

Variations in cardiovascular disease outcomes across Europe

Cardiovascular diseases and health inequalities in Europe—a pressing public health challenge

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Cardiovascular diseases are a leading cause of mortality in Europe. Extensive research has elucidated risk factors and preventive strategies. Incidence of cardiovascular diseases have decreased in several developed countries over recent decades. However, progress has been disproportionately slow in disadvantaged groups as low-income and immigrant populations.

Four papers in this Series provide an overview of the cardiovascular disease inequalities across Europe and the association between cardiovascular disease and social disparities.^{1–4} Hoejstrup et al. focus on Nordic countries,¹ where inequality in access to care persists despite universal healthcare. Patients with low socioeconomic position, mental illness, or immigrant status receive inadequate care, leading to poor outcomes.¹ Despite the highly evolved healthcare systems of the Nordic countries, relative cardiovascular mortality risks remain between 1.6 and 2.1 for persons with a low level of education compared with the highly educated. The gap in life expectancy between highly educated men and those with a low level varies between 4.0 years in Sweden and 5.1 years in Finland (with a slightly lower disparity for women).¹ The persistence of inequality may be an example of the Nordic paradox, *i.e.*, the introduction of the welfare state in the 1960s and 1970s improved overall mortality, but mortality rates remained high in lower socioeconomic classes.⁵ As interpreted by Hoejstrup et al., the persistent inequality in cardiovascular disease mortality may be explained by the higher prevalence of smoking, unhealthy diets, alcohol consumption, physical inactivity, and obesity in socially disadvantaged subgroups, but also by a complex interplay between genetics, childhood environment, material living conditions, social and psychological factors, and access to health care.^{1,5} Although attempts have been made to reduce health inequality, concrete actions remain limited.⁵

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To narrow the socioeconomic gap, it is essential to implement targeted policies addressing behavioural risk factors, particularly in younger adults, and to introduce interventions that reduce structural barriers and improve access to healthcare for those facing the greatest need.

Nadarajah et al. describe disparities in cardiovascular care in the UK.² Their paper bears witness to the association between inconsistent care delivery among health providers and variation in mortality rates.² In contrast, ethnic minorities received comparable treatment quality for myocardial infarction and were found to have a fatality rate similar to Whites. This result differs from that of a meta-analysis of 41 studies, which found a relative risk of 1.32 (95% CI 1.14–1.54) for cardiovascular mortality in South Asia.⁶ Yet in a subgroup analysis, the meta-analysis reported that South Asian patients in North America had lower cardiovascular mortality than Whites. Thus the location of health care providers and social factors may influence the prognosis for minorities.

Lenko et al. examine Eastern European countries,³ pointing out large variations in ischemic heart disease prevalence and mortality. They report the highest disease burden for countries in North Eastern Europe. Interestingly, Eastern European countries with a high ischemic heart disease (IHD) prevalence rates had high percutaneous coronary intervention (PCI) rates. For example, Estonia and Poland had PCI rates of 219.9 and 258.8, respectively, and the rate ratios between IHD prevalence and PCI per 100,000 inhabitants were quite similar: 4.1% and 3.5%. However, while Estonia and Poland provide adequate access to acute healthcare and spend similar amounts on public health, the 30-day mortality rate after acute myocardial infarction was 9.2% for Estonia and 4.7% for Poland. The network of PCI centres across Poland established to manage IHD events may explain this difference. To bridge the gap between Poland and other Eastern European countries, the authors propose that a network of PCI centres be supported by an efficient patient transportation system, availability of reperfusion therapies, and enhanced data reporting for monitoring treatment quality.³ In addition, public health initiatives targeting improvements in lifestyle, in access to healthcare, and in length of waiting lists may help to decrease mortality.³

Timmis et al. compare cardiovascular disease occurrence, risk factors, and healthcare utilization across



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Western and Southern European countries.⁴ While trends in cardiovascular disease and related risk factors declined in the two regions from 1990 to 2019, Western European countries spent twice as much on healthcare in 2019 and had higher cardiovascular-related procedure rates compared with Southern European countries.⁴ Addressing inequalities in availability of diagnostic and therapeutic technologies would require financial support in every European country. At the same time, strategies to reduce unhealthy behaviour may be at least as efficient for further reducing mortality.³ This is supported by research showing that much of the decline in mortality cannot be explained by new medications and improved medical care, but rather by the success of public health measures.⁷

The four papers present compelling evidence of the widening gap in cardiovascular and other chronic disease outcomes between advantaged and disadvantaged subgroups across Europe. In contrast to the availability of strong epidemiological data, progress in implementing effective and targeted preventive measures and policies is lagging. Action is needed that takes a broad perspective, addressing not only proximal risk factors (*i.e.*, tobacco use, lack of physical activity, and unhealthy diet), but also key mediators. As the papers note, the latter include environmental, economic, and sociocultural factors linked to stress, social isolation, and depression, which are highly prevalent in vulnerable populations. As early life exposures influence chronic diseases in later life,⁸ prevention should start early in life, and include programs to reduce social and behavioural exposure to risk factors. Such programs also need to acknowledge and address multimorbidity (the presence of two or more co-existing chronic diseases), which is associated with adverse health outcomes and poor quality of life.⁹ On average, 16–20% of the lifespan is now spent with late-life morbidity, particularly in individuals with lower socioeconomic status.⁹ In most European health systems, clinical guidelines are still organized following a single-disease approach—not optimal for treating coronary heart disease in the presence of multimorbidity.

The link between social factors and cardiovascular disease is strong but complex. As described in the papers and other research, health is unevenly distributed

in Europe.⁵ People with low socioeconomic standing live shorter lives and spend more years with health problems.⁵ Long-standing health inequalities have not disappeared even with the expansion of social programs in the Nordic welfare states.⁵ Inequalities in mortality are unexpectedly large in Northern Europe, surprisingly small in Southern Europe, and massive in Eastern and Central Europe. The substantial evidence base for preventing cardiovascular disease thus must focus on population health outcomes, with action taken at the individual, organizational, and policy levels. A multi-disciplinary approach is needed to ensure equity in healthcare.

Contributors

Both authors contributed equally.

Declaration of interests

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References

- Højstrup S, Thomsen JH, Prescott E. Disparities in cardiovascular disease and treatment in the Nordic countries. *Lancet Reg Health Eur.* 2023;33:100699. <https://doi.org/10.1016/j.lanepe.2023.100699>.
- Nadarajah R, Farooq M, Raveendra K, et al. Inequalities in care delivery and outcomes for myocardial infarction, heart failure, atrial fibrillation, and aortic stenosis in the United Kingdom. *Lancet Reg Health Eur.* 2023;33:100719. <https://doi.org/10.1016/j.lanepe.2023.100719>.
- Cenko E, Manfrini O, Fabian N, et al. Clinical determinants of ischemic heart disease in Eastern Europe. *Lancet Reg Health Eur.* 2023;33:100698. <https://doi.org/10.1016/j.lanepe.2023.100698>.
- Timmis A, Kazakiewicz D, Torbica A, et al. Cardiovascular disease care and outcomes in West and South European countries. *Lancet Reg Health Eur.* 2023;33:100718. <https://doi.org/10.1016/j.lanepe.2023.100718>.
- Mackenbach JP. *Health inequalities: persistence and change in European welfare states*. 1st ed. Oxford: Oxford University Press; 2019.
- Patel M, Abatcha S, Uthman O. Ethnic differences between South Asians and White Caucasians in cardiovascular disease-related mortality in developed countries: a systematic literature review. *Syst Rev.* 2022;11(1):207.
- Nabel EG, Braunwald E. A tale of coronary artery disease and myocardial infarction. *N Engl J Med.* 2012;366(1):54–63.
- Barker DJ. Fetal origins of coronary heart disease. *BMJ.* 1995; 311(6998):171–174.
- Jagger C, Gillies C, Moscone F, et al. Inequalities in healthy life years in the 25 countries of the European Union in 2005: a cross-national meta-regression analysis. *Lancet.* 2008;372(9656):2124–2131.