

- 1) arrest the progress of an established disease and to control its negative consequences;
- 2) reduce disability and handicap;
- 3) minimize suffering; and
- 4) promote the patient’s adjustment to irremediable conditions, i.e. “minimize the consequences”.

### **EXPECTED OUTCOME 4**

4.A Improved glycemic control among persons diagnosed with diabetes

4.B Improved weight control among persons diagnosed with obesity

### **TARGET SETTING:**

4.A.1 Among persons diagnosed with **diabetes**:

4.A.1.1 Reduce the proportion with HbA1c value greater than 9 percent.

4.A.1.2 Increase the proportion with HbA1c value less than 7 percent.

4.A.1.3 increase the proportion who lost at least 5/7/10% of body weight.

4.B.1 Among persons diagnosed with **obesity**:

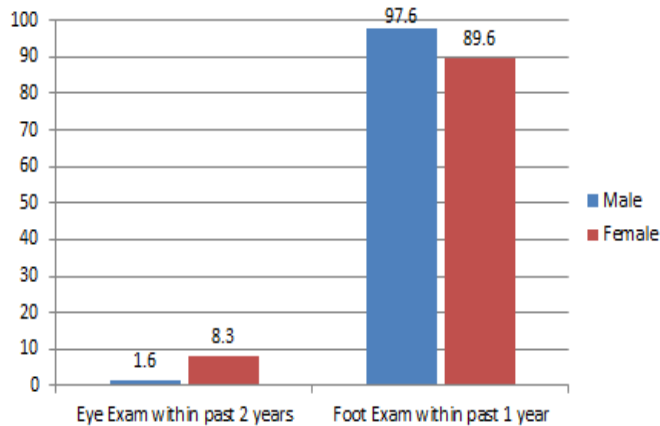
4.B.1.1 increase the proportion who lost at least 10% of body weight, within past year.

**TRANSITION POINT 5**  
 “inadequate care” to “adequate care”

**Current Data**

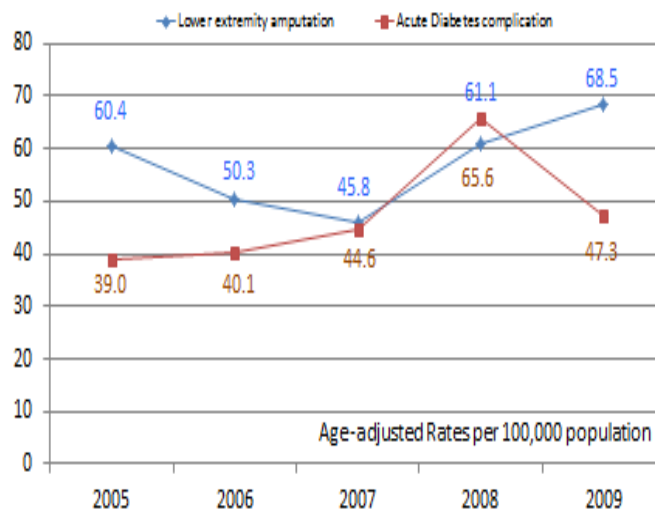
Among adult Bermudians, as part of comprehensive management of diabetes, only 5.1% reported that their eyes were examined within the past 2 years, while 93.4% reported having their feet examined within the past 1 year – SOURCE: STEPS 2014, see **Figure 12** below.

**FIGURE 12: SELF-REPORTED: DIABETES CARE – EYE AND FOOT EXAMINATION**



Also, during the period 2005-2009, the 2007 rates of avoidable hospitalizations for lower extremity amputation in Bermuda (46 per 100,000 population) and for acute complications of diabetes (45 per 100,000 population) were twice as high as the OECD averages (15 per 100,000 and 21 per 100,000 respectively) - SOURCE: BHeC (2011) Health In Review, see **Figure 13** below. New data to 2014??

**FIGURE 13: AVOIDABLE HOSPITALIZATIONS FOR COMPLICATIONS OF DIABETES, 2005-2009**



Diabetes was ranked the 5<sup>th</sup> leading cause of deaths in Bermuda (2014), with mortality rate of 22.7 per 100,000 in Males and 27.9 per 100,000 in Females. Diabetes ranked 6<sup>th</sup> in the leading causes of years of potential life lost before age 75 years (**Bermuda Mortality Data, 2014**).

## PROPOSED STRATEGY

**IMPROVED QUALITY OF CARE** - doing the right thing (providing the health care services that are needed), at the right time (when the health care services are needed), in the right way (using the appropriate test or procedure), to achieve the best possible results. Quality encompasses three equally important parts:

- Care that is **clinically effective**— not just in the eyes of clinicians but in the eyes of patients themselves;
- Care that is **safe**; and,
- Care that provides as positive an **experience** for patients as possible

## EXPECTED OUTCOME 5

5. Improved quality of care provided to persons diagnosed with diabetes and obesity

**TARGET SETTING:** 5% improvement

- 5.1 Increase the proportion of persons diagnosed with diabetes who have blood glucose self-monitoring devices and who perform self-monitoring at least once daily.
- 5.2 Increase the proportion of persons diagnosed with diabetes who have at least:
- a) an annual dental examination,
  - b) an annual foot examination,
  - c) an annual dilated eye examination, and
  - d) an annual urinary microalbuminuria measurement.
- 5.3 Reduce the rate of major lower extremity amputations in persons diagnosed with diabetes from 6 per 100,000 to XX per 100,000. *Baseline data – Health in Review 2017.*
- 5.4 Reduce the diabetes death rate from 43 per 100,000 to to XX per 100,000. *Baseline data – Health in Review 2017.*

## MONITORING AND EVALUATION

Monitoring and evaluation (M&E) is a process that helps improve performance and achieve results. In the context of this proposed plan, it is about collecting, storing, analyzing and finally transforming data into strategic information so it can be used to make informed decisions for program management and improvement, policy formulation, and advocacy.



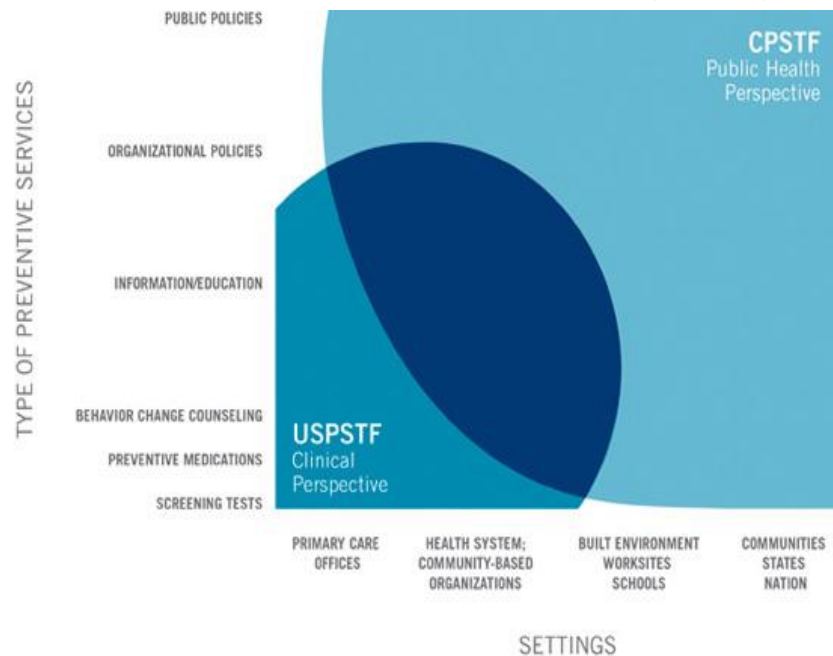
The **CDC's Framework for Evaluation in Public Health** (a practical, non-prescriptive tool, designed to summarize and organize essential elements of program evaluation) can provide guidance to public health professionals.

Adhering to the steps and standards of this framework allows an understanding of the programme's context and will improve how the programme evaluation is conceived and conducted, while encouraging an approach that is integrated with routine programme operations.

## **EVIDENCE FOR DIABETES & OBESITY PREVENTION**

The Bermuda Health Council (BHeC) and the Ministry of Health and Seniors have endorsed the adoption of the recommendations of the US Preventive Services Task Force (USPSTF) for clinical management. The USPSTF works in collaboration with the Community Preventive Services Task Force (CPSTF) that deals with evidence-based recommendations from the public health perspective (see Chart below).

### **Complementary Work of Community Preventive Services Task Force (CPSTF) and U.S. Preventive Services Task Force (USPSTF)**



### **US NATIONAL DIABETES STUDY**

Impaired glucose tolerance (pre-diabetes) manifesting as high blood glucose levels, can lead to heart disease, stroke, and type 2 diabetes. Without intervention, 15% to 30% of people with pre-diabetes will develop type 2 diabetes within 5 years.

In 2008, the US National Institutes of Health showed that people with pre-diabetes can cut their risk of developing type 2 diabetes by 58% (71% for people over 60 years old) through taking part in a structured lifestyle change program. This finding resulted from the program helping people lose 5% to 7% of their body weight through healthier eating and 150 minutes of physical activity a week. And the impact of this program can last for years. Follow-up research has found that even after 10 years, people who completed a diabetes prevention lifestyle change program were one third less likely to develop type 2 diabetes.

The Community Preventive Services Task Force recommends the use of assessments of health risks with feedback when combined with health education programs

### **USE OF PERSONALIZED HEALTH RISK ASSESSMENTS (HRAs)**

HRAs are techniques or processes of gathering information (self-reported and biometric) to develop health profiles, using the profiles to estimate future risks of adverse health outcomes, and providing persons with feedback on means of reducing their health risks. The HRA can be utilized by the health care provider to provide feedback to the patient related to changing high risk behaviours and health habits, in a shared decision-making process.

Notwithstanding the inherent limitations of self-reporting of health and health risks, there are advantages to the use of HRAs plus prolonged health promotion and risk reduction interventions in changing behaviours. The CDC's Community Preventive Services Task Force recommends the use of assessments of health risks

with feedback when combined with health education programs to improve the following outcomes among participants:

- a) Tobacco use (strong evidence of effectiveness)
- b) Excessive alcohol use (sufficient evidence of effectiveness)
- c) Seat belt use (sufficient evidence of effectiveness)
- d) Dietary fat intake (strong evidence of effectiveness)
- e) Blood pressure (strong evidence of effectiveness)
- f) Cholesterol (strong evidence of effectiveness)
- g) Number of days lost from work due to illness or disability (strong evidence of effectiveness)
- h) Healthcare services use (sufficient evidence of effectiveness)
- i) Summary health risk estimates (sufficient evidence of effectiveness)

The Task Force found insufficient evidence for

- Body composition
- Consumption of fruit and vegetables
- Fitness

In clarifying the problem that Bermuda faces with respect to obesity and diabetes, and framing the options for interventions, it is vital that implementation considerations include the research evidence available internationally, on approaches to address these two issues. The utilization of the “**best evidence available**” should guide which interventions and how interventions are implemented; inform advocacy and policy-making; and ultimately, seek to address existing inequities in health.

Health research evidence on applicable interventions and approaches should be assessed through systematic reviews - available on the following sites which collaborate with the Cochrane databases:

- **Health Evidence:** [www.healthevidence.org](http://www.healthevidence.org) which provides systematic reviews evaluating the effectiveness of public health interventions.
- **Health Systems Evidence:** <https://www.healthsystemsevidence.org/> which provides systematic reviews on:
  - How decisions about care are made [governance arrangements]
  - How care is paid for [financial arrangements]
  - How care is organized [delivery arrangements]
  - How change can be brought about [implementation strategies]
- **CARPHA Evidence Portal:** <http://carphaevidenceportal.bvsalud.org/> which provides sources of data relevant to Caribbean countries.

Implementation considerations will take into account, not only the scientific evidence but the social and environmental context of:

- Clients/citizens
- Health care workers
- Organizations
- Health system arrangements (governance, financing, and delivery)

## **FRAMEWORK FOR THE NATIONAL PLAN ON OBESITY AND DIABETES**

Obesity and diabetes mellitus are health problems that cross economic, social, environmental and health realms, and therefore require adaptive, multi-stakeholder solutions. The intent of the framework for the national plan on obesity and diabetes is to discourage problem-solving via single organizations producing isolated outcomes, and instead to encourage collaboration across sectors and institutions, through an “all-of-society” approach, aimed at achieving collective systemic impact.

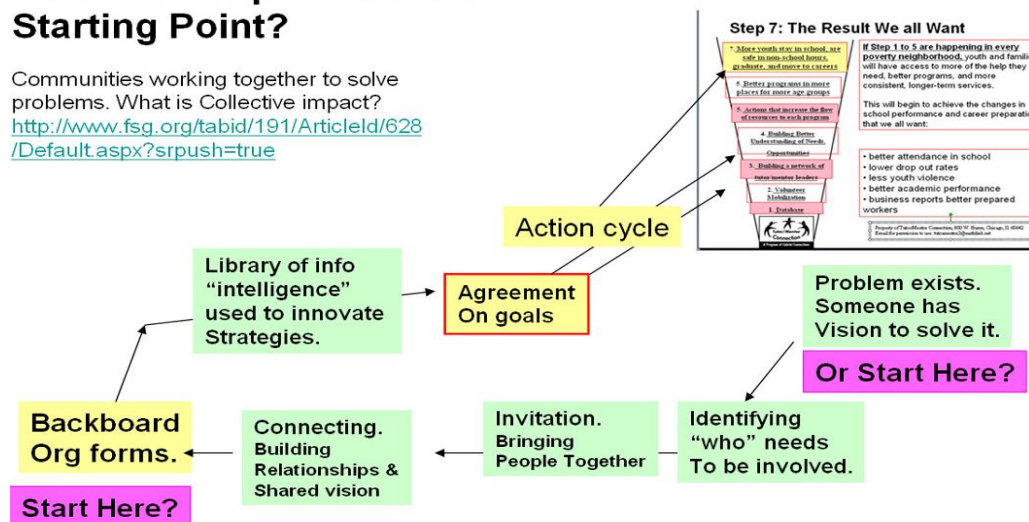


The multi-stakeholder solution or “all-of-society” approach should mimic the five collective impact activities of the **Collective Impact Model**:

1. **Common Agenda** - All participants have a common agenda for change including a shared understanding of the problem and a joint approach to solving it through agreed upon actions. At a very high level, a three step process for developing a common agenda is outlined below:
  - a. **Engage broadly and with others**: the usual players, as well as those who have great influence and the ability to shift the conversation towards new thinking and ideas.
  - b. **Define the problem being tackled**, which may mean creating boundaries if the problem being addressed is complex and multifaceted. Significant attention must be given to the root cause of the problem and problems which will have a significant impact on the agenda. Data is essential to clearly define the nature and size of the social challenge and to focus of agenda.
  - c. **Develop a plan of action**: define a strategic action framework to outline the way in which the problem will be tackled and clarify the role of each organization in this process; then balance the necessity of having clearly defined functions and responsibilities for each organization, with allowing enough space for new learning to happen and be incorporated in the strategy.
2. **Shared Measurement** - Collecting data and measuring results consistently across all the participants ensures shared measurement for alignment and accountability.
3. **Mutually Reinforcing Activities** - A plan of action that outlines and coordinates mutually reinforcing activities for each participant. This is achieved, not by requiring that all participants do the same thing, but by encouraging each participant to undertake the specific set of activities at which it excels in a way that supports and is coordinated with the action of others.
4. **Continuous Education** - Open and continuous communication is needed across the many players to build trust, assure mutual objectives, and create common motivation.
5. **Backbone support** - A backbone organization(s) with staff and specific set of skills to serve the entire initiative and coordinate participating organizations and agencies.

## Collective Impact: What is Starting Point?

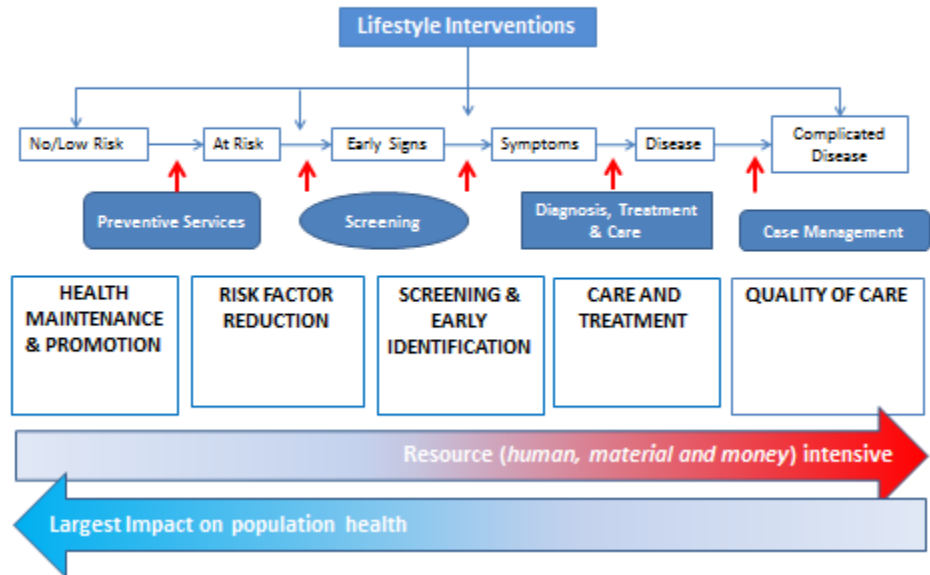
Communities working together to solve problems. What is Collective impact?  
<http://www.fsg.org/tabid/191/ArticleId/628/Default.aspx?srpush=true>



Preconditions for the “all-of-society” approach utilizing the framework of interventions along the disease continuum are:

- Influential champions
- Sufficient funding
- Prioritization and a sense of urgency for change.

## “All-of-Society” Involvement INTERVENTIONS ON THE CONTINUUM



The Table overleaf shows the alignment of recommended actions of the Global (WHO), Regional (CARICOM) and proposed National Plan to Address Diabetes and Obesity for Bermuda, which will be elaborated later in the document.

# DIABETES & OBESITY PLAN

## ALIGNMENT OF GLOBAL, REGIONAL AND NATIONAL PLANS

WHO Global Report on Diabetes	CCH IV – Proposal to COHSOD	Ministry of Health/Department of Health, Bermuda
<p><b>Political &amp; Financial Commitment</b></p> <p>Ensure political commitment, resource allocation, effective leadership and advocacy for an integrated NCD response by establishing national mechanisms (e.g. high-level multi-sectoral commissions)</p>	<p><b>Political commitment</b></p> <ul style="list-style-type: none"> <li>- High-level multi-sectoral response to socio/macro determinants</li> </ul> <hr/> <p><b>Health Financing</b></p> <ul style="list-style-type: none"> <li>- cost and economic analyses to generate options for sustainable predictable financing for implementation</li> <li>- Financing to meet changing health care needs for:               <ul style="list-style-type: none"> <li>o Information systems for health</li> <li>o new categories of human resources for health (e.g. new categories, new specialties)</li> </ul> </li> </ul>	<p><b>Leadership</b></p> <ul style="list-style-type: none"> <li>• Establishment of high-level multi-sectoral NCD commission.</li> <li>• High-level political commitment</li> </ul> <p><b>Health Financing</b></p> <ul style="list-style-type: none"> <li>• National Obesity and Diabetes policies and plans are:               <ul style="list-style-type: none"> <li>- fully costed.</li> <li>- funded</li> <li>- implemented.</li> </ul> </li> </ul>
<p><b>Health Governance</b></p> <p>Build capacity of ministries of health to exercise a strategic leadership role:</p> <ul style="list-style-type: none"> <li>o engaging stakeholders,</li> <li>o setting national targets and indicators,</li> <li>o ensuring policies and plans are fully-costed, then funded and implemented.</li> </ul>	<p><b>National Health Authority (Ministry of Health)</b></p> <ul style="list-style-type: none"> <li>- Build national health authority’s capacity for defining, implementing, monitoring and evaluating the national health strategies and plans, supported by multi-sectoral policies and national investment.</li> <li>- Improve governance through change management, legislation, and policy.</li> <li>- Strengthen human resources for:               <ul style="list-style-type: none"> <li>o health care service provision</li> <li>o health information systems</li> </ul> </li> </ul>	<p><b>Leadership &amp; Governance</b></p> <ul style="list-style-type: none"> <li>• Capacity-building within MOHS for service provision and health information systems.</li> <li>• Definition of role within national NCD commission</li> <li>• Multi-sectoral approach to policy, strategy and national priority</li> <li>• Defining, implementing, monitoring and evaluating the national health strategies and plans, supported by multi-sectoral policies and national investment.</li> <li>• Health-in-all-policies approach.</li> </ul>

WHO Global Report on Diabetes	CCH IV – Proposal to COHSOD	Ministry of Health/Department of Health, Bermuda
<p><b>Prevention</b> Prioritize actions to prevent people becoming overweight and obese (throughout the life course).</p> <ul style="list-style-type: none"> <li>○ Implement policies and programmes for better nutrition (promote breastfeeding, promote consumption of healthy foods, discourage consumption of unhealthy foods (e.g. sugary drinks))</li> <li>○ Create supportive built and social environments for physical activity</li> <li>○ Fiscal policies</li> <li>○ Legislation</li> <li>○ Environmental changes</li> <li>○ Raising awareness of health risks</li> </ul>	<p><b>National Policies &amp; Programmes</b></p> <ul style="list-style-type: none"> <li>- Develop childhood obesity policy &amp; plan (e.g. to protect children’s exposure to obesogenic foods)</li> <li>- Implement the Tobacco prevention commitments of the FTCT.</li> <li>- Implement policies that promote and facilitate increased physical activity</li> <li>- Implement policies that provide incentives and disincentives for promotion of health in different settings</li> <li>- Improve media and social communications for advocacy and health promotion.</li> <li>- Introduce innovative approaches for integrated chronic disease care in primary care.</li> <li>- Implement policy framework for healthy food and nutrition.</li> <li>- Collaboration with Education Sector for in-school and out-of-school interventions and health promotion.</li> </ul>	<p><b>Healthy Public Policy (and “Health in all Policies”)</b> Combination of:</p> <ul style="list-style-type: none"> <li>● Fiscal Policies</li> <li>● Legislation</li> <li>● Changes to the “environment” enabling support for healthy behaviours: <ul style="list-style-type: none"> <li>- increase access to and consumption of affordable healthy foods and beverages</li> <li>- discourage consumption of unhealthy foods and sugary beverages;</li> <li>- promote physical activity</li> <li>- Increase access for all adults to primary prevention and screening services.</li> <li>- Raising awareness of behavioural health risks.</li> </ul> </li> </ul> <p><b>Public Education/Health Education (population-level intervention)</b></p> <ul style="list-style-type: none"> <li>● Community support</li> <li>● Settings-based interventions: schools, workplaces and communities <ul style="list-style-type: none"> <li>- Awareness building</li> <li>- Risk reduction</li> </ul> </li> </ul>

WHO Global Report on Diabetes	CCH IV – Proposal to COHSOD	Ministry of Health/Department of Health, Bermuda
<p>Strengthen <b>health system response at the primary care level</b> by:</p> <ul style="list-style-type: none"> <li>○ Implementing guidelines and protocols</li> <li>○ Establish policies to ensure equitable access to essential technologies for management</li> <li>○ Ensure availability and affordability of essential medicines</li> </ul>	<p><b>Clinical Care &amp; Treatment</b></p> <ul style="list-style-type: none"> <li>- Development of guidelines for preventive services</li> <li>- Clinical guidelines for NCDs including obesity management for those already obese (adults and children).</li> <li>- Training health care personnel</li> <li>- Improve secondary &amp; tertiary level care services</li> <li>- Strengthen regulatory capacity for essential technology and medicines.</li> <li>- Reorientation and retraining or providers to deliver integrated care.</li> </ul>	<p><b>Screening &amp; Referral</b></p> <ul style="list-style-type: none"> <li>• Settings-based screening interventions (schools, workplaces and communities):</li> <li>• Referral services for clinical management for secondary/tertiary prevention of complications</li> </ul> <p><b>Risk Assessment, Counselling, Testing &amp; Referrals, and Risk Reduction</b></p> <ul style="list-style-type: none"> <li>• Health Risk Assessments</li> <li>• High-risk behavioural risk factor identification and referral</li> <li>• Targeted risk reduction interventions</li> <li>• Improvement of maternal health, promotion of breastfeeding and early childhood nutrition.</li> </ul> <p><b>Clinical Care</b></p> <ul style="list-style-type: none"> <li>• Treatment guidelines and protocols</li> <li>• Referral guidelines</li> <li>• Personal Diabetes monitoring technology</li> <li>• Essential medications</li> </ul> <p><b>Quality Care</b></p> <ul style="list-style-type: none"> <li>• Monitoring and evaluation of indicators of care quality improvement</li> </ul> <p><b>Capacity-building &amp; Training</b></p> <ul style="list-style-type: none"> <li>• Training in the management guidelines/protocols.</li> <li>• Training/updates on advances in clinical preventive and management guidelines</li> </ul>

WHO Global Report on Diabetes	CCH IV – Proposal to COHSOD	Ministry of Health/Department of Health, Bermuda
		<p><b>Expanding Roles and Categories of HCWs</b></p> <ul style="list-style-type: none"> <li>• Inclusion of new or expansion of roles of existing categories of HCWs</li> <li>• Equitable distribution of Human Resources for Health (HRH).</li> </ul> <p><b>Essential Medical Products &amp; Technologies</b></p> <ul style="list-style-type: none"> <li>• Equitable access to essential technologies for diagnosis and self-management.</li> <li>• Available and affordable essential medicines for management</li> </ul>
<p><b>Evaluate the outcomes</b> of programmes intended to change behaviour.</p>	<ul style="list-style-type: none"> <li>- Training in implementing and auditing clinical guidelines</li> <li>- Development of tools for auditing national NCD programmes</li> </ul>	<p><b>Capacity-building &amp; Training</b></p> <p>Training in monitoring and evaluation of programmes</p>
<p>Strengthen national <b>capacity to collect, analyse and use representative data</b> on burden, trends of diabetes and its risk factors</p> <ul style="list-style-type: none"> <li>○ Diabetes register</li> <li>○ National health information systems</li> </ul>	<ul style="list-style-type: none"> <li>- Improve surveillance of NCDs and their risk factors</li> <li>- Standardization of data collection and report for priority information.</li> <li>- Development and management of Health Information Systems with modular data sets</li> </ul>	<p><b>Well-functioning Health Information System</b></p> <ul style="list-style-type: none"> <li>• Outcome evaluations of programmes intended to change behaviours.</li> <li>• Enhanced national capacity to collect, analyse and use data – risk factors, incidence, prevalence, and clinical outcomes</li> <li>• Development, maintenance and utilization of national Chronic Disease (e.g. Diabetes) Registers, within the context of other nationally available health data.</li> <li>• Care Quality Indicators</li> </ul>

A functional health system has six key “building blocks” (Source: WHO), shown in Box below:

<b>THE SIX BUILDING BLOCKS OF A HEALTH SYSTEM</b>	
<ul style="list-style-type: none"> <li>• Good <b>health services</b> are those which deliver effective, safe, quality personal and non-personal health interventions to those that need them, when and where needed, with minimum waste of resources.</li> <li>• A well-performing <b>health workforce</b> is one that works in ways that are responsive, fair and efficient to achieve the best health outcomes possible, given available resources and circumstances (i.e. there are sufficient staff, fairly distributed; they are competent, responsive and productive).</li> <li>• A well-functioning <b>health information</b> system is one that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance and health status.</li> </ul>	<ul style="list-style-type: none"> <li>• A well-functioning health system ensures equitable access to essential <b>medical products, vaccines and technologies</b> of assured quality, safety, efficacy and cost-effectiveness, and their scientifically sound and cost-effective use.</li> <li>• A good <b>health financing</b> system raises adequate funds for health, in ways that ensure people can use needed services, and are protected from financial catastrophe or impoverishment associated with having to pay for them. It provides incentives for providers and users to be efficient.</li> <li>• <b>Leadership and governance</b> involves ensuring strategic policy frameworks exist and are combined with effective oversight, coalition-building, regulation, attention to system-design and accountability.</li> </ul>

The Table below displays the application of the concept of the building blocks of a health system to the issue of Diabetes and overweight/obesity (its precursor condition and modifiable risk factor) in the proposed approach of the Ministry of Health and Seniors (MOHS), Department of Health (DOH), stakeholders and partners.

<b>BUILDING BLOCKS OF HEALTH SYSTEM APPROACH</b>	
<b>LEADERSHIP &amp; GOVERNANCE</b>	
<i>LEADERSHIP AND GOVERNANCE – ensures strategic policy frameworks exist and are combined with effective oversight, coalition-building, regulation, attention to system-design and accountability.</i>	
<p><b>Governance</b></p> <ul style="list-style-type: none"> <li>• Establishment of high-level multi-sectoral commissions for an integrated NCD response, to ensure:               <ul style="list-style-type: none"> <li>- political commitment,</li> <li>- resource allocation,</li> <li>- effective leadership, and</li> <li>- advocacy.</li> </ul> </li> <li>• High-level political commitment ensuring:               <ul style="list-style-type: none"> <li>- national policies are developed.</li> <li>- national plans are fully funded and implemented</li> <li>- national plans are fully funded and implemented</li> </ul> </li> </ul> <p><b>Leadership</b></p> <ul style="list-style-type: none"> <li>• Capacity-building within MOHS to exercise strategic leadership, engaging stakeholders, setting national targets and indicators; setting policies on eligibility for community health care services.</li> </ul>	<p><b>Ministry of Health</b></p> <ul style="list-style-type: none"> <li>• Establishment of multi-sectoral commission to address the national threat caused by obesity and diabetes</li> <li>• costing and financing projections for national plan implementation, over time horizon</li> <li>• advocacy at level of political directorate for funding the implementation plan</li> <li>• setting policies on universal coverage, and eligibility for community healthcare services for prevention of obesity and diabetes</li> <li>• propose legislation and national policies in a “health in all policies” approach (see section below - <b>HEALTHY PUBLIC POLICY</b>).</li> <li>• Advocate for health insurance coverage for preventive and educational visits.</li> <li>• Advocate for integration of relevant programmes at all sites of service.</li> </ul> <p><b>OCMO</b></p> <ul style="list-style-type: none"> <li>• Advocacy for capacity building within the human resources for health for:               <ul style="list-style-type: none"> <li>○ addressing preventive services for obesity &amp; diabetes</li> <li>○ target-setting and development of national indicators related to prevalence, access, process, client satisfaction and outcomes.</li> <li>○ monitoring service delivery in accordance with standard protocols and clinical practice guidelines in public &amp; private health sectors.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• ensure development of disease registries, data collection, analysis and reporting on international indicators.</li> <li>• promote wide stakeholder involvement in national obesity and diabetes response plan (especially, including all professional medical, nursing and allied health bodies).</li> </ul> <p><b><u>Department of Health</u></b></p> <ul style="list-style-type: none"> <li>• exercise strategic leadership in development, and implementation of the national obesity and diabetes response plan</li> <li>• capacity building for preventive care and health education and promotion.</li> </ul> <p><b><u>Bermuda Hospitals Board</u></b></p> <ul style="list-style-type: none"> <li>• capacity building for delivery of services in accordance with standard protocols and clinical practice guidelines</li> <li>• capacity building for measuring and reporting national indicators related to prevalence, access, process, client satisfaction and outcomes.</li> </ul>
<p><b>HEALTHY PUBLIC POLICY (and “HEALTH IN ALL POLICIES”)</b>  <i>Advocacy from MOH for a combination of:</i></p> <ul style="list-style-type: none"> <li>• <b>Fiscal Policies</b> e.g. for increasing the price of unhealthy foods and reducing price of healthy alternatives; trade and agricultural policies and practices</li> <li>• <b>Legislation</b> regulating the marketing of foods high in sugars, fats and salt; nutrition labelling; reducing exposure to tobacco</li> <li>• <b>Changes to the “environment”</b> enabling support for healthy behaviours: <ul style="list-style-type: none"> <li>- increase access to and consumption of affordable healthy foods and beverages/discourage consumption of unhealthy foods and sugary beverages;</li> <li>- promote physical activity; supportive built and social environments e.g. complete streets, safe walking routes to school and for recreation (collaboration with other sectors, including education).</li> <li>- Increase access for all adults to primary prevention and screening services.</li> </ul> </li> <li>• <b>Raising awareness of behavioural health risks</b> – sustained media and social marketing campaigns.</li> </ul>	
<b>HEALTH SERVICES</b>	<b>ROLES &amp; RESPONSIBILITIES</b>
<p><b>GOOD HEALTH SERVICES</b> – Delivery of effective safe, quality personal and non-personal health interventions to those that need them, when and where needed, with minimum waste of resources.</p>	
<p><b>HEALTH EDUCATION</b> - any combination of learning experiences designed to help individuals and communities improve their health, by <b>increasing their knowledge or influencing their attitudes</b>.</p> <p><b>HEALTH PROMOTION</b> - the process of <b>enabling people to increase control over, and to improve, their health</b>; moving beyond a focus on individual behaviour towards a wide range of social and environmental interventions.</p>	
<p><b>Public Education / Health Education (population-level intervention)</b></p> <ul style="list-style-type: none"> <li>• Local Community support</li> <li>• Settings-based health promotion interventions in schools, workplaces and communities: <ul style="list-style-type: none"> <li>- Awareness building</li> <li>- Risk reduction</li> </ul> </li> </ul>	<p><b><u>Health Promotion</u></b></p> <p>INTERSECTORAL COLLABORATION</p> <ul style="list-style-type: none"> <li>- Well Bermuda Strategy and Partnership</li> <li>- Government agencies &amp; departments (e.g. Education, Food &amp; Nutrition, Agriculture, Parks &amp; Recreation);</li> <li>- NGOs</li> <li>- private sector (e.g. food distributors, wholesalers and retailers; food service establishments etc.)</li> </ul>



<p><b>Public Education / Health Education (population-level intervention) contd</b></p>	<p>MEDIA ALLIANCE</p> <ul style="list-style-type: none"> <li>- awareness-building</li> <li>- mass media campaigns</li> </ul> <p>PUBLIC EDUCATION</p> <ul style="list-style-type: none"> <li>- community-targeted events</li> <li>- mass media campaigns</li> <li>- social marketing</li> </ul> <p><b><u>Ministry of Education</u></b></p> <p>SCHOOL-BASED AWARENESS</p> <ul style="list-style-type: none"> <li>- school health education curriculum</li> <li>- physical education.</li> </ul> <p><b><u>Department of Health</u></b></p> <p>SCHOOL-BASED AWARENESS - school health education.</p> <p>CLINIC-BASED AWARENESS – individual health education,</p> <p>COMMUNITY-BASED AWARENESS – workplace interventions</p>
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**CLINICAL PREVENTIVE SERVICES** - medical care that focuses on disease prevention and health maintenance, including early diagnosis of disease, discovery and identification of people at risk of development of specific problems, counseling, and other necessary referrals and interventions to avert a health problem.

<p><b>Screening &amp; Referral</b></p> <ul style="list-style-type: none"> <li>• Settings-based screening interventions (schools, workplaces and communities):</li> </ul> <p><u>Health promotion and Primary prevention</u></p> <ul style="list-style-type: none"> <li>- Awareness building</li> <li>- Risk identification and referrals</li> <li>- Periodic screening of at-risk persons</li> </ul> <p><u>Secondary prevention</u></p> <ul style="list-style-type: none"> <li>- Referral services for clinical management for secondary/tertiary prevention of complications</li> </ul>	<p><b><u>Health Care Providers (public &amp; private)</u></b></p> <p>RISK FACTOR IDENTIFICATION</p> <ul style="list-style-type: none"> <li>- Diabetes risk factor identification (<i>see Table on page 2</i>).</li> <li>- Health Risk Assessments</li> <li>- Obesity and Diabetes Screening Tools</li> <li>- Nutrition, physical activity, &amp; Individual risk awareness-building</li> </ul> <p>“FIRST-CONTACT STRATEGY” FOR SCREENING</p> <ul style="list-style-type: none"> <li>- biomedical screening of at-risk persons (adults aged 18-59 years) for key modifiable risk factors (focus on overweight &amp; obesity (BMI) and blood glucose)</li> </ul> <p>REFERRAL SYSTEM &amp; RESOURCES</p> <ul style="list-style-type: none"> <li>- for personalized behavior modification &amp; nutrition counseling,</li> <li>- primary care physicians</li> <li>- BHB’s Patient-centred Medical Home; HID’s Enhanced Care programme, NGOs</li> </ul> <p>CARE AND TREATMENT</p> <ul style="list-style-type: none"> <li>- clinical management</li> <li>- prevention of complications (e.g. eye examination, foot examination, renal function tests)</li> </ul> <p><b><u>Department of Health</u></b></p> <p>CLINIC-BASED PREVENTIVE HEALTH CARE SERVICES</p> <ul style="list-style-type: none"> <li>- adults</li> <li>- children</li> </ul>
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<p><b>Screening &amp; Referral <i>contd.</i></b></p>	<p><b><u>Health Promotion</u></b>          WORKPLACE-BASED AWARENESS &amp; SCREENING          COMMUNITY-BASED AWARENESS &amp; SCREENING</p> <p><b><u>Ministry of Education</u></b>          SCHOOL-BASED AWARENESS &amp; SCREENING</p> <ul style="list-style-type: none"> <li>- school health education curriculum</li> <li>- physical education</li> <li>- Premier’s Council on Fitness</li> <li>- screening using fitnessgram.</li> </ul>
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**HEALTH RISK ASSESSMENT/APPRaisal** - a screening tool for the promotion of health that is used as the first step in multi-component programs; it elicits self-reported information on risk factors, behaviors, or diagnoses, and may be supplemented with clinical examinations to obtain data on variables such as body mass index (BMI), or blood sugar. It analyses all that is known about a person's life and health, including personal and family medical history, in order to estimate the person’s risk of disease, disability or death as compared with known statistical averages.

<p><b>Risk Assessment, Counselling, Testing &amp; Referrals, and Risk Reduction</b></p> <ul style="list-style-type: none"> <li>• Diabetes &amp; Obesity risk factor identification, counselling, testing and referral</li> <li>• High-risk behavioural risk factor identification and referral</li> <li>• Targeted risk reduction interventions to reduce the prevalence of modifiable risk factors:             <ul style="list-style-type: none"> <li>- Prevent or reverse process of people becoming overweight and obese.</li> <li>- Promote healthy diets; increase consumption of fruit and vegetables</li> <li>- Increase physical activity</li> </ul> </li> <li>• Improvement of maternal health, promotion of breastfeeding and improvement in early childhood nutrition.</li> </ul>	<p><b><u>Health Care Providers (public, private &amp; NGOs)</u></b></p> <p>FIRST-CONTACT STRATEGY FOR SCREENING (Individual or high risk-based approach to prevention)</p> <ul style="list-style-type: none"> <li>- biomedical screening at-risk persons (adults aged 18-59 years) for BMI and blood glucose.</li> <li>- Use of information, education and communication (IEC) technologies in health to facilitate screenings and individual health risk assessment (HRAs) computer-applications.</li> </ul> <p>REFERRAL SYSTEM FOR PERSONALIZED COUNSELLING &amp; RISK REDUCTION</p> <ul style="list-style-type: none"> <li>- Nutrition counseling (Nutritionists)</li> <li>- Motivational interviewing (Behavioural Health specialists)</li> <li>- patient education on self-management (Diabetes educators)</li> <li>- Smoking cessation programmes (Behavioural Health specialists)</li> </ul> <p>NUTRITION PROGRAMMES</p> <ul style="list-style-type: none"> <li>- promotion of breastfeeding</li> <li>- improvement in early childhood nutrition, focusing on 1<sup>st</sup> 1000 days from a woman’s pregnancy to child’s second birthday</li> </ul> <p>ALL ADULT HEALTH PROGRAMMES (ADULT, MATERNAL, SEXUAL &amp; REPRODUCTIVE HEALTH) - Individual or high risk-based approach to prevention)</p> <ul style="list-style-type: none"> <li>- periodic biomedical screening of at-risk persons (adults aged 18-59 years) for BMI and blood glucose.</li> </ul>
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**CLINICAL CARE & TREATMENT** - the observation and treatment of patients directly. A clinical care team consists of the health professionals (physicians, advanced practice registered nurses, other registered nurses, clinical pharmacists, and other health care professionals) with the training and skills needed to provide high-quality, coordinated care specific to the patient's clinical needs and circumstances. Care and *treatment should be based on clinical need and the effectiveness of treatment options, and decisions should be arrived at through assessment and discussion with the patient.*

**Quality clinical care** encompasses three equally important parts: 1) Care that is **clinically effective** – not just in the eyes of clinicians but in the eyes of patients themselves; 2) Care that is **safe**; and, 3) Care that provides as positive an **experience** for patients as possible

**Clinical Care**

- Treatment guidelines and protocols
- Referral guidelines (e.g. use of personal diabetes passport).
- Personal monitoring technology (e.g. blood glucose meters for Diabetes)
- Essential medications

**Quality Care**

- Monitoring and evaluation of indicators of care quality improvement

**Professional Associations (Medical & Allied Health)**

HEALTH WORKFORCE

- Advocacy for “new” categories of professionals (e.g. health educators, diabetes educators, community public health workers etc)
- Application of standards of treatment (national guidelines)
- “Statutory” non-communicable disease reporting

COMPREHENSIVE OBESITY AND DIABETES MANAGEMENT GUIDELINES & PROTOCOLS

- improve diagnosis
- encourage quality treatment and follow-up
- facilitate referrals
- improve disease self-management

**Health Insurers**

ACCESS TO CLINICAL MANAGEMENT TOOLS

- support for use of Health risk Assessment (HRA) technology
- insurance coverage for home glucose monitoring technology (glucometer and test strips)
- access to essential medications
- Increased coverage for clinical preventive care (e.g. reduced or no co-pays).

**Health Information / Surveillance**

SURVEILLANCE UNIT/HEALTH INFORMATION

- Surveillance (e.g. national Diabetes Register)
- Reporting of clinical quality indicators
- Integrated National Health Information System

**Bermuda Hospitals Board/KEMH**

- Advocacy for “new” categories of professionals
- Application of standards of treatment (national guidelines)
- “Statutory” reporting of non-communicable disease and clinical quality indicators
- Integrated National Health Information System

HEALTH WORK-FORCE	ROLES & RESPONSIBILITIES
<p><b>WELL PERFORMING WORK-FORCE</b> – the health workforce works in ways that are responsive, fair and efficient to achieve the best health outcomes possible, given available resources and circumstances (i.e. sufficient numbers of staff, fairly distributed, competent, responsive and productive).</p>	
<p><b>Capacity-building &amp; Training</b></p> <ul style="list-style-type: none"> <li>• Training in the national obesity and diabetes management guidelines and protocols.</li> <li>• Training/updates on advances in clinical preventive and management guidelines for: <ul style="list-style-type: none"> <li>- overweight and obesity</li> <li>- diabetes</li> </ul> </li> </ul> <p><b>Expanding Roles and Categories of HCWs</b></p> <ul style="list-style-type: none"> <li>• Inclusion of new categories of HCWs as dictated by the morbidity &amp; mortality picture (e.g. health educators, diabetes educators)</li> <li>• Expansion of roles of existing categories of HCWs as dictated by the morbidity &amp; mortality picture (e.g. health educators, diabetes educators)</li> <li>• Equitable distribution of Human Resources for Health (HRH) to address priority health issues based on Health Plan and Strategy.</li> </ul>	<p><b>Professional Associations (Medical &amp; Allied Health)</b></p> <ul style="list-style-type: none"> <li>- Advocacy for “new” categories of professionals (e.g. health educators, diabetes educators etc)</li> <li>- Development of academic and other certifications and credentials acceptable for performing new roles</li> <li>- On-going professional development</li> </ul> <p><b>Department of Health</b></p> <ul style="list-style-type: none"> <li>- Advocacy for “new” categories of MOHS professionals (e.g. health educators, diabetes educators etc)</li> <li>- On-going professional development</li> <li>- Distribution of HRH to address Ministry of Health’s priorities</li> </ul> <p><b>Health Care Professionals</b></p> <ul style="list-style-type: none"> <li>- Advocacy for “new” categories of professionals (e.g. health educators, diabetes educators etc)</li> <li>- On-going professional development</li> </ul>
MEDICAL PRODUCTS & TECHNOLOGIES	ROLES & RESPONSIBILITIES
<p><b>ESSENTIAL MEDICAL PRODUCTS AND TECHNOLOGIES</b> – assured quality, safety, efficacy and cost-effectiveness; equitable access to scientifically-sound and cost-effective medical products, vaccines and other technologies.</p>	
<p><b>Available, Affordable, Accessible Care</b></p> <ul style="list-style-type: none"> <li>• Equitable access to essential technologies for diagnosis and self-management.</li> <li>• Available and affordable essential medicines for management</li> </ul>	<p><b>OCMO &amp; Pharmaceutical Regulatory Authority</b></p> <ul style="list-style-type: none"> <li>- Treatment guidelines and protocols for obesity and diabetes</li> <li>- Essential technologies for diagnosis and self-management</li> <li>- Essential medication and care and management</li> </ul> <p><b>Health Insurers</b></p> <ul style="list-style-type: none"> <li>- Medical coverage in keeping with: <ul style="list-style-type: none"> <li>o treatment guidelines and protocols;</li> <li>o essential technologies for self-management;</li> <li>o essential medication and care and management</li> </ul> </li> </ul> <p><b>Bermuda Hospitals Board/KEMH</b></p> <ul style="list-style-type: none"> <li>- Advocacy for “new” categories of professionals</li> <li>- Application of national guidelines for obesity and for diabetes management in all services including the Patient-centered Medical Home (PCMH)</li> <li>- “Statutory” reporting of non-communicable disease and clinical quality indicators</li> <li>- Integrated National Health Information System</li> </ul>

	<p><b><u>Health Care Professionals</u></b></p> <ul style="list-style-type: none"> <li>- On-going professional development</li> <li>- Advocacy for accessible and affordable technologies and medicines.</li> </ul>
<b>HEALTH INFORMATION SYSTEM</b>	<b>ROLES &amp; RESPONSIBILITIES</b>
<p><b><i>WELL FUNCTIONING HEALTH INFORMATION SYSTEM</i></b> – ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance and health status.</p>	
<p><b>Monitoring &amp; Evaluation</b></p> <ul style="list-style-type: none"> <li>• Outcome evaluations of programmes intended to change behaviours.</li> <li>• Enhanced national capacity to collect, analyse and use data – risk factors, incidence, prevalence, and clinical outcomes</li> <li>• Care Quality Indicators</li> </ul> <p><b>Statutory Reporting</b></p> <ul style="list-style-type: none"> <li>• Development, maintenance and utilization of national Chronic Disease (e.g. Diabetes) Registers, within the context of other nationally available health data.</li> <li>• Care Quality Indicators</li> </ul>	<p><b><u>Well Bermuda Partners</u></b></p> <ul style="list-style-type: none"> <li>- Training in planning and implementation of programmes intended to change behaviours.</li> <li>- Training in monitoring and evaluation of programmes intended to change behaviours.</li> </ul> <p><b><u>Department of Health</u></b></p> <ul style="list-style-type: none"> <li>- Training in planning and implementation of programmes intended to change behaviours.</li> <li>- Training in monitoring and evaluation of programmes intended to change behaviours.</li> </ul> <p><b><u>OCMO/Surveillance Unit/Health Information</u></b></p> <ul style="list-style-type: none"> <li>- Surveillance (Diabetes Register)</li> <li>- National clinical and care quality indicators</li> <li>- Integrated National Health Information System</li> <li>- Reporting of national quality indicators</li> </ul> <p><b><u>Bermuda Hospitals Board/KEMH</u></b></p> <ul style="list-style-type: none"> <li>- “Statutory” reporting of non-communicable disease and clinical quality indicators</li> <li>- Integrated National Health Information System</li> </ul>
<b>HEALTH FINANCING SYSTEM</b>	<b>ROLES &amp; RESPONSIBILITIES</b>
<p><b><i>GOOD HEALTH FINANCING SYSTEM</i></b> – raises adequate funds for health, in ways that ensure people can use needed services, and are protected from financial catastrophe or impoverishment associated with having to pay for them. It provides incentives for providers and users to be efficient.</p>	
<p><b>Health Financing</b></p> <ul style="list-style-type: none"> <li>• National Diabetes policies and plans are: <ul style="list-style-type: none"> <li>- fully costed (with emphasis on return on investment, cost avoidance etc).</li> <li>- funded and implemented.</li> </ul> </li> </ul>	<p><b><u>Ministry of Health / Bermuda Health Council</u></b></p> <ul style="list-style-type: none"> <li>- development of national diabetes and obesity plan with stakeholder and multi-sectoral input</li> <li>- demographic and financial forecasting (national health needs assessment)</li> <li>- costing of implementation plan over time horizon</li> <li>- advocacy at level of political directorate for financing and funding the implementation plan</li> </ul> <p><b><u>Department of Health</u></b></p> <ul style="list-style-type: none"> <li>- Implementation of national diabetes and obesity plan</li> <li>- monitoring and evaluation of the national diabetes and obesity plan</li> </ul>

## CONCLUSION

The **2000 Arthur Andersen Report** developed criteria for success for disease management in Bermuda. These are as valid today as when proposed. Criteria in *blue italic font* have been added by this author:

### Education for primary and secondary disease prevention

- *Patients will be educated about a) the modifiable risk factors of the major chronic diseases, and b) measures to prevent their occurrence and minimize their health effects.*
- Patients will be educated about their disease and preventive measures to improve their health status, prevent complications and understand the implications of co-morbid conditions.
- Children will be educated in school on primary and secondary prevention.
- Adults will be educated at work with work-site wellness programmes.
- Community will be educated on primary and secondary prevention.
- Providers of care (physicians, pharmacists, nurses and allied health professionals) will be educated on standard *preventive healthcare services*, disease management and treatment protocols.
- *New categories of staff will be established in order to provide the services required in comprehensive disease management (e.g. health educators, community health promotion specialists, diabetes educators, health information specialists etc)*

### High quality care delivery in the least restrictive environment

- *Health promotion and screening services will be provided in school-, clinic- and community-based settings.*
- Site of service for care will be aligned with intensity of service and intervention.
- Care delivery will be in accordance with standard protocols (clinical practice guidelines, care maps) across all sites of service.

### Coordination of care will reduce duplication of effort and promote quality

- Disease management will be an integrated programme at all sites of service.
- Collaborative approach between hospital, community [*i.e. public health*], private sector and overseas providers to define and coordinate standards of care and care delivery.

### Data-base warehouse

- *A national health information plan will be developed to govern the collection, analysis and reporting of public health information for programming and decision-making.*
- *New categories of staff will be established in order to provide the health information and disease register services (e.g. health information specialists, data entry personnel etc)*
- A central [*data*] repository for disease registry, data collection and reporting will be maintained.
- Standard reports measuring patient outcomes will be available to providers and administrators.
- Universal coding, billing and reimbursement.

### Health Insurance coverage to fund prevention and disease management education

- Patient's health coverage (regardless of payor) will cover preventive and educational office visits and pharmaceuticals *and self-monitoring devices and supplies.*
- Community will have clear concise information regarding their health insurance coverage for preventive care.

### Incentives

- Preventive care and education provided in provider's offices is [compensated] financially based on standard performance measures aligned with peer review.

## REFERENCES

1. (Apr 2000) **Bermuda Healthcare System Redesign Initiative**. Arthur Andersen.
2. (Jan 2016) **Bermuda Health Strategy 2014-2019. Priorities for Bermuda's Health System Reform**. Ministry of Health, Seniors and Environment, Government of Bermuda.
3. (2016) **Bermuda Health Action Plan 2014-2019**. Ministry of Health, Seniors and Environment, Government of Bermuda.
4. (2014) **STEPS To A Well Bermuda. PAHO-WHO Non-Communicable Disease Risk Factor Survey**. Ministry of Health, Seniors and Environment, Government of Bermuda.
5. (2011) **Health In Review. An International Comparative Analysis of Bermuda Health System Indicators**. Bermuda Health Council/Ministry of Health, Government of Bermuda.
6. (2011) **Health Survey of Adults in Bermuda**. Bermuda Health Council/Ministry of Health, Government of Bermuda.
7. (2013) **Health Disparities Report**. Bermuda Health Council
8. (2016) **Global Report On Diabetes**. World Health Organization.
9. (2016) **Results Matrix of DRAFT – CCH IV Proposal to COHSOD**. CARICOM/Dr. Karen Sealey, International Health Consultant.
10. (2008) **Diabetes Prevention Program (DPP)**. US Department of Health and Human Services/National Institutes of Health/National Institute of Diabetes and Digestive and Kidney Diseases.
11. (2011) **A Framework For Patient-centered Health Risk Assessments – providing health promotion and disease prevention services to Medicare Beneficiaries**. US Department of Health and Human Services, Centers for Disease Control and Prevention.
12. **The Guide to Community Preventive Services**. Centers for Disease Control and Prevention. Accessed on 28 September 2016 at: <http://www.thecommunityguide.org/worksites/ahrf.html>
13. (2013) **Global Action Plan for the Prevention and Control of NCDs 2013-2020**. World Health Organization.
14. (2016) **Report of the Commission on Ending Childhood Obesity**. World Health Organization.
15. (2015) **Clinical Guideline: Obesity Prevention** (2006; Updated March 2015). National Institute for Health Care Excellence (NICE)
16. (1999) **Framework for Program Evaluation in Public Health**. Centers for Disease Control and Prevention. MMWR 1999;48 (No. RR-11).
17. Collaboration for Impact: Collective Impact Model. Accessed on 19 October 2017 at: <http://www.collaborationforimpact.com/collective-impact/>
- 18.

# APPENDIX 1

## Life Course Approach in National Obesity & Diabetes Plan

DEFINITIONS: *INFANT* – those less than 12 months of age. *YOUNG CHILD* – those less than 5 years of age. *CHILD* – those less than 18 years of age

Age Range	LIFE COURSE					
	Pregnancy & Birth (foetus in-utero)	Infancy, Toddler and Pre-School-aged	School-aged child	Young Adult of Reproductive Age	Older Adult	Seniors / Elderly
STRATEGY		Sub-groups				
TRANSITION POINTS	Gestational period	0-<1 yr; 1-2 yrs; 2-5 yrs	5-18 years	18-44 years	45-64 years	65+ years
<p><b>SOCIAL DETERMINANTS APPROACH and HEALTH PROMOTION</b></p> <p>“no risk factor” to “behaviour for development of modifiable risk factor” to “presence of modifiable risk factor”</p>	<p>Health Education for both parents on preconception and antenatal diet and nutrition.</p> <p>Health Promotion on avoidance of the use or exposure to tobacco, alcohol, drugs and other toxins in preconception and antenatal period.</p> <p>Health Promotion on avoidance of risk factors for Obesity, Diabetes and other risk factor development.</p> <p>Promotion of diet and/or physical activity during pregnancy to reduce excessive weight gain</p> <p>Promotion of exclusive Breastfeeding.</p> <p>Enforcement of the Code of Marketing of Breast-milk substitutes</p>	<p>Health Education for Parents and care-giver on early childhood diet/nutrition and physical activity</p> <p>Promotion of standards for incorporation of physical activity in Day Cares and Early Childhood education.</p> <p>Promotion of standards and clear guidance for diet &amp; nutrition, food education (e.g. portion size) in Day Cares and Early Childhood education.</p> <p>Healthy lifestyle promotion in Child and Day Care settings.</p>	<p>National policies on taxing sugar-sweetened beverages; labelling, and marketing of foods and non-alcoholic beverages to children etc</p> <p>School Health and Family Life Education policy and health education curriculum including nutrition literacy.</p> <p>Health Education/Promotion on avoidance of risk factors</p> <p>Health Education - Parents and care-giver: nutrition, food preparation (for children, parents and care-givers) and physical activity.</p> <p>National policies for nutrition, meal standards, access to potable water in school environments.</p> <p>National policies for inclusion of quality physical activity in schools.</p> <p>Promotion of standards for nutrition and physical activity in schools.</p> <p>Premier’s Council on Fitness</p>	<p>National policies on support for exclusive breastfeeding (e.g. <i>maternity leave, breast-pumping technology and facilities, etc</i>)</p> <p>National policies on access to healthy foods, food labelling, pricing etc</p> <p>National policies on provision of community spaces for physical activity.</p> <p>Adult health preventive services protocols and standards for young adults.</p> <p>Insurance Coverage: Copay-free annual physicals (1/year); plus physician incentive; Green Prescriptions</p> <p>Health Education re Nutrition and Obesity &amp; Diabetes prevention</p> <p>Media campaigns and social mobilization</p>	<p>National policies on access to healthy foods, food labelling, pricing etc</p> <p>National policies on provision of community spaces for physical activity.</p> <p>Adult health preventive services protocols and standards.</p> <p>Community Health Education re Nutrition and Obesity &amp; Diabetes prevention</p> <p>Insurance Coverage: Copay-free annual physicals (1/year); plus physician incentive; Green Prescriptions</p> <p>Media campaigns and social mobilization</p>	<p>National policies on access to healthy foods, food labelling, pricing etc</p> <p>National policies on provision of community spaces for physical activity.</p> <p>Adult health preventive services protocols and standards.</p> <p>Insurance Coverage: Copay-free annual physicals (1/year); plus physician incentive; Green Prescriptions</p> <p>Community Health Education re Nutrition and Obesity &amp; Diabetes prevention</p> <p>Media campaigns and social mobilization</p>



Age Range	LIFE COURSE					
	Pregnancy & Birth (foetus in-utero)	Infancy, Toddler and Pre-School-aged	School-aged child	Young Adult of Reproductive Age	Older Adult	Seniors / Elderly
STRATEGY	Gestational period	Sub-groups	5-18 years	18-44 years	45-64 years	65+ years
<b>PRIMARY PREVENTION and RISK REDUCTION</b>  “no/low risk” to “risk present”	<p>Overweight/obesity and blood glucose screening guidelines in preconception and prenatal Care.</p> <p>Health Education on preconception and antenatal diet and nutrition.</p> <p>Complete diabetes risk factor profile of antenatal women</p> <p>Preconception and Prenatal Counseling on risk identification and risk reduction.</p> <p>Monitoring, diagnosis and management of pregnant women with overweight and obesity and excessive weight gain.</p>	<p>Weight and blood glucose screening guidelines for all children (0-18 yrs)</p> <p>Monitoring of birth weights, and monitoring of weight percentiles at routine growth &amp; development assessments.</p> <p>Implementation of weight and blood glucose screening guidelines in all Child (0-5 yrs) Care services.</p> <p>Referral protocol for high risk child (under 5 years)with high BMI</p>	<p>Weight and blood glucose screening guidelines for all children (0-18 yrs)</p> <p>Implementation of weight and blood glucose screening guidelines in Child and School Health Care (5-18 yrs).</p> <p>School health assessments and referral protocol.</p> <p>Premier’s Council on Fitness</p>	<p>Adult health preventive services guidelines including weight and blood glucose screening</p> <p>Screening for BMI, Waist circumference, blood glucose.</p> <p>Monitoring, diagnosis and management of young adults with overweight, obesity and excessive weight gain.</p> <p>Referrals for risk reduction</p>	<p>Adult health preventive services guidelines including weight and blood glucose screening</p> <p>Screening for BMI, Waist circumference, blood glucose.</p> <p>Monitoring, diagnosis and management of older adults with overweight, obesity and excessive weight gain.</p> <p>Referrals for risk reduction</p>	<p>Adult health preventive services guidelines including weight and blood glucose screening</p> <p>Screening for BMI, Waist circumference, blood glucose.</p> <p>Monitoring, diagnosis and management of seniors with overweight, obesity and excessive weight gain.</p> <p>Referrals for risk reduction</p>

Age Range	LIFE COURSE					
	Pregnancy & Birth (foetus in-utero)	Infancy, Toddler and Pre-School-aged	School-aged child	Young Adult of Reproductive Age	Older Adult	Seniors / Elderly
STRATEGY	Gestational period	Sub-groups	5-18 years	18-44 years	45-64 years	65+ years
<p><b>SCREENING AND EARLY IDENTIFICATION</b></p> <p>“unrecognized disease” to “recognized disease”</p>	<p>Blood glucose screening guidelines in Preconception and Prenatal Care.</p> <p>Monitor, diagnose and manage pregnant women with overweight/obesity and excessive weight gain.</p>	<p>Implement weight and blood glucose screening guidelines in all Child (0-5 yrs) Care services.</p> <p>Referral resources for family support and health education.</p> <p>Statutory reporting for Diabetes Register</p>	<p>Protocol for management of impaired glucose metabolism (high blood sugar).</p> <p>Protocol for management of children with overweight, obesity and excessive weight gain.</p> <p>(School-based) implementation of weight and blood glucose screening guidelines for all children (5-18 yrs).</p> <p>Referral resources for family support and health education.</p> <p>Statutory reporting for Diabetes Register</p>	<p>Adult health preventive services protocols and standards.</p> <p>Accessible and affordable adult health preventive services.</p> <p>Work- and community-based screening for BMI, Waist circumference, blood glucose.</p> <p>Referrals system for risk reduction and health education</p> <p>Statutory reporting for Diabetes Register</p>	<p>Adult health preventive services protocols and standards.</p> <p>Work- and Community-based Screening for BMI, Waist circumference, blood glucose.</p> <p>Referrals for risk reduction and health education</p> <p>Statutory reporting for Diabetes Register</p>	<p>Adult health preventive services protocols and standards.</p> <p>Work- and Community-based Screening for BMI, Waist circumference, blood glucose.</p> <p>Referrals for risk reduction and health education</p> <p>Statutory reporting for Diabetes Register</p>

Age Range	LIFE COURSE					
	Pregnancy & Birth (foetus in-utero)	Infancy, Toddler and Pre-School-aged	School-aged child	Young Adult of Reproductive Age	Older Adult	Seniors / Elderly
STRATEGY	Gestational period	Sub-groups	5-18 years	18-44 years	45-64 years	65+ years
<b>CARE AND TREATMENT</b>  “no care” to “access to appropriate care”	<p>Protocol for management of impaired glucose metabolism (high blood sugar) in pregnancy.</p> <p>Appropriate diagnosis and management of hyperglycemia and gestational hypertension.</p> <p>Statutory reporting for Diabetes Register</p>	<p>National protocols for pediatric weight management.</p> <p>National protocols for pediatric management of impaired glucose metabolism (high blood sugar) and diabetes.</p> <p>Referral resources for family support and health education.</p> <p>Statutory reporting for Diabetes Register</p>	<p>National protocols for pediatric weight management.</p> <p>National protocols for pediatric management of impaired glucose metabolism (high blood sugar) and diabetes.</p> <p>Referral resources for developing self-care skills, family support and health education.</p> <p>Comprehensive school- and/or community-based screening and diagnostic services for diabetes and overweight &amp; obesity (weight management) for children and adolescents, which is family-focused and multi-component.</p> <p>Statutory reporting for Diabetes Register</p>	<p>National protocols for weight management.</p> <p>National protocols for management of impaired glucose metabolism (high blood sugar) and diabetes.</p> <p>Work- and community-based resources for “healthy eating and active living”.</p> <p>Referral resources for developing self-care skills, support and health education.</p> <p>Accessible diabetes and obesity treatment and care services</p> <p>Statutory reporting for Diabetes Register</p>	<p>National protocols for weight management.</p> <p>National protocols for management of impaired glucose metabolism (high blood sugar) and diabetes.</p> <p>Accessible and affordable adult health preventive services.</p> <p>Referral resources for developing self-care skills, support and health education.</p> <p>Accessible diabetes and obesity treatment and care services</p> <p>Statutory reporting for Diabetes Register</p>	<p>National protocols for weight management.</p> <p>National protocols for management of impaired glucose metabolism (high blood sugar) and diabetes.</p> <p>Accessible and affordable adult health preventive services.</p> <p>Referral resources for developing self-care skills, support and health education.</p> <p>Accessible diabetes and obesity treatment and care services.</p> <p>Statutory reporting for Diabetes Register</p>

Age Range	LIFE COURSE					
	Pregnancy & Birth (foetus in-utero)	Infancy, Toddler and Pre-School-aged	School-aged child	Young Adult of Reproductive Age	Older Adult	Seniors / Elderly
STRATEGY	Gestational period	Sub-groups	5-18 years	18-44 years	45-64 years	65+ years
<b>CARE QUALITY</b> "inadequate care" to "adequate care"	<p>Promote and encourage adherence to national guidelines on clinical management.</p> <p>Establishment of care quality reporting system, with monitoring and accountability mechanisms.</p>	<p>Encourage adherence to national guidelines on clinical management.</p> <p>Establishment of care quality reporting system, with monitoring and accountability mechanisms.</p> <p>Raise awareness of childhood obesity through dissemination of information and incorporation into appropriate curricula.</p>	<p>Raise awareness of childhood obesity through dissemination of information and incorporation into appropriate curricula.</p> <p>Encourage adherence to national guidelines on clinical management.</p> <p>Establishment of care quality reporting system, with monitoring and accountability mechanisms.</p>	<p>Raise awareness of obesity through dissemination of information.</p> <p>Encourage adherence to national guidelines on clinical management.</p> <p>Establishment of care quality reporting system, with monitoring and accountability mechanisms.</p>	<p>Raise awareness of obesity through dissemination of information.</p> <p>Encourage adherence to national guidelines on clinical management.</p> <p>Establishment of care quality reporting system, with monitoring and accountability mechanisms.</p>	<p>Raise awareness of obesity through dissemination of information.</p> <p>Encourage adherence to national guidelines on clinical management.</p> <p>Establishment of care quality reporting system, with monitoring and accountability mechanisms.</p>

## APPENDIX 2

### **RECOMMENDATIONS FOR SPECIFIC GROUPS**

#### **1. Local Authorities (e.g. other Government sectors – trade, transport, sports, recreation, parks) and Community Partners**

- a) Ensure that prevention/management of obesity is a priority for action (at strategic and delivery levels) through community interventions, policies and dedicated resources, as part of the regulatory and enforcement role.
- b) Encourage and promote access to physical activity, through travel system plans, providing showers, secure pedal-cycle parking, encouraging use of stairs etc.
- c) Assess the effect of policies (ideally by doing a health impact assessment) on the ability of the community to be physical active and eat a healthy diet.
- d) Identify and correct environmental barriers to physical activity and healthy eating.
- e) Identify and correct policy barriers to physical activity and healthy eating.
- f) Create and manage more safe spaces for incidental and planned physical activity, addressing safety, crime and inclusion (cycling/walking routes, bicycle parking, safe play areas; complete streets – pedestrian crossings, sidewalks, walking schemes; buildings access to and use of stairs/walkways).
- g) Encourage and ensure access to affordable healthy foods.
- h) Encourage and incentivize local shops to promote healthy food and drink.
- i) Promote and raise awareness for multi-component interventions rather than one-off activities.

#### **2. Ministry of Health (MOH), Department of Health (DOH)**

- a) Prioritize preventing and managing obesity and diabetes at the strategy and delivery levels, dedicating necessary resources for effective action.
- b) Develop public health policies to prevent/manage obesity and diabetes, following existing internationally-recommended guidelines, and local strategy.
- c) Address the training needs of health care workers, and support staff to give advice and support (e.g. effectiveness of interventions, motivational interviewing techniques etc).
- d) Develop and enhance local strategic partnerships with other sectors, agencies etc.
- e) Develop and enhance skills and knowledge of health care professionals to work in multi-disciplinary teams to promote healthy lifestyles
- f) Develop strategies for engagement with various communities for delivery of patient-centered interventions.
- g) Tailor advice to address potential barriers to prevention actions (e.g. cost, personal tastes, availability, time, family & community dynamics)
- h) All MOH/DOH care settings should be equipped with systems and resources to implement the obesity and diabetes strategy.
- i) Collaborate in public-private partnerships to develop national guidelines, standards and care quality indicators and monitoring/reporting systems.

#### **3. All Health Professionals**

- a) Discuss weight, diet and activity routinely, but especially at times when weight gain is more likely (e.g. during/after pregnancy, menopause, during tobacco cessation).
- b) Promote interventions to increase physical activity (e.g. by fitting it into everyday life, tailoring to personal preference and circumstances, behavior modeling, referral etc).

- c) Promote interventions to improve diet and reduce energy intake.
- d) Promote and raise awareness for multi-component interventions rather than one-off activities.
- e) Promote and encourage involvement of parents/care-givers of children in preventing excess weight gain and improving diet.
- f) Interventions in community settings should address availability of services, cost of changing behavior, dietary tastes, dangers with walking/cycling, and mixed messages in the media.
- g) Work with food establishments (e.g. shops, supermarkets, restaurants) to promote healthy eating choices.
- h) Work with community agencies/groups to improve access to physical activity.
- i) Support and promote evidence-based behavior change programmes.
- j) Provide on-going support by trained health professional to families of children and young people identified as being at high risk of obesity, for individual and family-based intervention.

#### **4. General Public**

- a) Learn about the preventability factor in overweight/obesity and diabetes, and how to make healthier personal choices.
- b) Assume responsibility for taking actions within home, family and community to increase physical activity, and make better dietary choices.
- c) Advocate with policy-makers and political decision-makers for school and community facilities and services that promote healthy eating and active living.

#### **5. Home/Family settings**

- a) Focus interventions on a range of components, rather than on parental education alone (e.g. diet, interactive cooking demonstrations, meal-planning, shopping for food and drink; physical activity – interactive demonstrations, videos, group discussions, opportunities for active play, safety and local facilities).
- b) Provide family programmes aimed at improving weight management.

#### **6. Early Years Setting (Preschools and Day Cares; children aged 2-5 years)**

- a) Incorporate in collaboration with parents/care-givers, a multi-component strategy (e.g. healthy diet and physical activity) for prevention of excessive weight gain as a priority.
- b) Minimize sedentary activities during play time, and provide regular opportunities for active, enjoyable play and structured physical activity sessions.
- c) Adopt and implement guidelines on healthy eating and portion size for young child.
- d) Ensure children are supervised and eat regular healthy meals in a sociable environment free from screen distractions (e.g. television).

#### **7. Schools (children 5-18 years)**

- a) Incorporate in collaboration with parents/care-givers, a whole school, multi-component strategy (e.g. healthy diet and physical activity) for prevention of excessive weight gain as a priority.
- b) Ensure existence and implementation of appropriate policies relating to school layout, recreational spaces, catering (including vending machine, and adequate potable water supplies), the food & drink students bring into school, and physical education in the taught curriculum, etc.
- c) Ensure that all teaching and support staff receive training on healthy school policies and how to support their implementation.
- d) Ensure employment of adequate numbers of physical education teachers to deliver enjoyable sport and physical activity that can take place after school, and throughout adulthood.

- e) Ensure children eat regular healthy meals in a sociable environment.
- f) Involve parents in school-based interventions e.g. special events, lunch menus and after-school activities.

**8. Workplaces (with employees aged 18 – 64 years)**

- a) Collaboration with occupational health and safety staff to [increase physical activity](#) to prevent and manage obesity.
- b) Creating a supportive physical environment, e.g. safe and pleasant stairwells, providing showers and secure bicycle parking.
- c) Support workplace programmes for healthy eating and active living, e.g. recreational opportunities, out-of-hours social activities, lunchtime walks, and use of local exercise/leisure facilities.
- d) Support and promote healthy choices at restaurants, and vending machines for staff and clients.
- e) Incentive schemes to support staff in managing weight, improving diet and increasing activity levels.
- f) Provide health checks to address weight, diet and activity, and provide on-going support.

## APPENDIX 3

### NATIONAL OVERWEIGHT AND OBESITY GUIDELINES

#### Scope of Care and Treatment Guidelines

The guidelines should:

- cover children (ages 0-17+ years); adults (18 – 64+ years); and Seniors/Elderly (over 65 years).
- Include advice on the following aspects of overweight and obesity
  - Prevention in people who are currently a healthy weight, mainly outside the clinical setting:
    - Raising awareness
    - Identifying children and adults at risk, who may benefit from participation in prevention programmes
    - Maintaining energy balance (healthy diet and physical activity)
    - Developing local strategies with a focus on multi-faceted, multi-component interventions in:
      - The community (services and wider environment)
      - Workplaces
      - Schools (5-18 years)
      - Childcare (0-5 years)
      - Vulnerable groups.
  - Identification and assessment in primary and secondary care
  - Clinical management in primary and secondary care
  - Clinical management of morbid obesity, with sufficient detail to identify and inform key aspects of care.

*Extracted from: NICE Clinical Guideline: Obesity Prevention (2015)*