

# The prevention of cardiovascular disease worldwide: whose task and WHO's task?

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**ABSTRACT** – Cardiovascular disease is the commonest chronic illness in both developed and developing countries, causing the most deaths and the greatest impact on morbidity. The superiority of disease prevention over treatment was appreciated at least 5,000 years ago in China. The link between the existence of disease in society and the political and social circumstances of a country was emphasised by Virchow in the nineteenth century. The scientific basis and methods for prevention of cardiovascular disease are known. What are lacking are the will and the means to implement change. The well-intentioned often have a dominant sense of entitlement in the pursuit of the common goal of disease prevention. There is a failure of many organisations to acknowledge the importance of other groups within society in achieving the common goal. Doctors, particularly cardiovascular physicians and cardiologists, must play a much greater role in linking with the public, other health workers, epidemiologists, media, industry, academia and politicians. Too many vested interests obstruct progress in the prevention of cardiovascular disease.

**KEY WORDS:** cardiovascular disease, epidemiology, health systems, myocardial infarction, prevention, stroke, World Heart Federation, World Health Organization

Lord Rayner (1926–1998) read theology at Cambridge and went on to be Chairman of Marks & Spencer (1984–1991). Giving this lecture in his memory is a particular pleasure, but for a reason probably not in the minds of those who asked me to speak. The Chair, of which I am the second occupant, was the first Chair of Cardiology in the UK, supported by the British Heart Foundation. It was set up in 1964 and funded by a generous donation from Simon Marks, the second Chairman of Marks & Spencer (1916–1964). During his career, Lord Rayner greatly influenced the functions and modernisation of the Civil Service and in his obituary was described as a 'big genial man of great charm whose recreations included music, food and travel'. He

developed an interest in the prevention of heart disease and the use of new technologies to achieve that goal. My theme is somewhat similar, namely that collaboration, common attitudes, sharing of knowledge and use of technology will allow the implementation of measures to alleviate the existing epidemic of cardiovascular disease.

The world is faced with the emergence of cardiovascular disease as a major health problem.<sup>1–5</sup> Neither the solution nor the prevention of the disease will be achieved by any single organisation or simple policy but by:

- coordination and unification of effort at a political level
- the creation of demonstrably effective health systems
- the activities and efforts of health workers – nurses, managers, physicians, cardiovascular specialists and cardiologists.

At present, the greatest hindrances to the successful prevention of heart disease are the failure of organisations to work closely together and a mistaken belief in ownership of the problem by some groups. Too often the problem is seen as the domain of epidemiologists or experts in health systems, to the exclusion of those health workers who are closest to patients and to individuals at risk or who have health concerns.

Although rheumatic fever in many poorer parts of the world<sup>6</sup> and Chagas' disease in South America are important cardiovascular health problems, the dominant health disorder is cardiovascular disease brought about by atherosclerosis in the arteries. This chronic disorder begins in childhood and develops progressively within the arterial system; by middle age it is manifest as cardiovascular events such as heart attacks (myocardial infarction), strokes (cerebrovascular accidents), angina, heart failure and peripheral vascular disease (intermittent claudication).<sup>7</sup>

We live in an age when the expectation of life in the Western world is around 80 years for women and 78 for men (Fig 1).<sup>8</sup> Two centuries ago the mean age of death in these countries was about 40 years. The greatest increase in duration of life occurred during the twentieth century, largely due to the prevention and treatment of communicable diseases. The



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scourge of poorer countries in the world remains communicable diseases in the form of AIDS, HIV, tuberculosis and malaria.<sup>9</sup> Many lower and middle income countries are now in an age of receding pandemics of disease and chronic diseases are of greater importance.<sup>4,5</sup> Although life expectancy relates to income, the relationship is grossly non-linear (Fig 2).<sup>10</sup> There is a large variation in life expectancy in countries on a low income per capita, probably linked to many factors which come under the broad category covered by the word 'poverty'. For a large spread of income across many countries, however, life expectancy is high.

Many attempts are being made to change this situation. For example, the Commission for Africa has just reported.<sup>11</sup> The UN Millennium Development Goals<sup>12</sup> and the Global Fund<sup>13</sup> have been established and there is increased prominence of this topic in the major medical journals. The moral basis for action has been repeatedly stated. The World Health Organization (WHO) constitution states:

*health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.*

The WHO objective, Article 1 says, 'shall be the attainment by all peoples of the highest possible level of health'.

The Declaration of Alma Ata in 1978 opined:

*The existing gross inequality in the health status of the people particularly between developed and developing countries as well as within countries is politically, socially and economically unacceptable and is, therefore, of common concern to all countries.*

In recent years there has been substantial debate on the moral basis of medicine.<sup>14-19</sup> Dignity, autonomy, non-exploitation, equity, rights, justice, fairness and confidentiality are all concepts widely discussed. Yet, at the same time, authority is not accepted, the concept of the expert is refuted,<sup>18</sup> confidence in science is lessened, professionalism challenged and public trust diminished. For many, the moral basis of disease prevention has not changed in the last two millennia. Confucius (551-479 BC) wrote:

*do unto another as thy wouldst be dealt with thyself; thou only needest this law alone; it is the foundation and principle of all the rest*

– a rather similar notion to that in the Christian tradition: thou shalt love thy neighbour as thyself.<sup>20</sup>

Converting such humane and comforting statements into reality is a totally different problem. John Snow removed the Broad Street pump in order to prevent the spread of disease in 1854 without permission from the authorities. A leading article in *The Times* in 1854 referring to this episode stated: 'we prefer to take our chances of cholera and the rest than be bullied into health.'<sup>21</sup> A similar attitude still prevails with regard to prevention where it is often seen as a personal responsibility, and intervention as a threat to individual liberties.

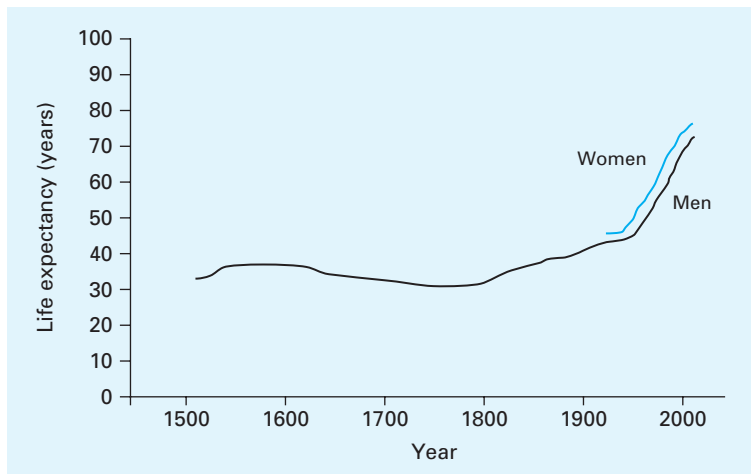


Fig 1. Life expectancy, 1500-2000 (England and Wales).<sup>8</sup>

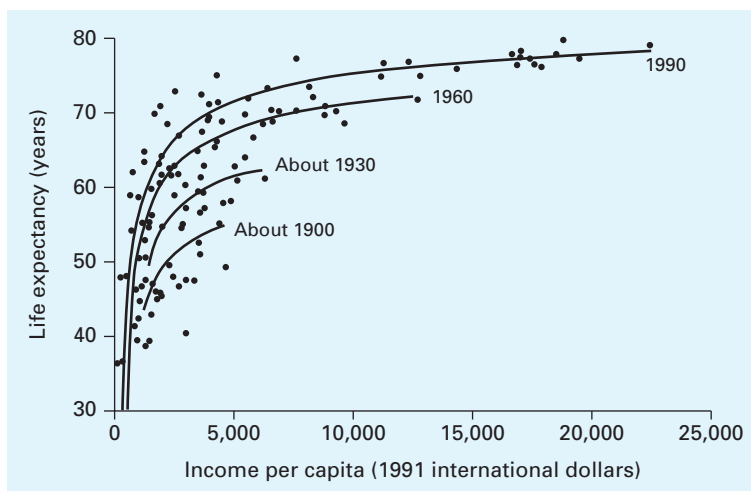


Fig 2. Life expectancy by income per capita and historical period.<sup>10</sup>

### The nature of the problem

The importance of cardiovascular disease to the health of the world can be easily stated (Table 1). Approximately one-third of the total deaths worldwide are cardiovascular in origin. Of those, 43% arise from coronary heart disease and 32% from stroke. The cardiovascular deaths amount to 16.6 million compared with 5.7 million from the major infectious diseases (AIDS, tuberculosis and malaria) (Figs 3 and 4).<sup>22</sup> Crucially, 78% of these cardiovascular deaths are not in the high income countries of the world but in the lower and middle income countries. There is variation across the world: for example, in some countries such as China stroke is more common than coronary heart disease whereas the reverse is true in other countries. In China, urbanisation is accompanied by an increase in coronary heart disease relative to cerebrovascular disease. In higher income countries both are falling on an age-adjusted basis but, since demographics are changing (more elderly persons), the total number of persons with these afflictions will be increasing over the next few decades.<sup>23,24</sup> There is no cure for the underlying pathology of

atherosclerosis – even the most recent drug therapies are largely ineffective in reversing the pathological process of atheroma once it is advanced. Catheter or surgical intervention delays events but does not prevent them indefinitely.

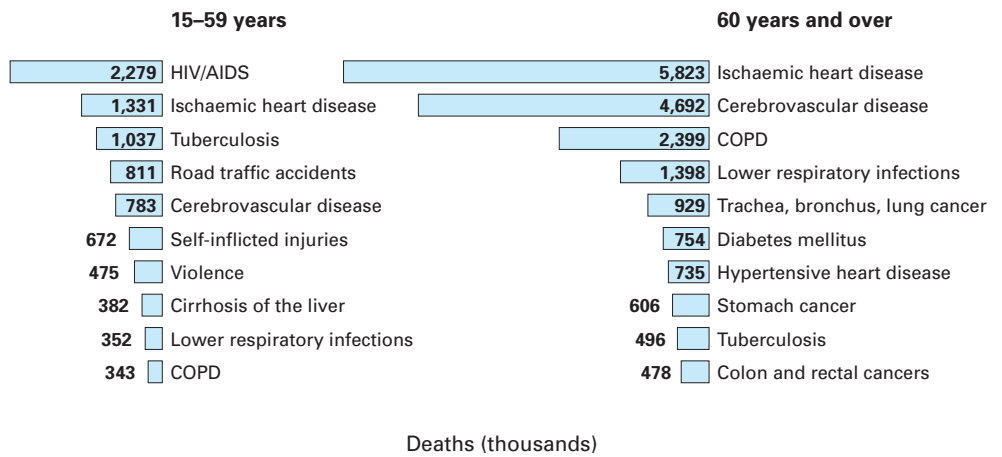
The higher number of people dying of cardiovascular disease in the developing world is a fact usually not appreciated and widely ignored.<sup>9</sup> It is certainly true that cardiovascular disease tends to occur in older patients and infections in younger patients, but ischaemic heart disease and cerebrovascular disease still remain important causes of death (Fig 4) even in those under the age of 60. It is projected that the two entities will be the first and second causes of death by 2020.<sup>1</sup> Even in sub-Saharan Africa cardiovascular disease is a major cause of death in the age range 15–60 years, killing more persons than infectious diseases, and the probability of death from a non-communicable disease is higher than in established market economies.<sup>9</sup> Furthermore, these deaths take out of the population people at an age when they are contributing to the economic, social and political stability of their country. The macro-economic argument in these countries for more

**Table 1. Global causes of death.**

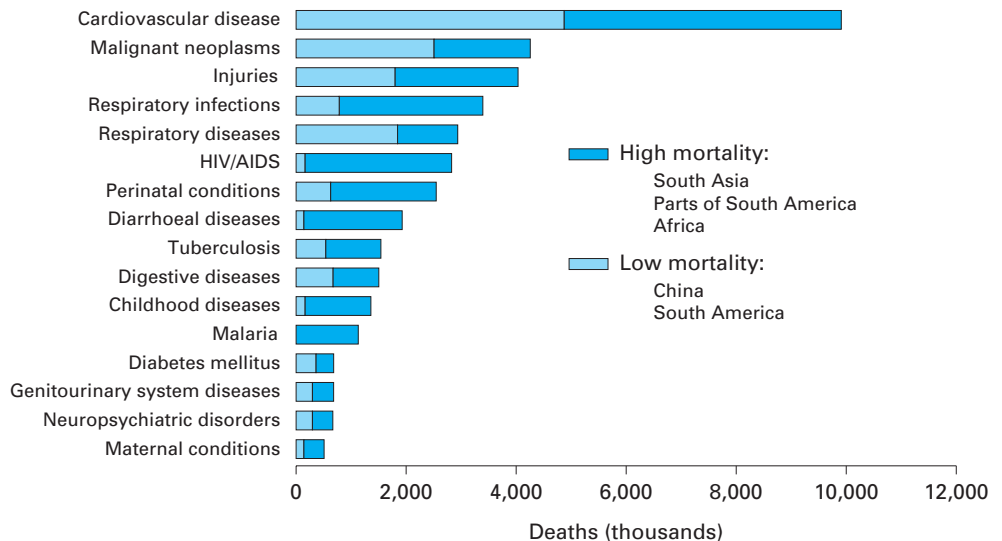
	Number	%
Population	6,400,000,000	
Total deaths per year	57,000,000	0.9
Cardiovascular deaths:	16,600,000	31
coronary heart disease		43
stroke		32
not in high income countries		78
AIDS	2,850,000	
Tuberculosis	1,700,000	
Malaria	1,140,000	
	(mostly in Africa)	

emphasis on the prevention of heart disease has not yet been made sufficiently forcibly.<sup>25</sup> It is difficult to justify both the current silence from many organisations in relation to the problem and the prominence given to infectious diseases.

**Fig 3. Leading causes of mortality in adults in 2002.**<sup>22</sup>  
COPD = chronic obstructive pulmonary disease.



**Fig 4. Deaths (thousands) attributable to 16 leading causes in developing countries in 2001.**<sup>22</sup>



### Risk factors

The causes of cardiovascular disease are well known and have been described many times since the initial work undertaken by Kannel and others.<sup>26</sup> The key risk factors are smoking, diet, lack of exercise, obesity and stress. Associated and contributory conditions or biochemical abnormalities are diabetes, hypertension and lipid abnormalities (raised cholesterol) which often merely reflect the lifestyle risk factors. A recent large multinational study<sup>27</sup> has suggested that nine risk factors account for 90% of cardiovascular deaths across the world and that they pertain regardless of gender, ethnicity and geography. Furthermore, their treatment is estimated to have a marked effect on the occurrence of cardiovascular disease in developing countries, thus reducing much of the inequity between developed and developing countries.<sup>28</sup>

A key point is that these risk factors are related not only to cardiovascular disease. Exactly the same risk factors underlie the origins of cancer, diabetes, hypertension and even respiratory disease. With regard to public health, such facts challenge what I and all other medical students are taught: the critical need to make a diagnosis. Removal of these risk factors would bring about increased health to a population and the specific diagnosis would be largely irrelevant.

The concept of risk factors being at the root of coronary heart disease has been inculcated into the minds of physicians for many years. The responsibility for change is subconsciously passed to the medical profession. Only recently has there been a realisation that these risk factors are not the underlying causes. The root risk factors relate to agricultural<sup>29</sup> and fiscal policies, availability of food, social deprivation,<sup>30-32</sup> climate change, tobacco, industrialisation and urbanisation (Table 2). Socio-economic changes in, for example, India and China, with individuals moving from a rural community into the cities have resulted in greater prosperity but at the cost of an increase of cardiovascular disease. The impact of the structure of society on the pattern of disease is relevant not just to the developed world but also to developing countries. Rudolph Virchow (1821–1902), a German pathologist turned politician in middle age, famously wrote that ‘medicine is a social science, and politics nothing else but medicine on a large scale’.

**Table 2. Fundamental origins of risk factors for cardiovascular disease.**

Risk factors	
Contemporary and accepted	Lifestyle: exercise, obesity, diet, stress, smoking, alcohol Pathological entities: blood pressure, elevated cholesterol, diabetes
Root	Agricultural policy/food availability Social deprivation Climate change Fiscal policy (eg tobacco) Industrialisation/urbanisation

### Solutions

If cardiovascular disease is a global problem, the solution must reside in a global approach. What is lacking are a clear structure and a mechanism to organise such responses. Some major advances have been made, such as the Framework Convention on tobacco control adopted by the 56th World Health Assembly in May 2003. The unpleasant habit of smoking is now less socially acceptable and in many countries politicians and authorities are belatedly responding with the introduction of new laws. They might heed the comments of an English king on the habit of tobacco smoking. In a counterblast at tobacco, King James I wrote in 1604:

*a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black stinking fume thereof nearest resembling the horrible stygian smoke of the pit which is bottomless.*

A second major advance occurred in May 2004 when the World Health Assembly adopted a further measure: the Global Strategy on Diet, Physical Activity and Health. (This has yet to be implemented in a meaningful manner.)

What is unclear is how implementation is to be carried out. The WHO should have the alleviation of cardiovascular disease as a major goal; recent documents would indicate a considerable change in thinking.<sup>1</sup> Nevertheless, WHO spends most of its funds on communicable diseases and other health strategies, with less than 3% of its budget on preventing the disease responsible for the deaths of almost a third of people in the world. This is hard to justify. WHO is not alone. The reports from the Commission for Africa,<sup>11</sup> the Millennium Development Goals,<sup>12</sup> the Global Fund<sup>13</sup> and the World Bank all largely ignore the problem.

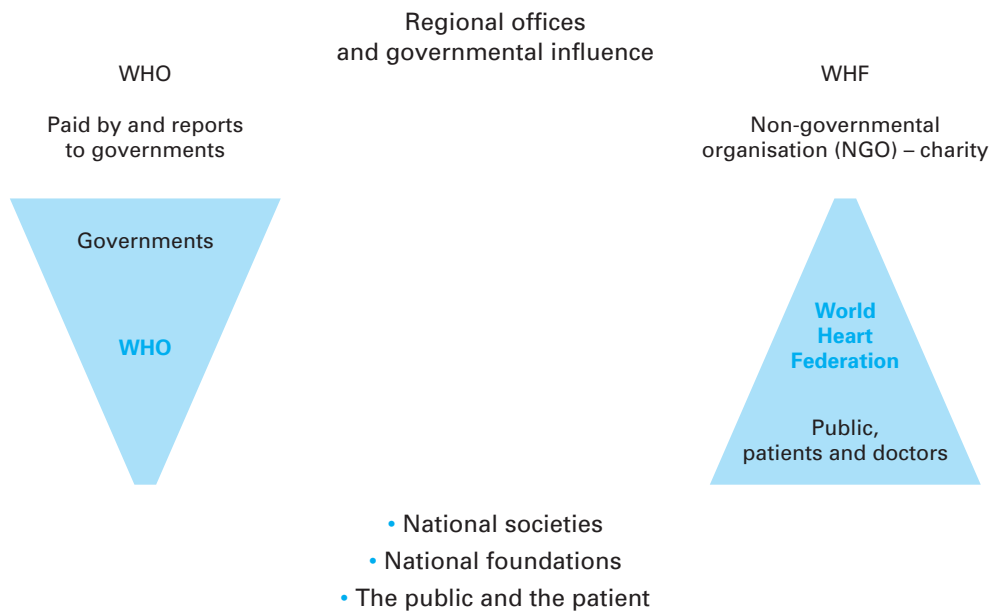
The reasons are unclear. These bodies are surely aware of the importance of cardiovascular disease. Perhaps the reasons include inability to change, past training in infectious diseases, a poorly presented macro-economic argument and political opportunism.

A further possible explanation is that WHO reports to governments and is paid by them (Fig 5). This is a great strength, provides some financial stability for the organisation and establishes a means of making an important contribution to world health. At the same time, it represents a potential weakness. Many of the high quality articles and documents emerging from the WHO are never seen or read by physicians, cardiologists and health workers because there is poor communication between WHO and clinical specialists.

### Cardiovascular medicine organisations

Cardiovascular medicine worldwide is represented by three large continental organisations: the American Heart Association, the American College of Cardiology and the European Society of Cardiology. There are global non-governmental organisations representing hypertension, diabetes, nutrition, stroke, atherosclerosis etc. In individual countries the national societies of cardiology in general represent the cardiac specialties. The national

**Fig 5. Key difference between the reporting responsibility and constituencies of the World Health Organization (WHO) and non-governmental organisations (NGOs) such as the World Heart Federation (WHF).**



foundations are crucial for prevention because they represent lay persons, patients and the public. Until recently all these organisations have focused on their own membership. The World Heart Federation (WHF),<sup>33</sup> a much smaller organisation than the continental cardiovascular societies, has as its mission statement:

*The World Heart Federation helps people achieve a longer and better life, through prevention and control of heart disease and stroke, with a focus on middle and lower income countries.*

It achieves this by bringing together all the national societies and national foundations (180 member societies from 100 countries) with an interest in cardiovascular disease. This is truly a global approach and one which involves both the public and patients. The major programmes are advocacy, the World Heart and Stroke Forum,<sup>34</sup> education, training and specific projects. In addition, the WHF is responsible for World Heart Day which, I would argue, has been the most successful single project for the prevention of heart disease ever to have been undertaken.

What is needed is to bring together groups such as the WHO, which speak to governments, and groups such as the WHF, which speak to patients and the public. The strategies and principles for prevention which apply will vary between different countries and have been set out in recent documents.<sup>34</sup>

### Challenges

There is a common perception that cardiovascular disease is a disease of the elderly, a disease of affluence, a pleasant way to die and a personal liability. All four perceptions are incorrect – even dangerous – because the consequence is the argument that cardiovascular disease is not a disorder with which governments should necessarily be concerned. On the other hand, recent data have shown just how great might be the benefit to communities across the world by reducing multiple risk factors, often by

political intervention.<sup>28</sup> There are numerous reasons why both the public and the medical profession are less than well informed:

- the benefits from prevention are illusive and not readily appreciated
- the immediate demands of visibly sick patients take precedence
- the public are led by the media to focus on expensive modern technology, new treatments and discoveries
- an irrational use of new technologies by cardiologists
- commercial entities, and even health professionals, obstruct change for many diverse reasons, including self-interest.

A clear framework for the delivery of healthcare is emerging, including macro-economic, environmental and behavioural change, risk factor detection and control, acute care management, chronic care and rehabilitation, and end-of-life care. Drugs for secondary prevention are now affordable even in poor countries because common drugs are available off patent. Those who should be responsible for prevention can easily be identified (Table 3). Far greater collaboration between the public health bodies, the public and the health professions is essential. Conflicts of interest within these groups should be put aside.

Heart disease and stroke are a global challenge. Cardiovascular disease is common, becoming more common, and has an economic impact in all countries. The problem exists regardless of gender, region or ethnicity. The disease is preventable in the sense that it can be delayed in onset. The causes are known and health systems identified which can stem the epidemic. A strong international effort will encourage country-led initiatives. International organisations must work together because no single organisation can alone achieve the common goal. However, the most powerful force for change is grass root demand, first from the public and secondly from the health professions.



**Table 3. Strategy and responsibility for prevention of cardiovascular disease.**

Identifiable person/ patient group	Means of intervening	Those responsible
Population Causes of risk factors	Socio-economic Political Fiscal Tariffs	Healthcare workers, nurses, doctors, epidemiologists, media, politicians, policy makers, advocates Foundations, civil society Individual persons
Persons at risk Identifiable risk factors for cardiovascular disease	Prevention Exercise, diet, nutrition Smoking cessation Selected use of drugs	Health workers, nurses, primary physicians, epidemiologists
Patients with overt disease	As above More stringent use of drugs Procedures	Physicians, specialists, cardiovascular physicians, cardiologists

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