

## *Diabesity: A Lifestyle-related Epidemic*

### *Key Messages*

- ※ Diabetes and obesity are major chronic non-communicable diseases (NCD) that on their own can lead to serious health consequences. Together they can increase individual's mortality risk by about 6 times.
- ※ In Hong Kong, the Population Health Survey (PHS) 2014/15 showed that 8.4% of land-based non-institutionalised persons aged 15–84 self-reported having doctor-diagnosed diabetes or newly detected by the survey through biochemical testing for diabetes; 29.9% were classified as obese with a body mass index  $\geq 25.0$ . Overall, 4.7% of land-based non-institutionalised persons aged 15–84 had diabesity (i.e. the co-existence of both diabetes and obesity) .
- ※ In May 2018, the Hong Kong SAR Government launched “Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong” (SAP) announcing a list of committed actions and 9 local NCD targets to be achieved by 2025. Of which, Target 7 is to halt the rise in obesity and diabetes.
- ※ To halt the rise in diabetes and obesity, the Government will continue to organise systematic health communication campaigns to increase health literacy, instill the concept of healthy lifestyle and raise public awareness of lifestyle factors and their relevance to biomedical states and chronic disease risk; foster co-operation across sectors to build a health-enhancing environment; strengthen the health system at all levels, in particular a comprehensive primary care for prevention, early detection and management of diabetes and obesity based on the family doctor model.
- ※ To reduce the risk of diabesity, individuals are encouraged to maintain an optimal body weight and waist circumference, eat healthier, be physically active, avoid smoking and refrain from alcohol use.

## Diabesity: A Lifestyle-related Epidemic

Diabetes and obesity are major chronic non-communicable diseases (NCD) that individually affect millions of people globally. According to the World Health Organization (WHO)'s estimation, the number of people with diabetes globally had risen from 108 million in 1980 to 422 million in 2014.<sup>1</sup> The increase in the prevalence of diabetes was parallel by an unabated rise in the prevalence of obesity. Since 1975, the world prevalence of obesity nearly tripled. In 2016, WHO estimated that globally more than 1.9 billion of adults aged 18 and above were overweight. Of these, over 650 million people were obese.<sup>2</sup> Among children and adolescents, there had been about 7-fold increase in the prevalence of obesity.<sup>3</sup> As WHO estimated, over 340 million of children and adolescents aged 5–19 were overweight or obese globally in 2016.<sup>2</sup> Because of the prevailing diabetes and obesity, the prevalence of diabesity has also progressively increased over the past few decades.<sup>4</sup> While diabetes and obesity on their own can lead to serious health consequences, together they interact with each other and can increase individual's mortality risk by about 6 times.<sup>5</sup>

### Interlinks between Diabetes and Obesity

The association of diabetes with obesity has been recognised for decades and most patients with type 2 diabetes are obese.<sup>6</sup> In Western developed countries (such as the United States, England, and Australia), at least four of every five diabetic patients were overweight or obese (body mass index (BMI)  $\geq 25.0$ ).<sup>7-9</sup> Among the paediatric population, obesity accounted for 45% of new onset of type 2 diabetes.<sup>10</sup> The major basis for the link between obesity and diabetes is the ability of fat cell and tissue to engender insulin resistance. The pathological process involves a

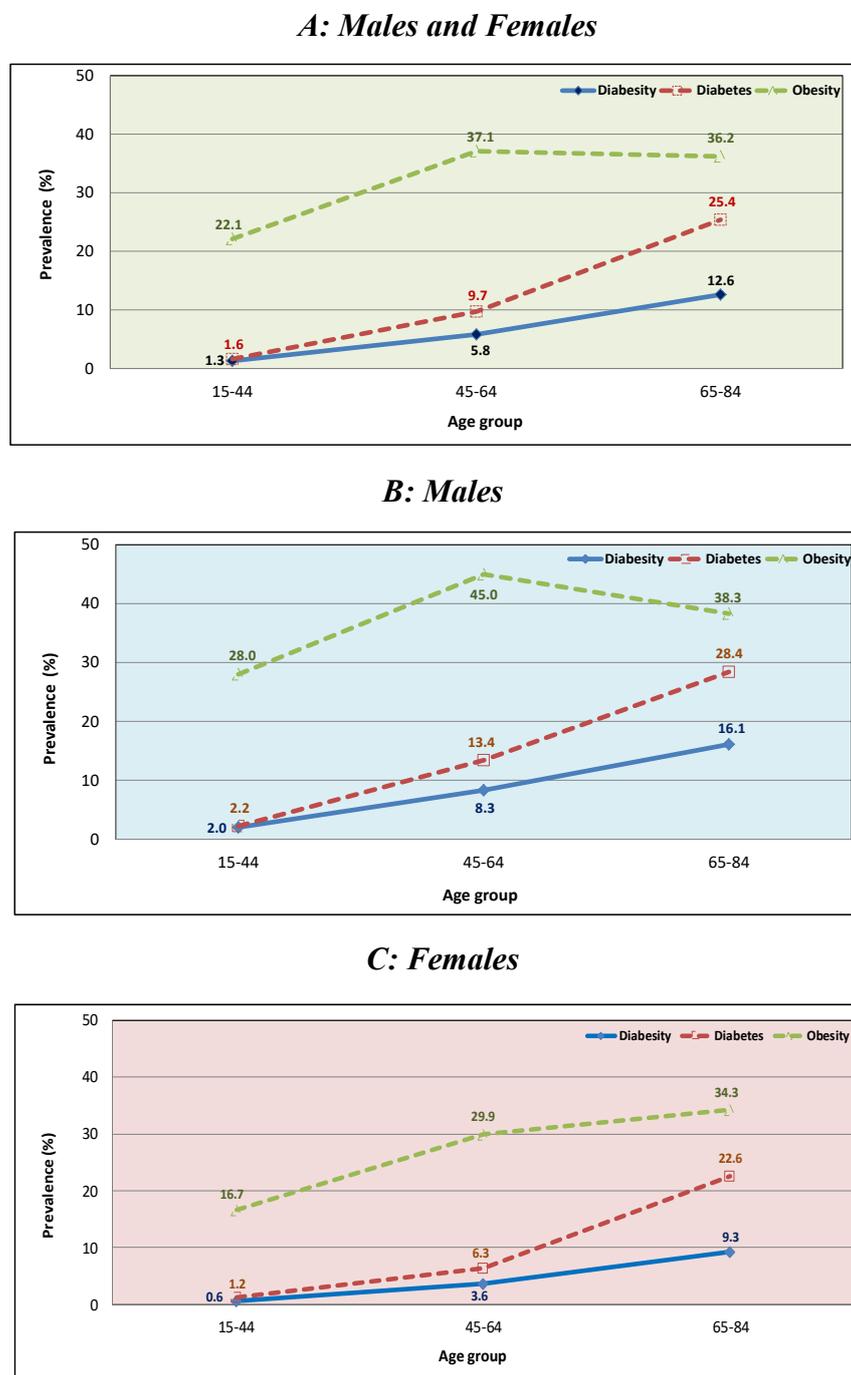
magnitude of endocrine functions, hormonal regulations, inflammatory responses and neural signaling pathways, along with the interplay of genetic susceptibility, environmental influences and lifestyle factors.<sup>11, 12</sup>

Obesity is a major risk factor for a number of chronic diseases, including cardiovascular diseases (mainly heart disease and stroke), musculoskeletal disorders (especially osteoarthritis), and some cancers (including cancers of the endometrium, breast, ovary, prostate, colon, liver, gallbladder and kidney).<sup>2</sup> A systematic review and meta-analysis of 18 weight-related diseases found that obesity has the strongest association with the incidence of type 2 diabetes. Compared with persons with BMI  $< 25.0$ , men and women with BMI  $\geq 30.0$  were 6.7 times and 12.4 times as likely to develop type 2 diabetes respectively.<sup>13</sup> The influence of obesity on diabetic risk is determined not only by the degree of obesity, but also by where fat accumulates that abdominal fat accumulation (i.e. central obesity) in particular exacerbates insulin resistance and confers a higher risk of developing diabetes.<sup>11</sup> Compared with persons without central obesity, men and women with central obesity were 5.1 times and 11.1 times as likely to develop type 2 diabetes.<sup>13</sup>

## Local Situation

In Hong Kong, the Department of Health (DH) conducted the Population Health Survey (PHS) 2014/15 to collect data on population health, including biochemical and anthropometric measurements among 1 976 land-based non-institutionalised persons aged 15–84. Results showed that 8.4% (10.5% of males; 6.4% of females) of persons aged 15–84 had diabetes based on respondents’ self-reported history of doctor-diagnosed diabetes or newly detected by the survey through biochemical testing for diabetes. Based on the locally adapted weight status classification for Chinese adults in Hong Kong, 29.9% (36.0% of males; 24.4% of females) were classified as obese with a BMI  $\geq 25.0$ . Overall, 4.7% (6.6% of males; 3.0% of females) of land-based non-institutionalised persons aged 15–84 had diabetes. As shown in Figure 1 (A, B and C), the proportion of diabetes increased with age, from 1.3% (2.0% for males; 0.6% for females) among persons aged 15–44 to 12.6% (16.1% for males; 9.3% for females) among persons aged 65–84. While the prevalence of obesity among persons aged 15–84 with diabetes was 56.7% (62.5% for males; 47.8% for females), over three-quarters (77.6%) of diabetic persons aged 15-44 were obese. For diabetic persons aged 45-64 and those aged 65–84, the corresponding obesity prevalence was 60.0% and 49.4% respectively.<sup>14</sup>

**Figure 1: Prevalence of persons aged 15–84 with diabetes, diabetes and obesity by age group**



Notes: Obesity refers to BMI  $\geq 25.0$ ; Diabetes refers to fasting blood glucose  $\geq 7.0$  mmol/L or HbA1c  $\geq 6.5\%$  and also self-reported doctor-diagnosed diabetes.

Base: All respondents aged 15–84 who participated in the health examination with valid results

Source: Population Health Survey 2014/15, Department of Health.

## Halt the Rise in Diabetes and Obesity

Studies have demonstrated that both obesity and type 2 diabetes are potentially preventable through lifestyle modification on a population level, but this requires a coherent and multifaceted strategy. In May 2018, the Hong Kong SAR Government launched “Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong” (SAP) with a list of committed actions and 9 local NCD targets to be achieved by 2025. Of which, Target 7 is to halt the rise in diabetes and obesity (Box 1).<sup>15</sup> To promote behavioural change and healthy living, the Government will continue to organise systematic health communication campaigns to increase health literacy, instill the concept of healthy lifestyle, as well as raise public awareness of lifestyle factors (including unhealthy diet, physical inactivity, smoking and alcohol use) and their relevance to biomedical states

(such as body weight, blood sugar, blood pressure as well as blood lipids) and risk of chronic diseases. Supporting children and adolescents to develop a healthy and active lifestyle starting from childhood can decrease their risk of obesity and diabetes in future. Over the years, DH has collaborated with other government bureaux and departments, schools and community partners and initiated various public health programmes to prevent and control childhood obesity in Hong Kong. The Government will continue to foster co-operation across sectors to build a health-enhancing environment, promote healthy eating and physical activity participation among school students, as well as strengthen support and education to families with obese children.

### Box 1: 9 local NCD targets by 2025



#### Target 1

A 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancers, diabetes, or chronic respiratory diseases



#### Target 2

At least 10% relative reduction in the prevalence of binge drinking and harmful use of alcohol (harmful drinking/alcohol dependence) among adults and in the prevalence of drinking among youth



#### Target 3

A 10% relative reduction in the prevalence of insufficient physical activity among adolescents and adults



#### Target 4

A 30% relative reduction in mean population daily intake of salt/sodium



#### Target 5

A 30% relative reduction in the prevalence of current tobacco use in persons aged 15+ years



#### Target 6

Contain the prevalence of raised blood pressure



#### Target 7

Halt the rise in diabetes and obesity



#### Target 8

Prevent heart attacks and strokes through drug therapy and counselling



#### Target 9

Improve availability of affordable basic technologies and essential medicines to treat major NCD

Effective management of coexistent obesity and diabetes presents a complex therapeutic challenge.<sup>16</sup> The Government will strengthen the health system at all levels, in particular a comprehensive primary care for prevention, early detection and management of those who are overweight and obese or already have diabetes based on the family doctor model; and regularly review and update drug lists and clinical protocols based on scientific and clinical evidence to ensure equitable access by patients to drugs and therapies of proven safety and efficacy for treatment of obesity or diabetes in all public hospitals and clinics.<sup>15</sup> To know more about the Government key initiatives and specific actions to halt the rise in diabetes and obesity in Hong Kong, please refer to the SAP which can be found at the Change for Health Website <https://www.change4health.gov.hk/en/saptowards2025/>.

For individuals, they are encouraged to —

**Maintain an optimal body weight and waist circumference.** Chinese adults should aim to maintain a BMI between 18.5 and 22.9. Irrespective of BMI, men should keep their waist circumference below 90 cm (~ 35.5 inches) and women should keep theirs below 80 cm (~ 31.5 inches);

**Eat healthier.** Have at least 2 servings of fruit and 3 servings of vegetables a day, choose whole grains over refined grains, and eat less sugar and fats (especially saturated fats and trans fats). This helps maintain a healthy body weight and lower the risk of type 2 diabetes;

**Be physically active.** Regular physical activity can reduce the risk of overweight and obesity and also improves insulin sensitivity and enhances glucose uptake by the muscles, which in turn helps regulate blood glucose level and reduce the risk of diabetes;

**Avoid smoking.** Smoking is a risk factor for insulin resistance and diabetes. Smokers should quit smoking as soon as possible;

**Refrain from alcohol use.** Alcohol can affect carbohydrate metabolism and raise blood glucose level. Moreover, each gram of alcohol contains 7 kilocalories. These additional calories contribute to increased body fat and weight gain. Drinkers are encouraged to reduce or quit drinking completely.

To get more information about healthy living, please visit the DH's Change for Health website at <https://www.change4health.gov.hk/>, or call the DH's 24-Hour Health Education Hotline at 2833 0111.

### References

1. Diabetes. Geneva: World Health Organization October, 2018.
2. Obesity and overweight. Geneva: World Health Organization February, 2018.
3. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. *Lancet*. 2017;390(10113):2627-2642.
4. Pappachan JM, Viswanath AK. Medical Management of Diabetes: Do We Have Realistic Targets? *Curr Diab Rep*. 2017;17(1):4.
5. Oldridge NB, Stump TE, Nothwehr FK, et al. Prevalence and outcomes of comorbid metabolic and cardiovascular conditions in middle- and older-age adults. *J Clin Epidemiol*. 2001;54(9):928-934.
6. Eckel RH, Kahn SE, Ferrannini E, et al. Obesity and type 2 diabetes: what can be unified and what needs to be individualized? *Diabetes Care*. 2011;34(6):1424-1430.
7. Adult Obesity and Type 2 Diabetes. London: Public Health England 2014.
8. Gregg EW, Cheng YJ, Narayan KM, et al. The relative contributions of different levels of overweight and obesity to the increased prevalence of diabetes in the United States: 1976-2004. *Prev Med*. 2007;45(5):348-352.
9. Thomas MC, Zimmet P, Shaw JE. Identification of obesity in patients with type 2 diabetes from Australian primary care: the NEFRON-5 study. *Diabetes Care*. 2006;29(12):2723-2725.
10. D'Adamo E, Caprio S. Type 2 diabetes in youth: epidemiology and pathophysiology. *Diabetes Care*. 2011;34 Suppl 2:S161-165.
11. Kahn SE, Hull RL, Utzschneider KM. Mechanisms linking obesity to insulin resistance and type 2 diabetes. *Nature*. 2006;444(7121):840-846.
12. Qatanani M, Lazar MA. Mechanisms of obesity-associated insulin resistance: many choices on the menu. *Genes Dev*. 2007;21(12):1443-1455.
13. Guh DP, Zhang W, Bansback N, et al. The incidence of comorbidities related to obesity and overweight: a systematic review and meta-analysis. *BMC Public Health*. 2009;9:88.
14. Population Health Survey 2014/15. Hong Kong SAR: Department of Health.
15. Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong. Hong Kong SAR: Food and Health Bureau, May 2018.
16. Bailey CJ. The challenge of managing coexistent type 2 diabetes and obesity. *BMJ*. 2011;342:d1996.

# World Diabetes Day

14 November 2019

The World Diabetes Day (WDD) was designated in 1991 by the International Diabetes Federation (IDF) and the World Health Organization to address the growing concerns about the escalating threat that diabetes poses. Every year, WDD campaign focuses on a theme. The theme for 2019 is **Family and Diabetes**. Families are urged to learn more about the warning signs of diabetes and find out their risk of type 2 diabetes.



To know more about WDD and relevant activities, please visit <https://www.worlddiabetesday.org/>, or follow @WDD.

**Non-Communicable Diseases (NCD) WATCH** is dedicated to promote public's awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to [so\\_dp3@dh.gov.hk](mailto:so_dp3@dh.gov.hk).

#### Editor-in-Chief

Dr Rita HO

#### Members

Dr Thomas CHUNG	Dr Ruby LEE
Dr Cecilia FAN	Dr YC LO
Dr Raymond HO	Dr Eddy NG
Mr Kenneth LAM	Dr Lilian WAN
Dr Karen LEE	Dr Karine WONG