

EAS Updates



Taking action: European Atherosclerosis Society targets the United Nations Sustainable Development Goals 2030 agenda to fight atherosclerotic cardiovascular disease in Europe

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1. Introduction

In 2015, the United Nations launched the Sustainable Development Goals 2030 Agenda as a universal call to action to end poverty, protect the planet, and improve the lives and prospects for all [1]. The 17 goals of this Agenda, adopted by all United Nations (UN) member states, are to be delivered within 15 years. As only 10 years remain, accelerated action is needed, with world leaders calling for a Decade of Action in 2019 to achieve these goals. According to the UN Secretary-General, urgent action is needed on three levels: 1) globally, to secure greater leadership, more resources and smarter solutions; 2) locally, to ensure smooth transition in policies, budgets, institutions and regulatory frameworks of governments, cities and local authorities; and 3) societally, to ensure an unstoppable movement of change by targeting all stakeholders. In accordance with its mission, the European Atherosclerosis Society (EAS) has committed itself to the Sustainable Development Goals 2030 Agenda and will act on all three levels.

Of paramount importance for the EAS is the third goal of the Sustainable Development 2030 Agenda, Good Health and Well-Being. Ensuring healthy lives and promoting well-being—for all genders,

ethnicities, social classes, and ages—with universal access to healthcare is crucial, since low socioeconomic status is an important risk factor for atherosclerotic cardiovascular disease (ASCVD). Yet in 2017, less than half of the global population received essential healthcare services, and this is not likely to change much by 2030. Furthermore, the EAS should contemplate how to help develop screening and implementation for primary care in low income countries. Combatting newly described environmental risk factors, such as air pollution and noise, is also becoming important.

A key target of the Good Health and Well-Being goal is reducing by one-third premature mortality from non-communicable disease (NCD), the major cause of death globally [2–5]. Preventing, treating and promoting mental health and well-being, particularly in lower- and middle-income (LMI) countries are essential. Early detection and management of determinants of health, and support for research, development, and access to medicines for NCDs that primarily affect these countries are needed. Legacy and succession planning ensure sustainability; expanding scholarships to developing countries, particularly under-resourced areas such as sub-Saharan Africa, is one approach to this.

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2. Atherosclerotic cardiovascular disease: a global issue

Cardiovascular disease is one of the major NCDs, with ASCVD, which includes ischaemic heart disease and ischaemic stroke, among the most prevalent. As the underlying risk factors become more common, ASCVD poses a threat to health in most regions of the world [6,7]. Superimposed on this is a global health crisis unlike any other caused by a communicable disease (COVID-19), which causes human suffering, destabilises the global economy, and overturns the lives of almost every person. Patients with pre-existing ASCVD and cardiometabolic diseases (CMD) have an increased propensity for worse outcomes from COVID-19 [8].

The Global Burden of Disease (GBD) Study is an unparalleled resource for trends in the major causes of death, disability and associated risk factors [4,6,9], as well as access to quality healthcare [10]. These data provide the foundation for global, regional, and national health policies for tackling ASCVD, the leading cause of disease burden in the world. In 2019, ASCVD was responsible for about one-third of all deaths, 8.9 million among women and 9.6 million among men [5], with more than one in 20 deaths in those younger than 50 years [5].

The situation is complicated by evidence suggesting that improvement in ASCVD mortality in high-income countries achieved over the last 40 years is declining, as ASCVD events increase [5]. Superimposed on this is an epidemic of ASCVD and CMD in LMI countries, driven by rapid urbanisation, adoption of westernised energy-dense diets (high-fat, high-sugar and excess calories), and sedentary lifestyles. CMD comprises various adverse health profiles including metabolic syndrome, type 2 diabetes mellitus and non-alcoholic fatty liver disease/non-alcoholic steatohepatitis. In addition, air pollution, together with a shift in tobacco marketing toward LMI countries due to restrictive regulation in high-income countries, also negatively impact the ASCVD epidemic [11].

Until recently, the lack of reliable definition of dietary patterns across regions hampered efforts to evaluate the impact of diet on global health [9]. The GBD initiative addressed this by systematically collecting data from 195 countries to characterise intake of 15 foods and nutrients that are either underconsumed (i.e., fruits, vegetables, legumes, whole grains, nuts and seeds, milk, fibre, calcium, omega-3 fatty acids from seafood, and polyunsaturated fatty acids) or overconsumed (i.e., red meat, processed meat, sugar-sweetened beverages, *trans*-fatty acids, and sodium). It is clear that trends in ASCVD, and more generally cardiovascular disease, reflect dietary risks. In 2019, nearly 8 million deaths were potentially attributable to dietary risks, reflecting increases in absolute and relative (by almost 50%) ASCVD burden over the last 30 years [5]. The GBD initiative also analysed how low socioeconomic and education status impacted the ability to access healthy diets, as well as the roles of physical activity, smoking, and air pollutants. Clearly, much of the global disease burden is preventable by optimising/correcting diet, lifestyle, and environmental factors, as the fundamental foundation for effective prevention strategies [12].

3. Challenges in Europe

Industrialisation, urbanisation and economic development in Europe have led to substantial social transition in Europe. Like other high-income regions, affluence has had benefits, improving health outcomes and life expectancy. Better management of risk factors led to a decline in the age-standardised incidence of ASCVD events and cardiovascular death, especially in Northern and Western European countries [2]. For example, in Finland, a comprehensive national prevention programme led to population decreases in serum cholesterol, blood pressure, and smoking, as well as 84% reduction in coronary mortality, between 1972 and 2014 [13].

Individual countries in Europe are at different stages of transition in the prevalence of risk factors, prevention strategies and policy. Despite this, efforts over the past 20 years have favourably impacted major risk factors for ASCVD [14]; currently ~24% are smokers, 23% have raised

blood pressure and 16% have elevated total cholesterol ≥ 6.2 mmol/L (Fig. 1) [15–17]. Such gains have been achieved using a variety of strategies. These include, for smoking, targeted taxation and pricing of tobacco products, the introduction of plain packaging, and bans on tobacco advertising; and for blood pressure, reformulation of food products with less salt, and implementation of guidelines. Elimination of industrial *trans*-fats, improved package labelling, and public education programmes, with better treatments and attention to patient compliance, have contributed to a decrease in median cholesterol levels in Europe, from 5.5 to 5.1 mmol/L [16]. However, affluence has also negatively impacted other areas. Europe is facing a crisis in obesity and diabetes, with the median age-standardised prevalence increasing 2–3-fold over the last 30 years [16]. Diabetes affects 3.9% of the global population, but 7.3% of those in Europe [17]. Overall, one in three adults living in Europe, higher among women, have insufficient physical activity levels [16]. Fat and energy consumption are also increasing in Eastern Europe.

With inpatient care accounting for over 50% of the total ASCVD healthcare expenditure in Europe, preventive strategies offer a cost-effective approach to reducing disease and improving quality of life. Studies such as EUROASPIRE and EURIKA, which track the clinical implementation of scientific knowledge on lifestyle, treatment and risk factor control, are crucial to fill the gaps between the science and what is done in clinical practice. Fighting obesity and diabetes at both the individual and population level has involved targeting the food industry to implement better diets, and promoting physical activity from very early in life.

4. Challenges in low- and middle-income countries

NCD is a growing problem in LMI regions [18], accounting for ~80% of global deaths from ASCVD [4]. Metabolic risk factors, such as high cholesterol, raised systolic blood pressure, and increased body mass index (BMI), are now as common in these regions as in high-income countries. Between 1990 and 2017, the summary exposure value (SEV), a risk-weighted prevalence measure, showed a doubling of BMI in 47 countries, of which 37 had a socio-demographic Index (SDI) less than the median [19].

Importantly, trends in metabolic risk are outpacing expectations based on development [19]. Therapeutic management of high cholesterol and raised blood pressure, although easy to implement and cost-effective, is inaccessible for many [10,20]. Public health preventive efforts should be guided by income-related trends (measured by SDI). For example, given that SEVs for smoking are higher for men than women at all SDI levels, anti-smoking interventions in LMI regions should primarily target men to be most effective, whereas in higher-income regions both men and women should be targeted similarly [19].

5. Affordability is crucial

Critical to efforts to improve global health are cost-effective prevention strategies and efficient delivery of therapies across different income regions. Aggressive education and prevention, with early treatment, are essential to ensure ‘no-one is left behind’ in meeting the Sustainable Development Goals 2030 Agenda.

Affordability is a particular issue for LMI regions. Premature NCD mortality in LMI countries is more than double that of high-income countries [5], due in part to poor access to healthcare services. As recognised by the UN, this needs urgent action (*UN General Assembly. High-level meeting on prevention and control of non-communicable diseases; New York, USA; Sept 19–20, 2011*). Even if there is access to healthcare, long-term unaffordability of effective preventive therapies is a major deterrent. According to the nine global World Health Organization (WHO) targets for 2025, 50% of eligible individuals should receive drug therapy and counselling to prevent ASCVD [21]. Yet the reality is in

Age-standardised population estimates
for WHO Europe region (%)

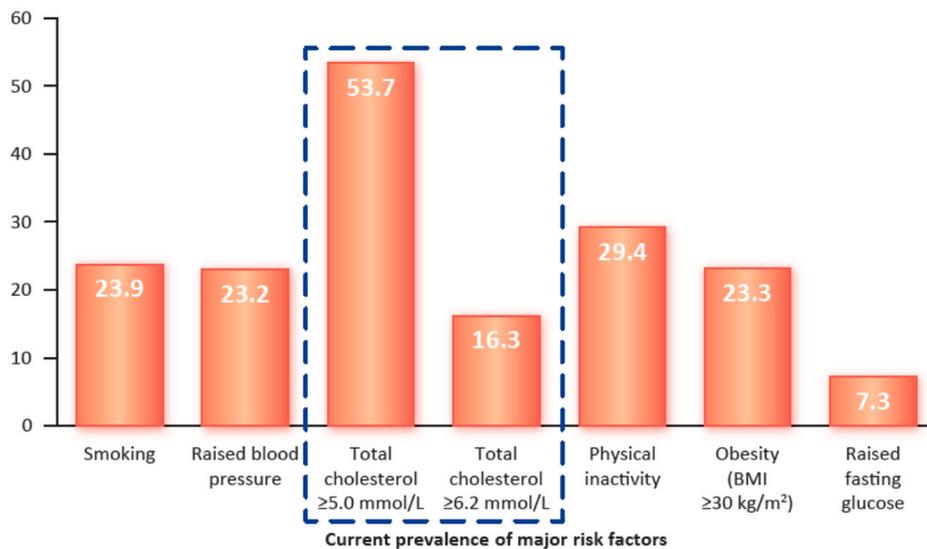


Fig. 1. Current prevalence of cardiovascular risk factors in Europe.

Latest age-standardised estimates for the World Health Organization Europe region, derived from World Health Organization data and statistics. Health 2020 Indicators, and Non-communicable diseases: risk factors and diabetes prevalence [15–17].

Raised blood pressure is defined as systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg; raised fasting glucose is defined as ≥ 7.0 mm/L.

stark contrast. The Prospective Urban Rural Epidemiology (PURE) study showed that secondary prevention medicines (aspirin, beta-blockers, angiotensin-converting enzyme inhibitors, and statins) were either unavailable or unaffordable in over 80% of communities and households in 18 middle-income, lower middle-income, and low-income countries [22]. Among individuals reporting ASCVD, inequalities in socioeconomic status clearly impacted the use of these therapies [23]; only 2% of those in Tanzania versus 91% in Sweden received at least one medicine, and none in South Africa, Tanzania, and Zimbabwe versus 49% in Canada received all three. The strongest predictors of inequality were public health expenditure and overall use of secondary prevention medicines [23].

Universal health coverage will slowly heal some of these disparities. Healthcare systems should focus on screening, improving health literacy and, where needed, using inexpensive combinations of generic therapies which lower cholesterol and blood pressure [24–26]. Polypills offer the advantages of lower cost and reduced pill burden, thus improving adherence. In intermediate-risk subjects, intervention with a polypill decreased the risk of cardiovascular events by 20% [27]. Using information on genetic variants for early targeting of cholesterol and blood pressure could substantially decrease the number of coronary heart disease events and thus reduce the global burden of ASCVD [28]. The challenge is reliance on self-management of essentially a silent condition, as risk factor control offers no immediate health benefits or feeling of well-being. Greater use of polypill-like strategies should be accompanied by methods to improve adherence, possibly with digital health tools readily available on smart phones. In addition, emerging therapies with a long duration of efficacy after single administration offer promise. While cost needs to be addressed, the use of such therapies would enable healthcare assistants, pharmacists and nurses in remote areas to lower cholesterol through a single injection each year. If repeated annually, population-level coverage to lower exposure may be achieved [29,30]. These therapies could work well (cost permitting), tapping into infrastructure that already delivers vaccination programmes or deals with communicable disease outbreaks.

6. The role of the EAS

The importance of ASCVD prevention is well recognised in Europe and a driver for policy change. Research on ASCVD (and CMD) has been funded by the European Union since 1984. In 2004, the European

Council adopted promotion of heart health, and in 2007 the European Parliament Resolution called for action to tackle ASCVD. Together, these actions have underpinned the development of heart health policies for risk-factor management and prevention in several European countries. Academic societies, such as the EAS and the European Society of Cardiology, have played a key role in developing guidelines for ASCVD prevention, and revising these in accordance with new information, as well as implementing programmes essential for benchmarks of best practice in Europe.

Aligning with its mission to advance and exchange knowledge on the causes, risk factors, prevention and treatment of ASCVD, the EAS has made, and continues to make, important contributions in research, education, and advocacy to reduce the burden of ASCVD in Europe. Insights from EAS consensus papers about lipid and lipoprotein-related risk factors and their management have been translated to guidelines [12,31]. Collaboration between the EAS-led Familial Hypercholesterolemia Studies Collaboration (FHSC), the largest global database on familial hypercholesterolemia (FH), patient organisations and the World Heart Federation, led a global call to action on FH [32]. Education, either face-to-face, online, or via the yearly EAS congress, allows scientists and healthcare professionals to keep up to date on the latest developments and best practice. Finally, the EAS offers support via grants and educational programmes tailored to the needs of young scientists and healthcare professionals.

7. Smart EAS-led approaches for global health

This proactive role of the EAS is crucial to achieving the UN Sustainable Development Goals 2030 Agenda. Underpinned by fundamental pillars (Fig. 2), EAS-led sustainable strategies will ensure cost-effectiveness and affordability, taking into account cultural and socioeconomic diversity across Europe. A key pillar of these activities is clinical guidance for the most effective primary prevention strategies targeting all modifiable ASCVD risk factors, including environmental risk factors.

Research initiatives, such as the FHSC and the more recently launched homozygous FH International Clinical Collaboration (HICC) registry, are fundamental to change [33]. By driving the development of a network of lipid clinics and referral centres for genetic testing in various countries, ensuring wider access to specialist services for FH diagnosis and management, the FHSC will raise standards of care for FH

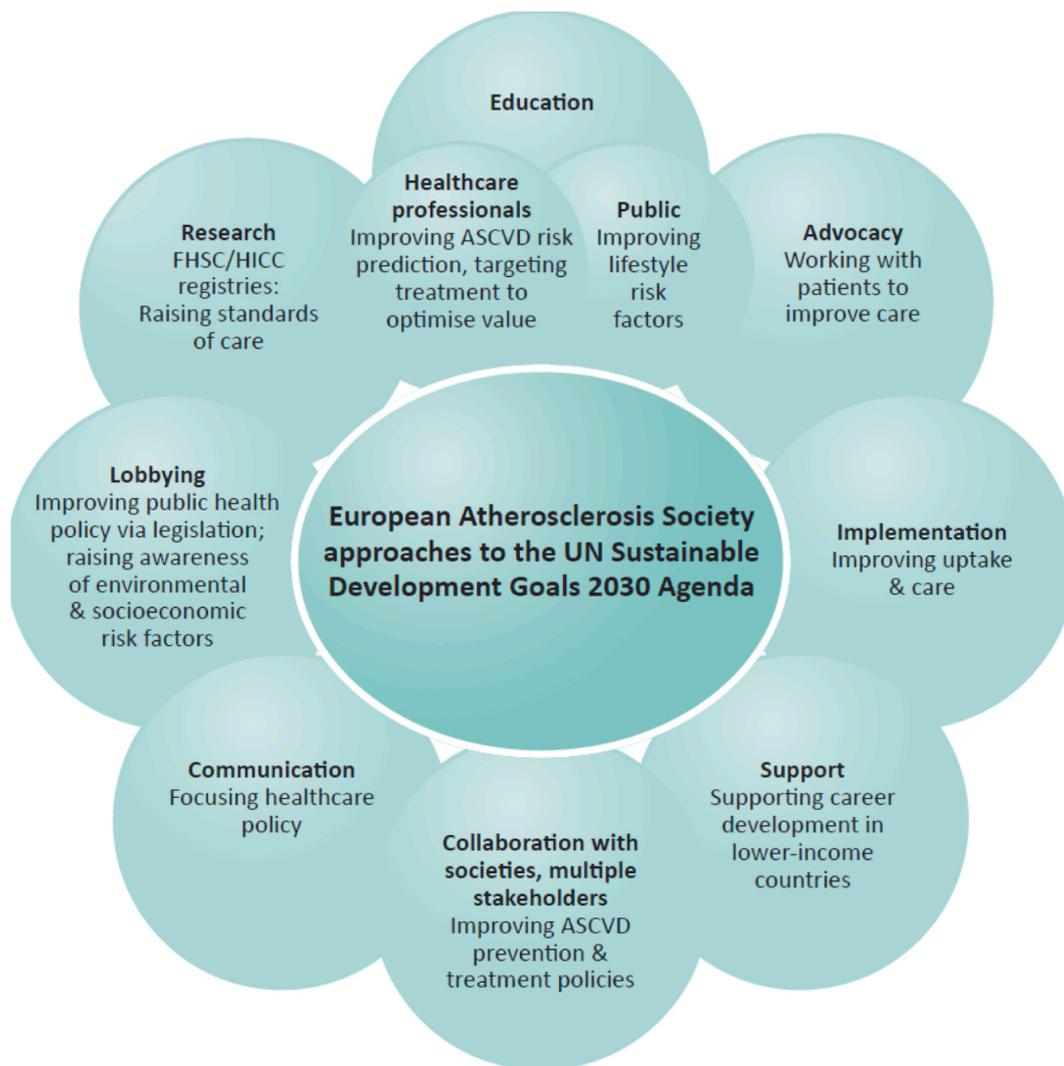


Fig. 2. Pillars of the European Atherosclerosis Society SMART approaches. These activities are crucial to achievement of the UN Sustainable Development Goals for ASCVD as part of the 2030 Agenda.

in Europe and beyond. Building on the success of the FHSC, future EAS plans include registries for rare genetic disorders of lipid metabolism, involving patients from various countries, including LMI regions. Collaboration between the EAS and other academic societies is critical to evaluating polygenic ASCVD risk scores to select the most appropriate for improving the precision of prevention and treatment policies.

Education using smart strategies represents another EAS pillar for achievement of global health. Education initiatives directed not only to healthcare professionals and researchers, but also to decision makers and the general population, aim to increase awareness of the role of lifestyle risk factors (e.g., smoking, poor quality diets, and physical inactivity), environmental risk factors (e.g., air pollution by particulate matters and fuel exhausts), and low socioeconomic status.

Optimising the value of more expensive therapies by specifically targeting those that derive greatest benefit, is particularly important for LMI countries. Key to success is collaboration with national atherosclerosis societies worldwide, so that healthcare professionals of these countries can take advantage of the myriad of EAS educational activities. Supporting career development of high-quality young scientists, especially those from LMI countries where funding is difficult to secure, is another pillar of EAS smart approaches to achieve the Sustainable Development Goals 2030 Agenda.

8. Conclusion

Globally, achievement of the UN Sustainable Development Goals 2030 Agenda will only be possible by collaboration on multiple levels among different stakeholders. Academic societies such as the EAS have a vital part to play, in contributing and implementing scientific evidence. While the current pandemic has hampered some of these efforts, the pillars of education, research, communication and collaboration are crucial to better implementation of clinical guidance and achievement of these global goals.

Declaration of competing interest

PP: have equity interests in Galmed Pharmaceuticals; has ownership in Lipoprotein Research Stockholm AB; has ownership of patent Japanese Patent No. 2020-011068; company consultant at Ambys Medica; has received company speaker honorarium from Sanofi; received research grants from Boehringer Ingelheim AB and Akcea.

RFS: discloses company consultancy at Novo Nordisk Scientific advisory board; has received company speaker honorarium from Amgen.

AT: discloses activity as company consultant at Elpen, Libytec and Galenica SA; has received company speaker honorarium from Libytec, Elpen and Amarin; received support in form of fellowship/travel grants

from Elpen and Galenica SA; has received research grants from Libytec, Elpen, AstraZeneca and Epsilon Health.

PM: company consultant at Akcea int, Akcea France, Boehringer and Sanofi; has received company speaker honorarium from Akcea int, Novo Nordisk, MSD, Akcea France and Sanofi; participation in clinical trials with Amgen, Novo Nordisk and Sanofi; has received support in form of fellowship/travel grants from Boehringer, Janssen and MSD; has received research grants from Akcea France.

AvE: company consultant at Amgen Switzerland, Sanofi-Aventis Switzerland, Daiichi Switzerland; has received company speaker honorarium from Amgen Germany and Sanofi-Aventis.

CB: company consultant at Akcea, Daiichi-Sankyo and Amgen; has received company speaker honorarium from Amgen and Novartis.

AC: company consultant at Akcea, Amgen, Esperion, Sanofi, MSD, Mylan, Regeneron, Daiichi-Sankyo, Menarini; has received company speaker honorarium from Akcea, Amgen, Sanofi, Esperion, Kowa, Novartis, Medco, MSD, Mylan, Menarini, Recordati, Regeneron, Daiichi-Sankyo, AstraZeneca, Aegerion, Amryt; research grants from Sanofi, Regeneron, Amgen, Mylan, Menarini, Eli Lilly; received honorarium from Akcea, Amgen, Sanofi, Esperion, Kowa, Novartis, Mylan, Menarini, MSD, Recordati, Regeneron, Daiichi-Sankyo, AstraZeneca, Aegerion, Amryt.

KR: has equity interests in Pemi31 Therapeutics, NewAmsterdam Pharma and Cargene; company consultant at Regeneron, Sanofi, Amgen, Ionis, Lilly, Cerenis, Abbott, Kowa, Pfizer, Abbvie, Novo Nordisk, BI, Akcea, Novartis, Bayer, MSD, Esperion, Daiichi-Sankyo; has received company speaker honorarium from Dr Reddys, Lupin, Zuellig Pharma, Pfizer, AZ, Amgen, Kowa, Sanofi, Cipla, BI, Novartis, Novo Nordisk, Daiichi-Sankyo; received research grants from Amgen, Regeneron, Daiichi-Sankyo, Sanofi. He is also the president of the European Atherosclerosis Society.

LT: company consultant at Abbott, Amgen, Bayer, MSD, Mylan, Sanofi; has received company speaker honorarium from Abbott, Actelion, Amgen, Bayer, Daiichi-Sankyo, MSD, Mylan, Novartis, Novo Nordisk, Sanofi, Servier, Pfizer, Recordati; trial participation Amgen.

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