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Editorial

Heart Diseases and Cardiovascular Health

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

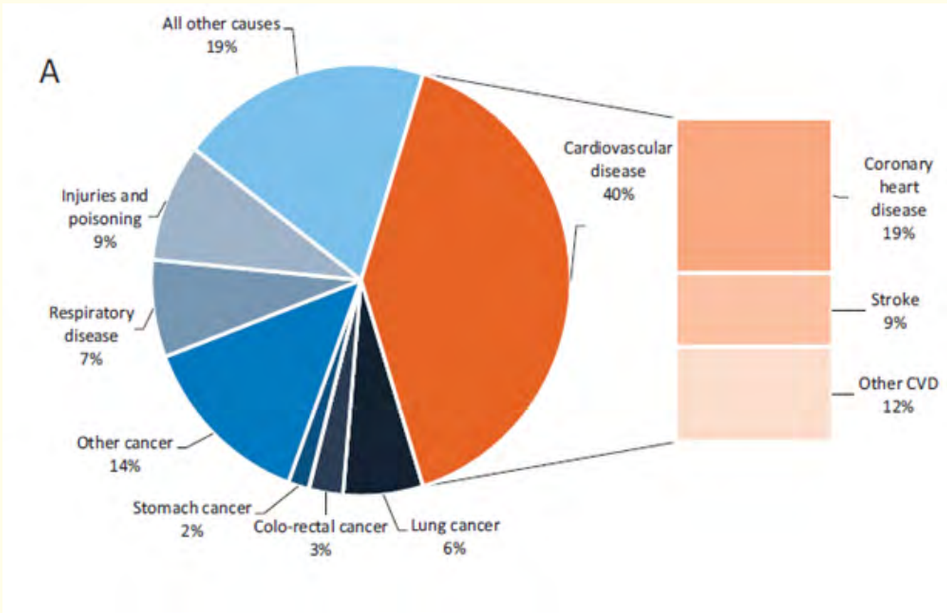
WHO, Preamble to the Constitution, 1948

Introduction

Over the past decades, cardiovascular disease (CVD) has remained a universal health problem associated with huge expenditures. The CVD burden can be assessed by various methods; however, the cause-specific mortality is believed to be one of the most fundamental metrics [1]. Comprehensive prevention of the adverse events comprises change of lifestyle, control of risk factors, use of medications and coronary revascularization. Many comprehensive analyses have been designed for policy makers, health professionals and medical researchers [2]. Yet the results should be conveyed, above all, to health care providers and their patients.

Mortality

Each year CVD takes 3.9 million lives in Europe and over 1.8 million lives in the European Union (EU), more than all other disorders [1-3]. CVD accounts for 40% of all deaths among men and 49% of all deaths among women (Figure 1). Coronary artery disease (CAD) is the leading single cause of mortality, responsible for 862,000 (19%) deaths a year among men and 877,000 (20%) among women. Stroke is the second most common cause, accounting for 405,000 (9%) deaths among men and 583,000 (14%) deaths among women. CVD mortality is dependent on numerous demographic variables as well as geographic inequalities. At present, the CVD mortality is falling in most EU countries, though the long-term trends in Central and Eastern EU have been less consistent [2]. Comparing the difference in death rates from 2003 and the latest available year, the rate of decline among men varied from 13% in the Czech Republic to 54% in the Netherlands and from 8% in the Czech Republic to 57% in Estonia among women. As a result, a number of EU countries now record a greater number of deaths from cancer than from CVD [3].



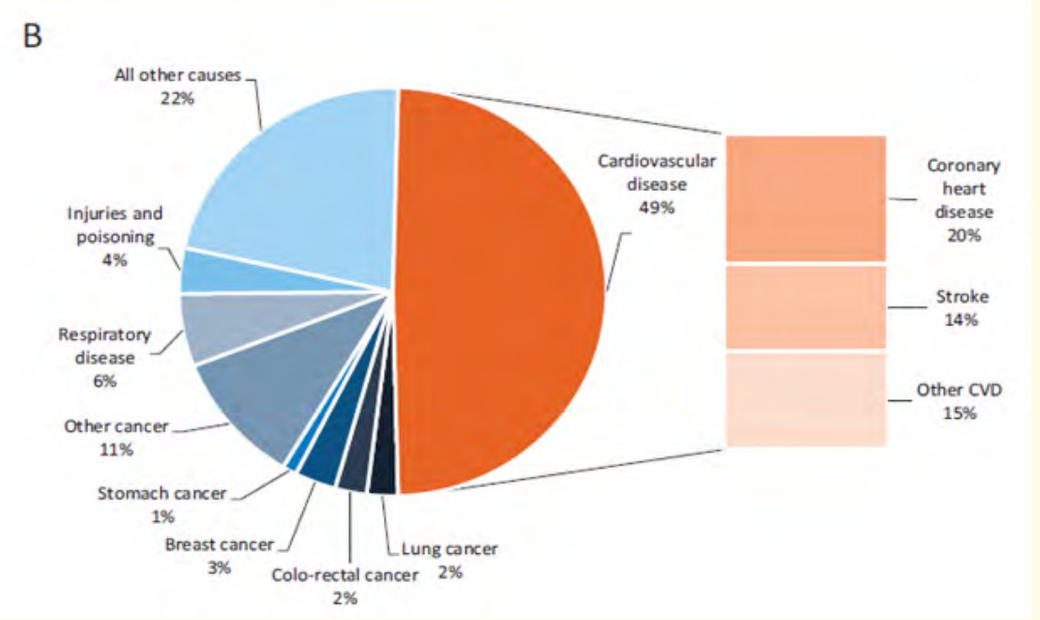


Figure 1: *Proportion of all deaths due to major causes in Europe, latest available year, among men (A) and women (B). Source: WHO Mortality Database.*

In stable CAD, estimates for annual mortality range from 1.2% to 2.4% with the incidence of cardiac death between 0.6% and 1.4% [4]. The outcomes are worse in patients with advanced age, diabetes mellitus, renal failure, previous myocardial infarction (MI), severe angina pectoris, multi-vessel CAD, severe and proximal coronary obstructions, extensive myocardial ischemia, reduced left ventricular ejection fraction and heart failure [4]. Additionally, mortality in patients with an ST-segment MI (STEMI) is influenced by Killip class, treatment strategy, presence of emergency medical system-based networks and time delay to reperfusion. Hospital mortality in STEMI patients in the EU varies between 4% and 12%, while reported 1-year mortality is approximately 10% [5]. In contrast, hospital mortality in patients without ST-segment MI (NSTEMI) is lower, from 3% to 5%, though at 6 months the mortality rates are similar to STEMI patients [6].

Morbidity

The incidence of a disease describes the number of new cases that develop within a population over a specified period of time. In the EU, there were 6.1 million new cases of CVD in 2015. Half of the new cases were due to the CAD (1.63 million among men, 1.4 million among women), while around 10% of new cases were due to stroke (286,000 among men and 340,000 among women). Between 1990 and 2015, most EU countries reported an increase in the CVD cases, except for the UK, Latvia, Hungary, Denmark and Germany [2].

The prevalence of a disease refers to the number of individuals in a population who are currently living with the disease. Within the EU, almost 49 million people (24.3 million male patients and 24.6 million female patients) were living with the CVD in 2015. Again, CAD was responsible for the greatest share of the CVD cases with 7.7 million male patients and 5.5 million female patients. Analyzing the age-standardized CVD prevalence per 100,000 population, the prevalence rates decreased on average by 12% among men and 9% among women. The most pronounced decreases between 1990 and 2015 occurred in Finland (-15.3%) and Germany (-16.6%) among men, and in Italy (-14.1%) in women [2].

The most comparable data available across the EU countries to track the burden of the CVD morbidity are hospitalization data. The most recent facts show that the rates of hospitalization for CVD have increased since the early 2000s. The median numbers of hospital discharges per 100,000 population in 2012 were 2097 for CVD, 608 for CAD and 298 for stroke [7]. Significant variation in admission rates reflected a combination of differences in the severity of the CVD burden as well as differences in access to and the efficiency of health care systems. Within the EU, the average length of hospital stay for the CVD varied twofold among men from 5.5 days in Denmark to 11.0 days in Hungary, and almost threefold among women from 5.8 days in Denmark to 15.9 days in Finland [2].

Disability-adjusted life years (DALY) are a composite measure of years of life lost due to death from a condition and years lived with disability due to a condition. In the EU, CVD was responsible for the loss of 26 million DALYs in 2015, or 19% of the total (Figure 2). Overall, 13.2 million (10%) DALYs were lost to CAD, while 6.5 million (5%) DALYs were lost to stroke. The contribution of the CVD to lost DALYs was exceeded by that of cancer only in Western EU [2].

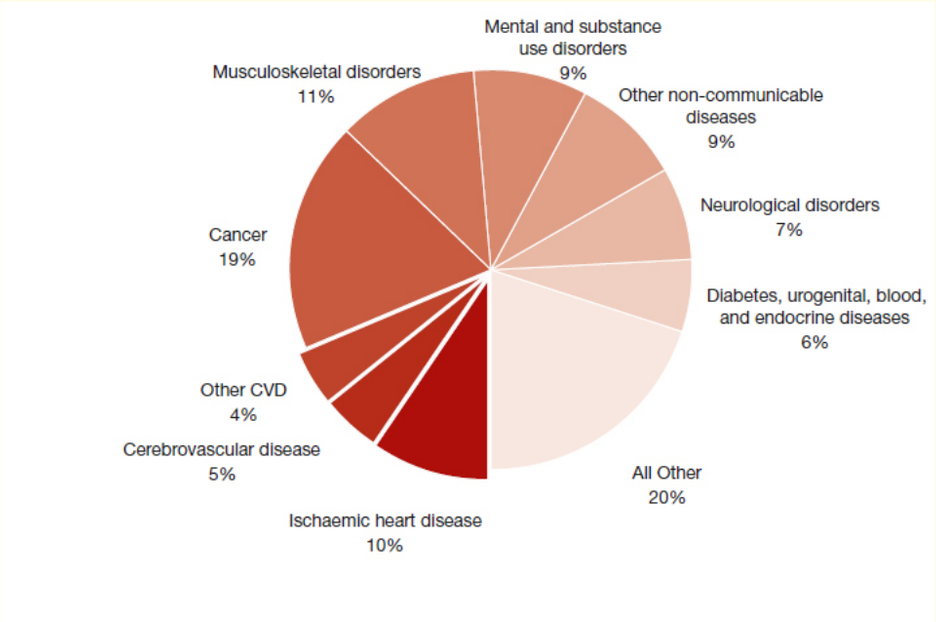


Figure 2: *Disability-adjusted life years lost by cause in Europe, 2015. Source: European Cardiovascular Disease Statistics 2017.*

Costs

CVD is estimated to cost the EU economy €210 billion a year: 53% (€111 billion) is due to direct health care costs, 26% (€54 billion) due to productivity losses and 21% (€45 billion) due to the informal care of people with the CVD (Figure 3). CAD is estimated to cost the EU economy €59 billion a year, which equals 28% of the overall cost of CVD. Stroke is estimated to cost the EU economy €45 billion a year, around one-fifth of the overall cost of the CVD.

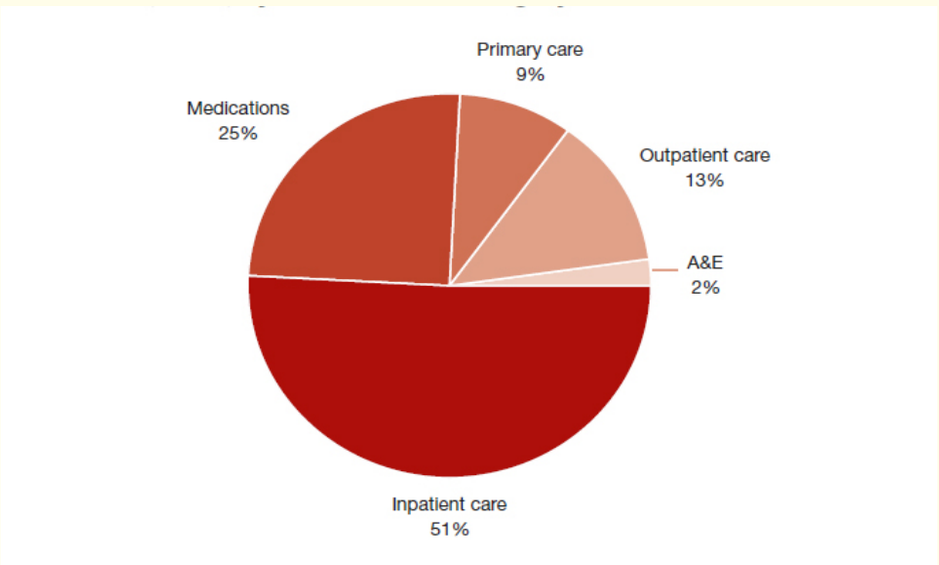


Figure 3: *Percentage of total healthcare expenditure on CVD in Europe, 2015, by resource use category. Source: European Cardiovascular Disease Statistics 2017.*

Changing of lifestyle

The four behavioral risk factors (diet, tobacco use, alcohol consumption, physical activity) largely contribute to the population-level CVD mortality burden in both sexes [2,8]. Changing one's lifestyle is an essential step in preventing the adverse events, though it is very demanding and the benefits are difficult to appraise. The comprehensive healthy diet comprises the following measures: a) saturated fatty acids account for < 10% of total energy intake and are possibly replaced by polyunsaturated fatty acids; b) trans unsaturated fatty acids account for < 1% of total energy; c) < 5g of salt per day; d) 30 - 45g of fibre per day; e) ≥ 200 g of fruit per day; f) ≥ 200g of vegetables per day; g) fish 1 - 2 times per week; h) 30g unsalted nuts per day; i) alcoholic beverages should limited to 2 glasses per day for men and 1 glass per day for women; and j) sugar-sweetened soft drinks are discouraged. The risk of the CAD is reduced by 2-3% when 1% of energy intake from saturated fatty acids is replaced by polyunsaturated fatty acids [8].

Cessation of smoking is the most cost-effective strategy for CVD prevention. The most effective are brief interventions accompanied by assistance with drug therapy and follow-up support [8].

Regular physical activity is the most important factor of CVD prevention, since it increases fitness, improves mental health, decreases all-cause and CVD mortality [8]. The ESC recommendations include: a) at least 150 min of moderate intensity activity a week; b) gradual increase in aerobic activity to at least 300 min of moderate intensity activity a week; c) regular assessment and counselling on physical activity; and d) multiple sessions of physical activity, each lasting ≥ 10 minutes evenly spread throughout the week [8].

CVD risk goes hand in hand with all measures of body fat. Adults with a body mass index of 25 to 30 kg/m^2 are considered to be overweight while those with a > 30 kg/m2 are considered to be obese. Although diet, exercise and behavior modifications are the most common therapies for overweight and obesity, they are often unsuccessful for long-term treatment. Medical therapy with orlistat and/or bariatric surgery are additional options [8].

Blood pressure control

Overall, the prevalence of hypertension appears among 30 - 40% of the general population, with a steep increase with age. Hypertension is a major attributable risk factor for developing CVD, heart failure and atrial fibrillation. Prompt initiation of drug treatment is recommended in individuals with grade 2 and 3 hypertension with any level of CVD risk, a few weeks after or simultaneously with initiation of lifestyle changes. The ESC guidelines recommend two distinct blood pressure targets, namely < 140/90 mm Hg in low-to-moderate risk and < 130/80 mm Hg in high-risk hypertensives (with diabetes, CVD, or renal disease). Blood pressure reduction by 10 mm Hg systolic or 5 mm Hg diastolic was showed to reduce stroke by 41%. Drug treatment include ACE/ARB inhibitors, calcium antagonists, β-blockers and diuretics, alone or in combination [9].

Lipid control

Dyslipidemias are the main causative factor in the atherogenesis. Therefore, prevention and treatment of dyslipidemias should always be considered within the broader framework of the CVD prevention. Evidence showed that reducing total cholesterol and LDL-cholesterol (LDL-C) has a significant effect, based on results from multiple randomized controlled trials. For patients with very high CVD risk, the treatment target for LDL-C is < 1.8 mmol/L, for high-risk < 2.5 mmol/L and for moderate-risk < 3.0 mmol/l. Every 1.0 mmol/L reduction in LDL-C is associated with a corresponding 22% reduction in CVD mortality and morbidity. Current available evidence suggests that the clinical benefit is largely independent of the type of statin but depends on the extent of LDL-C lowering. Along with the statin, drug treatment includes bile acid sequestrants, cholesterol absorption inhibitors, nicotinic acid and PCSK9 inhibitors [10].

Glucose control

Estimates for 2011 suggested that 52 million Europeans aged 20 - 79 years had diabetes mellitus. Unfortunately, the prevalence of diabetes is increasing by > 50% in many countries. Diabetes is significantly associated with microvascular and microvascular complications, atherogenic dyslipidemia, impairment of coagulation and platelet function and diabetic cardiomyopathy. ESC guidelines recommend: a) glucose lowering should be instituted in an individualized manner taking into account duration of diabetes, co-morbidities and age into account; b) a tight glucose control targets HbA1c < 7.0% to decrease microvascular complications; c) basal bolus insulin regimen combined with frequent glucose monitoring is recommended for type 1 diabetes; and d) metformin should be considered in subjects with type 2 diabetes following evaluation of renal function. Unfortunately, long-term CVD outcomes for most glucose-lowering treatments are largely unknown [11].

Antiplatelet drugs

Platelets are vital components of normal hemostasis and key participants in atherothrombosis by virtue of their capacity to adhere to injured blood vessels and to accumulate at sites of injury. Antiplatelet agents decrease platelet aggregation and may prevent formation of coronary thrombus. Due to a favourable ratio between benefit and risk in patients with stable CAD and it's low cost, low-dose aspirin is the drug of choice in most cases. Dual antiplatelet therapy (DAPT) combining aspirin and a thienopyridine is the standard care for patients with unstable clinical presentations for at least 1 year, or in stable CAD treated with stent implantation generally for 6 months. Drug treatment includes aspirin, clopidogrel, ticagrelor and prasugrel [12].

Coronary revascularization

Myocardial revascularization, percutaneous or surgical, in the elective setting is appropriate when the expected benefits, in terms of survival or health outcomes, exceed the expected negative consequences of the procedure. The decision to revascularize a patient should be based on the presence of significant obstructive coronary artery stenosis and the amount of related ischemia. Survival advantage of revascularization is expected in patients with three-vessel disease, left main coronary artery disease and involvement of the proximal left anterior descending artery plus one other major coronary artery [4]. In NSTEMI patients, the selection of the optimal timing of invasive coronary angiography and revascularization should be guided by individual risk stratification. It is recommended that patients at very high risk undergo an immediate invasive strategy treatment. In low-risk patients, a non-invasive stress test for inducible ischemia is recommended. Complete revascularization strategy of significant lesions should be pursued in multi-vessel disease [6]. In STEMI patients, primary percutaneous coronary intervention (PCI) is the preferred reperfusion strategy within 12h of symptom onset. Pre-hospital management is based on regional networks designed to deliver reperfusion therapy expeditiously and effectively, with efforts to make primary PCI available to as many patients as possible. It is recommended that patients who are sent to a PCI-capable center for primary PCI bypass non-PCI hospitals, emergency department and CCU/ICCU and are transferred directly to the catheterization laboratory. Immediate revascularization of the culprit artery is warranted, while the revascularization of the other significant lesions should be considered before hospital discharge.

Conclusion

CVD has remained, despite constant advances in medicine, an enormous medical and economic problem in the EU. Comprehensive treatment consisting of lifestyle changes, risk control, medication and coronary artery revascularization must be engaged to resolve the acute adverse events and prevent recurrences. The patients should be supported to fully rehabilitate and reintegrate into their communities thus contributing to a healthier society.

Bibliography

1. Lozano R., *et al*. "Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010". Lancet 380.9895 (2012): 2095-2128.

2. European Cardiovascular Disease Statistics 2017 edition. Brussels: European Heart Network (2017).

3. Townsend N., *et al*. "Cardiovascular disease in Europe: epidemiological update 2016". *European Heart Journal* 37.42 (2016): 3232-3245.

4. Montalescot G., *et al*. "2013 ESC guidelines on the management of stable coronary artery disease". *European Heart Journal* 34.38 (2013): 2949-3003.

5. Ibanez B., *et al*. "2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation". *European Heart Journal* 39.2 (2017): 119-177.

6. Roffi M., *et al*. "2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation". *European Heart Journal* 37.3 (2016): 267-315.

7. Nichols M., *et al*. "Cardiovascular disease in Europe 2014: epidemiological update". *European Heart Journal* 35.42 (2014): 2950-2959.

8. Piepoli F., *et al*. "2016 European Guidelines on cardiovascular disease prevention in clinical practice". *European Heart Journal* 37.29 (2016): 2315-2381.

9. Mancia G., *et al*. "2013 ESH/ESC guidelines for the management of arterial hypertension". *European Heart Journal* 34.28 (2013): 2159-2219.

10. Reiner Z., *et al*. "ESC/EAS Guidelines for the management of dyslipidaemias ESC/EAS Guidelines for the management of dyslipidaemias". *European Heart Journal* 32.14 (2011): 1769-1818.

11. Ryden L., *et al*. "ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD". *European Heart Journal* 34.39 (2013): 3035-3087.

12. Valgimigli M., *et al*. "2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS". *European Heart Journal* 39.3 (2017): 213-260.

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