

THE ATLAS OF HEART DISEASE AND STROKE



DR JUDITH MACKAY AND DR GEORGE A. MENSAH



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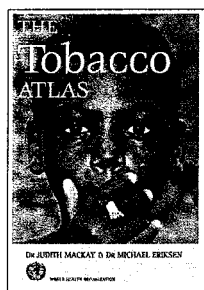


The Atlas of Heart Disease and Stroke



World Health Organization
Geneva

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The Atlas of Children's Health and the Environment

The Atlas of Heart Disease and Stroke

Dr Judith Mackay and Dr George A. Mensah

with

Dr Shanthi Mendis and Dr Kurt Greenlund



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Foreword



A message from

Dr LEE Jong-Wook
Director-General
World Health Organization

Heart disease and stroke are currently the leading cause of death in all developed countries and in most developing countries. There were approximately 17 million deaths due to cardiovascular disease in 2003 – one-third of all deaths in the world.

It is disturbing to note that at least 75% of deaths from heart disease and stroke now occur in the poorer regions of the world, which also face major threats from communicable diseases. These regions thus suffer under the so-called “double burden” of disease. If preventive action is not taken urgently, heart disease and stroke – which are already major public health problems – will rapidly advance across regions and social classes to reach epidemic proportions worldwide.

We know that the major risk factors for heart disease and stroke are high blood pressure, high blood cholesterol, tobacco use, physical inactivity, unhealthy diet and obesity. Many of these risk factors result from unhealthy lifestyles. These unhealthy lifestyle habits, which are linked to urbanization, often start in childhood and youth, encouraged by the influence of mass advertising and social pressures. This underscores the importance of targeting children and young people in all programmes that aim to prevent heart disease and stroke.

Prevention and control of heart disease and stroke in developing countries represent a challenging task. There are a number of major barriers to progress, including lack of reliable epidemiological information, inaccessibility of health care, shortages of trained manpower and resources, and misconceptions about heart disease and stroke among policy-makers and the public.

However, the good news is that knowledge about the causes of heart disease and stroke is growing, and various countries are gaining experience in translating this knowledge into effective action.

I believe that our efforts to control heart disease and stroke can only succeed if they are focused at country level. Current WHO activities in this area are based on the WHO Global Strategy for the Prevention and Control of Noncommunicable Disease, which was adopted by the World Health Assembly in 2000. Our goals are to:

- provide guidance to countries on policy, legislative and financial measures that can help prevent cardiovascular disease;
- assess and track the magnitude of the cardiovascular disease epidemic and its social, economic, behavioural and political determinants in developing countries;
- reduce cardiovascular risk factors and their determinants and promote cardiovascular health for all age groups;
- strengthen the health care of people with cardiovascular disease by developing norms and guidelines for cost-effective interventions.

To achieve these goals, WHO has developed standardized approaches to strengthen national surveillance systems for key risk factors. Further, WHO has initiated programmes at country level to scale up health care for those with established cardiovascular disease and to introduce affordable and innovative approaches for managing cardiovascular risk factors and cardiovascular disease in low-resource settings.

WHO is also in the process of addressing some of the main risk factors for cardiovascular disease through global action, such as the Framework Convention on Tobacco Control and the Global Strategy on Diet, Physical Activity and Health. These strategies will help countries in their efforts to develop and implement policies to reduce the burden of cardiovascular disease.

We recognize that advocacy, resource mobilization, capacity development, and research are necessary to galvanize global action against the causes of cardiovascular disease. WHO is working with other UN agencies, research institutions, nongovernmental organizations, the private sector and civil society to promote these activities. Together, we can move the global public health agenda forward to avert unnecessary deaths and suffering due to this eminently preventable disease.

A handwritten signature in black ink, reading "Jong Hark Lee". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

Preface

“We have the scientific knowledge to create a world in which most heart disease and stroke could be eliminated.”

The Victoria Declaration on Heart Health, 1992

“Change before you have to.”

Jack Welch,

former Chairman and Chief Executive Officer of

General Electric, USA (1935–)

Heart disease and stroke, the main cardiovascular diseases, are truly global epidemics. They deserve the attention of governments, policy-makers, national and international organizations, committed individuals and families everywhere.

Heart disease and stroke are no longer diseases of old men in developed countries. They are also diseases of women, young adults, and even children. They affect the wealthy and the poor. Already they claim more lives in developing than developed countries. The Asian girl on the cover is at risk, as are many children and young adults throughout the world.

The risk factors for heart disease and stroke begin in youth, and most can be prevented or controlled. Yet, worldwide, most people who have risk factors are either not treated or are inadequately treated. Special attention to high blood pressure, high blood cholesterol, tobacco and other major risk factors is crucial.

Cardiovascular diseases are more than just health problems: both the diseases and their underlying causes have major financial implications for governments, businesses and individuals. The “globesity” epidemic is causing international concern. The tobacco epidemic is linked to smuggling, big business and politics. If people are to be encouraged to take regular physical activity, commitment is needed from both individuals and society. The prevention and control of high blood pressure and high blood cholesterol require action from governments and the pharmaceutical industry, not just individual patients.

Research achievements in the field of heart disease and stroke have been phenomenal. We know a lot today, but as Goethe put it, “knowing is not enough, we must apply.” We must apply what we already know, and translate the best science into practice for the benefit of all, worldwide.

The good news, as stated most eloquently in the Victoria Declaration on Heart Health more than a decade ago, is that we know what we need to do to eliminate most heart disease and stroke. What is needed now is the combination of necessary resources and political will on a global scale to take effective action. Now is the time to act – and to change before we have to.

Judith Mackay, Hong Kong SAR, China

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Somnath Chatterji, Scientist, Classification, Assessment, Surveys and Terminology, Evidence and Information for Policy;

Charles Gollmar, Group Leader, School Health and Youth Health Promotion, Noncommunicable Diseases and Mental Health;

Carina Marquez, Technical Officer, Surveillance and Information for Policy, Noncommunicable Diseases and Mental Health;

Colin Mathers, Scientist, Epidemiology and

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Patricia Mucavele, Technical Officer, Nutrition for Health and Development, Noncommunicable Diseases and Mental Health;

Mona Nassef, Secretary, Cardiovascular Diseases, Noncommunicable Diseases and Mental Health;

Chizuru Nishida, Scientist, Nutrition for Health and Development, Noncommunicable Diseases and Mental Health;

Tomoko Ono, Technical Officer, Surveillance and Information for Policy, Noncommunicable Diseases and Mental Health;

Leanne Riley, Scientist, School Health and Youth Health Promotion, Noncommunicable Diseases and Mental Health;

Gojka Roglic, Technical Officer, Diabetes Mellitus, Noncommunicable Diseases and Mental Health;

Jukka Sailas, Scientist, Management Support Unit, Evidence and Information for Policy, Noncommunicable Diseases and Mental Health;

Bakuti Shengelia, Medical Officer, Cardiovascular Diseases, Noncommunicable Diseases and Mental Health;

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About the authors



Dr Judith Mackay
MBChB, FRCP (Edin), FRCP (Eng)

Dr Judith Mackay is a medical doctor based in Hong Kong Special Administrative Region, China, and a Senior Policy Adviser to the World Health Organization. After an early career as a hospital physician, she became a health advocate. She is a Fellow of the Royal Colleges of Physicians of Edinburgh and of London, and an Honorary Fellow of the Hong Kong College of Cardiology. Dr Mackay has received many international awards, including the WHO Commemorative Medal, the Fries Prize for Improving Health, the Luther Terry Award for Outstanding Individual Leadership, the International Partnering for World Health Award, and the Founding International Achievement Award from the Asia Pacific Association for the Control of Tobacco. She is the author of *The Tobacco Atlas*, *The State of Health Atlas* and *The Penguin Atlas of Human Sexual Behavior*.



Dr George A. Mensah
MD, FACC, FACP, FESC

Dr George Mensah is acting director, the National Center for Chronic Disease Prevention and Health Promotion, and chief of the Cardiovascular Health Branch at the Centers for Disease Control and Prevention in Atlanta, Georgia, USA, and clinical professor of medicine and cardiology at the Medical College of Georgia. He is a fellow of the American College of Cardiology, American Heart Association, and the European Society of Cardiology, and a foundation fellow of the Ghana College of Physicians and Surgeons. Recent honours include the Distinguished Research Award of the International Society of Hypertension in Blacks, the 25th Bernard Pimstone Memorial Lecturer at the University of Cape Town in South Africa, and the National Heart Foundation of Australia Lecturer at the 50th Anniversary Celebration of the Cardiac Societies of Australia and New Zealand.

Glossary of terms used in this publication

ACE inhibitors: angiotensin-converting-enzyme inhibitors. Drugs used to treat high blood pressure, and to aid healing after a heart attack.

Angina (angina pectoris): pain or discomfort in the chest that occurs when part of the heart does not receive enough blood. Typically, it is precipitated by effort and relieved by rest.

Angioplasty: a non-invasive surgical procedure used to open up blockages in blood vessels, particularly the coronary arteries that feed the heart. Often performed with either a balloon or a wire mesh (stent).

Anticoagulant: medication that delays the clotting (coagulation) of blood.

Arrhythmia: a change in the regular beat or rhythm of the heart. The heart may seem to skip a beat, or beat irregularly, or beat very fast or very slowly.

Arteriosclerosis: a general term for the hardening of the arteries.

Asymptomatic: without symptoms. This term may apply either to healthy persons or to persons with preclinical (prior to clinical diagnosis) disease in whom symptoms are not yet apparent.

Atherosclerosis: one form of arteriosclerosis, where the hardening and narrowing of the arteries is caused by the slow build-up of fatty deposits on the inside lining.

Atrial fibrillation: a common heart rhythm disorder in which the two small upper chambers of the heart (the atria) quiver instead of beating effectively. This quivering makes the heart less efficient, allows blood to pool and form clots, and predisposes to stroke.

Blood pressure: the force of the blood pushing against the walls of arteries. Blood pressure is given as two numbers: systolic pressure (the pressure while the heart is contracting) and diastolic pressure (the pressure when the heart is resting between contractions).

Body mass index (BMI): a measure of weight in relation to height. It is calculated as weight (in kilograms) divided by the square of height (in metres). A BMI of less than 25 is considered normal, 25–30 is overweight, and greater than 30 defines obesity.

Cardiovascular disease (CVD): any disease of the heart or blood vessels, including stroke and high blood pressure.

Carotid stenosis: narrowing of the carotid arteries, the main arteries in the neck that supply blood to the brain.

Cerebrovascular disease: also called a stroke or the brain equivalent of a heart attack. A condition in which a blood vessel in the brain bursts or is clogged by a blood clot, leading to inadequate blood supply to the brain and death of brain cells.

Cholesterol: a waxy substance that circulates in the bloodstream.

Cholesterol plaques: deposits of fat, cholesterol, cellular waste products, calcium and other substances that build up on the inner lining of an artery.

Congestive heart failure: a condition in which the heart cannot pump enough blood to meet the needs of the body's other organs.

Coronary artery bypass surgery (CABG): A type of heart surgery that re-routes blood around clogged arteries – or “bypasses” them – to improve the supply of blood and oxygen to the heart.

Coronary heart disease: heart disease in which the coronary arteries are narrowed and the supply of blood and oxygen to the heart therefore decreased. Also called coronary artery disease or ischaemic heart disease. It includes heart attack and angina.

Developing country, high mortality: a developing country with high child mortality and high or very high adult mortality.

Developing country, low mortality: a developing country with low child mortality and low adult mortality.

Diabetes mellitus: a chronic disease due to either insulin deficiency or resistance to insulin action or both, and associated with hyperglycaemia (elevated blood glucose levels).

Direct costs: costs associated with an illness that can be attributed to a medical service, procedure, medication, etc., such as X-ray examination, pharmaceutical drugs (for example, insulin), surgery, or a clinic visit.

Disability adjusted life years (DALYs): a measure of overall burden of a disease by combining the years of potential life lost due to premature death and the years of productive life lost due to the disability. One DALY is one lost year of healthy life.

Epidemic: the occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events clearly in excess of what would normally be expected.

Health: a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

HDL (high-density lipoprotein) cholesterol: the so-called “good cholesterol”. HDL helps remove cholesterol from the blood vessels. High levels of blood HDL protect against heart disease.

Heart attack (myocardial infarction): death of part of the heart muscle as a result of a coronary artery becoming completely blocked, usually by a blood clot (thrombus), resulting in lack of blood flow to the heart muscle and therefore loss of needed oxygen.

Heart failure: see Congestive heart failure.

High blood pressure: a systolic blood pressure of 140 mmHg or greater or a diastolic pressure of 90 mmHg or greater.

Homocysteine: an amino acid produced by the body. Elevated levels of homocysteine in the blood can damage blood vessels and disrupt normal blood clotting, and possibly increase the risk of heart attack, stroke, and peripheral vascular disease.

Indirect costs: costs associated with an illness that occur because an individual or family members cannot work at their usual jobs, because of premature death, sickness, or disability.

Ischaemic heart disease: see Coronary heart disease.

LDL (low-density lipoprotein) cholesterol: the so-called “bad cholesterol”. High levels of LDL put people at risk of heart attack.

Lipid: fat or fat-like substance, such as cholesterol, present in blood and body tissues.

MET: metabolic equivalent; a measure of energy expenditure. One MET/min is the amount of energy expended while sitting quietly at rest for one minute.

Obesity: a condition characterized by excessive body fat. Usually defined as a body mass index greater than 30.

Peripheral vascular disease: disease of certain blood vessels outside the heart or disease of the lymph vessels, for example the arteries supplying the limbs, which leads to inadequate blood supply and claudication (intermittent pain on exercise such as walking).

Physical activity: bodily movement that substantially increases energy expenditure.

Premature death: death that occurs at an age earlier than the average life expectancy for the population.

Primary prevention: a strategy that helps to prevent the onset of a disease or condition in people who are at risk but do not already have the disease or condition. Examples are promotion of exercise in the general population, smoking prevention in young people, and also the treatment and control of high blood pressure as a strategy for primary prevention of stroke.

Rheumatic heart disease: damage to the heart valves and other heart structures from inflammation and scarring caused by rheumatic fever. Rheumatic fever begins with a sore throat due to streptococcal infection.

Secondary prevention: a strategy that helps to prevent recurrent disease or complications in people who already have the disease. For example, the use of a daily dose of aspirin by heart attack survivors is an effective strategy for preventing a second heart attack.

Sedentary: denotes a person who is relatively inactive and has a lifestyle characterized by a lot of sitting.

Stent: a device used to support tissues while healing takes place. A stent can keep “tube-shaped” structures, such as blood vessels, open after a surgical procedure. An intraluminal coronary artery stent is a small, self-expanding, stainless steel mesh tube, which is placed within a coronary artery to keep the vessel open.

Stroke: the brain equivalent of a heart attack. A condition in which a blood vessel in the brain bursts (haemorrhagic stroke) or is clogged (embolic or ischaemic stroke) by a blood clot. This leads to inadequate blood supply to the brain and death of the brain cells, and usually results in temporary or permanent neurological deficits.

Transient ischaemic attack (TIA): small stroke-like event, which resolves in a day or less. It is often a warning sign of an impending stroke.

Triglyceride: the chemical form in which most fat exists in food and in the body.

Sources

PART 1 CARDIOVASCULAR DISEASE

1 Types of cardiovascular disease

Deaths from cardiovascular diseases

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2 Rheumatic fever and rheumatic heart disease

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PART 2 RISK FACTORS

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Maps: Blood Pressure

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Map: Physical activity levels

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Maps: Body mass index

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PART 3 THE BURDEN

13 Global burden of coronary heart disease

Map: Healthy years of life lost to coronary heart disease

Mortality and burden of disease estimates for countries provided by Colin Mathers (Evidence and Information for Policy, WHO) from analyses prepared for *The World Health Report 2003*.

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Map: Deaths from coronary heart disease

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15 Global burden of stroke

Map: Healthy years of life lost to stroke

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American Stroke Association
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PART 4 ACTION

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Personal choices in lifestyles and behaviour; Personal actions for safeguarding cardiovascular health

Bulletin of the WHO, 1999.

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Eat fruit and cereals

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http://www.lungusa.org/tobacco/quit_ben.html

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Wow: Japan

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HeartBytes. Reduce heart disease risk: encourage and prescribe exercise for your patients. *Medscape cardiology*, 2004, 8(1)
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Wow: People with low fitness...

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Standards of medical care in diabetes. *Diabetes care*, 2004, 27 (Suppl 1):S15–35.

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21 Prevention: population and systems approaches

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Alwan A, Maclean D, Mandil A. *Assessment of national capacity for noncommunicable disease prevention and control; the report of a global survey*. Geneva, WHO, 2001.

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Gaps in secondary prevention of myocardial infarction and stroke: WHO study on Prevention of REcurrences of Myocardial Infarction and Stroke (WHO-PREMISE) in low and middle income countries. WHO-PREMISE (Phase I) Study Group.

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22 Health education

Map: World Heart Day

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World Heart Day: themes; activities; Evaluation of

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23 Policies and legislation

Map: Smoke-free workplaces

Shafey O, Dolwick S, Guindon GE, eds. *Tobacco control country profiles 2003*. Atlanta, GA, American Cancer Society, WHO, International Union Against Cancer, 2003.

Cardiovascular disease plans worldwide; Legislation

Policy data from: WHO. Capacity for NCD prevention and control survey 2001. *Assessment of national capacity for noncommunicable disease prevention and control. The report of a global survey*. Geneva, WHO, 2001.

Wow: 2002 USA

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24 Treatment

Cardiac rehabilitation; Patients reaching blood pressure and blood cholesterol goals during treatment

EUROASPIRE II Study Group (2001). Lifestyle and risk factor management and use of drug therapies in coronary patients from 15 countries. Principal results from EUROASPIRE II Euro Heart Survey Programme. *European heart journal*, 2001, 22:554–572.

Simple secondary prevention medication treatments

Yusuf S. Two decades of progress in preventing vascular disease. *Lancet*, 2002, 360:2–3
<http://www.thelancet.com>

Diabetes treatment

Ustun TB, Chatterji S, Mechbal A, Murray CJL, WHS Collaborating Groups. *The World Health Surveys in Health Systems Performance Assessment: debates, methods and empiricism*. Murray CJL and Evans DB, eds, Geneva, WHO, 2003.

Trends in cardiovascular operations and procedures in the USA

American Heart Association. *Heart disease and stroke statistics – 2004 update*. Dallas, American Heart Association, 2003.

Wow: Proportion of people...

Mensah GA. The global burden of hypertension: good news and bad news. *Cardiology clinics*, 2002, 20(2):181–185

Wolf-Maier K, Cooper RS, Banegas JR et al. Hypertension prevalence and blood pressure levels in 6 European countries, Canada, and the United States. *Journal of the American Medical Association*, 2003, 289(18):2363–2369.

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PART 5 THE FUTURE AND THE PAST

25 Future

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Treatment

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Wald NJ, Law MR. A strategy to reduce cardiovascular disease by more than 80%. *British medical journal*, 2003, 326:1419.

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Major sources

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Weisse AB. *Heart to heart: the twentieth century battle against cardiac disease: an oral history*. London, USA, Rutgers University Press, 2002.

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A timeline of milestones from The Framingham Heart Study <http://www.framingham.com/heart/timeline.htm>

Schooler C, Farquhar JW, Fortmann SP, Flora JA. Synthesis of findings and issues from community prevention trials. *Annals of epidemiology*, 1997, S7:S54–68.

Useful contacts

World Health Organization

<http://www.who.int>

Cardiovascular disease:

<http://www5.who.int/cardiovascular-diseases/>

Diabetes:

http://www.who.int/health_topics/diabetes_mellitus/en/

Diet:

http://www.who.int/health_topics/diet/en/

Nutrition:

http://www.who.int/health_topics/nutrition/en/

Obesity:

http://www.who.int/health_topics/obesity/en/

Public Health Surveillance:

http://www.who.int/health_topics/public_health_surveillance/en/

Tobacco Free Initiative:

<http://www.who.int/tobacco/en/>

Centers for Disease Control and Prevention, USA

<http://www.cdc.gov/>

Cardiovascular Health Program:

<http://www.cdc.gov/cvh/>

Nutrition and Physical Activity Program:

<http://www.cdc.gov/nccdphp/dnpa/>

Tobacco Program:

<http://www.cdc.gov/tobacco/>

Diabetes Program:

<http://www.cdc.gov/diabetes/>

Laboratory Sciences Program:

<http://www.cdc.gov/ncchd/dls/programs.htm>

Office of Global Health:

<http://www.cdc.gov/ogh/>

Behavioral Risk Factor Surveillance System:

<http://www.cdc.gov/brfss>

National Center for Health Statistics:

<http://www.cdc.gov/nchs>

International and Regional Organisations

Asian Society for Cardiovascular Surgery:

<http://www.ascvs.org/>

Association for European Paediatric Cardiology/Association

Européenne pour la Cardiologie Pédiatrique:

<http://www.aepc.org/home.htm>

Brain Aneurysm Foundation:

<http://www.bafound.org>

Cairdes: <http://www.cairdes.com>

CardioStart International Inc:

<http://www.cardiostart.com/>

Cardiothoracic Surgery Network:

<http://www.ctsnet.org/>

Chain of Hope: <http://www.chainofhope.org>

Children's HeartLink:

<http://www.childrensheartlink.org/>

Children's Hearts: <http://www.childrensheart.org.uk>

Clearinghouse for Tobacco Control (South East Asia):

<http://www.prn2.usm.my/pages/about.asp>

Cœurs pour Tous (Hearts for All):

<http://www.cptg.ch/fr/start.htm>

Congenital Heart Information Network:

<http://www.tchin.org/>

Congress of Neurological Surgeons:

<http://www.neurosurgeon.org>

Consortium for Southeastern Hypertension Control (COSEHC):

<http://www.cosehc.org/>

East Meets West: <http://www.eastmeetswest.org>

Eastern Mediterranean Network on Heart Health, (EMNHH):

<http://emnhh.homestead.com/files/index.htm>

The Endocrine Society: <http://www.endo-society.org/>

European Association for Cardiothoracic Surgery:

<http://www.eacts.org/>

European Heart Institute:

<http://www.european-academy.at>

European Heart Network:

<http://www.ehnheart.org/index2.asp>

EMASH European Medical Association on Smoking and Health:

<http://emash.globalink.org/>

ENSH European Network for Smoke-free Hospitals:

<http://ensh.free.fr/>

ENSP European Network for Smoking Prevention:

<http://www.ensp.org>

European Network of Young People and Tobacco:

<http://www.kul.fi/enypat/>

European Network of Quitlines:

<http://www.quitlines-conference.com/>

European Society for Noninvasive Cardiovascular Dynamics:

<http://www2.mf.uni-lj.si/~esnicvd/>

European Society of Cardiology:

<http://www.escardio.org/>

European Society of Hypertension:

<http://www.eshonline.org/>

European Stroke Initiative:

<http://www.eusi-stroke.com/index.shtml>

European Union of Non-smokers:

<http://www.globalink.org/tobacco/docs/eu-docs/uene.htm>

Framework Convention Alliance (FCA):

<http://www.fctc.org/>

G8 Telematics Heart Health Project:

<http://www.med.mun.ca/g8hearthealth/>

Gift of Life International Inc.:

<http://www.giftoflifeinternational.org/>

Global Connection International:

<http://www.gciworld.org>

Global Cardiovascular Infobase (in English and Spanish):

<http://www.cvdinfobase.ca/>

Global Healing: <http://www.globalhealing.org>

Global Health Information Network:

<http://www.healthnet.org/>

Global Partnerships for Tobacco Control:

<http://www.essentialaction.org/tobacco/>

Globalink, UICC International Union against Cancer:

<http://www.globalink.org/>

Healing the Children:

<http://www.healingchildren.org>

Heart Care International:

<http://www.heartcareintl.org>

HeartGift Foundation:

<http://www.heartgift.org/index.html>

The Heart of a Child Foundation – Little Hearts on the Mend:

<http://www.littleheartsonthemend.org>

Heart-to-Heart International:

<http://www.hearttoheart.org/>

Heart-to-Heart International Children's Medical Alliance:
<http://www.heart-2-heart.org/>

Initiative for Cardiovascular Health Research in Developing Countries:
http://www.globalforumhealth.org/pages/index.asp?ThePage=page1_000500040001_1.htm&Nav=000500040001

InterAmerican Heart Foundation:
<http://www.interamericanheart.org>

InterAmerican Society of Cardiology (in Spanish and English):
<http://www.soinca.org>

Inter-American Society of Hypertension:
<http://org.unc.edu/iash/homepage.htm>
<http://www.musc.edu/iash/generale.htm>

International Academy of Cardiology:
<http://www.cardiologyonline.com/>

International Agency on Tobacco and Health (IATH):
 Email: admin@iath.org

International Atherosclerosis Society:
<http://www.athero.org/>

International Children's Heart Foundation:
<http://www.ichf.org/>

International Children's Heart Fund:
<http://www.ichfund.org/>

International Diabetes Federation:
<http://www.idf.org/>

International Diabetes Institute, Australia:
<http://www.diabetes.com.au/home.htm>

International Federation of Sports Medicine:
<http://www.fims.org/>

International Hospital for Children (IHC):
<http://www.healachild.org>

International Network of Women against Tobacco (INWAT):
<http://www.inwat.org/>

International Network towards Smoke-Free Hospitals (INTSH):
<http://intsh.globalink.org/>

International Non Governmental Coalition against Tobacco (INGCAT):
<http://www.ingcat.org/>

International Obesity Task Force:
<http://www.iotf.org/>

International Pediatric Hypertension Association:
<http://www.pediatrichypertension.org/>

International Society for Adult Congenital Cardiac Disease:
<http://www.isaccd.org/>

International Society for Aging and Physical Activity:
<http://www.isapa.org/>

International Society for Cardiovascular Surgery:
<http://www.vascarg.org/doc/1576.html##.htm>

International Society for Heart Research:
<http://www.ishrworld.org/>

International Society for Heart & Lung Transplantation:
<http://www.isht.org/>

International Society for Minimally Invasive Cardiac Surgery:
<http://www.ismics.org/>

International Society for the Prevention of Tobacco Induced Diseases (PTID): <http://www.ptid.org>

International Society of Cardiovascular Ultrasound:
<http://www.iscu.org/>

International Society of Hypertension:
<http://www.hypertension2004.com.br/>

International Society of Nephrology:
<http://www.isn-online.org/>

International Society on Hypertension in Blacks (ISHIB):
http://www.ishib.org/main/ishib_open.htm

International Stroke Society:
<http://www.internationalstroke.org/index.php>

International Task Force for the Prevention of Coronary Heart Disease:
<http://www.chd-taskforce.de/>

International Tobacco Evidence Network (ITEN):
<http://www.tobaccoevidence.net/>

The Internet Stroke Center:
<http://www.strokecenter.org/pat/organizations.htm>

Legacy Foundation, tobacco document site:
<http://legacy.library.ucsf.edu/cgi/b/bib/bib-idx?g=tob>

Mediterranean Stroke Society:
<http://www.hsanmartino.liguria.it/cictus/med.htm>

OTAF L'Observatoire du Tabac en Afrique Francophone:
<http://otaf.globalink.org/>

Physicians for Peace: <http://www.physiciansforpeace.org>

ProCOR: Conference on Cardiovascular Health:
<http://www.procor.org/>

Project Hope: <http://www.projecthope.org>

Project Kids Worldwide:
<http://www.projectkidsworldwide.org>

Project Open Hearts: <http://www.poh.org>

Repace's site, especially on passive smoking (Jim Repace):
<http://www.repace.com/>

Save A Child's Heart Foundation:
<http://www.saveachildsheart.com>

Society for Research on Nicotine and Tobacco (SRNT):
<http://www.srnt.org/>

Smokescreen Action Network:
<http://www.smokescreen.org>

Southeast Asian Tobacco Control Alliance:
<http://www.tobaccofreeasia.net/>

Stroke Awareness for Everyone:
<http://www.strokesafe.org/>

Stroke Clubs International:
 Email: strokeclub@aol.com

Stroke Net:
<http://www.strokenet.info/resources/stroke/internationalsites.htm>

Surgeons of Hope Foundation:
<http://www.surgeonsofhope.org>

Tobacco.org: <http://www.tobacco.org>

Tobacco Control journal:
<http://www.tobaccocontrol.com>

Tobacco Control Resource Center/Tobacco Products Liability Project (TCRC/TPLP): <http://tobacco.neu.edu/>

TCRC Tobacco Control Resource Centre, BMA, UK:
<http://www.tobacco-control.org/>

Tobacco Control Supersite:
<http://www.health.usyd.edu.au/tobacco/>

Tobacco Documents Online (TDO, Smokescreen):
<http://www.tobaccodocuments.org>

Tobaccopedia:
<http://TobaccoPedia.org>

Treatobacco Database & Educational Resource for Treatment of Tobacco Dependence:
<http://www.treatobacco.net/>

World Federation of Neurology:
<http://www.wfnneurology.org/>

World Heart Federation:
<http://www.worldheart.org/>

World Heart Foundation:
<http://www.world-heart.org/>

World Hypertension League:
<http://www.mco.edu/org/whl/>

World Kidney Foundation:
<http://www.worldkidneyfund.org/>

World Medical Association:
<http://www.wma.net/>

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