



衛生防護中心
Centre for Health Protection

Non-Communicable Diseases Watch

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Health Tips

Being stroke aware not only involves knowing the causes and major risk factors of the disease, but also getting familiar with the warning signs of stroke and acting fast to get medical attention in order to save lives, reduce disabilities and improve treatment outcomes.

Preventing Stroke

Stroke is a serious medical condition that occurs when the blood supply to part of the brain is cut off causing brain damage. It can be caused either by a clot obstructing the flow of blood to the brain (called an ischaemic stroke), or by a blood vessel rupturing and preventing blood flow to the brain (called a haemorrhagic stroke). Without the oxygen and nutrient carried by blood, brain cells die and it can lead to various degrees of disability (such as limb weakness, difficulty in speaking or understanding speech) or even death. Similar to stroke, transient ischaemic attack (TIA) or “mini-stroke” occurs when the blood supply to the brain is interrupted by a temporary clot but the symptoms (such as face or limb numbness, difficulty in speaking or blurred vision) usually last for less than 24 hours. Although TIA generally does not cause permanent brain damage, it increases the chance of a subsequent stroke developing. Within 7 days after a TIA, 5.2% of people will have a stroke¹; up to 40% of all people who have experienced a TIA will go on to have an actual stroke.²

Stroke is a global public health issue. In 2005, there was an estimated 16 million first-ever strokes. In the absence of additional population-wide interventions, the numbers of first-ever stroke are expected to rise to 18 million in 2015, and further to 23 million by 2030.³ Stroke is also an important contributor to global patterns of mortality. As the Global Burden of Disease Study 2010 reported, the number of people who died of stroke worldwide increased from about 4.66 million in 1990 to more than 5.87 million in 2010, representing a 26.0% increase in number over the interval (Table 1). Stroke remained the second leading cause of death in the past two decades after ischaemic heart disease.⁴ In adults, stroke is also a prominent cause of permanent disability, affecting the person who may be disabled as well as their family and caregivers. A population study of follow-up of stroke survivors demonstrated that two-thirds had some forms of neurologic impairment and disability, 22.5% had dementia, 20% had experienced a recurrent stroke and 15% were institutionalized at five-years.⁵

Table 1: Number of people who died of stroke globally in 1990 and 2010 for all ages and sexes combined

	Number ('000)		% Change over the interval
	1990	2010	
Cerebrovascular disease (stroke)	4 660.4	5 874.2	26.0% increase
• <i>Ischaemic stroke</i>	2 241.1	2 835.4	26.5% increase
• <i>Haemorrhagic and other non-ischaemic stroke</i>	2 419.4	3 038.8	25.6% increase

Source: Global Burden of Disease Study 2010.

In this Issue Page

Preventing Stroke . . . 1

Data Brief 6

World Stroke Day 2013 8

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Risk Factors of Stroke

Stroke can occur in anyone at any time, regardless of age, sex or ethnicity. But the chances of having a stroke increase if a person has certain stroke risk factors, either non-modifiable or modifiable. Besides, the risk grows as the number of risk factors increases. The good news is most of the risk factors for stroke are modifiable.

Non-modifiable risk factors

Advancing age is the greatest non-modifiable risk factor for stroke, doubling every decade after age 55.⁶ Worldwide, stroke is more common among men than women.⁷ Besides, family history of stroke increases personal stroke risk by about 30%.⁶ With respect to race or ethnicity, blacks and some Hispanic/Latino Americans have more strokes than whites.⁶ A recent systematic review also finds a slightly higher overall stroke incidence and higher proportion of intracerebral haemorrhage

(a bleeding type of stroke) in Chinese than white populations.⁸

Modifiable risk-factors

Epidemiological studies implicated a number of significant behavioural and biomedical risk factors that can increase the risk of stroke (Box 1). According to the INTERSTROKE study, a standardised case-control study involving 6 000 people in 22 countries to assess the contribution of known and emerging risk factors to the burden of stroke, 10 potentially modifiable risk factors accounted for about 90% of the global risk of all stroke. They included: hypertension, current smoking, central obesity, unhealthy diet, physical inactivity, diabetes, excessive alcohol use, cardiac causes (such as atrial fibrillation), suboptimal blood cholesterol ratio and psychosocial stress (such as depression).⁹

Box 1: Major modifiable risk factors for stroke

Elevated blood pressure – It is by far the most important risk factor for stroke. Compared to people who have an optimal blood pressure, people with pre-hypertension (SBP between 120 and 139 mmHg or DBP between 80 and 89 mmHg) would have a 55% increased risk of stroke.¹⁰

Smoking – Cigarette smoke raises blood pressure, damages blood vessels, makes blood thicker and more likely to clot, and reduces the amount of oxygen the blood can carry to the brain. Compared with non-smokers, cigarette smokers would have an overall 51% increased risk of having a stroke. The risk of stroke also increases with the number of cigarettes smoked, from a 37% increase in people who smoked less than 10 cigarettes a day, to a 45% increase in people who smoked 10-20 cigarettes a day and a 82% increase in people who smoked more than 20 cigarettes a day.¹¹

Excess body weight – Overweight and obesity are associated with hypertension, diabetes, and heart disease, all of which are significant risk factors for stroke. Compared to people with an optimal weight, overweight and obese people would have a respective 22% and 64% increased risk of ischaemic stroke.¹² Similarly, stroke risk increases with growing waist-to-hip ratio, a marker of central obesity. Compared to people in the lowest tertile of waist-to-hip ratio, those in the second and third tertile of waist-to-hip ratio would have a 42% and 65% increased risk of stroke respectively.⁹

Box 1: Major modifiable risk factors for stroke (continued)

Unhealthy diet – Certain dietary patterns are associated with an increased risk of stroke. For example, compared to people in the lowest categories of consumption of red meat, processed meat or total meat (combined red and processed meat), those in the highest categories would have a 9%, 14% and 15% increased risk of stroke. In the dose-response analysis, the risk of stroke increased by 13% for each 100 grams (g) per day increment in red meat consumption, 11% for each 50 g per day increment in processed meat consumption, and 10% for each 100 g per day increment in total meat consumption.¹³ High salt diets often contribute to high blood pressure, thereby increasing the risk of stroke. Compared to people with ‘lower’ salt intake, people with ‘higher’ salt intake would have a 23% increased risk of stroke.¹⁴ Cooking with lard would also increase a person’s risk for stroke by 66%.⁹

Physical inactivity – Being sedentary increases the risk of hypertension, obesity, diabetes and heart diseases. Compared to people who are physically active, inactive people would have about 1.5 times increased the risk of ischaemic stroke.¹⁵

Diabetes – Diabetes increases the risk of stroke because high levels of glucose in the blood can damage blood vessels, making them harder and narrower (called atherosclerosis). Diabetes also increases the risk of the build-up of fatty deposits in the arteries, which block oxygen from reaching the brain. Patients with diabetes are 2 to 3 times as likely to have ischaemic stroke when compared with non-diabetic individuals.¹⁶

Excessive alcohol intake – Drinking too much of any type of alcohol increases blood pressure and contribute to the development of stroke. Compared to people who do not drink, heavy drinkers (consuming more than 60 g of alcohol per day) would have a 118% increased risk of haemorrhagic stroke and 69% increased risk of ischaemic stroke.¹⁷

Heart diseases – Heart diseases, such as irregular heart beat (atrial fibrillation), coronary heart disease and chronic heart failure, can cause blood to pool in the heart and result in blood clot formation that may block vessels in or leading to the brain. For example, people with atrial fibrillation are about 5 times as likely to have a stroke compared to those who do not have the disease.¹⁸ People with coronary heart disease or chronic heart failure are about 2 to 4 times as likely to have stroke.^{18,19}

Suboptimal blood cholesterol ratio – The association between cholesterol and stroke is complicated because their relationship varies based upon the type of stroke and the type of cholesterol involved. People in the highest tertile of non-high-density lipoprotein to high-density lipoprotein ratio would have a 47% increased risk of ischaemic stroke compared to those in the lowest tertile.⁹

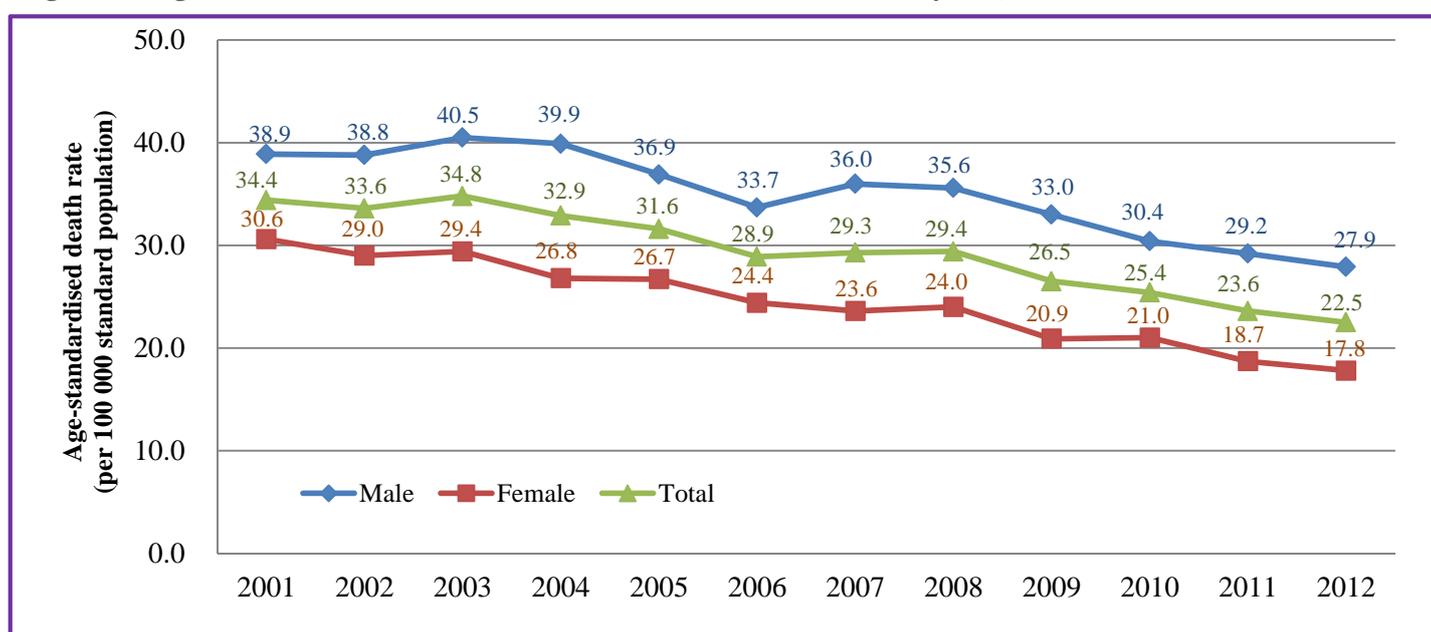
Psychological distress – Greater psychological distress is associated with elevated blood pressure, diabetes, higher blood cholesterol, and risky behaviours including smoking and excessive drinking, all of which can increase the risk of stroke. For example, people with a history of depression would have a 34% increased risk of stroke compared to people who do not have a history of depression.²⁰ Psychological stress is also associated with a 30% increased risk of stroke.⁹

Local Situation

Despite the fact that the age-standardised death rate (per 100 000) of stroke dropped from 34.4 in 2001 to 22.5 in 2012 (Figure 1) and was lower than the global rate (88.4 per 100 000 standard population in 2010⁴), stroke poses a significant disease burden in Hong Kong. In 2012, stroke was the fourth commonest cause of death in Hong Kong with 3 276 registered deaths (or 7.5% of all registered deaths).²¹ A household survey conducted by the Census and Statistics Department during October 2011 to January 2012 reported that some 40 300 persons (or 0.6% of the total land-based non-institutional population excluding foreign domestic helpers) had stroke as told by practitioners of Western

medicine.²² Furthermore, a study used clinical data of the Hong Kong Hospital Authority to examine the incidence of stroke among Hong Kong population aged 35 and above found that the first-ever ischaemic stroke incidence (per 100 000) for the period from 1999 to 2007 was 270.7 for men and 204.5 for women. The corresponding first-ever haemorrhagic stroke incidence was 80.5 for men and 44.5 for women.²³ Among Chinese children in Hong Kong, an earlier study reported an estimated incidence of 2.1 cases per 100 000 children-year between 1998 and 2001, which was much less than that reported for Europe, and slightly less than those reported for North America.²⁴

Figure 1: Age-standardised death rate of cerebrovascular disease by sex, 2001-2012



Sources: Department of Health and Census and Statistics Department.

Be Stroke Aware and Know Stroke Prevention

Being stroke aware not only involves knowing the causes and major risk factors of the disease, but also getting familiar with the warning signs of stroke including TIA (Box 2) and acting fast to get medical attention in order to save lives, reduce disabilities and improve treatment outcomes. However, overseas studies showed that approximately 70% of patients failed to correctly recognise their TIA or minor stroke and 30% delayed seeking medical attention for more than 24 hours.²⁵ At the time of stroke, only 30-60% of patients sought medical help within the recommended 3-hour timeframe.²⁶ Such delay was also very often due to patients and witnesses such as family and friends who did not recognise typical symptoms of TIA or stroke, fear of the consequences of stroke, or not realising the importance of receiving timely treatment.²⁵⁻²⁷ In fact, time is muscle: the earlier a person takes heed of the stroke symptoms and gets appropriate treatment, the better outcome it would be. So if you think you or someone may be having a stroke, immediately stop what you are doing and seek emergency medical help right away. Remember, any delay may cost lives.

Box 2: Warning signs of stroke and TIA

- Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing in one or both eyes
- Sudden trouble with walking, dizziness, loss of balance or poor coordination
- Sudden, severe headache with no known cause

Regarding stroke prevention, there is good evidence that adherence to healthy lifestyle factors is associated with a lower lifetime risk of stroke. Besides, the greater number of healthy lifestyle factors one has, the more protection one gains against stroke.²⁸ Here are some tips for optimal brain health and reducing the risk of brain attack:

Do not smoke. Smokers should know that quitting today can immediately and markedly reduce stroke risk. For free advice and help, call the Integrated Smoking Cessation Hotline of the Department of Health (DH) at 1833 183, or visit the website of the Tobacco Control Office at <http://www.tco.gov.hk/eindex.html> to download the free Quit Smoking iPhone or Android App.

Maintain optimal weight and waist circumference. Asian adults should aim at maintaining a body mass index (BMI) between 18.5 and 22.9. Irrespective of their BMI, Asian men should keep their waist circumference below 90 cm (~ 36 inches) and Asian women should keep theirs below 80 cm (~32 inches).

Eat a balanced diet that is high in fruit and vegetables with appropriate amounts of whole-grains. Meta-analyses have shown a dose-response relationship between risk of stroke and fruit and dietary fibre intake. For each additional serving per day of fruit, the risk of stroke decreased by 11%.²⁹ For each 10 g per day increment in dietary fibre intake, the stroke risk would be reduced by 12%.³⁰ Besides, avoid food and beverages that are high in salt, sugar, fat and cholesterol. For adults, they should also cut back on salt to less than 5 g (approximately one level teaspoon) per day. Children should consume less salt than adults in accordance to their size, age and energy needs.³¹ Adults should avoid alcohol consumption.

Stay physically active and avoid prolonged sitting. Highly active individuals would have a 27% lowered risk of stroke incidence or mortality than their low-active counterparts.³² As the World Health Organization recommends, adults should do at least 150 minutes of moderate-intensity physical activity, or 75 minutes of vigorous-intensity physical activity, or equivalent amounts throughout the week. For children and young people, they should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily.³³

Keep blood pressure, blood sugar and blood cholesterol at optimal levels. Healthy adults are generally advised to maintain a SBP of less than 120 mmHg and a DBP of less than 80 mmHg;

a fasting blood glucose of less than 5.6 millimole per litre (mmol/l); and a total blood cholesterol of less than 5.2 mmol/l.

Keep hypertension, diabetes, hypercholesterolaemia, heart diseases, and other medical conditions under control. Take an active part in self-care, and follow the treatment plan offered by healthcare professionals.

Manage negative emotions with healthy coping strategies, such as practising Tai Chi, yoga or deep breathing.

For more information about healthy living, please visit the Central Health Education Unit website of DH at <http://www.cheu.gov.hk>, or call the 24-hour Health Education Hotline at 2833 0111.



Data Brief

Stroke is a medical emergency that often requires hospital admission for treatment. In 2012, there were over 25 700 episodes of in-patient discharges and deaths due to stroke in public and private hospitals. In general, the rate of in-patient discharges and deaths from stroke for males (421.3 per 100 000 population) was higher than that for females (306.0 per 100 000 population), and increased sharply with age from 12.2 per 100 000 population for people aged 24 and below to 1 805.1 per 100 000 population for people aged 65 and above.³⁴

Number and rate of episodes of in-patient discharges and deaths in public and private hospitals due to stroke by sex and age group, 2012

Age group	Male		Female		Total	
	Number	Rate [#]	Number	Rate [#]	Number	Rate [#]
24 and below	109	12.6	97	11.7	206	12.2
25-44	562	60.4	405	31.0	967	43.3
45-64	4 370	404.8	2 491	213.0	6 861	305.1
65 and above	8 976	1 968.4	8 719	1 663.0	17 695	1 805.1
Total	14 017	421.3	11 712	306.0	25 729	359.6

Note: [#] Per 100 000 population of the respective age group.

Sources: Hospital Authority, Department of Health and Census and Statistics Department.

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World Stroke Day is set annually on 29 October by the World Stroke Organization. It is a day of awareness which aims to call attention to stroke as one of the leading causes of disability and death, and to highlight the ways in which stroke can be prevented.

“Because I care...” launched on World Stroke Day 2012, will remain as the campaign slogan for World Stroke Day 2013.

The slogan was chosen as it can easily be adapted to all cultures and in any setting. There remain myths and misconceptions about stroke. The slogan attempts to address prevailing misinformation about the disease, e.g., stroke only happens later in life. Moreover, caregivers and the role of family and close friends – as those in the frontline providing supportive care - will play an essential role in the campaign.

The campaign will celebrate their important contributions. Care givers are the conduits between the stroke community and the general public in correcting misinformation as they know first-hand what the reality is around stroke.

To know more about the World Stroke Day 2013 and relevant activities, please visit <http://www.worldstrokecampaign.org/2012/About/Pages/WorldStrokeDay2013.aspx>.

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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.

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