

Fighting cardiovascular disease – a blueprint for EU action

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Substantial progress in the prevention and treatment of cardiovascular disease (CVD¹) has resulted in the dramatic decline in premature death from CVD over the last 50 years. This may have led to false optimism that CVD need no longer be a public health priority.

However, this is not the case.

In the European Union (EU)², the burden of CVD remains greater than that of any other disease. Cardiovascular events – mainly myocardial infarction (heart attack) and stroke – remain, by far, the leading cause of death in the EU. In addition, millions of people now live with, and in the aftermath of, CVD.

Any notion that “the job is done” is clearly amiss.

The development of innovative solutions to ensure people’s access to prevention and treatment of CVD across Europe is a necessary and urgent priority. Supporting research in CVD by creating a European-wide infrastructure to enable quality of care assessment, harmonised high-quality disease registries, and streamlined pragmatic randomised clinical trials will not only improve the health of people living in Europe, but stimulate the pharmaceutical and device industry to invest in Europe.

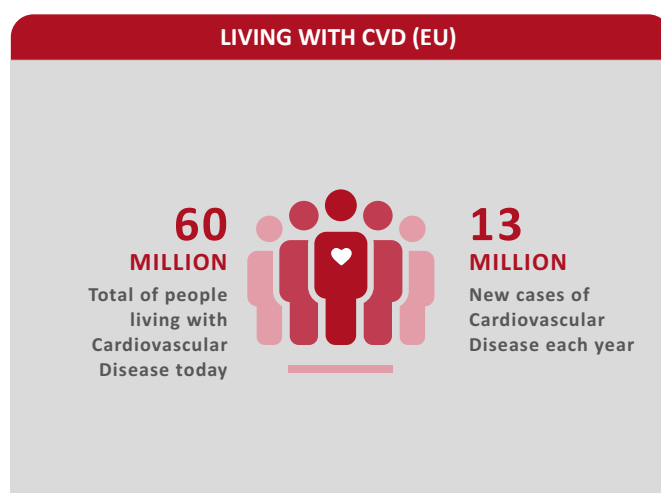
This paper provides a blueprint for addressing the huge burden of CVD among the EU population, by putting forward specific recommendations for an ambitious EU action plan that addresses cardiovascular health to be implemented in the current EU mandate.

We call on EU policymakers to support this proposal.

Understanding the burden of cardiovascular disease (CVD)

Morbidity

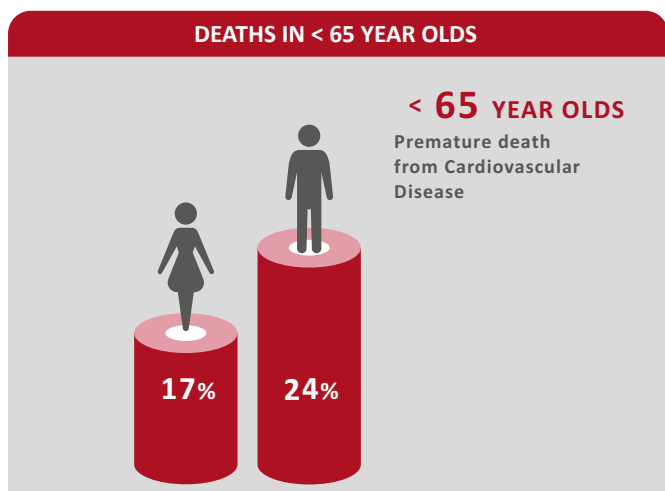
Most recent data from the Global Burden of Disease database estimate that, in the EU, more than 60 million people live with CVD, and that close to 13 million new cases of CVD occur every year.



1 For the definition of CVD please see Appendix 1

2 In this paper, the EU comprises 28 member states

More patients survive heart attack or stroke, and the pattern of CVD has changed – in particular, nowadays many patients with CVD are co-morbid (that is, have co-existing renal failure, cognitive decline, diabetes or other conditions). This combination has significant adverse effects on patients and puts substantial strain on health care systems across the EU.



Mortality

CVD is the number one cause of death in the EU: more than 1.8 million people – equal to the population of Vienna – die every year as a result of CVD, accounting for 36% of all deaths – far more than any other condition (as a comparison, cancer accounts for 26% of all deaths in the EU). This represents, on average, about 5 000 deaths per day in the EU.

Moreover, a large proportion of CVD deaths is premature. In the EU, 24% of deaths among men before age 65, and 17% of deaths among women before age 65, are due to CVD.

Notably, the rate of decline in CVD mortality appears to be tapering. Indeed, **for the first time in 50 years some EU countries have reported an increase in premature CVD death.** These adverse trends have been attributed to an insufficient awareness of CVD, limited and geographically varied investment in cardiovascular prevention and treatment, and the rising prevalence of obesity (and with that of diabetes, hypertension, dyslipidaemia and atherosclerosis).

The economic cost

The burden of CVD is not only a health issue, but an enormous economic challenge to health care systems in the EU that is expected to grow in future years.

The most recent data estimate that **CVD costs the EU economy approximately €210 billion a year.** Of that cost, around 53% (€111 billion) is for health care costs, 26% (€54 billion) is due to productivity losses and 21% (€45 billion) due to informal care of people with CVD.

Inequalities in CVD in the EU

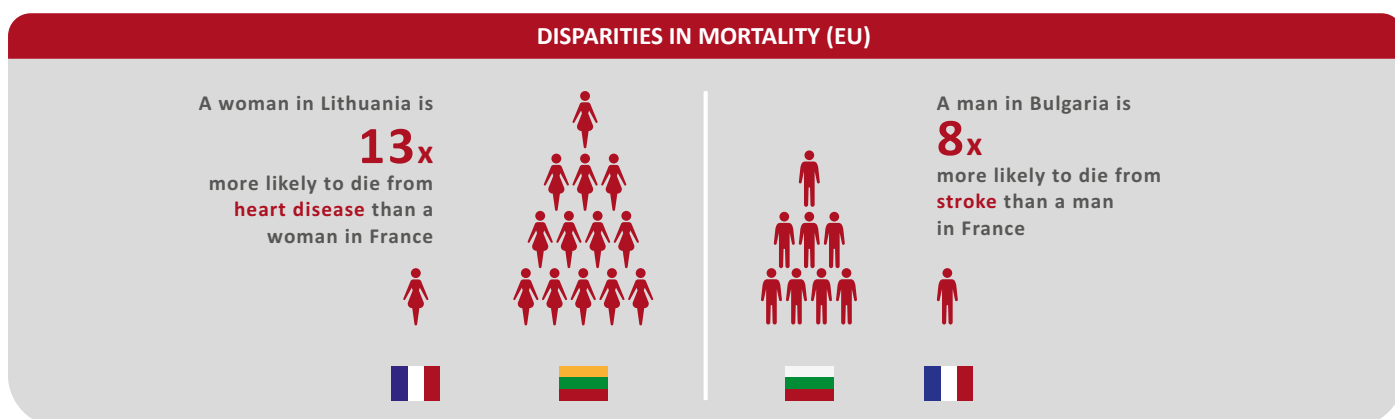
Robust action on CVD has the potential to significantly reduce health inequalities in the EU. Inequalities in mortality from **CVD account for almost half of the excess mortality in lower socio-economic groups in most European countries.**

Geographical inequalities are significant and persistent in CVD:

- The prevalence of CVD is higher in Eastern and Central European countries and lower in Western, Northern and Southern European countries. Indeed, in 2017, or latest available year, the age-standardised CVD prevalence rate in the EU in men was 50% higher in the country with the highest rate (Bulgaria) than in the country with the lowest rate (Cyprus), and in women the rate was 60% higher in the countries with the highest rates (Bulgaria and the Czech Republic) compared to the countries with the lowest rates (Italy and Spain).

- **CVD is responsible for 27 million disability-adjusted life years (DALYs) in the EU (18%).** The rates of DALYs lost due to CVD are again higher in Central and Eastern Europe than in Northern, Southern and Western Europe.
- In line with the prevalence data, **death rates from both heart disease and stroke are higher in Central and Eastern Europe** than in Northern, Southern and Western Europe. For example, the age-standardised death rate for heart disease in 2017, or latest available year, is 13-fold higher in women in Lithuania than in France, and 9-fold higher in men. For stroke, the age-standardised death rate is 7-fold higher in women in Bulgaria than in France, and 8-fold higher in men.

The single most important contributor to excess mortality in Eastern European countries is CVD. **While among men less than 50% of the excess mortality is due to CVD, in women this percentage is 80%.**

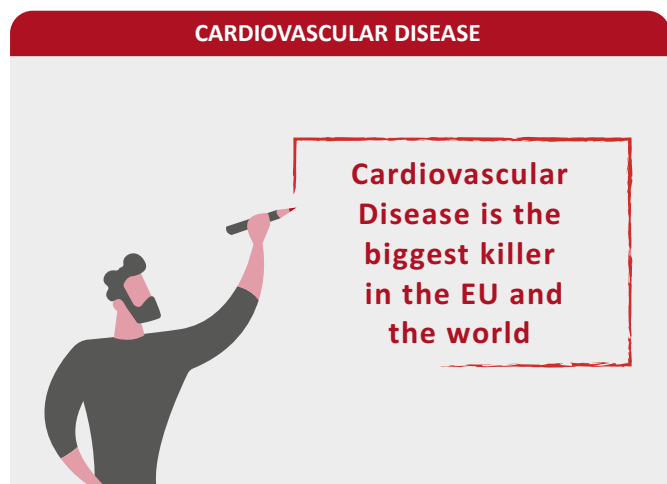


An action plan for cardiovascular disease

While the organisation and delivery of health care are Member States' competences, **the EU can play a crucial role in tackling the burden of CVD through policy and regulation, as well as supporting research and innovation into CVD prevention and management.**

Taking into consideration the competences of the EU, we propose an action plan on CVD in the following areas:

- The need for prioritising prevention of avoidable CVD
- The need for promoting innovation and modernising research regulations to improve access
- Better patient care through improved diagnosis, treatment and management



1 The Need for Prioritising Prevention of Avoidable CVD

CVD is often referred to as a lifestyle disease because of its causal link with behavioural risk factors (lifestyle determinants). However, as for cancer, CVD is caused by several other factors³ and, given the scale of the disease, it would be more appropriate to refer to CVD as a societal disease.

Many people are already disabled by ill-health before they reach retirement age. Greater reduction of exposure to the main behavioural risk factors – tobacco, unhealthy diet, physical inactivity and harmful use of alcohol – would increase the number of years lived in good health.

Effective population-wide interventions to prevent CVD have the potential to provide both human and economic benefits with considerable returns on investment.

Given that the majority of cases come from individuals at low or moderate risk of CVD, small reductions in CVD risk factors across the population will produce large societal gain.

³ See Appendix 2 for CVD risk factors

1.1 Food and nutrition

In the EU, unhealthy diets are associated with over 800 000 deaths from CVD each year, accounting for over 40% of all CVD deaths – 417 000 in men and almost 400 000 in women. Dietary risks are responsible for almost 45% of all the years lost to CVD death or disability in the EU.

Achieving a CVD health-promoting diet requires moving away from an animal-based diet to a more plant-based diet. CVD-specific nutrients, where target goals at a population level should be reached, are saturated fats (less than 10% of calories), salt (less than 5 g of salt per day) and fibre (at least 12.6 g of dietary fibre per 1000 kcal = 3 g per MJ energy).

RECOMMENDED EU PRIORITY ACTIONS

- **Set nutrient profiles to underpin nutrition and health claims as required by the EC regulation on nutrition and health claims (EC) No 1924/2006**
 - **Adopt rules on simplified front-of-pack nutritional labelling**
 - **Adopt regulations restricting all marketing to children, including digital, of food and drinks high in fat, salt and sugar**
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1.2 Smoking

Smoking is the second largest cause of CVD after high blood pressure. It is associated with 13% of all CVD deaths in the EU, which translates to almost 250 000 CVD deaths every year (around 165 000 male and 82 000 female deaths).

The average prevalence of smoking (daily and occasional smokers; people older than 15) in the EU is 24%. However, prevalence varies hugely, from just under 17% in Sweden to almost 35% in Bulgaria.

Recent studies increasingly highlight the risks of electronic cigarette use to the cardiovascular system.

RECOMMENDED EU PRIORITY ACTIONS

- **Raise minimum tobacco excise duties to the highest possible level**
 - **Bring excise duties on “roll your own” tobacco up to the same level as manufactured cigarettes**
 - **Strengthen regulation on e-cigarettes**
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1.3 Physical inactivity

Low physical activity is estimated to be responsible for 140 000 cardiovascular deaths in the EU every year. It causes more deaths among the female population (77 000) than among the male population (63 000).

Participation in regular physical activity and/or aerobic exercise training is associated with a reduction in the prevalence of and mortality from CVD, while a sedentary lifestyle increases the risk of CVD by increasing the risk of hypertension, high triglycerides, low HDL ('good') cholesterol, diabetes and obesity.

RECOMMENDED EU PRIORITY ACTION

- **Encourage the development and approval of EU funded projects (in particular projects supported by EU Structural Funds) that have a positive impact on active living**
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1.4 Alcohol

Harmful alcohol consumption is estimated to be responsible for close to 50 000 CVD deaths in the EU.

High alcohol consumption, particularly binge drinking, increases the risk of CVD by raising blood pressure and blood levels of triglycerides. Consumption of three or more alcoholic drinks per day is associated with increased CVD risk.

RECOMMENDED EU PRIORITY ACTIONS

- **Raise minimum excise duties on alcoholic beverages to the highest possible level**
 - **Introduce mandatory, front-of-pack energy labelling on alcohol**
 - **Introduce mandatory ingredients list on alcoholic beverages**
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1.5 Air pollution

Air pollution has been associated with around 115 000 cardiovascular deaths per year (6% of all cardiovascular deaths) in the EU, accounting for more than 60 000 male deaths and more than 53 000 female deaths.

Exposure to air pollution affects everybody, but it is an amplifying factor for health inequalities, as people living in less affluent areas are often more exposed to it.

RECOMMENDED EU PRIORITY ACTION

- **Revise the ambient air quality directive adopting the WHO Air Quality Guideline values as limit values**
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2 The need for promoting innovation and modernising research regulations to improve access

Despite the burden of CVD being greater than any other disease, research and innovation in CVD is lagging, compared with other disease domains. Only one CVD medicine was approved by the European Medicines Agency in 2018.

The complexity and costs of clinical trials and an unfavourable regulatory framework for fostering innovation are key contributors to this decline.

2.1 The need for promoting research & innovation in CVD

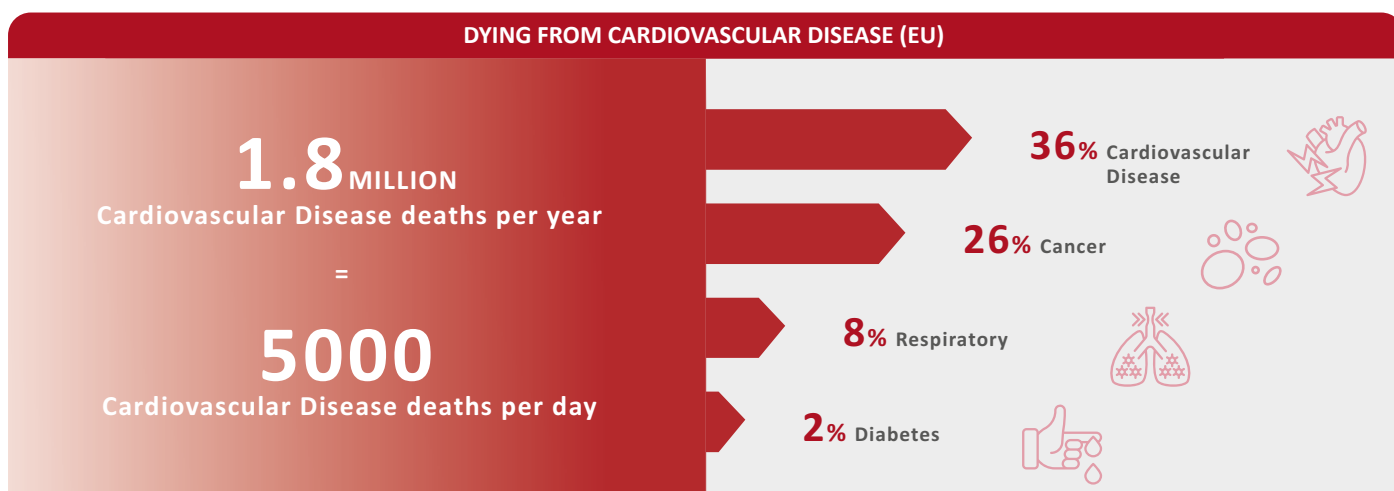
Research funding for CVD is disproportionately low at EU level, compared with other diseases. CVD and its risk factors feature very little in the call descriptions for Horizon 2020, and the number of EU-funded projects related to CVD is far fewer than those in other clinical areas.

The Strategic Research Agenda for CVD, which was produced by the ERA-CVD Network in cooperation with the European Heart Network and the European Society of Cardiology, identifies key areas for which clinical research is needed if we want to succeed in reducing CVD mortality and morbidity. The top five research priorities identified are:

1. Earlier recognition of cardiovascular disease
2. Repair of the heart and blood vessels
3. The interaction between CVD and other disorders
4. Treatment of chronic heart failure and atrial fibrillation
5. Personalised treatment and management of cardiovascular disease

RECOMMENDED EU PRIORITY ACTION

- **Recognise key areas of CVD research as priorities in the Horizon Europe programme**



2.2 Modernise the regulatory framework for the assessment of the efficacy and safety of new treatments

Cardiology has one of the strongest evidence bases, yet only about 14% of ESC Clinical Practice Guideline recommendations are based on randomised clinical trial evidence, demonstrating the prohibitive cost and complexity of clinical trials in CVD.

Currently, the cost of randomised controlled trials and the reluctance of payers to reimburse therapies that produce effects on moderate size in very large numbers of eligible patients are a major threat to the development of new treatments in CVD, and the reason why several pharmaceutical companies have moved out of the cardiovascular area.

To mitigate these worrying trends, innovative approaches are urgently needed.

These include a regulatory framework adapted to the challenges of developing new therapies, better and more flexible rules for the conduct of randomised clinical trials, and **the development of a European-wide infrastructure** either based on **patients' electronic health records** or **continuous patient registries** that would allow randomisation at the point of care and low-cost long-term automated capture of efficacy and safety signals within health care systems or registries for reliable assessment of new therapies and devices.

Few interventions could have such a major impact on the cost effectiveness of regulatory studies, ultimately leading to better data and potentially much less expensive treatments, not only for CVD but for all common conditions.

Together, such developments would not only improve patient access to better treatments, but also **be instrumental in bringing investment to and promoting innovation in Europe** and would benefit all areas of medical research.

RECOMMENDED EU PRIORITY ACTIONS

- **Promote and support the development of harmonised and comprehensive continuous patient registries in CVD, as well as the digital capability to enable the evidence generated within health systems to improve the speed and efficiency of randomised controlled trials**
 - **Establish a structured collaboration between academic clinical trialists, patients, regulators and industry, to modernise the International Council of Harmonisation (ICH) Good Clinical Practice (GCP) standards and make them fit for the digital era**
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2.3 Unlocking the full potential of digital technologies for cardiovascular health

Digital technologies may have great potential in transforming prevention, early detection and management of cardiovascular disease. In primary prevention for example, mobile applications, text messaging and monitoring sensors for self-tracking, as well as online counselling, have the potential to identify people with high cardiovascular risk, and improve lifestyle management intervention to reduce cardiovascular risk.

Digital technologies in health care delivery provide the opportunity to redesign and improve patients' care after diagnosis and discharge, thanks to innovations in telecommunication technologies (i.e. cardiac telerehabilitation).

Furthermore, supporting the digitisation of health systems through the development of electronic health records and data repositories, as well as exploiting the potential of artificial intelligence, would play a key role in improving diagnosis and treatment of CVD.

RECOMMENDED EU PRIORITY ACTION

- **Support research and deployment of digital health technologies in cardiovascular disease prevention and management**
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2.4 Better understand the interaction between CVD and cancer

Advances in oncological treatment have led to the improved survival of patients with cancer but have also increased morbidity and mortality due to the cardiotoxicity of cancer treatment.

Researchers have found that within five years of a cancer diagnosis, the risk of heart failure was three times higher in people treated for breast cancer or lymphoma than in people without cancer. Equally, an increased incidence of cancer in patients with heart failure has been identified, with some studies estimating this incidence to be in the range of 19–33% per 1 000 person-years.

We believe it is of great importance to conduct research in the area of CVD and cancer co-morbidities and complications, as we witness an increasing number of patients with both diseases or recovering completely from cancer but ending up dying or suffering from cardiovascular disease as a result of their cancer treatment.

RECOMMENDED EU PRIORITY ACTION

- **Include a focus on cancer and CVD co-morbidities and research on the short-term and long-term cardiovascular effects of cancer treatment in the new Europe's Beating Cancer Plan and Cancer Mission within Horizon Europe**
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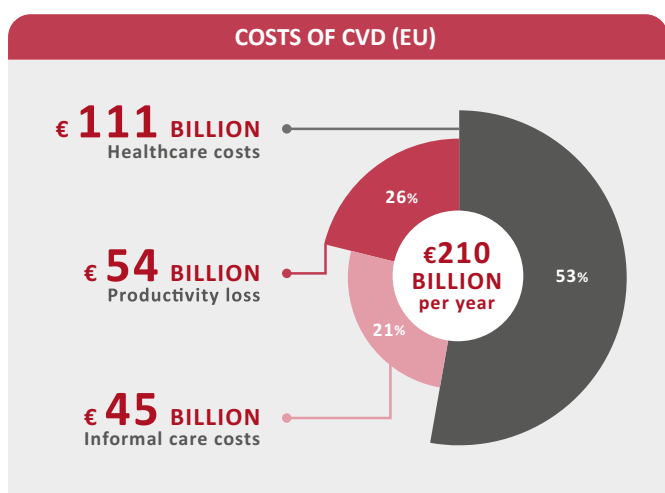
3 Better patient care through improved diagnosis, treatment and management

It is essential to enable people who are at high risk of developing CVD, or who have already contracted CVD, to actively manage their condition, so that they can live to an old age with a good quality of life.

EU Member States are responsible for organising, funding and providing health care to their people. EU policymakers can promote coordination, share best practice and guidelines, as well as carry out non-binding initiatives.

3.1 Identification of people at high risk of developing CVD

Around 20–40% of heart attacks occur in people previously undiagnosed with CVD. In order to assist these people to reduce their risks, and to avoid the onset of disease, it is crucial to identify them and provide them with the appropriate advice and preventative treatment.



Targeted high-quality, risk-assessment programmes may help identify people at risk and determine the most appropriate preventive measures. In deprived communities, the rate of high-risk individuals is known to be significantly higher than in other areas. It is therefore critical to develop approaches that enable the inclusion of hard-to-reach groups.

RECOMMENDED EU PRIORITY ACTION

- **Establish a joint action/network of Member States, supported by experts, to identify the most effective policies and measures for reaching out to and managing individuals at high risk of developing CVD**

3.2 Improving treatment

Substantial differences exist between countries in terms of access to technologies and procedures for treating patients with cardiovascular disease. While access to innovative treatments correlates with health expenditure per capita in a country, budget allocation explains only some of the variation in provision.

High standards for the evaluation and monitoring of health technologies along their whole life-cycle – from market authorisation to post-marketing surveillance – are an essential element of ensuring that safe, effective and innovative technologies are available to patients in a timely manner.

The EU must ensure adequate capacity for a fully operational regulatory system for pharmaceuticals and medical devices alike. Cooperation in Health Technology Assessment (HTA) at EU level is equally important for reducing inequalities in CVD treatment and wasteful spending, allowing decision-makers to take informed decisions based on the clinical effectiveness of technologies. In this respect, patients and health care professionals must be involved in regulatory processes so that they may meaningfully contribute to a safe, effective and equitable system.

RECOMMENDED EU PRIORITY ACTIONS

- **Ensure the necessary human and financial resources are available to the European Commission services responsible for the implementation of the Medical Devices Regulation**
 - **Secure a positive outcome for the EU legislative proposal on Health Technology Assessment, covering the assessment of both medicines and medical devices**
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3.3 Cardiac and stroke rehabilitation and secondary prevention

A crucial part of treatment for CVD is rehabilitation after an event, including counselling, medical treatment, exercise and psychological support. These programmes help prevent recurrence, and improve functional capacity, recovery and psychological well-being. They help patients regain as normal a life as possible, optimise their quality of life, and reduce the burden on health services by reducing hospital re-admissions.

Although the considerable benefits of cardiac and stroke rehabilitation for patients as well as the wider society are well-documented, access to and uptake of quality rehabilitation is patchy in most European countries and is considered an underutilised resource.

RECOMMENDED EU PRIORITY ACTIONS

- **Adopt a European definition of cardiac and stroke rehabilitation**
 - **Establish a joint action/network of Member States to identify barriers for uptake of cardiac and stroke rehabilitation and secondary prevention programmes and how to address them**
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Conclusions and recommendations

Death rates from CVD have fallen steadily over the past half century. This has been due to successful interventions, including population-based prevention and improved treatment options. Nonetheless, CVD remains the most common cause of death in the EU, claiming more than 1.8 million lives each year. Recent data estimate that more than 60 million people in the EU live with CVD.

Recent trends show a slowdown in the rate of decline in CVD death rates – a trend which is more pronounced in younger age groups. These trends are alarming and suggest that if the status quo prevails, there could be an increase in deaths from CVD over and above what would be expected from a growing and ageing population. Moreover, there is evidence from EU countries for an increase in the determinants of CVD, including diabetes and obesity. Should this trend continue, then the latent effects would set the scene for a tremendous setback in CVD morbidity and mortality.

We must not be complacent: fighting CVD is far from over, and action at EU level is urgently needed. This CVD Action Plan provides a blueprint for the 2019–24 EU mandate.

OVERALL AIM

Reduce premature disease and death from CVD and inequalities in cardiovascular death rates in the EU

OVERARCHING RECOMMENDATION

Ensure that TFEU Article 168 is properly operationalised, by establishing a world-class health impact assessment methodology that considers potential impact on CVD as well as differential impact in regions (East/West) of the EU by 2024

Specific priority recommendations to be achieved by 2024

- Set **nutrient profiles** to underpin nutrition and health claims as required by the EC regulation on nutrition and health claims (EC) No 1924/2006
- Adopt rules on simplified **front-of-pack nutritional labelling**
- Adopt regulations restricting all **marketing to children**, including digital, of food and drinks high in fat, salt and sugar
- Raise **minimum tobacco excise duties** to the highest possible level
- Bring **excise duties** on “**roll your own**” tobacco up to the same level as manufactured cigarettes
- Strengthen regulation on **e-cigarettes**
- Encourage the development and approval of EU funded projects (in particular projects supported by EU Structural Funds) that have a **positive impact on active living**
- Raise minimum **excise duties on alcoholic beverages** to the highest possible level
- Introduce mandatory, front-of-pack **energy labelling on alcohol**
- Introduce **mandatory ingredients list on alcoholic beverages**
- Revise the **ambient air quality directive** adopting the WHO Air Quality Guideline values as limit values
- Recognise **key areas of CVD research** as priorities in the Horizon Europe programme

- Promote and support the development of harmonised and comprehensive continuous **patient registries in CVD**, as well as the digital capability to enable the evidence generated within health systems to improve the speed and efficiency of **randomised controlled trials**
- Establish a **structured collaboration** between academic clinical trialists, patients, regulators and industry to modernise the International Council of Harmonisation (ICH) Good Clinical Practice (GCP) standards and make them fit for the digital era
- Support **research and deployment of digital health technologies** in cardiovascular disease prevention and management
- Include a focus on **cancer and CVD co-morbidities** and research on the short-term and long-term cardiovascular effects of cancer treatment in the new Europe's Beating Cancer Plan and Cancer Mission within Horizon Europe
- Establish a joint action/network of Member States, supported by experts, to identify the most effective policies and measures for reaching out to and **managing individuals at high risk of developing CVD**
- Ensure the necessary human and financial resources are available to the European Commission services responsible for the **implementation of the Medical Devices Regulation**
- Secure a positive outcome for the EU legislative proposal on **Health Technology Assessment**, covering the assessment of both medicines and medical devices
- Adopt a **European definition** of cardiac and stroke rehabilitation
- Establish a joint action/network of Member States to identify barriers to uptake of **cardiac and stroke rehabilitation** and **secondary prevention programmes**, and how to address them

This blueprint has been developed by:

The European Heart Network and the European Society of Cardiology.

About the EHN

The European Heart Network (EHN) is a Brussels-based alliance of foundations and associations dedicated to fighting heart disease and stroke and supporting patients throughout Europe.

The EHN plays a leading role in the prevention and reduction of cardiovascular diseases, in particular heart disease and stroke, through advocacy, networking, capacity-building, patient support, and research so that they are no longer a major cause of premature death and disability throughout Europe.

www.ehnheart.org

About the ESC

The European Society of Cardiology (ESC) brings together health care professionals from more than 150 countries, working to advance cardiovascular medicine and help people lead longer, healthier lives.

www.escardio.org

Appendix 1

What is CVD?

CVD affects men and women of all ages, in all EU countries. CVD has many forms, all related to the heart and the circulatory system.

They include:

- **Ischaemic heart disease (IHD)**, also known as **coronary artery disease (CAD)**, which is caused by atherosclerosis in which fatty plaque deposits cause a narrowing of the artery walls leading the heart to reduce blood flow, the primary cause of heart attacks. Chronic stable angina is chest pain that occurs when the heart is working hard and needs more oxygen. It is often due to physical exertion and indicates damaged heart function.
- **Stroke**, which occurs when an artery that carries oxygen and nutrients to the brain is affected by atherosclerosis, blocked by a clot, or bursts.
- **Peripheral artery disease**, in which narrowed arteries reduce blood flow to the limbs. Common in diabetes, and the major cause of lower limb amputations.
- **Heart rhythm disturbances: sudden cardiac death** is often the first and final presentation of other underlying CVD and is of ongoing concern in most patients with CVD. **Atrial fibrillation (AF or AFIB)** is an arrhythmia with irregular heart rate that may cause stroke, heart failure, palpitations, fatigue and shortness of breath.
- **Heart failure (HF)** occurs when damage to the heart muscle is severe enough to prevent it from functioning properly; morbidity and mortality in severe heart failure is worse than in many cancers and the only current cure is transplantation.
- **Congenital heart disease** is a general term for a range of birth defects that affect the normal way the heart works. The term “congenital” means the condition is present from birth. Congenital heart disease is one of the most common types of birth defect, affecting up to 8 in every 1,000 babies born in Europe.
- **Inherited heart conditions**, also known as **genetic heart conditions**, as they are passed on through families. They can affect people of any age and can be life-threatening. If left undetected and untreated, an inherited heart condition may lead to heart failure or even sudden death from cardiac arrest. For many families, the first sign there is a problem is when someone dies suddenly with no obvious cause or explanation.
- **Vascular dementia**, in which mental problems such as confusion, slow thought, memory issues, mood and personality changes occur in combination with reduced blood flow to the brain; it is increasing in incidence with the ageing population.
- **Valvular heart disease**, of which aortic stenosis and mitral valve insufficiency are the most frequent.

Appendix 2

What are CVD risk factors?

Risk factors associated with cardiovascular disease can be divided into different categories:

Biological determinants	Lifestyle determinants
Elevated blood pressure	Unhealthy diet
Raised blood sugar	Tobacco use
Elevated blood cholesterol	Physical inactivity
Overweight/obesity	Alcohol abuse

Broader determinants

Fixed	Modifiable
Age	Income
Sex	Education
Genetics	Living conditions (including air pollution)
Ethnicity	Working conditions

Possessing one or more risk factors increases a person's risk of developing cardiovascular disease. While some risk factors of CVD have been well reported, notably elevated blood pressure and cholesterol and lifestyle factors, others are emerging. These include:

Genetics

Many cardiac disorders can be inherited, including arrhythmias, congenital heart disease and cardiomyopathies. Children of parents who have both suffered from CVD before the age of 55, have a 50% greater risk of developing CVD than the general population. Individuals with a parent or a sibling who has suffered a stroke are at an increased risk of stroke.

Cancer treatments

Certain cancer treatments, including chemotherapy and radiation, may cause heart problems. Researchers have found that within five years of a cancer diagnosis, people treated with chemotherapy and anthracyclines were three times as likely to develop heart failure than people who had never had cancer.

Kidney disease

Kidneys are important organs in regulating blood pressure. Elevated blood pressure, on the other hand, often causes kidney insufficiency. The heart and kidneys operate closely together, and chronic kidney disease (CKD) and heart disease quite often co-exist, with CKD being the most common co-morbidity of heart failure patients (50%). Data from the US has shown that the prevalence of CVD among people aged 66 and older who have kidney disease is 69.6%.

Diabetes

Over 60 million people in Europe are living with diabetes. The majority of cases are type 2. Among Europeans, the prevalence of diabetes has been skyrocketing. A survey of 17 European countries showed a doubling of the percentage from 1995 to 2014. In Romania, it tripled, while a dramatic four-fold increase was observed in Latvia. People with diabetes have an increased risk of cardiovascular disease, which is the leading cause of death in people with type 2 diabetes.

Sources for the paper

- Ameri P, Canepa M, Anker MS, Belenkov Y, Bergler-Klein J, Cohen-Solal A, Farmakis D, López-Fernández T, Lainscak M, Pudil R, Ruschitska F, Seferovic P, Filippatos G, Coats A, Suter T, Von Haehling S, Ciardiello F, Boer RA de, Lyon AR, Tocchetti CG. *Cancer Diagnosis in Patients With Heart Failure: Epidemiology, Clinical Implications and Gaps in Knowledge*. *Eur J Heart Fail*; 2018; 20:879–887. <https://doi.org/10.1002/ejhf.1165>
- Bowman L, Baras A, Bombien R, Califf RM, Chen Z, Gale CP, Gaziano JM, Grobbee DE, Maggioni AP, Muse ED, Roden DM, Schroeder S, Wallentin L, Casadei B. *Understanding the use of observational and randomized data in cardiovascular medicine*. *Eur Heart J*; 2020. <https://doi.org/10.1093/eurheartj/ehaa020>
- British Heart Foundation. *Heart & Circulatory Disease Statistics 2019*. <https://www.bhf.org.uk/-/media/files/research/heart-statistics/bhf-statistics-compendium-2019-final.pdf?la=en> (accessed on 18 March 2020)
- Capewell S, Graham H. Will Cardiovascular Disease Prevention Widen Health Inequalities? *PLoS Med*; 2010; 7:e1000320. <https://doi.org/10.1371/journal.pmed.1000320>
- European Commission. *EUROCAT: European Network of Population-Based Registries for The Epidemiological Surveillance of Congenital Anomalies*. https://eu-rd-platform.jrc.ec.europa.eu/eurocat_en (accessed on 18 March 2020)
- European Commission. *Causes and occurrence of deaths in the EU*. <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190716-1> (accessed on 26 May 2020)
- European Commission. *Eurostat News Release: Tobacco consumption 1 in every 4 persons aged 15 or over in the European Union is a smoker...and 1 in 5 confronted by passive smoking 2016*. <https://ec.europa.eu/eurostat/documents/2995521/7762296/3-07122016-AP-EN.pdf/e6cf7fd2-06a5-45ba-8385-991bccef54fd> (accessed on 18 March 2020)
- European Heart Network and the European Society of Cardiology. *Red Alert for Women's Hearts 2009*. <http://www.ehnheart.org/projects/euroheart/publications-wp-5-wp-6/117:red-alert-on-womens-hearts.html> (accessed on 18 March 2020)
- European Heart Network. *EHN Paper on Cardiac and Stroke Rehabilitation 2018*. <http://www.ehnheart.org/patients/papers/1166:revised-ehn-paper-on-cardiac-and-stroke-rehabilitation.html> (accessed on 18 March 2020)
- European Heart Network. *European Cardiovascular Disease Statistics 2017*. <http://www.ehnheart.org/cvd-statistics/cvd-statistics-2017.html> (accessed on 18 March 2020)
- European Heart Network. *European Heart Network. EHN Paper on Electronic Cigarettes and Cardiovascular Disease 2019*. <http://www.ehnheart.org/publications-and-papers/publications/1241:electronic-cigarettes-and-cardiovascular-disease.html> (accessed on 18 March 2020)
- European Heart Network. *Transforming European Food and Drink Policies for Cardiovascular Health 2017*. <http://www.ehnheart.org/publications-and-papers/publications/1093:transforming-european-food-and-drinks-policies-for-cardiovascular-health.html> (accessed on 18 March 2020)
- European Medicines Agency. *EMA Annual Report 2018*. <https://www.ema.europa.eu/en/news/ema-annual-report-2018-published> (accessed on 18 March 2020)
- European Research Area Network on Cardiovascular Diseases. *ERA-CVD Strategic Research Agenda (SRA-CVD): Challenges and Opportunities for Cardiovascular Disease Research 2019*. <https://www.era-cvd.eu/396.php> (accessed on 18 March 2020)
- European Society of Cardiology. *ESC Cardiovascular Realities 2019*. <https://www.escardio.org/Research/ESC-Atlas-of-cardiology> (accessed on 18 March 2020)
- Fanaroff AC, Califf RM, Windecker S, Smith SC Jr, Lopes RD. *Levels of Evidence Supporting American College of Cardiology/American Heart Association and European Society of Cardiology Guidelines, 2008–2018*. *JAMA*; 2019; 321:1069–1080. <https://doi.org/10.1001/jama.2019.1122>
- Fordyce, C. B., et al. *Cardiovascular Drug Development: Is it Dead or Just Hibernating?* *J Am Coll Cardiol*; 2015; 65:1567–1582. <https://doi.org/10.1016/j.jacc.2015.03.016>
- Hall M, Dondo TB, Yan AT, Mamas MA, Timmis AD, Deanfield JE, Jernberg T, Hemingway H, Fox KAA, Gale CP. *Multimorbidity and Survival For Patients with Acute Myocardial Infarction in England and Wales: Latent Class Analysis of a Nationwide Population-Based Cohort*. *PLoS Med*; 2018; 15:e1002501. <https://doi.org/10.1371/journal.pmed.1002501>
- Institute for Health Metrics and Evaluation. *Global Burden of Disease database 2017*. <http://www.healthdata.org/gbd> (accessed on 18 March 2020)

- Landray MJ, Bax JJ, Alliot L, Buyse M, Cohen A, Collins R, Hindricks G, James SK, Lane S, Maggioni AP, Meeker-O'Connell A, Olsson G, Pocock SJ, Rawlins M, Sellors J, Shinagawa K, Sipido KR, Smeeth L, Stephens R, Stewart MW, Stough WG, Sweeney F, Van de Werf F, Woods K, Casadei B. *Improving Public Health by Improving Clinical Trial Guidelines And Their Application*. *Eur Heart J*; 2017; 38:1632–1637. <https://doi.org/10.1093/eurheartj/ehx086>
- Mackenbach JP. *Health Inequalities: Europe in Profile 2006*. https://www.who.int/social_determinants/media/health_inequalities_europe.pdf (accessed on 18 March 2020)
- McClellan M, Brown N, Califf RM, Warner JJ. *Call to Action: Urgent Challenges in Cardiovascular Disease: A Presidential Advisory From the American Heart Association.*, *Circulation*; 2019; 139: e44–e54. <https://doi.org/10.1161/CIR.0000000000000652>
- National Cancer Institute. *Higher Risk of Heart Failure Seen in Some Cancers 2018*. <https://www.cancer.gov/news-events/cancer-currents-blog/2018/increased-heart-failure-risk> (accessed on 18 March 2020)
- National Institute of Diabetes and Digestive and Kidney Diseases. *Kidney Disease Statistics in the United States 2016*. <https://www.niddk.nih.gov/health-information/health-statistics/kidney-disease> (accessed on 18 March 2020)
- Raleigh V. 108. *Trends in life expectancy in EU and other OECD countries: Why Are Improvements Slowing?* OECD Health Working Papers 2019; No. 108. https://www.oecd-ilibrary.org/social-issues-migration-health/trends-in-life-expectancy-in-eu-and-other-oecd-countries_223159ab-en
- Rose G. *Strategy of Prevention: Lessons from Cardiovascular Disease*. *Br Med J (Clin Res Ed)*; 1981; 282:1847–51. <https://doi.org/10.1136/bmj.282.6279.1847>
- Streng KW, Nauta JF, Hillege HL, Anker SD, Cleland JG, Dickstein K, Filippatos G, Lang CC, Metra M, Ng LL, Ponikowski P, Samani NJ, Veldhuisen DJ van, Zwinderman AH, Zannad F, Damman K, Meer P van der, Voors AA. *Non-Cardiac Comorbidities in Heart Failure with Reduced, Mid-Range and Preserved Ejection Fraction*. *Int J Cardiol*; 2018; 271: 132–139. <https://doi.org/10.1016/j.ijcard.2018.04.001>
- Timmis A, Townsend N, Gale CP, Torbica A, Lettino M, Petersen SE, Mossialos EA, Maggioni AP, Kazakiewicz D, May HT, De Smedt D, Flather M, Zuhlke L, Beltrame JF, Huculeci R, Tavazzi L, Hindricks G, Bax J, Casadei B, Achenbach S, Wright L, Vardas P, Mimosza L, Artan G, Aurel D, Chettibi M, Hammoudi N, Sisakian H, Pepoyan S, Metzler B, et al. *European Society of Cardiology: Cardiovascular Disease Statistics 2019*. *Eur Heart J*; 2020; 41:12–85. <https://doi.org/10.1093/eurheartj/ehz859>
- Wallentin L, Gale CP, Maggioni A, Bardinet I, Casadei B. *EuroHeart: European Unified Registries on Heart Care Evaluation and Randomized Trials*. *Eur Heart J*; 2019; 40:2745–2749. <https://doi.org/10.1093/eurheartj/ehz599>
- World Health Organisation. *Saving Lives, Spending Less: A Strategic Response to Noncommunicable Diseases 2018*. <https://apps.who.int/iris/bitstream/handle/10665/272534/WHO-NMH-NVI-18.8-eng.pdf?ua=1> (accessed on 18 March 2020)
- World Health Organization. *Global Recommendations on Physical Activity for Health 2010*. https://www.who.int/dietphysicalactivity/factsheet_recommendations/en/ (accessed on 18 March 2020)
- World Heart Federation. *Risk Factors 2017*. <https://www.world-heart-federation.org/resources/risk-factors/> (accessed on 18 March 2020)



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