

Blood Lipid Disorders

Key Messages

- ※ The increasing prevalence of blood lipid disorders has become a worldwide public health problem. High blood cholesterol, especially the ‘bad’ low-density lipoprotein cholesterol, is a potent risk factor for atherosclerotic cardiovascular diseases, including ischaemic heart disease and stroke. In 2017, an estimated 4.32 million deaths were attributable to high low-density lipoprotein cholesterol globally.
- ※ In Hong Kong, the Population Health Survey 2014/15 reported that 42.2%, 35.0%, and 16.8% of non-institutionalised persons aged 15-84 were respectively tested having a borderline high or above level of total cholesterol, low-density lipoprotein cholesterol, and triglycerides. The proportion of persons with low ‘good’ high-density lipoprotein cholesterol level was 23.7%. Combining the prevalence of self-reported doctor-diagnosed hypercholesterolaemia (14.8%) and those who were undiagnosed before the survey but detected of having hypercholesterolaemia via blood tests (34.8%), the total prevalence of hypercholesterolaemia among persons aged 15–84 was 49.5%.
- ※ For prevention and management of blood lipid disorders, the Government will continue to promote healthy diet and physical activity participation; enhance public awareness about the importance of primary prevention of blood lipid disorders; strengthen the health system at all levels, in particular a comprehensive primary care for prevention, early detection and management of blood lipid disorders; as well as review and update drug lists and clinical protocols regularly to ensure equitable access by patients with blood lipid disorders to drugs and therapies of proven safety and efficacy.
- ※ Having an optimal blood lipid level is important for everyone regardless of their age and sex. To keep levels of ‘bad’ cholesterol and triglycerides in check and booster up the ‘good’ cholesterol levels in the blood, individuals should lead a healthy lifestyle that includes avoiding foods that are high in saturated fats and trans fats; being physically active; maintaining a healthy body weight and waistline; no smoking; and refrain from alcohol drinking.

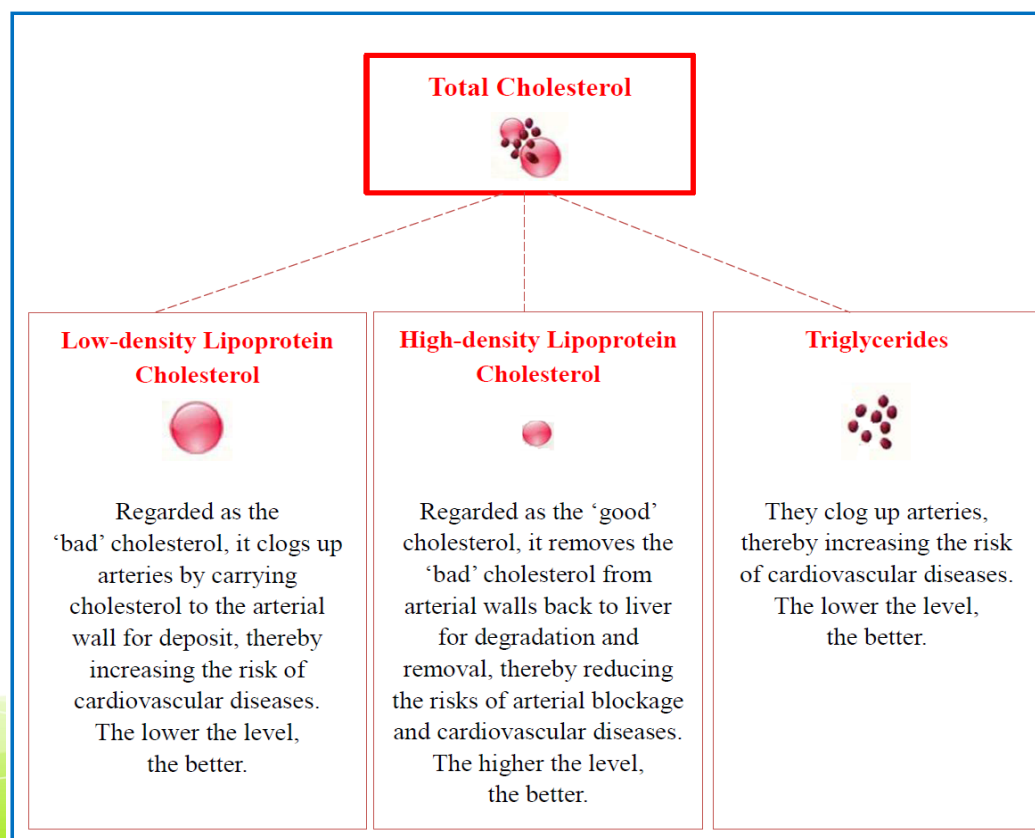
Blood Lipid Disorders

The increasing prevalence of blood lipid disorders has become a worldwide public health problem. Depending on the type of blood lipids involved (Figure 1), individuals may have high levels of total cholesterol (TC), high levels of low-density lipoprotein cholesterol (LDL-C), low levels of high-density lipoprotein cholesterol (HDL-C), high levels of triglycerides (TG), even a combination of these suboptimal blood lipid conditions. Apart from aging, gender (men are generally at higher risk than women of the same age for higher blood cholesterol, but women's risk would go up after menopause) and genetic susceptibility (such as in the form of familial hypercholesterolaemia, familial hypertriglyceridaemia or familial dyslipidaemia), certain lifestyles (including excessive intake of foods high in saturated or trans fats, physical inactivity, obesity and smoking), chronic diseases (such as diabetes mellitus, hypothyroidism, Cushing's Syndrome and chronic renal failure) and medications (such as steroids and oral contraceptive pills), can also contribute to blood lipid disorders.

Global Perspective

In 2008, a systematic analysis estimated that the global age-standardised mean TC was 4.64 mmol/L for men and 4.76 mmol/L for women.¹ According to the World Health Organization (WHO)'s estimation, the global prevalence of raised TC (≥ 5.0 mmol/L) among adult population was 39% in 2008 (37% for males; 40% for females). While around a quarter of adults had raised TC in low-income countries, the prevalence rose to around a third in lower middle-income countries and over 50% in high-income countries.² Although cholesterol levels among adults in Asian countries are generally lower than that in the United States and other Western countries, the levels are rising in many Asian regions. The increase is compatible with economic growth and associated lifestyle changes, such as increased supply and intake of high-fat diets, reduced physical activity and an increase in obesity rate.³

Figure 1: Major types of blood lipids



High blood cholesterol, especially LDL-C, is a potent risk factor for atherosclerotic cardiovascular diseases (CVD), including ischaemic heart disease and stroke.⁴ In Western countries, it was estimated that 45% of heart attacks were due to abnormal blood lipids. Between 2007 and 2017, the Global Burden of Diseases, Injuries, and Risks Factors Study (GBD) reported that the number of ischaemic heart disease deaths attributed to high LDL-C increased 20.7% from about 3.14 million to 3.79 million. The number of ischaemic stroke deaths attributed to high LDL-C also increased 21.2% from about 0.44 million to 0.53 million over the same period. Overall, an estimated 4.32 million deaths and 94.9 million disability-adjusted life-years (i.e. years lost due to ill-health, disability or early death) were attributable to high LDL-C globally in 2017.⁵

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 information on blood lipid profiles among 2 347 non-institutionalised persons aged 15–84 who had participated in the health

examination and blood tests. Results showed that the mean TC among people aged 15–84 was 5.1 mmol/L, mean LDL-C was 3.1 mmol/L, mean HDL-C was 1.4 mmol/L, and mean TG was 1.2 mmol/L (Table 1). Overall, 42.2%, 35.0% and 16.8% of persons had a borderline high or above level of TC (≥ 5.2 mmol/L), LDL-C (≥ 3.4 mmol/L) and TG (≥ 1.7 mmol/L), respectively. The proportion of persons with low HDL-C level (< 1.3 mmol/L for females; < 1.0 mmol/L for males) was 23.7%.⁶

As shown in Figure 2, prevalence of hyperlipidaemia (i.e. having a borderline high or above level of TC, LDL-C or TG) increased with age and peaked at age 55–64, but then decreased for persons aged 65–84. Regarding low HDL-C level, the prevalence was highest among the persons aged 65–84, followed by persons in the 35–44 age group. Combining the prevalence of self-reported doctor-diagnosed hypercholesterolaemia (14.8%) and those who were undiagnosed before the PHS but detected of having hypercholesterolaemia via blood tests (34.8%), the total prevalence of hypercholesterolaemia among persons aged 15–84 was 49.5%.⁶

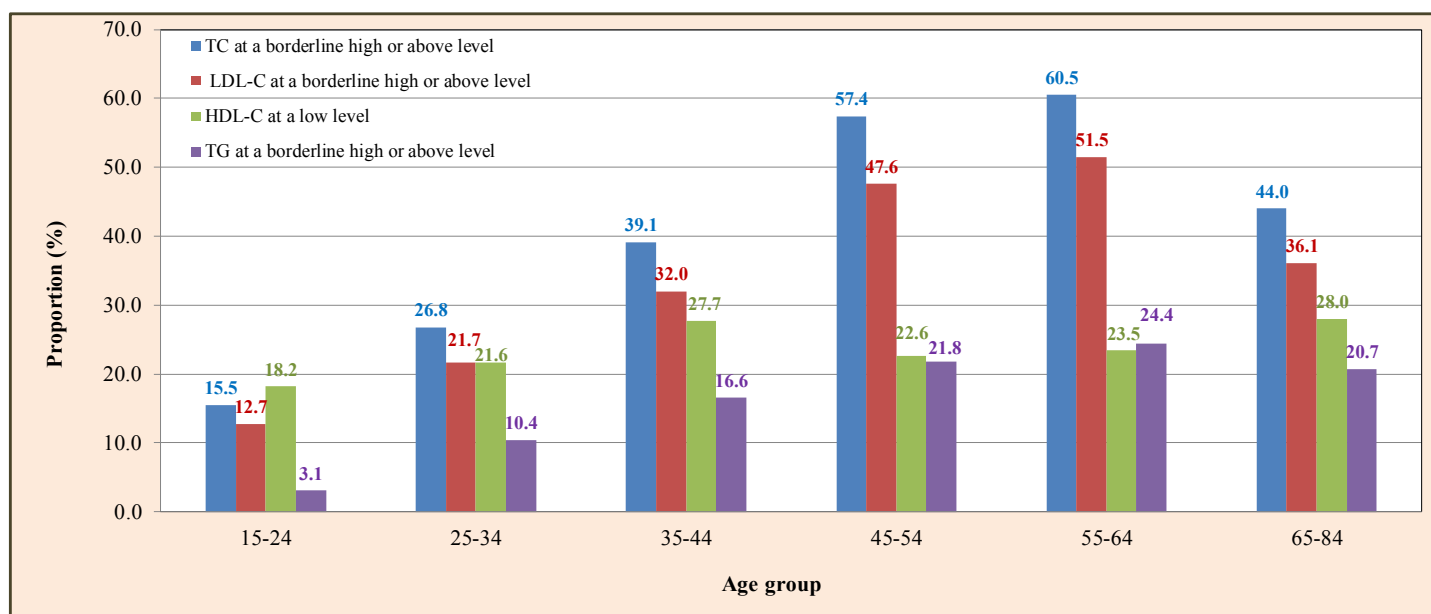
Table 1: Level of blood lipids among non-institutionalised persons aged 15–84 by gender and type of blood lipids

Type of blood lipids		Female	Male	Overall
TC	Mean (mmol/L)	5.1	5.0	5.1
	Borderline high or above (%)	42.7	41.6	42.2
LDL-C	Mean (mmol/L)	3.1	3.2	3.1
	Borderline high or above (%)	32.5	37.6	35.0
HDL-C	Mean (mmol/L)	1.5	1.3	1.4
	Low (%)	30.9	15.9	23.7
TG	Mean (mmol/L)	1.1	1.4	1.2
	Borderline high or above (%)	12.4	21.7	16.8

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

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

Figure 2: Proportion (%) of ‘suboptimal’ level of blood lipids among persons aged 15–84 by age groups and type of blood lipids



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

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

Prevention and Control of Blood Lipid Disorders

Having an optimal blood lipid level is important for everyone regardless of their age and sex. In order to function properly, our body needs cholesterol to make and repair cell, as well as uses it to produce hormones, vitamin D and bile acids which aid in digestion. However, too much cholesterol in the blood is harmful to health. From a public health perspective, the best strategy to tackle high blood cholesterol and other blood lipid disorders is primary prevention by promoting a healthy lifestyle that not only has the potential to decrease the incidence but also is likely to use far fewer resources than treating blood lipid disorders and related complications. Intervening upstream on a cluster of behavioural risk factors can induce parallel reductions in the prevalence of biomedical risk factors including suboptimal blood lipid levels, thereby reducing the risk of CVD. 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 that Hong Kong would pursue to achieve the ultimate Target 1: Reduce premature mortality from non-communicable diseases comprising CVD by 2025. The Government will continue to promote healthy diet and physical activity participation; enhance public awareness about the importance of primary prevention of blood lipid disorders; strengthen the health system at all levels, in particular a comprehensive primary care for prevention, early detection and management of blood lipid disorders; as well as review and update drug lists and clinical protocols regularly to ensure equitable access by patients with blood lipid disorders to drugs and therapies of proven safety and efficacy. For more information about the SAP, please visit the Change for Health Website at <https://www.change4health.gov.hk/en/saptowards2025/>.

It is noteworthy that dyslipidaemia usually has no signs and symptoms. Although high blood cholesterol or other blood lipid disorders will not cause to feel bad, it can significantly increase the risk of CVD.

To be 'cholesterol smart', individuals are encouraged to know what risk factors can affect blood lipid levels, lead a healthy lifestyle for maintaining an optimal blood lipid level, have blood lipid checks as advised by family doctor, as well as take blood lipid-lowering drugs if indicated and prescribed. As for those who are suffering from hyperlipidaemia, even a small reduction can yield substantial health benefits. The followings are some health advices that can help keeping levels of 'bad' cholesterol and triglycerides in check and boosting up the 'good' cholesterol level in the blood —

Eat a healthy diet. limit the intake of high fat foods, especially foods high in saturated fats (such as lard, butter, whole dairy products or cream, palm or coconut oils, processed meat including sausage and bacon, fatty meats, organ meats including brain and liver) and trans fats (such as margarine, cookies and pastries). For adults, WHO recommends less than 30% of total energy intake from fats. While consumption of saturated fats should be limited to less than 10% of total energy intake, total consumption of trans fats should be limited to less than 1% of total energy intake.⁷ Adequate consumption of dietary fibre can modulate lipid metabolism. Eat at least five servings (i.e. about 400 grams) of fruit and vegetables per day to ensure an adequate daily consumption of dietary fibre.⁷

Be physically active. Regular physical activity or exercise has been shown to have beneficial changes in blood lipids, including increases in HDL-C level and decreases in TG level.⁸ For health, WHO recommends adults in general to do at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic physical activity, or equivalent amounts of both throughout the week.⁹

Maintain a healthy body weight and waistline. Obesity can affect the way the body produces and metabolises cholesterol, and blood lipid disorders are commonly seen among obese subjects (of note is that body type does not predict blood lipid levels and some thin people have hyperlipidaemia too).¹⁰

Do not smoke. The toxic chemicals in cigarettes (such as nicotine and acrolein) can affect the way

the body processes cholesterol. Compared with non-smokers, smokers have significantly lower HDL-C level. However, smoking cessation increases HDL-C level and the increase generally occurs rapidly (in less than 3 weeks) after quitting.¹¹ Ask family doctor or call the DH's Integrated Smoking Cessation Hotline at 1833 183 for support to quit smoking.

Refrain from alcohol drinking. Alcohol drinking is known to affect lipid metabolism and elevate TG level¹² (and blood pressure), thereby increasing the risk of CVD.

For more information about healthy living, please visit the Change for Health website at <https://www.change4health.gov.hk/>.

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Created by the World Heart Federation, World Heart Day informs people around the globe that CVD, including heart disease and stroke, is the world's leading cause of death claiming millions of lives each year, and highlights the action that individuals can take to prevent and control CVD. This year on World Heart Day, we can all be Heart Heroes, for MY HEART, for YOUR HEART, for ALL OUR HEARTS, by making a simple promise to ourselves and those we care about ...

- ✓ A promise to our ourselves to do more exercise
- ✓ A promise to families to cook and eat more healthily
- ✓ A promise to our children to say no to smoking and help our loved ones to stop
- ✓ A promise as a healthcare professional to help patients give up smoking or lower their cholesterol
- ✓ A promise as an employer to create a joyful and heart-healthy working environment
- ✓ A promise as a policymaker to implement an action plan to prevent and control non-communicable diseases



Let's join Lazy Lion and be Heart Heroes! For his latest moves, please follow his facebook (www.facebook.com/lazylionhk) and instagram (www.instagram.com/lazylionhk) pages. To know more about the World Heart Day 2019, please visit <https://www.world-heart-federation.org/world-heart-day/>.

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.

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