



CHAPTER 2

BACKGROUND OF CARDIOVASCULAR DISEASES

The most common cardiovascular diseases are hypertension and heart disease, but the basis of the most cardiovascular diseases is atherosclerosis, which is almost universally present in U.S adults and the manifest clinically as coronary heart disease (CHD), cerebrovascular disease (stroke), or peripheral arterial disease (Fuster et al. 2000).

2.1 Facts

1. CVD made up 16.7 million, or 29.2% of total global deaths according to World Health Report 2003.
2. Around 80% of CVD deaths took place in low and middle-income countries.
3. By 2010, CVD will be the leading cause of death in developing countries.
4. At least 20 million people survive heart attacks and strokes every year; many require continuing costly clinical care.
5. Heart disease has no geographic, gender or socio-economic boundaries.

An estimated 16.7 million-or 29.2% of total global deaths-result from the various forms of cardiovascular disease (CVD), many of which are preventable by action on the major primary risk factors: unhealthy diet, physical inactivity, and smoking. More than 50% of the deaths and disability from heart disease and strokes, which together kill more than 12 million people each year, can be cut by a combination of simple, cost-effective national efforts and individual actions to reduce major risk factors such as high blood pressure, high cholesterol, obesity and smoking.

And these are no longer only diseases of the developed world: some 80% of all CVD deaths worldwide took place in developing, low and middle-income countries, while these countries also accounted for 86% of the global CVD disease burden. It's estimated that by 2010, CVD will be the leading cause of death in developing countries.

The major CVDs include:

1. Coronary (or ischemic) heart disease (heart attack).

2. Cerebrovascular disease (stroke).
3. Hypertension (high blood pressure).
4. Heart failure.
5. Rheumatic heart disease (WHO, 2001).

Coronary Heart Disease: CHD kills and disables people in their most productive years and in 1999 was estimated to account for \$53 billion in medical care costs and \$47 billion in indirect economic costs. Each year there are more hospitalizations for CHD than for any broad diagnostic group, with the exceptions of births, all respiratory diseases, all digestive diseases, and all injuries.

Cerebrovascular Diseases (stroke): two percent of the U.S adult populations, 4.4 million people, have cerebrovascular disease. More than 1 million of these individuals are limited in their usual activity. In the Framingham study, the most common variety of complete stroke is atherothrombotic brain infarction, which accounts for 61 percent of all strokes (excluding transient ischemic attacks). Next most common are cerebral hemorrhage, and subarachnoid hemorrhage. Intracerebral hemorrhage apparently has declined most in recent years.

Hypertension: present in 50 million Americans, is one of the most powerful contributors to cardiovascular morbidity and mortality: the 600,000 annual cases of stroke, 1.1 million annual heart attacks, 400,000 annual new cases of CHF, and most of the nearly 1 million annual deaths from cardiovascular and kidney diseases hypertension means that patient had blood pressure of 160/95 mmHg or greater or is on antihypertensive medication.

Heart Failure: it's the end stage of cardiac disease after the myocardium has used all its reserve and compensatory mechanisms. Once overt signs appear, half of patients die within 5 years despite medical management. Heart failure is most often a consequence of hypertension, CHD, valve deformity, diabetes, or cardiomyopathy. The various etiologies tend to coexist. CHD, frequently accompanied by hypertension, is responsible in more than 50 percent of cases and has been increasing in prevalence among new cases

of heart failure. Left ventricular hypertrophy, hypertension, and valvular diseases are diminishing determinants.

Rheumatic fever and Rheumatic Heart Disease: Rheumatic fever is a prominent cause of serious valvular heart disease. Acute rheumatic fever and subsequent rheumatic heart disease remain important cardiovascular problems in the tropical and subtropical developing countries of South America, Africa, the Middle East, and Asia, and there have been outbreaks in the U.S. in the recent years. Although preventable, rheumatic fever occurs more frequently because of overcrowding, the deceptive self-limited nature of symptoms in streptococcal pharyngitis, and the mild and often clinically inapparent nature of streptococcal infections. Rheumatic fever is rare before age 3, occurring most frequently between 5 and 10 years of age, when streptococcal infections are most frequent (Fuster et al. 2000).

Of the 16.7 million deaths from CVDs every year, 7.2 million are due to ischemic heart disease, 5.5 million to cerebrovascular disease, and an additional 3.9 million to hypertensive and other heart conditions. As well, at least 20 million people survive heart attacks and strokes every year, a significant proportion of them requiring costly clinical care, which puts a huge burden on long-term care resources. CVD affects people in their mid-life years, undermining the socioeconomic development, not only of affected individuals, but families and nations. Lower socioeconomic groups generally have a greater prevalence of risk factors, diseases and mortality in developed countries, and a similar pattern is emerging as the CVD epidemic matures in developing countries.

The time lag effect of risk factors for CVD means that the full effect of past exposure to behavioral risk factors, especially among children, will only be seen in the future. Unless preventive and management efforts are embraced worldwide, the global burden of CVD death and disease will continue to rise (WHO, 2001).

2.2 Risk Factors for Cardiovascular disease

The modifiable risk factors for cardiovascular disease (high blood pressure, high cholesterol, being overweight, low fruit and vegetable intake, physical inactivity and

tobacco use) are common throughout the world. They are increasing in low- and middle-income countries contributing to the increased prevalence of cardiovascular disease in these countries.

Part of this increase in prevalence of these risk factors is due to aging of the population and also to urbanizations with countries. Individuals in urban settings have a different diet (more saturated fat intake, sodium intake) and higher rates of obesity associated with greater intake of calories and less physical activity. Another contributing factor is globalization that contributes to the spread of unhealthy behaviors like smoking from high income to low- and middle- income countries.

Risk factors for cardiovascular disease are a major contributor to mortality and disability adjusted life years (DALYs). In South-east Asia, for example, the burden of disease attributable to tobacco, blood pressure and cholesterol is similar to that of nutritional deficiencies and only marginally smaller than that attributable to poor water, sanitation and hygiene.

Addressing these risk factors will improve not only heart health, but also other chronic diseases such as cancer, chronic respiratory disease and diabetes. Therefore, an integrated approach to chronic disease prevention would be both effective and efficient. The multi-sectoral nature of the determinants of these risk factors calls for a variety of strategies including public policy, education, primary health care, and the creation of supportive environments (Maclean, 2004).