

# Avoiding Heart Attacks and Strokes

Don't be a victim – Protect yourself



World Health Organization



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This booklet has been produced by WHO, World Self Medication Industry (WSMI), World Heart Federation (WHF), and International Stroke Society (ISS). It is intended for a global audience, and cannot therefore address the specific cultural, dietary and lifestyle situation of different countries and populations. It is hoped that national professional associations will translate and adapt it for local use. Translations in French, Spanish, Chinese, and Arabic are in preparation.

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# What you can do

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7. Improve your diet
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## 6. Stop using tobacco

Tobacco can be used in many different ways, such as in cigarette, cigar or pipe smoking, in tobacco chewing or as snuff. No matter how you use it, tobacco is very harmful to your health. If you use tobacco, you should try to quit as soon as you can. This is one of the most important steps you can take to protect your health.

### The benefits of quitting

Stopping tobacco use at any age results in health benefits right away. It will reduce your chances of having a heart attack or a stroke from the day you stop! It will also reduce your chances of having other health problems, such as cancer and lung disease.

There are other benefits to stopping tobacco use:

- After a few weeks, you will feel less tired and wake up feeling more refreshed. You will have more energy. Your blood circulation will improve within a few weeks, making walking easier.
- Your sense of taste and smell will improve, so you will be able to enjoy food more.
- You will not smell of stale smoke, and will have fresher breath.
- You will save money.
- You will no longer be putting your family and friends in danger from your tobacco smoke.

### How to make your plan for quitting

There is more than one way to stop using tobacco. You have to find the way that works best for you.

Before you try to quit, sit down and make a plan.

- Choose a certain day to stop completely, and STOP.
- Set yourself targets.
- Get the support of your family and friends. Ask them to help you quit.
- Think about what you are going to do if you have cravings.

### Dealing with your cravings after you quit

For some people, the hardest part of stopping tobacco use is coping with the withdrawal symptoms. These can include:

- headache;
- feeling irritable, moody, or depressed;
- difficulty concentrating.

Stopping tobacco use reduces the chance of a heart attack or stroke from the moment you stop.

Tobacco is an addictive substance. It is normal to have strong cravings for the first week or so after you quit. Even months after you quit, it is very easy to start again. Products such as nicotine chewing gum, patches or tablets can help with cravings and withdrawal symptoms.

*Note:* If you already have heart disease or you are pregnant, you should not use these products without the advice of a doctor.

## **Tips for quitting the tobacco habit**

- Never allow yourself to have “just one”. This is how many people end up using tobacco again. Even after just one, the cravings will be back.
- Keep yourself busy so that you have less time to think about your cravings. If you feel a strong desire for tobacco, say to yourself: “I will wait another five minutes”. Then do something to take your mind off it.
- Avoid places where you used to use tobacco, and avoid others who use it. Ask your family and friends not to use tobacco in front of you during this period.
- Go to bed early, get plenty of rest, and avoid stress. Remind yourself that after a week or so, things will start to get better. Continue the changes you make to your lifestyle for several months after your cravings stop.
- Keep your target in mind and think about what you are going to gain from stopping tobacco use. Think about how good you are going to feel!
- Put away the money that you save and buy yourself a treat to congratulate yourself on your achievement.
- Don’t worry if you put on a bit of weight. This happens to some people when they stop using tobacco, usually because they eat more. You can control this by being careful what you eat and taking exercise. The most important thing is to stop using tobacco!

## **Don’t be discouraged if you have tried to quit and failed.**

Many people who have succeeded in stopping tobacco use have had to try several times before giving it up for good. You may want to try a different approach this time. But keep trying!

## 7. Improve your diet

### “Take 5” – Eat five servings of fruit and vegetables each day

Fruits and vegetables contain substances that help to prevent heart attacks and strokes. They protect blood vessels and heart and brain tissue.

You should eat at least five servings of fresh fruit or vegetables every day (400–500 grams daily).

How much is a serving? Here are some guidelines. One average-size banana, apple, orange, or mango would be a serving of fruit. Two tablespoons of cooked vegetables, or one big tomato would be a serving of vegetables.

### Avoid salt and salty food

Many preserved foods, like pickles and salt fish, contain a lot of salt. In addition, fast food, like French fries, often has a lot of added salt. Prepared foods, such as frozen dinners, can also be very salty.

Try not to add salt to your food. A good guideline is to use less than 1 teaspoon (5 grams) of salt each day.

### Eat more fibre

Fibre protects against heart attacks and strokes. Sources of fibre include beans, lentils, peas, oats, fruits, and vegetables.

### Eat at least two servings of oily fish a week

Fish oils contain “good” fats called omega-3 fatty acids, such as EPA (eicosapentanoic acid) and DHA (docosahexaenoic acid). They protect people from heart attacks and strokes by preventing blood clots. One serving of fish is about the size of a pack of playing cards. Fish oil supplements are also good.

### Limit alcohol

You do not need to avoid alcohol completely. A man should not drink more than two alcoholic drinks a day. Women should not drink more than one. One drink, or unit, of alcohol, contains about 10 grams of alcohol. That is about one 250-ml bottle of beer, one 100-ml glass of wine, or one 25-ml glass of whisky.

Eating at least 5 servings of fruit and vegetables a day, and limiting your salt intake to less than one teaspoon a day, can help to prevent heart attacks and strokes.

## Limit fatty foods

All fats are high in energy and will make you gain weight unless you burn them off by staying active. Some fats are more likely to increase your risk of heart attack and stroke:

- Saturated fats and trans-fats lead to “bad” cholesterol in your blood, and increase your risk of heart disease. Try to restrict your use of these fats.
- Unsaturated fats are less risky, but they still make you gain weight. You should eat them in moderation.

Sources of saturated fat, trans-fat, and cholesterol Restrict your use of:	Sources of unsaturated fat Use these fats in moderation:
Butter and ghee	Safflower oil
High fat dairy products, such as cream and creamy cheeses	Canola oil
Palm oil and coconut oil	Nuts, such as peanuts, cashews, walnuts, and almonds
Food fried in saturated fat	Sunflower oil
Processed meats, such as burgers and sausages	Sesame, pumpkin, or sunflower seeds
Liver and other organ meats	Cottonseed oil
Fatty pork	Corn oil
Lard and shortening	Soybean oil
Poultry skin	Fish oil
Egg yolks	Soft margarine (not hard margarines )
Chocolate	

## Cooking tips for reducing fat

- Use only a very little cooking oil.
- Instead of frying foods, bake, broil, boil, grill, steam, roast, poach, or microwave them.
- Trim the fat and skin off meat before cooking.
- Eat chicken instead of red meat like beef, pork, and mutton.

## 8. Stay active and control your weight

### Obesity and overweight

If you eat a lot and are not active enough to burn off the calories you take in, you will put on weight. You could even become obese. People who are overweight or obese are at higher risk of heart attacks and strokes.

### How to know if you are obese

The body mass index (BMI) is a measure of weight in relation to height. It is calculated as follows:

$$\text{BMI} = \frac{\text{body weight in kilograms}}{\text{height (in metres) squared}}$$

A person with a BMI over 25 kg/m<sup>2</sup> is considered to be overweight. A person with a BMI over 30 kg/m<sup>2</sup> is considered obese. The risk of heart attacks, strokes and diabetes increases as BMI increases. Ideally, the BMI should be maintained between 18.5 and 24.9 kg/m<sup>2</sup>.

### Central obesity increases the risk of heart attacks and strokes

People who are overweight or obese are at higher risk of heart attacks and strokes, especially when they have a lot of excess fat in the waist area and abdomen (stomach area). This is called central obesity. Regular waist measurements are a simple measure of the total fat in your body and of central obesity. Central obesity is said to be present if the waist measurement is 102 cm or more in men, and 88 cm or more in women.

The best weight for you depends on your height, age and sex. Your doctor can help you determine your ideal weight.

### What staying active does for your health

Physical activity lowers the risk of heart attacks and strokes by:

- lowering your blood sugar, blood pressure and blood fats;
- increasing oxygen levels in your body;
- helping you lose weight;
- reducing stress;
- strengthening your heart, muscles and bones;
- improving blood circulation;
- toning your muscles.

Being overweight increases the risk of heart attacks and strokes. To maintain an ideal body weight, take regular physical activity and eat a healthy diet.

Staying active also reduces the risk of some cancers, such as colon cancer and breast cancer. It makes you feel healthier, helps you sleep, and improves your state of mind.

## Do I have to join a health club to stay active?

No! Physical activity is any form of exercise or movement. It does not only mean sports and athletics. Daily chores such as walking, gardening, housework, and playing games with your children are all forms of physical activity. Whatever your age, physical activity plays a big role in your health and well-being.

There are many ways to increase your activity level. Think about small changes you could make to your routine, such as taking the stairs instead of the lift, or walking to work instead of driving. Above all, avoid sitting in front of the television for too long.

## How much physical activity do I need?

Try to get at least 30 minutes of physical activity on most days of the week. This does not have to be all at once. It can be spread over the course of the day.

Start slowly. If you have any medical problems, talk to your doctor about the amount and type of physical activity that is good for you. Listen to your body, and if you feel unwell when you are active, see your doctor about it right away.

If you feel comfortable with the amount of physical activity you are doing, build it up gradually. For most people, the right kind of physical activity produces a light sweat and makes you slightly breathless. If you are active on most days of the week, your fitness will gradually increase.

Once you start getting regular exercise, don't stop. You will lose the fitness you gained and all the benefits it brings. The best thing is to stay active for your whole life.

Engaging in physical activity for at least 30 minutes on most days of the week will help to keep away heart attacks and strokes.

## 9. Reduce high blood pressure

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### What is high blood pressure?

Blood pressure is measured in millimeters of mercury (mmHg), and it has two numbers. The first is the *systolic* blood pressure, and is the pressure when the heart is contracting. The second is the *diastolic* blood pressure, and is the pressure when the heart is resting. A person has high blood pressure, or hypertension, when the first pressure is above 140 mmHg or the second is above 90 mmHg.

### What causes high blood pressure?

Some people have high blood pressure because it runs in the family. Blood pressure also tends to increase with age. But lifestyle factors can also cause high blood pressure or make it worse. These factors include:

- being overweight or obese;
- eating too much salt in the diet;
- drinking too much alcohol.

High blood pressure can also be linked to some illnesses, such as kidney disease. Some medicines, such as birth control pills, can increase blood pressure.

### Why is high blood pressure dangerous?

High blood pressure makes the heart work harder than it should, causing it to get weaker over time. The higher your blood pressure, the greater your risk of heart attack and stroke.

### How do I know if I have high blood pressure?

You cannot tell if you have high blood pressure unless you have it measured. You should have it measured once a year. The measurement is quick and painless.

## What should I do if I have high blood pressure?

- Maintain a healthy body weight.
- Stay active.
- Eat a healthy diet that is low in salt and fat and high in fruit and vegetables.
- Do not smoke.
- Do not drink too much alcohol.
- Have your blood pressure taken regularly.

If you are doing these things and your blood pressure is still high, your doctor can prescribe medicines. These do not cure high blood pressure, but they control it. You must take them as directed, probably for the rest of your life. You should have your blood pressure checked regularly.

*To find out more about medicines for high blood pressure, read the Annex.*

High blood pressure has no symptoms, but can cause a sudden stroke or heart attack. Have your blood pressure checked regularly.

## 10. Reduce high blood sugar

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People with high blood sugar levels, or diabetes, have a higher risk of heart attacks and strokes. At least half of the people who have diabetes do not know they have it.

Diabetes speeds up the development of atherosclerosis – the narrowing and hardening of the arteries that causes heart attacks and strokes. Untreated diabetes can also lead to blindness, kidney failure, nerve damage, leg ulcers and coma. Pregnancy is much more difficult for diabetic women and their babies are more likely to have birth defects.

### What causes diabetes?

Diabetes occurs when the body fails to produce enough insulin, or cannot use it properly. Sugar then builds up in the blood. There are two main types of diabetes:

*Type I Diabetes* develops most often in children and young adults. Patients need to have daily injections of insulin to survive.

*Type II Diabetes* is the most common form -- almost 95 % of people with diabetes have this type. Patients with type II diabetes cannot produce enough insulin or cannot use insulin properly. It occurs mostly in middle-aged people, but children and young adults can also develop it, particularly if they are obese, have an unhealthy diet, and are physically inactive. The number of children and young adults with type II diabetes is increasing. This type of diabetes can usually be treated through lifestyle changes and oral medicines.

The causes of diabetes include hereditary factors, obesity, an unhealthy diet and lack of physical activity. If you keep an ideal body weight, regularly take physical activity, and consume a healthy diet, you reduce your risk of getting diabetes.

### How do I know if I have diabetes?

Some people have few or no symptoms at all until they start having serious problems. The early signs of diabetes include:

- tiredness and weakness;
- frequent need to urinate (pass water);
- unusual thirst;
- weight loss or gain;
- blurred vision;
- frequent infections;
- wounds that heal slowly.

A doctor can diagnose diabetes by measuring the blood sugar level using a simple blood test. If necessary, you may be asked to take a special drink with glucose (sugar) so that your blood sugar level can be measured afterwards.

## Diagnostic criteria for diabetes

Condition		Blood glucose level
Diabetes		fasting blood glucose: 7.0 mmol/l (126 mg/dl) and above or 2 hours after glucose load: 11.1 mmol/l (200mg/dl) and above
Blood glucose level higher than normal but not yet diabetes	Impaired glucose tolerance	fasting blood glucose (if measured): less than 7.0 mmol/l (126 mg/dl) and 2 hours after glucose load: 7.8 mmol/l (140mg/dl) and above and less than 11.1mmol/l(200mg/dl)
	Impaired fasting glucose	fasting blood glucose: 6.1 mmol/l (110 mg/dl) and above and less than 7.0 mmol/l (126mg/dl) and 2 hours after glucose load: less than 7.8 mmol/l (140mg/dl)

Modified from Definition, diagnosis and classification of diabetes mellitus and its complications. Report of a WHO consultation (WHO, Geneva, 1999) and the International Diabetes Federation IGT/IFG consensus statement (Unwin N, et al. International Diabetes Federation IGT/IFG Consensus Statement. Report of an Expert Consensus Workshop 1-4 August 2001, Stoke Poges, UK. Diabetic Medicine 2002; 19: 708-723).

Individuals with a fasting blood sugar level between 6.1 mmol/l (110 mg/dl) and 7.0 mmol/l (126 mg/dl) are at high risk of developing diabetes and should improve their lifestyle to reduce the risk.

## How can I control my diabetes?

If diabetes is well controlled, the risk of developing heart attack, stroke, or heart failure will decrease. Lifestyle changes can often help to control blood sugar levels. These changes include:

- eating a healthy diet;
- avoiding foods that are high in sugars, fats, and calories;
- maintaining a healthy body weight;
- drinking less alcohol;
- staying active.

If lifestyle changes do not reduce your blood sugar levels enough, you will need to take medicine. Many people with type II diabetes can be treated with oral medicine alone. Some may need insulin injections, or sometimes both.

At the time of diagnosis, the doctor will do tests to detect any complications from the diabetes and will advise on treatment. If you have diabetes, you should have regular check-ups. You should also follow carefully instructions for making lifestyle changes and taking medicine. Be sure to ask questions if there is anything you do not understand.

You may have to measure the sugar levels in your blood or urine in between check-ups. Your doctor will show you how to do this if it is necessary.

## Medicines used to treat diabetes

Many people with type II diabetes can be treated with oral medicines (medicine taken by mouth). You can read more about them in the Annex.

If lifestyle changes and oral medicines are not enough to control the diabetes, the doctor will prescribe insulin. This is injected, using a syringe or a “pen-type” injector.

Patients with type I diabetes need insulin injections; they cannot be treated with oral medicine.

## Watching your blood sugar levels

When you have diabetes, you have to watch your blood sugar level, because if it is too low or too high you could get very sick. When the blood sugar level drops, you could become nervous, shaky, and confused. You may be advised to carry sugar cubes or drops to take when you feel these symptoms. If level drops very low, it can lead to fainting, coma, and even death. If the blood sugar level is too high, it can also lead to a diabetic coma.

Here are some tips for keeping your blood sugar level correct:

- Never miss doses of your medicine.
- Do not stop taking your medicines without asking your doctor.
- Do not miss meals.
- Be careful about taking your medicine when you are sick and not eating as much as you usually do (e.g. When you have a cold and your appetite is less than usual and cannot eat as much as you usually do). Seek your doctor’s advice on this.

Control your blood pressure and blood sugar if you have diabetes.

# 11. Reduce high blood fat levels

Blood fats, or lipids, include cholesterol and triglycerides. The body needs a certain amount of cholesterol, but when there are too many fats in the blood (hyperlipidaemia), fatty deposits build up in the arteries, increasing the risk of heart attacks and strokes.

## “Good” and “bad” cholesterol

Cholesterol cannot dissolve in blood, so it needs “carrier” proteins to transport it around the body. The carrier proteins are called lipoproteins. There are two main kinds:

*High density lipoprotein (HDL):* When cholesterol is carried by HDL, it is called HDL cholesterol. This is “good” cholesterol, and reduces the risk of heart disease and strokes.

*Low density lipoprotein (LDL):* When cholesterol is carried by LDL, it is called LDL cholesterol. This is “bad” cholesterol, and increases the risks of heart attacks and strokes.

## Current recommended blood fat levels (European guidelines)

Total cholesterol	less than 5.0 mmol/l (190 mg/dl)
LDL-cholesterol	less than 3.0 mmol/l (115 mg/dl)
HDL-cholesterol	more than 1.0 mmol/l (40 mg/dl) in men more than 1.2 mmol/l (46 mg/dl) in women
Triglycerides (fasting)	less than 1.7 mmol/l (150 mg/dl)

Modified from: Mackay J, Mensah GA, Mendis S and Greenlund K. The atlas of heart disease and stroke (Geneva, World Health Organization, 2004).

Healthy diet is low in fat, low in salt and sugar and high in fruits and vegetables.

## What causes high blood fat levels?

High cholesterol levels may run in some families. But most often, high blood fat levels are caused by an unhealthy diet and lack of physical activity. High blood fat levels rarely produce symptoms or warning signs. When cholesterol levels are very high, some people develop skin growths called xanthomas. To check your blood fat levels, ask your doctor for a simple blood test.

In some cases, a high blood fat level may be associated with an undiagnosed medical condition, like diabetes.

## What should I do if I have a high blood fat level?

- Eat a healthy diet that is rich in fruits and vegetables, and low in animal fat, saturated fat, and cholesterol (read about the kinds of fats and oils you can eat more of in Section 7).
- Maintain a healthy body weight.
- Stay active.

If these things do not lower your blood fat levels enough, your doctor can prescribe medicines. You must take these regularly, even if you cannot feel their effects, and you must keep following a healthy lifestyle.

## Annex. Medicines for treating and managing heart attacks and strokes

This table shows medicines commonly used to treat heart attacks, strokes, and the physical problems that cause them.

*Warning:* Most of these medicines are prescribed by doctors and must only be used under medical care. Never take them without your doctor's advice. Used wrongly, these medicines can be fatal.

Type of medicine	What it does	Examples
Antiplatelet agent	Prevents blood clots that cause heart attacks and strokes.	Aspirin
Anticoagulant or blood thinner	Prevents blood clots. Used for patients with an irregular heartbeat (atrial fibrillation) and after surgery to replace damaged heart valves.	Warfarin
Vasodilator	Relaxes blood vessels, relieves and prevents angina. Used also for heart failure to reduce the burden on the heart by relaxing blood vessels.	Nitrates (such as isosorbide dinitrate)
Diuretic	Removes excess water from the body and prevents build-up. Lowers blood pressure. Used for high blood pressure and heart failure.	Furosemide Thiazides
Calcium-channel blocker	Relaxes blood vessels and lowers blood pressure. Used for high blood pressure and angina.	Nifedipine (long-acting)
Beta-blocker	Slows the heart rate and makes it beat with less force. Used for high blood pressure and angina. Some can be used for heart failure to decrease the workload of the heart.	Atenolol Metoprolol
Angiotensin converting enzyme (ACE) inhibitor	Relaxes blood vessels and reduces the strain on the heart. Used for high blood pressure and to reduce the risk of heart attacks. Also used for heart failure to prevent further damage to the heart.	Enalapril
Centrally acting antihypertensive	Lowers blood pressure by acting on the brain.	Methyldopa
Angiotensin II receptor blocker (ARB)	Dilates blood vessels and lowers blood pressure.	Candesartan
Cardiac glycoside	Increases the strength of heart muscles and helps the heart pump blood. Used for heart failure.	Digoxin

Type of medicine	What it does	Examples
Blood cholesterol-lowering agent	Lowers cholesterol levels in the blood. Used for high blood fats (high cholesterol).	Statins
Biguanide	Helps the cells of the body to take in sugar. Used for diabetes to lower blood sugar level.	Metformin
Sulfonylurease	Increases the production of insulin. Used for diabetes to lower blood sugar level.	Glibenclamide

## Side-effects of heart and stroke medicines

Ask your doctor about possible side-effects before you start taking medicine. Contact your doctor if you have any symptoms that you think could be side-effects.

### Allergic reactions

The most common side-effects are allergic reactions such as:

- itching, red or swollen skin;
- stomach pain and vomiting;
- diarrhoea;
- high heart rate;
- feeling giddy or dizzy.

### Dry cough

Dry cough sometimes occurs with ACE inhibitors.

### Bleeding

If you are using an antiplatelet agent like aspirin, or an anticoagulant like warfarin, it can produce bleeding. Watch out for:

- blood in the urine or faeces (stool);
- bleeding from the gums when eating or brushing teeth;
- abnormal pain in the stomach area.

If you have any of these symptoms, talk to your doctor before taking another dose of medicine. People taking warfarin need to be carefully monitored. If you are taking warfarin, you should follow closely your doctor's recommendations, which will include regular blood tests.

### High or low blood sugar

If you are taking medicine for diabetes, you must make sure your blood sugar levels do not become too low or too high.

# Explanation of terms used in this booklet

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**abdomen:** the part of the body between the chest and the hips.

**angina:** chest pain caused by a reduction in blood flow to the heart muscle.

**angioplasty:** a procedure to open up blocked blood vessels, particularly coronary arteries. Often performed with either a balloon or a wire mesh (stent, see also stenting).

**antibiotic:** a drug used to treat bacterial infections.

**arteriogram:** an imaging procedure in which contrast medium (dye) is injected into the blood vessels, which are then X-rayed, to find out whether they are blocked or narrowed.

**coronary arteriogram:** an arteriogram performed on the heart blood vessels (coronary arteries) to see if they are narrowed or not.

**atrial fibrillation:** a type of irregular heart-beat, which can be a risk factor for stroke.

**blood fats/lipids:** fats or fat like substances such as cholesterol and triglyceride present in blood.

**blood pressure:** the force with which blood pushes against the walls of arteries.

**diastolic blood pressure:** blood pressure when the heart is resting between contractions.

**systolic blood pressure:** blood pressure when the heart is contracting.

**blood sugar:** sugar that circulates in the blood.

**body mass index (BMI):** a measure of weight in relation to height, calculated as weight in kilograms divided by the square of height in metres.

**bypass surgery:** a type of surgery, in which blood is rerouted around a blocked artery, often using a segment of a healthy blood vessel removed from another part of the body.

**coronary artery bypass surgery (CABG):** a bypass surgery performed on coronary arteries to improve the supply of blood to the heart.

**carotid endarterectomy:** a surgical procedure to remove the thickened and hardened parts inner walls of the artery that supplies blood to the brain.

**cholesterol:** a waxy substance that can be produced by the liver, or absorbed from certain animal foods, such as dairy products, meat, animal fats and egg yolks. It can be found in the blood stream.

**high density lipoprotein (HDL) cholesterol:** so-called 'good' cholesterol, which protects against heart attacks and strokes.

**low density lipoprotein (LDL) cholesterol:** so-called 'bad' cholesterol, which can increase the risk of heart attacks and strokes.

**coma:** a state in which a person is not conscious, usually due to serious illness or injury.

**computerized tomography (CT):** an imaging procedure, in which X-rays are used to produce cross-sectional images of the body.

**coronary arteries:** blood vessels on the surface of the heart, which feed the heart muscles.

**diabetes:** a chronic disease characterized by inability of the body to produce or use insulin properly. Associated with high levels of sugar in the blood.

**echocardiogram:** a medical examination that uses ultrasound to record the movement and structure of the heart.

**electrocardiogram:** a medical examination in which electrodes are attached to the surface of the body to record electrical signals associated with the contractions of the heart.

**endocarditis, infective:** an infection inside the heart, which can damage heart valves.

**exercise stress test:** a medical examination in which an electrocardiogram is performed on a person who is exercising, to measure the response of the heart to physical activity and how much physical activity the heart can tolerate.

**fasting plasma glucose:** blood sugar levels when you have not had meals at least for 8 hours. Plasma is the yellowish liquid part of the blood used for the measurement of the blood sugar levels are measured.

**heart attack:** death of part of the heart muscle as a result of a coronary artery becoming blocked.

**heart failure:** a condition in which the heart cannot pump enough blood to meet the needs of the body.

**heart murmur:** abnormal heart sounds produced by blood flow in the heart. Often associated with an abnormality of the heart (such as damaged or abnormal heart valves).

**heart valves:** valves between the heart chambers and the large blood vessels, which control blood flow by opening and closing in accordance with the heartbeat. If damaged, blood flow within the heart will become erratic.

**haemoglobin:** substance contained in red blood cells, which carries oxygen through the body.

**hormone:** a substance produced by various glands in the body with specific functions. Insulin is an example of a hormone.

**insulin:** a hormone produced by the body, which allows cells to use sugar.

**magnetic resonance imaging (MRI):** an imaging technique, in which powerful electromagnets are used to produce detailed pictures of the inside of the human body.

**Omega-3 fatty acids:** 'good fats' that can protect people from heart attacks and strokes. Fish oils are rich in omega-3 fatty acids.

**DHA(docosahexanoic acid):** a type of omega-3 fatty acid ('good fat') that can protect blood vessels from heart attacks and strokes.

**EPA(eicosapentanoic acid):** a type of omega-3 fatty acid ('good fat') that can protect blood vessels from heart attacks and strokes.

**penicillin:** an antibiotic, which is usually used to treat streptococcal infections, such as strep-sore throat and rheumatic fever.

**physical activity:** any kind of activity that involves bodily movements.

**physiotherapy (physical therapy):** treatment using exercises, heat, etc.

**saturated fat:** a type of fat that can increase the risk of heart attacks and strokes. Found in foods from animals and some plants, e.g. coconuts. Known to increase the risk of heart attacks and strokes by elevating blood fat levels.

**stenting:** a procedure to open up hardened and narrowed arteries, using a wire mesh called a stent (see also angioplasty).

**strep-sore throat:** infection in the throat caused by streptococcal bacteria.

**streptococci, group A:** the bacteria that cause strep-sore throat and rheumatic fever

**stroke:** a condition in which brain tissue is damaged as a result of interruption of the blood supply, usually because a blood vessel bursts or is blocked by a clot.

**thrombolytic therapy:** treatment for heart attacks and strokes, in which a drug that dissolves blood clots is injected to recover blood flow in the area suffering from the lack of blood flow into the bloodstream.

**tonsils:** two large lymph nodes located at the back of the mouth.

**trans-fat:** a type of fat that increases the risk of heart attacks and strokes. It is generated when oil is processed to stay fresh longer, and is often found in foods like stick margarines and fast foods.

**transient ischaemic attack:** a small stroke-like event, which resolves in a day or less (minor stroke). Often a warning sign of an impending major stroke.

**triglyceride:** a type of fat found in food and in the body.

**unsaturated fat:** a type of fat usually found in foods from plants, such as safflower, sesame, sunflower, canola, and olives.

**waist-to-hip ratio:** ratio of waist circumference and hip circumference. Can be used as an indicator of overweight and obesity.

**xanthoma:** a soft yellowish bulge of skin containing cholesterol. High blood fats (cholesterol) can cause xanthomas.

**X-ray:** an imaging procedure that uses electromagnetic radiation called x-ray to obtain a picture of inside the human body.

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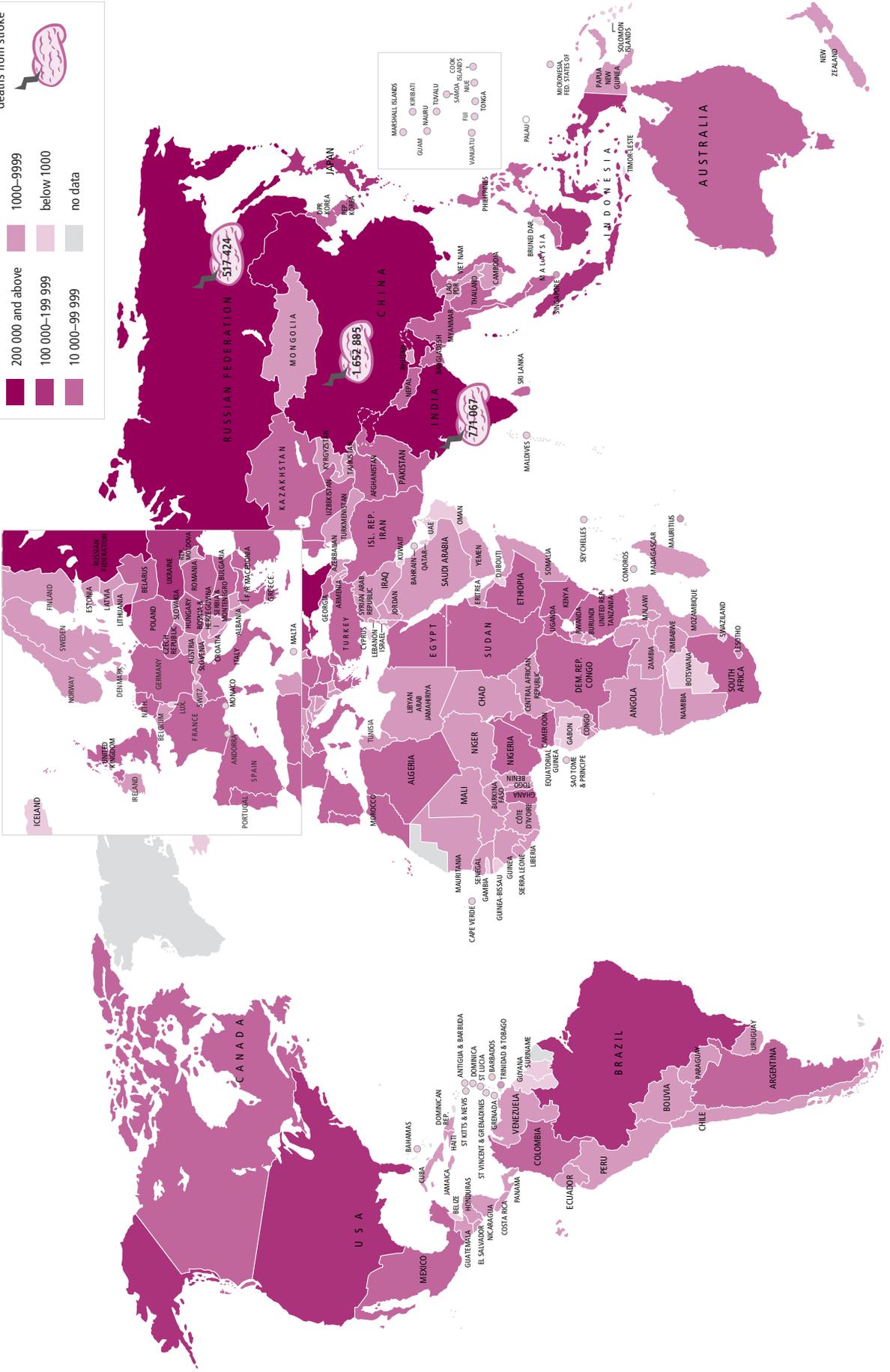
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# Deaths from stroke

Number of deaths from stroke 2002



Top 3 highest number of deaths from stroke



**Tobacco use**

**Unhealthy diet**

**Lack of physical activity**



**Hypertension**

**Diabetes**

**Hyperlipidaemia**



# **Heart attacks and Strokes**



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