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NAT

Cardiovascular diseases: Regional Prevention and Detection Policies



Cardiovascular diseases: Regional Prevention and Detection Policies

Final Report

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Executive Summary

Cardiovascular diseases (CVDs) are the leading cause of death in the EU and around the world. The irony is that many of these diseases are preventable and they often progress without people noticing their presence when the disease is at an early stage. To put the challenge in perspective, cardiovascular death rates vary by as much as seven to one across different EU regions. A gap that wide shows the EU and its Member States are simply not doing enough to address regional health needs. While cutting-edge medical research and innovation continue to improve patient outcomes, the most effective and affordable approach for CVDs is prevention. This requires a lifelong personal commitment from an early age, as well as comprehensive public policies that tackle environmental and lifestyle risk factors. Prevention and early screening measures are already widely implemented, some of them well known and tested, others very innovative. The innovative element is often not about using some advanced technology, but a new and effective way to engage the public. External incentives, or simply mobilising healthcare services to reach people in everyday settings where they live, commute, work or socialise, can be highly effective in encouraging early health checks and consultations. Local and regional authorities (LRAs) therefore play a vital role in shaping a healthier living environment, particularly for children and vulnerable groups. LRAs are often the initiators of actions but can also be the facilitators of those implemented by other local stakeholders. They should not limit their imagination; instead dream big and design comprehensive plans that not only tackle easy fixes in the short-term but also keep an eye fixed on long-term public health.

List of Acronyms

AI	Artificial Intelligence
BMI	Body-mass index
CAD	Coronary artery disease
CVD	Cardiovascular disease
EEA	European Environment Agency
GDP	Gross Domestic Product
GP	General practitioner
ICD	International Statistical Classification of Diseases and Related Health Problems
LEZ	Low-emission zone
LRA	Local and regional authority
PM2.5	Particulate matter with a diameter of 2.5 µm or less
VAT	Visceral adipose tissue

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1. Introduction

Cardiovascular diseases (hereafter, CVDs) are the leading cause of death worldwide, with 19.8 million people dying from CVDs in 2022.¹ Across the EU Member States, CVDs claim roughly 1.7 million lives each year and cause an estimated EUR 282 billion reduction in productivity and economic output, because of the induced disabilities, early retirement and lower life expectancy caused by CVDs.² This bleak outlook is not inevitable. One could prevent CVDs through proactive changes to our environments and daily habits. Even though healthcare technology advances every day, stopping CVD before it begins is still the cheapest and most effective way to protect one's health.³

To respond to the threat, the European Commission launched the Safe Hearts Plan in December 2025, as a part of the European Health Union. The Plan will build upon existing national and regional efforts across all 27 EU Member States. In response, the European Committee of the Regions decided to draft an opinion reflecting a regional view on cardiovascular health, detailing how cities, villages and regions can act to bolster prevention and improve health outcomes of their citizens.⁴ To provide even more evidence and scientific advice, this study aims to take stock of existing prevention and detection practices and policies implemented or supported by local and regional authorities (LRAs). While high-level policies help direct resources and political attention, healthcare services are ultimately delivered at the local level. This means that LRAs have an important role to play, and their actions can make a real difference. LRAs often lead major public health initiatives in their communities or support and facilitate projects and events launched by the private sector, research institutions, healthcare professionals, and other stakeholders.

The opportunities for action are wide-ranging, from introducing smoke-free public spaces to deploying mobile screening units to helping healthcare projects secure EU funding. Many innovative approaches have already been tested, refined, and successfully scaled. Rather than reinventing the wheel, LRAs can benefit from looking around, learning from their peers, and adapting proven solutions to their own local context. Adaptation is particularly important. Our study shows that regions do not share the same exposure to CVD risk factors. Climate, levels of pollution, economic development, dietary habits, smoking and alcohol consumption, and even local sports culture can all influence a population's susceptibility to CVDs. As a

¹ WHO, [Cardiovascular diseases \(CVDs\)](#), Website, 31 July 2025, accessed 23 April 2026.

² European Commission, [Cardiovascular health](#), Website, accessed 23 April 2026.

³ WHO, [Cardiovascular diseases \(CVDs\)](#), Website, 31 July 2025, accessed 23 April 2026.

⁴ European Committee of the Regions, [DRAFT OPINION - An EU cardiovascular health plan: the Safe Hearts Plan](#), 2026.

result, LRAs should assess the specific determinants affecting their populations to develop the most appropriate combination of prevention and detection policies.

Our study does not seek to prescribe a single formula, as the right policy mix is best determined by policymakers on the ground. Instead, it identifies innovative and effective practices from regions across the EU and neighbouring countries, serving as a repository of CVD prevention and early detection initiatives. In doing so, it aims to help LRAs learn from one another and adapt successful approaches to their own local circumstances.

This study starts by looking at how common CVDs are across EU regions. We then explain possible causes, such as the environment, daily habits, income and social background. Wherever possible, we illustrate links or correlations using data and charts. Next, we present 30 cases of regional policies, actions and practices that aim at responding to the threats and burdens brought by CVDs.⁵ Our study concludes with recommendations and the key message that smart regional planning will be able to reduce risk factors and contribute to nurturing a healthier population.

2. The current situation of cardiovascular diseases across the EU

To develop useful recommendations, our first step is to describe and understand the extent of inequalities of CVDs across the EU regions. Yet, this is not straightforward and requires some explanation. The best measure of a region's CVD burden would be the number of CVD cases (i.e. CVD prevalence), which is often not available for several reasons. CVDs usually develop slowly and show no acute warning signs. Without proper diagnosis, many people have them without their knowledge. Second, the diagnostic technologies and screening practices vary across regions, making regional prevalence data hard to compare. Conversely, deaths and their causes are systematically collected, and the data is publicly available.⁶ CVDs are usually long-term conditions that need ongoing care and so looking only at mortality rates is like looking at the tip of an iceberg; they don't show the massive healthcare costs or the huge efforts spent trying to prevent these diseases in the first place. Still, mortality rates do show us just how heavy this health burden is across different areas. By

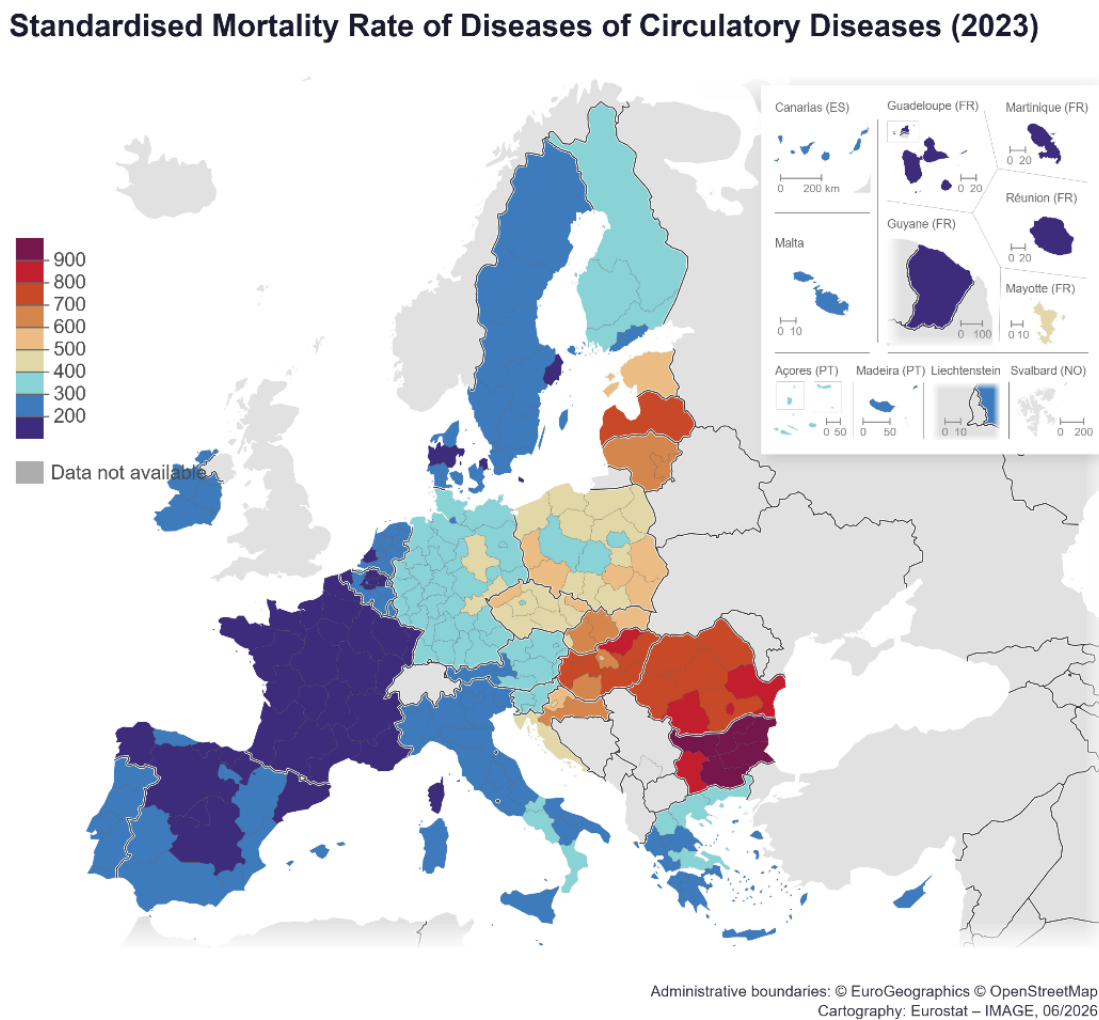
⁵ The latest data on causes of death at the NUTS 2 level was updated as of 2023.

⁶ Eurostat systematically collects from Member States mortality information of a wide range of death causes following the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD 10). Another consideration is the definition of CVDs. According to the WHO, CVDs are a group of disorders of the heart and blood vessels. The best corresponding category of death causes is “diseases of circulatory system” under the ICD10. Note that they are not exactly equivalent but largely considered the best measure of CVDs by researchers and institutions. For example, OECD, [The State of Cardiovascular Health in the European Union](#), OECD Publishing, 2025.

looking at where mortality rates are unequal, we can get a clearer picture of where the biggest gaps in heart healthcare really are.

Figure 1 illustrates the regional differences in CVD mortality rates across the EU.

Figure 1 - Standardised death rate of Diseases of Circulatory System by NUTS 2 (2023)



Source: Author's illustration using data provided by Eurostat

The regional differences in CVD mortality rate show a general East-West divide where Western Europe fares better than Eastern Europe. Bulgaria ranks the worst among all 27 Member States, with its six NUTS 2 regions having the highest CVD mortality rates in Europe (ranging from 820 to 1015 deaths per 100 000 population,

at least 2.3 times the EU average). At the other extreme, three French regions achieved a death rate lower than 150 deaths per 100 000 population, meaning a difference of 6-7 times between the best and the worst regions in the EU. These health differences should be better studied and addressed through policies and actions by governments and institutions.

Many studies have looked at the main risk factors for CVDs. Biological factors are usually the primary focus of medical research. A general conclusion is that males over the age of 65 tend to be at a higher risk of CVDs.⁷ Another major category of risk factors is environmental.⁸ Environmental factors could be natural; sunlight exposure, seasonal change and geographic features of an environment may contribute to the development of CVDs. Meanwhile, modifiable environmental factors, such as the physical characteristics of the built environment and pollution, are also influential. Socio-economic factors also play a significant role in CVDs. The impacts of social isolation, discrimination, ethnicity, socio-economic status, and violence on the incidence of CVDs have been studied in the literature.⁹ Finally, behavioural factors are gaining increasing attention. Unhealthy dietary habits, smoking, alcohol consumption, low fruit and vegetable consumption, are all associated with CVDs, while an unhealthy lifestyle may cause obesity, or raise cholesterol or blood pressure - major predictors of CVDs.¹⁰ Moreover, it is important to recognise that these factors are interrelated and may reinforce or exacerbate one another.

⁷ Scheuner, M.T., Setodji, C.M., Pankow, J.S., Blumenthal, R.S. and Keeler, E., '[General Cardiovascular Risk Profile identifies advanced coronary artery calcium and is improved by family history: the multiethnic study of atherosclerosis](#)', *Circulation: Cardiovascular Genetics*, Vol. 3, Issue 1, 2010, pp.97-105.

⁸ Bhatnagar, A., '[Environmental determinants of cardiovascular disease](#)', *Circulation research*, Vol. 121, Issue 2, 2017, pp.162-180.

⁹ Teshale, A.B., Htun, H.L., Owen, A., Gasevic, D., Phyo, A.Z.Z., Fancourt, D., Ryan, J., Steptoe, A. and Freak-Poli, R., '[The role of social determinants of health in cardiovascular diseases: an umbrella review](#),' *Journal of the American Heart Association*, Vol. 12, Issue 13, 2023, e029765.

¹⁰ Barbaresko, J., Rienks, J. and Nöthlings, U., '[Lifestyle indices and cardiovascular disease risk: a meta-analysis](#)', *American journal of preventive medicine*, Vol. 55, Issue 4, 2018, pp.555-564.

3. Determinants of Cardiovascular Diseases

a. Biological factors

Biological determinants of cardiovascular health include both non-modifiable risk factors, such as age, sex, ethnicity and genetics, and modifiable risk factors, including high blood pressure (hypertension), high cholesterol and high fasting plasma glucose.¹¹ Ageing is the primary cause of the rising burden of cardiovascular diseases.¹² A study expects advances in medical technology would reduce CVD mortality by 30.5% from 2025 to 2050, but, as our populations are getting older the overall number of CVD deaths is still expected to increase.¹³

Men are more likely to report heart conditions (26.9%) and high blood pressure (58.5%) compared to women (16.8% and 49.1% respectively)^{14 15}. However, women under 65 may face higher risk than men influenced by ethnicity, socio-economic status (SES), and underlying health conditions.¹⁶ Moreover, preeclampsia and menopause are associated with higher CVD risk.¹⁷ In Europe, men's CVD mortality rate is generally higher.

Figure 2 illustrates the gender difference by showing the ratio of mortality rate between two genders, where the higher the ratio, the greater the difference between male and female CVD mortality rate. Although France and parts of Spain (Pais Vasco, Comunidad Foral de Navarra, and La Rioja) have lower overall CVD mortality rates, their large male-female differences in mortality rates highlight the comparatively poor cardiovascular health among men in these areas. The difference between the least unequal region (Ionia Nisia, Greece; 1.118) and the most unequal region (Região Autónoma da Madeira, Portugal; 1.862) is substantial. Although we may not be able to pin down the exact reasons, the regional differences may be due to the less salient awareness of heart health among men in those highly unequal regions.

In response to the growing burden of biological risk factors, authorities have placed a strong focus on early detection and management of modifiable risk factors such as

¹¹ OECD, [Designing and implementing effective policies for CVD prevention and control: The State of Cardiovascular Health in the European Union | OECD](#), 2025, p.34.

¹² Ibid.

¹³ Chong, B., Jayabaskaran, J., Jauhari, S.M., Chan, S.P., Goh, R., Kueh, M.T.W., Li, H., Chin, Y.H., Kong, G., Anand, V.V. and Wang, J.W., 'Global burden of cardiovascular diseases: projections from 2025 to 2050', *European Journal of Preventive Cardiology*, Vol. 32, Issue 11, 2025, pp.1001-1015.

¹⁴ OECD, [Patient-Reported Indicator Surveys \(PaRIS\)](#), Website. Accessed 22 June 2026.

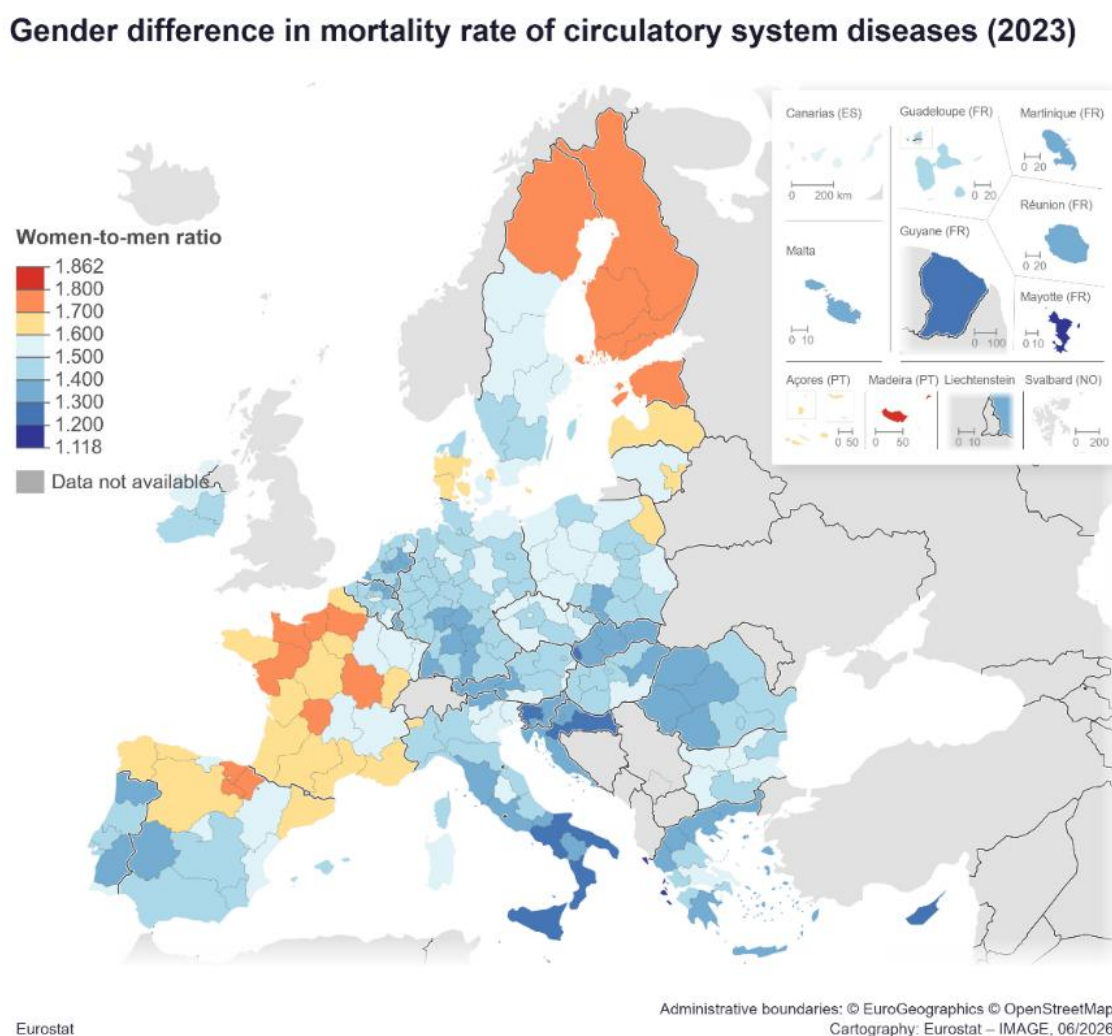
¹⁵ OECD, [Health at a Glance 2025: OECD Indicators](#), 2025.

¹⁶ OECD, [Designing and implementing effective policies for CVD prevention and control: The State of Cardiovascular Health in the European Union](#), OECD Publishing, 2025.

¹⁷ Young, L. and Cho, L., 'Unique cardiovascular risk factors in women', *Heart*, Vol. 105, Issue 21, 2019, pp.1656-1660.

high blood pressure, high cholesterol levels and high fasting glucose (See the Glossary for explanations of these medical terms). For instance, by 2035,¹⁸ Member States should ensure that at least 75% of individuals aged between 25-64 and 90% of those aged 65 and above have their blood pressure measured and monitored regularly; similar goals are also set for cholesterol and fasting blood glucose. Screening initiatives aimed at detecting these biological factors have been implemented in many different EU regions (see the case studies below).

Figure 2 - Gender difference in standardised mortality rate of diseases of circulatory system in EU NUTS 2 regions.



Source: Authors' elaboration and illustration of data provided by Eurostat

¹⁸ European Commission, *EU cardiovascular health plan: the Safe Hearts Plan*, 2025.

Note: The ratio represents the number of CVD deaths among men for each CVD death among women. A ratio larger than one refers to an inequality against men. The higher the ratio the worse the gender inequality.

b. Environmental factors

Environmental factors are major modifiable risks. According to the estimates by the Institute for Health Metrics and Evaluation in 2021, 21% of deaths by stroke and 22% of deaths by ischemic heart disease were attributed to environmental risk factors.¹⁹ ²⁰ In particular, exposure to air pollution, extreme temperatures and noise pollution are all associated with increased risk of CVDs.²¹

Air quality is the most important environmental risk factor for CVDs.²² Pollutants such as fine particulate matter (PM_{2.5}), ozone and nitrogen dioxides are known to be associated with a range of health conditions including respiratory and cardiovascular diseases and several cancers. The harmful effects of air pollution can exacerbate existing inequalities – with vulnerable groups (such as the very young, the elderly, pregnant women and those with pre-existing health conditions) being at greater risk. There is evidence of association between air pollution exposure and socio-economic status, with studies suggesting that poorer communities are more likely to have higher exposure to air pollution.²³ While some aspects of air quality are determined by geography and weather patterns, emissions from industry, energy production, vehicles, and cooking and heating are all sources of pollutants, and can be better managed by national and local authorities and policies.

Most Europeans face an exposure to PM_{2.5} higher than the WHO suggested limits.²⁴ The EEA estimates that 239 000 deaths were attributed to exposure to PM_{2.5} concentrations above the WHO guideline level.²⁵ Figure 3 illustrates the relationship between air pollution (PM_{2.5} concentrations) and CVD mortality rate across EU NUTS 2 regions in 2023. Worse air quality is associated with more CVD deaths, and an East-West divide is also observed with regions of Bulgaria, Hungary and Romania clustered at the top-right of the graph. The worst region is București-Ilfov, Romania, at 16.2 µg/m³, which is 1.76 times of the level of Région de Bruxelles-Capitale,

¹⁹ Institute for Health Metrics and Evaluation (IHME), [GBD Compare](#), Website. Accessed 22 June 2026.

²⁰ European Environment Agency, [Preventing cardiovascular disease through a healthy environment](#), EEA Briefing 15/2025, 2025.

²¹ OECD, *The State of Cardiovascular Health in the European Union*, 2025, p. 181.

²² Franklin, B.A., Brook, R. and Pope III, C.A., ‘[Air pollution and cardiovascular disease](#)’, *Current Problems in Cardiology*, Vol. 40, Issue 5, 2015, pp.207-238.

²³ European Environmental Agency, [Preventing cardiovascular disease through a healthy environment](#), Briefing, 2025.

²⁴ European Environment Agency, [Harm to human health from air pollution in Europe: burden of disease 2024](#), Briefing, 2024.

²⁵ Ibid.

years.²⁷ Meanwhile, cold could be more detrimental to health than heat; roughly 7% of cardiovascular deaths can be attributed to low temperatures.²⁸

While less discussed, noise pollution is also a significant risk factor for CVDs. Noise causes sleep problems, heightened stress hormone levels, and increases oxidative stress in the vasculature and the brain, leading to vascular inflammation and high blood pressure, eventually elevating the risk of CVDs.²⁹ In its report ‘Environmental noise in Europe 2025’ the EEA reported that at least 49 000 new cases of CVDs in Europe in 2021 were associated with the impact of long-term exposure to transport noise, the dominant source of noise pollution. In May 2026, the European Committee of the Regions adopted an opinion that urges the European Commission to revise the Environmental Noise Directive to align the noise exposure thresholds with the WHO recommendations.³⁰

c. Behavioural factors

Behavioural or lifestyle habits are fundamental risk factors for CVDs.³¹ Behavioural choices – such as stopping tobacco use, reducing salt in the diet, consuming a wide variety of fruit and vegetables, regular physical activity and moderating alcohol intake – could reduce the risk of CVDs.³²

Tobacco smoking significantly contributes to CVD risk; the 10-year risk of CVD mortality is twice as high for smokers compared to non-smokers.³³ While smoking prevalence has declined in many high-income countries, Europe remains the world’s largest consumer of tobacco.³⁴ Research shows that smoking increases the risk of almost all CVD subtypes, including heart attacks and stroke.³⁵ Meanwhile, evidence begins to show that electronic cigarettes could also worsen cardiovascular health.³⁶

²⁷ Copernicus, [Heatwaves – a brief introduction](#), Website. Accessed 24 June 2026.

²⁸ European Environmental Agency, [Preventing cardiovascular disease through a healthy environment](#), Briefing, 2025.

²⁹ Münzel, T., Sørensen, M. and Daiber, A., ‘[Transportation noise pollution and cardiovascular disease](#)’, *Nature Reviews Cardiology*, Vol. 18, 2021, pp. 619–636.

³⁰ European Committee of the Regions, [Sound Policies: Protecting Citizens and Nature from Noise Pollution Opinion factsheet](#), Opinions, 2026.

³¹ Mozaffarian, D., Wilson, P. W. and Kannel, W. B., ‘[Beyond established and novel risk factors: lifestyle risk factors for cardiovascular disease](#)’, *Circulation*, Vol. 117, Issue 23, 2008, pp. 3031–3038.

³² World Health Organization, [Cardiovascular diseases \(CVDs\)](#), Fact Sheets, 11 June 2021. Accessed 22 June 2026.

³³ Piepoli, M., Hoes, A., Agewall, S., Albus, C., Brotons, C., Catapano, A., Cooney, M.T., Corra, U., Cosyns, B., Deaton, C. and Graham, I., ‘[2016 European Guidelines on cardiovascular disease prevention in clinical practice](#)’, *European Heart Journal*, Vol. 37, pp. 2315–2381

³⁴ WHO, [Tobacco crisis: WHO European Region projected to remain worst globally by 2030](#), News, 26 February 2026.

³⁵ Banks, E., Joshy, G., Korda, R.J., Stavreski, B., Soga, K., Egger, S., Day, C., Clarke, N.E., Lewington, S. and Lopez, A.D., ‘[Tobacco smoking and risk of 36 cardiovascular disease subtypes: fatal and non-fatal outcomes in a large prospective Australian study](#)’, *BMC Medicine*, Vol. 17, Issue 1, 2019, p.128.

³⁶ Mears, M. J., Hookfin, H. L., Bandaru, P., Vidal, P., Stanford, K. I. and Wold, L. E., ‘[Electronic nicotine delivery systems and cardiovascular/cardiometabolic health](#)’, *Circulation Research*, Vol. 132, Issue 9, 2023, pp. 1168–1180.

The relationship between alcohol consumption and CVDs is less conclusive.³⁷ While some found that moderate drinkers may not have higher risk of CVDs compared to abstainers,^{38 39} alcohol remains a major factor of developing high blood pressure and diabetes.⁴⁰

Obesity (typically defined as a body-mass index (BMI) of 30 or above) is also a complex risk factor for CVDs. While it has long been considered as a major cause of CVDs,⁴¹ recent academic discussions suggest that the accumulation of fat deep inside the abdomen, around internal organs like the liver, intestines, and heart (visceral adipose tissue, or called VAT) and in organs, such as liver (ectopic fat) is one of the root-causes to the increased CVD risk rather than BMI alone. This has led to the rise of the term “normal-weight obesity,” describing individuals with a healthy BMI who still carry high CVD risk due to VAT.⁴² Nevertheless, BMI remains a strong clinical indicator for the prognosis of VAT, including other CVD risk factors such as increased blood pressure, dyslipidaemia, and diabetes.⁴³ With the WHO predicting a rapid increase in BMI across Europe, obesity is becoming a prominent health problem, particularly in Eastern Europe.⁴⁴

Research also finds a connection between adult and childhood obesity.⁴⁵ The European obesity crisis could be turning into a childhood obesity health issue. For children in the EU, this has diverse effects. Compare, for example, Italy and Romania. Recent national studies found the obesity rates in Italy and Romania to be 23%⁴⁶ and 34%, respectively. These trends are reflected in childhood overweight

³⁷ Hoek, A.G., van Oort, S., Mukamal, K.J. and Beulens, J.W., ‘[Alcohol consumption and cardiovascular disease risk: placing new data in context](#)’, *Current Atherosclerosis Reports*, Vol. 24, Issue 1, 2022, pp.51-59.

³⁸ Klatsky, A.L., ‘[Alcohol and cardiovascular diseases: where do we stand today?](#)’, *Journal of Internal Medicine*, Vol. 278, Issue 3, 2015, pp.238-250.

³⁹ Hoek, A.G., van Oort, S., Mukamal, K.J. and Beulens, J.W., ‘[Alcohol consumption and cardiovascular disease risk: placing new data in context](#)’, *Current Atherosclerosis Reports*, Vol. 24, Issue 1, 2022, pp.51-59.

⁴⁰ Matsumoto, C., Miedema, M.D., Ofman, P., Gaziano, J.M. and Sesso, H.D., ‘[An expanding knowledge of the mechanisms and effects of alcohol consumption on cardiovascular disease](#)’, *Journal of Cardiopulmonary Rehabilitation and Prevention*, Vol. 34, Issue 3, 2014, pp.159-171.

⁴¹ Poirier, P. and Eckel, R. H., ‘[Obesity and cardiovascular disease](#)’, *Current Atherosclerosis Reports*, Vol. 4, Issue 6, 2002, pp. 448-453.

⁴² Piché, M. E., Tchernof, A., and Després, J. P., ‘[Obesity phenotypes, diabetes, and cardiovascular diseases](#)’, *Circulation Research*, Vol. 126, Issue 11, 2020, pp. 1477-1500.

⁴³ Shuster, A., Patlas, M., Pinthus, J.H. and Mourtzakis, M., ‘[The clinical importance of visceral adiposity: a critical review of methods for visceral adipose tissue analysis](#)’, *The British Journal of Radiology*, Vol. 85, Issue 1009, pp.1-10.

⁴⁴ EUFIC, [Europe’s obesity statistics: figures, trends & rates by country](#), 17 October 2024. Accessed 22 June 2026.

⁴⁵ Lee JS, Jin MH, Lee HJ. [Global relationship between parent and child obesity: a systematic review and meta-analysis](#). *Clin Exp Pediatr*. 2022 Jan;65(1):35-46. doi: 10.3345/cep.2020.01620. Epub 2021 Mar 29. PMID: 33781054; PMCID: PMC8743427.

⁴⁶ Marcozzi, B., Lo Noce, C., Cardinale, A., Dipol, T., Vannucchi, S., Damiano, C., Galeone, D., Bellisario, P., Palmieri, L. and Donfrancesco, C., ‘[Obesity/overweight measured in adults: Italian Health Examination Survey 2023-2024-CUORE Project](#)’, *European Journal of Public Health*, Vol. 35, Supplement 4, ckaf161.1795.

(including obesity) rates, with Italy having the EU's lowest rate (10.4%) and Romania the highest (31.4%).⁴⁷

Dietary habits with a high intake of fruits, vegetables, whole grains, and lean protein sources are essential for prevention of CVDs. Conversely, low fruit in diet accounts for approximately 7% of deaths of ischemic heart disease and 20–22% of stroke deaths, while diet with high trans fatty acids accounts for roughly 4% of stroke deaths.^{48 49} Likewise, physical inactivity increases the risk of both heart attack and stroke while at the same time exacerbating other risk factors for CVD, such as obesity, high blood pressure and high fat level in blood.⁵⁰

d. Socio-economic factors

Socio-economic status, such as income, profession, or education level, is a modifiable risk factor of CVDs.⁵¹ Income matters in many aspects. Lower-income groups usually face worse health outcomes. Relatively poorer families are often living in “energy poverty”, where individuals cannot afford to maintain safe indoor temperatures, thus increasing exposure to extreme temperatures in multiple European regions, which are both known to raise CVD risk.⁵²

People with lower social- economic status spend a larger portion of their lifespan living with comorbidities and various health problems,⁵³ and consume less fruits and vegetables.⁵⁴ Research across several OECD countries shows that patients with higher socio-economic status often experience shorter wait times for a coronary bypass surgery.⁵⁵ On the other hand, patients of lower socio-economic status face delays in access to healthcare, causing worse healthcare outcomes, higher emergency admission rates, and increased pre-surgical mortality.⁵⁶ In general, less advantaged populations use preventive care less frequently, causing higher rates of undiagnosed or poorly managed risk factors. These gaps were further widened by the COVID-19

⁴⁷ Olaya, B., Moneta, M.V., Pez, O., Bitfoi, A., Carta, M.G., Eke, C., Goelitz, D., Keyes, K.M., Kuijpers, R., Lesinskiene, S. and Mihova, Z., ‘[Country-level and individual correlates of overweight and obesity among primary school children: a cross-sectional study in seven European countries](#)’, *BMC Public health*, Vol. 15, Issue 1, 475.

⁴⁸ Institute for Health Metrics and Evaluation, [GBD Compare](#), Website. Accessed 22 June 2026.

⁴⁹ CardioCare Today. [Fruit & vegetable consumption and cardiovascular deaths](#), Website. Accessed on 23 June 2026.

⁵⁰ Prior, P.L. and Suskin, N., ‘[Exercise for stroke prevention](#)’, *Stroke and Vascular Neurology*, Vol. 3, Issue 2, 2018.

⁵¹ European Environmental Agency, [Preventing cardiovascular disease through a healthy environment](#), 2025.

⁵² Abrignani, M.G., Lombardo, A., Braschi, A., Renda, N. and Abrignani, V., ‘[Climatic influences on cardiovascular diseases](#)’, *World Journal of Cardiology*, Vol. 14, Issue 3, 2022, 152.

⁵³ Jagger, C., Gillies, C., Moscone, F., Cambois, E., Van Oyen, H., Nusselder, W. and Robine, J.M., ‘[Inequalities in healthy life years in the 25 countries of the European Union in 2005: a cross-national meta-regression analysis](#)’, *The Lancet*, Vol. 372, Issue 9656, 2008, pp.2124-2131.

⁵⁴ OECD, [Health at a Glance: Europe 2024: State of Health in the EU cycle](#), 2024.

⁵⁵ <https://www.sciencedirect.com/science/article/abs/pii/S0277953616302714?via%3Dihub> OECD, [The State of Cardiovascular Health in the European Union](#), 2025, p. 268.

⁵⁶ Ibid.

pandemic, which led to disruptions in care delivery and exacerbated socio-economic disparities in cardiovascular outcomes.^{57 58} Indeed, some Eastern European regions, e.g. Nord-Est (Romania), Severozapaden (Bulgaria) and Anatoliki Makedonia (Greece), with higher risk of poverty or social exclusion are also regions with higher cardiovascular mortality rates.⁵⁹

Social inequalities also intersect with gender. Although men generally face higher mortality rates from CVDs, cardiovascular risk factors in women are frequently under-assessed and under-treated compared to men, particularly among low-income women who are also more likely to live with obesity.^{60 61} Furthermore, women in lower socio-economic groups exhibit significantly lower levels of awareness regarding coronary artery disease.⁶²

Figure 4 plots the relationship between GDP per capita (at 2023 EUR price) and CVD mortality rate of the same year. In general, higher-income regions are associated with lower mortality rates. There are obvious between-country differences. For example, Bulgarian and Romanian regions are clustered at the top-left of the scatter plot (high mortality-low income). Within a nation, poorer regions tend to correlate with higher CVD mortality. In the scatter plot, we illustrate the within-country differences using trendlines to show the correlation within a country. Most of the trendlines are going downward from the left to the right, showing a negative relationship between income and CVD mortality. For example, Yugozapaden, Bulgaria's richest region, has the lowest cardiovascular disease mortality rate, while Severozapaden, the country's second poorest region, has the highest. In Germany, the richest region, Hamburg, has the lowest CVD mortality rate, whereas the poorest region, Chemnitz, records a rate that is 1.5 times higher than Hamburg's.

⁵⁷ Khan, Y., Verhaeghe, N., Devleeschauwer, B., Cavillot, L., Gadeyne, S., Pauwels, N.S., Van den Borre, L. and De Smedt, D., '[Impact of the COVID-19 pandemic on delayed care of cardiovascular diseases in Europe: a systematic review](#)', *The Lancet*, Vol. 402, 2023, S61.

⁵⁸ OECD, '[Is Cardiovascular Disease Slowing Improvements in Life Expectancy?](#)', *OECD and The King's Fund Workshop Proceedings*, 2020.

⁵⁹ Eurostat, '[Living conditions statistics at regional level](#)', Website, 2026. Accessed 9 June 2026.

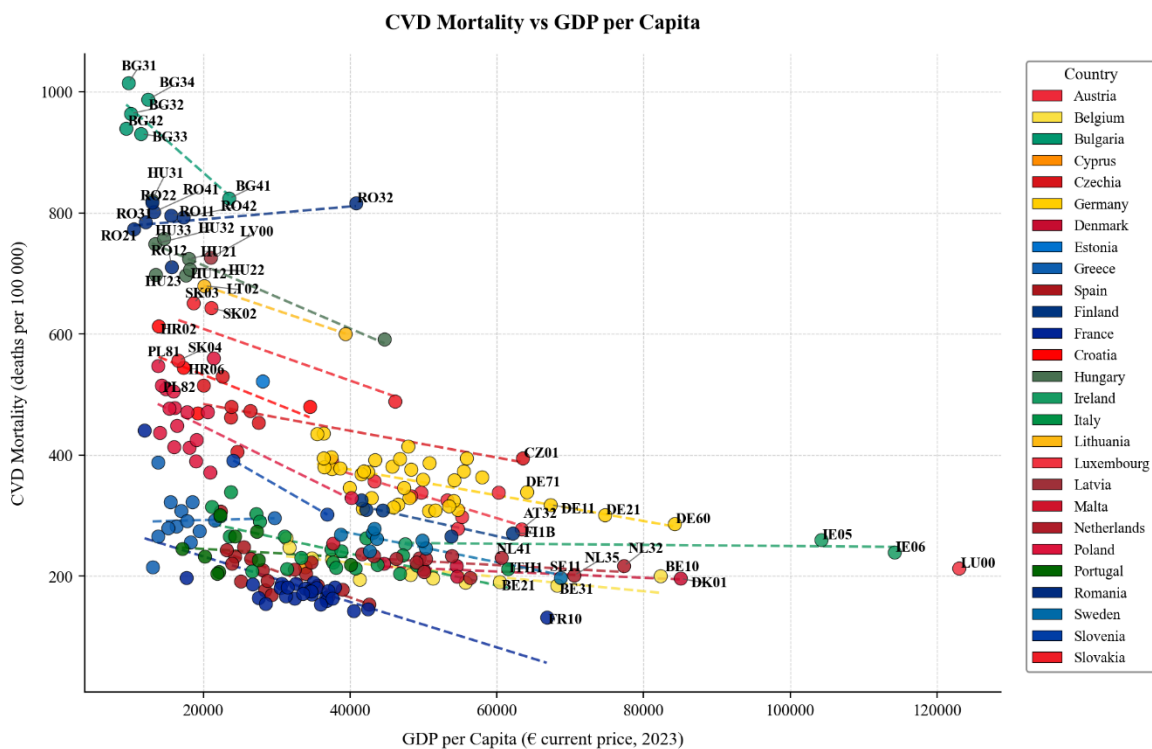
⁶⁰ Daponte-Codina, A., Knox, E.C., Mateo-Rodriguez, I., Seims, A., Regitz-Zagrosek, V., Maas, A.H., White, A., Barnhoorn, F. and Rosell-Ortiz, F., '[Gender and social inequalities in awareness of coronary artery disease in European countries](#)', *International Journal of Environmental Research and Public Health*, Vol. 19, Issue 3, 2022, 1388.

⁶¹ Hyun, K.K., Redfern, J., Patel, A., Peiris, D., Brieger, D., Sullivan, D., Harris, M., Usherwood, T., MacMahon, S., Lyford, M. and Woodward, M., '[Gender inequalities in cardiovascular risk factor assessment and management in primary healthcare](#)', *Heart*, Vol. 103, Issue 7, 2017, pp.492-498.

⁶² Daponte-Codina, A. et al., 2022. Daponte-Codina A, Knox EC, Mateo-Rodriguez I, Seims A, Regitz-Zagrosek V, Maas AHM, White A, Barnhoorn F, Rosell-Ortiz F., '[Gender and Social Inequalities in Awareness of Coronary Artery Disease in European Countries](#)', *Int J Environ Res Public Health*, Vol.19, Issue 3, 2022.

Annex I lists the highest 25 and the lowest 25 NUTS 2 regions in terms of CVD mortality rate, together with the latest figures of GDP per capita (in current euros).

Figure 4 - GDP per inhabitant and CVD mortality rate (2023)



Source: Eurostat

4. Repository of cardiovascular diseases prevention and detection policies

The research on CVD risk factors and regional patterns highlights the need for public policies and interventions from authorities; many risk factors are in fact modifiable and prevention and detection policies can either address the sources of the risk factors or mitigate their impacts. Prevention policies work to stop CVDs from developing or aggravating, while detection policies aim to address the diseases at their early stages when the healthcare burden is lighter. These policies may involve changing people's behaviours through incentives, which are costly to provide or implement. Therefore, a smart mix of policies corresponding to a region's characteristics is key to protecting people's hearts.

This part of the study presents 30 examples of local and regional initiatives on CVD prevention, detection, and long-term care, reflecting a wide range of policy tools, approaches, and collaboration mechanisms from across the EU.

To support clarity and comparability, and in line with the EU Safe Hearts Plan, the identified best practices are organised around three policy-relevant pillars:

1. **Prevention:** interventions that reduce CVD risk factors (such as health promotion)
2. **Early detection and screening:** approaches that identify CVDs in a timely manner, thereby improving opportunities for early intervention
3. **Living with the disease:** models that support long-term management of CVDs, including prevention of complications, rehabilitation, etc.

Each case follows a consistent format, and highlights the challenge, intervention design, outcomes, and key lessons for transferability. Together, these case studies provide practical insights into how regions can strengthen CVD prevention, detection, and management through targeted interventions.

Pillar 1 - Prevention

Primary prevention aims to reduce the risk of CVD before it develops by addressing modifiable risk factors through health promotion and preventive measures. This includes initiatives that encourage healthy diets, regular physical activity, tobacco control, and reduced alcohol consumption, as well as policies that support healthier environments and improve access to preventive healthcare. EU strategies and national public health programmes seek to lower the burden of CVDs by promoting healthier lifestyles and reducing inequalities in health across Member States.

Cases under Pillar 1 include:

Case #1.1: Community-based childhood obesity prevention in Toulouse, France

Case #1.2: Smoking ban in the City of Milan, Italy

Case #1.3: Battling Obesity in Tartu Municipality, Estonia

Case #1.4: Digitalisation and telemedicine to address regional inequalities, Estonia.

Case #1.5: “Physical Activity on Prescription” in Sollentuna Municipality, Sweden

Case #1.6: Smoking bans from local initiative to national legislation, Spain

Case #1.7: Low Emission Zones in Brussels and Antwerp, Belgium

Case #1.8: Childhood obesity prevention through the EDDY study, Vienna, Austria

Case #1.9: Extending Austria’s Green Fields to Citizen Plates, Vienna, Austria

Case #1.10: Parks in Motion, Czechia

Case #1.11: Targeted behavioural health programme aimed at disadvantaged communities, Ireland

Case #1.12: Let’s Live Healthily! Pomurje Region, Slovenia

Case #1.1: Community-based childhood obesity prevention in Toulouse

Background

In France, in 2024, 17% of children and adolescents aged from 6 to 17 were overweight, and 4% were obese.^{63,64} Children living in disadvantaged areas are particularly exposed to health inequalities related to nutrition, physical inactivity and sedentary behaviours.⁶⁵ A local health needs assessment was performed in the northern districts of Toulouse, and childhood obesity was identified as a priority issue requiring a coordinated action at the local level. In response, the city of Toulouse, with the support of the Regional Health Agency (ARS) Occitanie and in partnership with SERO Occitanie, launched a community-based health promotion programme aimed at children, adolescents and their families.⁶⁶ The initiative adopted a territorial approach, centred on capacity-building among local stakeholders. Schools, childcare and leisure centres, social services, community organisations, healthcare professionals and families were mobilised and trained to promote healthier lifestyles among children within their daily work. The programme focused on key determinants of childhood obesity, including healthy eating, physical activity, sedentary behaviour, sleep habits, and screen use. Particular attention was given to involving families and local residents through a community-health approach, ensuring that health promotion and prevention activities reflected local needs and realities. The initiative sought to create a supportive environment for healthier neighbourhoods.



Toulouse, Occitanie Region, France

City Population (2022):

774 656

City GDP per capita (2021):

EUR 40 700

Implemented by: Municipality of Toulouse, SERO Occitanie, Regional Health Agency Occitanie

Period: 2012 -

Outcomes

The programme strengthened local capacity for childhood obesity prevention by supporting organisations working directly with children and families in disadvantaged communities. During the 2023-2024 school year, 23 health promotion interventions took place, reaching 561 participants.⁶⁷ Furthermore, 36 professionals were trained or supported to implement prevention activities.⁶⁸ The initiative fostered collaboration between educational, social and health actors at the local level, demonstrating a coordinated approach to childhood obesity prevention. Through integrating health promotion activities within existing community settings, the programme helped establish sustainable mechanisms for encouraging healthy behaviours among children and adolescents. The approach is being extended and replicated in other neighbourhoods across Toulouse.

Key Takeaways for LRAs

- **Children as the targeted group:** Local interventions targeting childhood obesity can help establish healthy eating habits and active lifestyles from an early age.
- **Create supportive environments for healthy behaviours:** Health promotion activities within everyday community settings can achieve more lasting behavioural change than standalone awareness campaigns while also helping address social determinants of health.

Case #1.2: Smoking ban in the Municipality of Milan

Background

Milan is one of Europe's most polluted cities in terms of air quality.⁶⁹ In 2024, the average concentration of fine particulate matter (specifically PM_{2.5}) was 3.6 times the annual limit recommended by the WHO.⁷⁰ In 2020, the city council passed an Air Quality Regulation – entered into force in 2021 – that banned smoking in specific areas, such as playgrounds and public transport stops. From 2025, the ban was extended to all public or publicly accessible outdoor spaces, with the only exception of a minimum distance of 10 metres from others to reduce exposure to passive smoke.⁷¹ According to the Municipality of Milan, cigarette smoke contributes around 7% of fine PM emissions.⁷² The regulation was primarily introduced as an air quality measure to protect the health of citizens, but it is particularly important in the context of CVDs, as exposure to air pollution is strongly associated with higher risk of cardiovascular conditions.⁷³ The measure also aims to promote healthier behaviours and encourage a broader cultural shift away from smoking. Evidence suggests that outdoor smoking bans can support such behavioural changes.⁷⁴



*Municipality of Milan,
Lombardy, Italy*
*Municipality Population
(2025): 1.4m*
*City GDP per capita (2021):
EUR 52 800*
*Implemented by:
City of Milan*
Period: 2021 –

Outcomes

Fines for violations range from EUR 40 to EUR 240.⁷⁵ However, enforcement has been challenging in practice: only 19 fines were issued in the first month following the January 2025 extension,⁷⁶ and only 79 fines had been issued in total since 2021.⁷⁷ As of mid-2026, a proposal to eliminate the 10-metre exception and introduce a complete outdoor smoking ban was put to the city council but did not pass, with opponents citing practical enforcement difficulties and questions about individual freedoms.⁷⁸ So far, no public data have been released showing whether the smoking ban has reduced fine PM levels. Milan's experience suggests that regulations can help set expectations and demonstrate political commitment to public health, but that their ability to change behaviour depends largely on effective enforcement and public compliance.

Key Takeaways for LRAs

- **Outdoor smoking bans can serve a dual public health purpose:** Improving air quality by reducing fine PM emissions and discouraging smoking jointly form part of a cultural shift towards healthier lifestyles.
- **Introduce restrictions gradually:** Starting with playgrounds, parks, and public transport stops before expanding them to all outdoor public spaces can give citizens time to adapt and may reduce public resistance to stricter measures.
- **Require effective enforcement:** Milan's experience highlights that rules alone are not enough to change behaviour. Without effective monitoring and enforcement, their impact may remain limited, even when public health benefits are clear. It also shows the importance of building public support before expanding restrictions, both to encourage compliance and to reduce political and social tension.

Case #1.3: Battling Obesity in Tartu Municipality	
Background	
More than 20% of the Estonian population is obese, substantially higher than the EU average of 16.5%.⁷⁹ This is a primary cause of long-term, non-communicable conditions, including deaths from cardiovascular disease. The crisis also affects younger Estonians as more than 20% of Estonian children aged 11 to 15 are currently overweight or obese.⁸⁰ This trend accelerates sharply after the fifth grade due to a steep decline in daily physical movement.⁸¹ To combat youth overweight and obesity before the risk factors turn into chronic cardiovascular conditions in early adulthood, the Association of Municipalities of Tartu County and the City of Tartu initiated a financial health promotion framework for youth aged 7 to 19.⁸² Rather than creating parallel municipal programmes, LRAs implemented a single system of direct subsidies to fund local sports clubs and private hobby schools, thereby lowering participation costs for children and youth. This localised strategy operationalises the national Estonian Green Paper on Nutrition and Physical Activity, and partners with the University of Tartu’s Institute of Sport Sciences.	 <i>Municipalities of Tartu County</i> <i>City Population (2024):</i> 101 032 <i>Country GDP per capita (2022):</i> EUR 27 000 <i>Implemented by:</i> Association of Municipalities of Tartu County, City of Tartu, University of Tartu’s Institute of Sport Sciences <i>Period:</i> 2024 -
Outcomes	
The subsidies to local sport clubs and private hobby schools successfully transformed community sport into public health infrastructure by removing the financial barriers to entry for local children and youth. Under the regional framework (<i>harrastajate toetus</i>), municipal grants are explicitly tied to strict operational quality controls: clubs only receive a per-capita subsidy if the training programme operates for at least ten months of the year, maintains a minimum frequency of two weekly sessions, and is led by a coach possessing at least a Level 3 state vocational qualification.⁸³ Now, over 43% of localised youth consistently meet the WHO-recommended 60 minutes of daily moderate-to-vigorous physical activity.⁸⁴ Furthermore, the partnership with the University of Tartu allowed the scheme to integrate directly with the University’s “Schools in Motion” laboratory, bridging the gap between academic research and urban policy implementation.	
Key Takeaways for LRAs	
• Subsidise the existing ecosystem: Giving direct financial support to participants with quality assurance leverages and boosts local sports clubs, without needing to substantially reform existing local health programmes. • Treat youth activity as upstream CVD prevention: Funding active habits and healthy lifestyles in young people can be a highly cost-effective, long-term investment. • Leverage local universities: The programme integrates local universities research facilities and academic laboratories and therefore fosters evidence-based urban policy implementation.	

Case #1.4: Digitalisation and telemedicine to address regional inequalities

Background

Health outcomes can vary across regions due to economic, geographic, and demographic differences. These inequalities are not only a challenge for large nations but also for smaller ones. In Estonia, citizens living in rural, remote, or lower-income districts face higher rates of CVD than those in wealthy urban centres.⁸⁵ The tragedy is that most of heart incidents are entirely preventable with the right early preventative healthcare interventions. Innovations of telemedicine can indeed help bridge the regional inequality gaps.⁸⁶ In 2024, researchers at the University of Tartu launched the **BIG-HEART registry**, which merges eight nation-wide databases into one, combining citizen's medial history (such as hospital visits, diagnoses, and prescriptions) with their socioeconomic background (such as education, employment history, and social benefits).⁸⁷ By looking at this complete picture, family doctors can identify vulnerable, high-risk individuals in rural areas up to 30 years before they show symptoms of CVD.⁸⁸ Moreover, the BIG-HEARTS collection can feed into modern AI and novel risk-prediction models as they evolve, ensuring that CVD screening of citizens in Estonia remains highly advanced as new technologies emerge.⁸⁹ Crucially, this data network plugs into Estonia's already existing e-Health system. Once a high-risk patient is identified, the system can easily transition into active care. Rural patients can receive remote diagnoses, receive digital prescriptions, and consult specialist healthcare providers from home, eliminating the need for long, expensive travel.⁹⁰



City of Tartu, Estonia

*City Population (2024):
101 032*

*Country GDP per capita
(2022): EUR 27 000*

Implemented by:

University of Tartu

Period: 2024 – present

Outcomes

The BIG-HEART platform successfully mapped a massive dataset covering 770 323 Estonian citizens (every Estonian resident aged 26 or older), achieving an average data-mapping accuracy rate of 95%.⁹¹ This prevents 'healthy-volunteering bias', where only healthy or wealthy people have capacity to participate in health studies – ensuring that at-risk citizens are highly visible to healthcare providers. Local doctors can soon bypass generic, one-size-fits-all treatments, and by some clicks on their laptop view a patients' personalised risk profile and instantly prescribe customised preventive care before it is too late.

Key Takeaways for LRAs

- **Data closes the gap:** By joining up the medical and social records we already have, local councils can spot who is most at risk and get them help early. This saves lives and cuts the long-term costs of expensive hospital care.
- **Connecting data to telemedicine:** Local councils need to match digital records with telehealth implementation like electronic prescriptions and online specialist appointments. This ensures that a person's postcode doesn't dictate the quality of their healthcare.

Case #1.5: “Physical Activity on Prescription” in Sollentuna Municipality

Background

Sweden is among the EU Member States with the lowest CVD mortality rate, compared to a significantly higher burden across Central and Eastern Europe (See Figure 1). Sweden is a country of many small rural neighbourhoods far away from the specialised hospitals in urban areas. Instead of focusing on the treatment and long-term care, Sweden CVD policy has been driven by primary prevention. Already in 1988, Sollentuna Municipality initiated a pilot programme to integrate municipal-wide lifestyle counselling into their welfare program and CVD prevention efforts with the **Sollentuna Prevention Programme (SoPP)**, practically implementing “Physical Activity on Prescription” (PAP).⁹² The SoPP integrated lifestyle counselling and exercise prescriptions into routine primary care, with the goal of reducing long-term cardiovascular risks and mortality. Operating from 1988 to 1993, until being incorporated into the broader Swedish healthcare policy framework, the SoPP was a hybrid collaboration bridging all four primary healthcare centres within the Sollentuna Municipality, the Stockholm County Council for governance, the Karolinska Institutet as an academic research partner, and local community sports associations.



**Sollentuna Municipality,
Sweden**

City Population (2026):

78 033

**NUTS2 (SE11) GDP per
capita (2024): EUR 72 300**

Implemented by:

Sollentuna Municipality

Period: 1988–1993

Outcomes

Multiple studies found that the SoPP had a significant impact on reducing CVDs.^{93 94} A study from 2020 revealed that compared to before the intervention, individuals who participated in the SoPP achieved a 12% lower risk of cardiovascular conditions, a 21% reduction in cardiovascular mortality, and a 17% decrease in all-cause mortality.⁹⁵ These findings demonstrate the benefit of shifting to advice-led interventions within the already existing clinical infrastructure. The SoPP was successful because it went beyond general clinical advice and implemented a structured referral system. Health professionals were trained to issue referrals to supervised training at affiliated sport associations. Rather than just focusing on high-risk individuals, the SoPP aims for population-wide awareness. By using a network of grocery stores, libraries, and schools, it brings health literacy directly into people's everyday lives. Today, the “Physical Activity on Prescription” (PAP) from the SoPP project has been integrated into Sweden’s national guidelines for primary care.⁹⁶

Key Takeaways for LRAs

- **Integration of “Physical Activity on Prescription” (PAP):** By partnering with existing local sports clubs, health services can deliver significant benefits with minimal extra effort.
- **Moving away from “clinic only”:** Long-term health prevention works best when it targets everyone, not just people at high risk. Local councils should look beyond traditional clinics and fund community-based activities 'on prescription'.
- **Intersectoral collaboration to break down siloes:** The SoPP was built on the idea that health matters in every policy, making it a community-wide effort rather than just a medical programme.

Case #1.6: Smoking bans from local initiative to national legislation

Background

Smoking is a significant risk factor for CVD, increasing the incidence of various CVDs by up to 30%.⁹⁷ Spain sits above the EU average smoking rate, with 18% of adults smoking tobacco in 2020 and 21% of adolescents aged 15-16 in 2019.⁹⁸ While smoking has been fully banned in indoor public spaces since 2011,⁹⁹ outdoor environments, particularly beaches, have remained largely unregulated. The first beach in Spain was declared smoke-free in 2006, yet by 2018 only 3% of beaches were smoke-free. However, in 2018, Nofumadores.org launched a petition to lobby for smoke-free beaches across the country, collecting almost 400 000 signatures to date.¹⁰⁰ By July 2025, 30% of beaches were smoke-free and regional governments were empowered to continue acting on public sentiment.¹⁰¹ Municipal experimentation on severity and type of measures has been widespread in the past decade, with Barcelona piloting enforcement-backed beach bans before full city-wide bans¹⁰² and the Balearic Islands developing a regional opt-in network model that allows municipalities to join a coordinated smoke-free designation scheme.¹⁰³ A turning point came with the National Law 7/2022 on waste and soil contamination, which enabled LRAs to designate smoke-free outdoor spaces and turned the practice into legally enforceable on ecological grounds. This national legislation enabled the accelerated pace of adoption across autonomous communities.¹⁰⁴ In subsequent scaling of preventive efforts, Spain's national government tabled a bill in September 2025 proposing the broadest outdoor smoking restriction in European history, covering beaches, terraces, stadiums, playgrounds, bus stops, and areas within 15 metres of hospitals and schools.¹⁰⁵



All Spanish regions

Country Population (2025): 49m

Country GDP per capita:

EUR 32 600

Implemented by: Scaled to all regions

Period: 2006 -

Outcomes

A civil society petition directly shaped the political conditions for regional and national action and continues to mobilise the public. Municipal experimentation – from information-only campaigns to fines of up to EUR 2 000 – demonstrates that enforcement can be calibrated to local context. National waste legislation with an environmental layer converted informal municipal practice into a legally enforceable framework, accelerating regional adoption by giving local councils explicit powers to act. Following ten years of local action, Spain is set to introduce the broadest outdoor smoking ban in European history.

Key Takeaways for LRAs

- **Health goals can be advanced through non-health legislation:** Law 7/2022 was an ecological and waste law, not a public health law, yet it became the primary legal means for expanding smoke-free outdoor spaces across Spain. LRAs should look beyond the health sector when considering measures for tobacco control: waste management, environmental protection, and clean air regulations can all provide entry points.
- **Local action can change national law:** Spain's 2025 bill to ban smoking across all outdoor public spaces was built on a decade of municipal and regional beach bans.

Case #1.7: Low Emission Zones

Background

In Belgium, ambient air pollution was responsible for 29% of Disability-Adjusted Life Years lost to ischaemic heart disease and 28% of those lost to stroke in 2021.¹⁰⁶ Belgium's air quality falls below the EU average for most pollutants, with health impacts disproportionately concentrated among children, older people, and socioeconomically disadvantaged groups.¹⁰⁷ Lower-income urban populations are also the most heavily exposed to traffic-related pollution, being more likely to live near high-traffic corridors.¹⁰⁸ Air pollution is now recognised as a leading modifiable cardiovascular risk factor, prompting more than 320 cities across Europe to adopt **Low Emission Zones** (LEZs) as a public health intervention.¹⁰⁹ Belgium was among the early movers, with Antwerp launching the country's first LEZ in 2017, followed by Brussels and Ghent in 2018 and 2020 respectively.¹¹⁰ The zones restrict access for vehicles that fail to meet progressively tightening emission standards, enforced through automated number-plate recognition camera networks. The LEZs were established by the municipalities, without requiring national legislation change, and were anchored in the WHO Air Quality Guidelines and connected to their respective regional climate-health adaptation plans.¹¹¹



Antwerp, Brussels, Ghent

Total City Population (2024): 2m

*Average City GDP per capita
(2022): EUR 57 733*

*Implemented by: Regional
governments of Brussels and
Antwerp*

Period: 2017-

Outcomes

A Belgian study published in 2025 tracked the health of around 420 000 people living in Antwerp, Brussels, Ghent, and 17 other cities without LEZs over nearly a decade. In Brussels, residents in the LEZ showed a measurable decline in the use of medication for diabetes compared to people living in cities without such zones – an early sign that cleaner air may be reducing metabolic health problems that often lead to heart diseases.¹¹² In Antwerp, the same trend was visible. Evidence from beyond Belgium found that restricting polluting vehicles from city centres produced measurable cardiovascular health benefits, with the most consistent effects on heart disease and stroke. Blood pressure reductions were also observed, with the greatest gains for older populations.¹¹³

Key Takeaways for LRAs

- **No national mandate needed:** Setting up LEZs are one of the few CVD-prevention instruments that subnational authorities could act independently with a national legislation. LEZs are usually established through municipal or regional ordinances without requiring national mandates. These three Belgian cities demonstrate the legal pathway and the health impact of this approach.
- **Addressing health inequalities:** Data consistently show that lower-income urban residents are more heavily exposed to traffic-related pollution. Well-designed LEZs that extend into inner-city residential areas function both as a health equity measure and a CVD prevention strategy.

Case #1.8: Childhood obesity prevention through the EDDY study

Background

Childhood obesity is a significant public health threat in Austria; around one quarter of Viennese primary school children are classified as overweight or obese.¹¹⁴

This matters for cardiovascular health because obesity in childhood is a major risk factor for hypertension, type 2 diabetes and CVDs in adult life. The earlier that unhealthy weight trajectories are established, the harder they are to reverse. The **EDDY programme** ("Effect of sports and diet training to prevent obesity and secondary diseases and to influence young children's lifestyle") was developed in Vienna by the Austrian Academic Institute for Clinical Nutrition in collaboration with the Institute for Sports and Movement Science at the University of Vienna.¹¹⁵

It was first implemented in 2012 at a primary school in Vienna, where it became embedded in the fourth-grade curriculum. It has since expanded to additional schools in Vienna, with a new cohort starting in September 2022, with support from the Federal Ministry of Education, Science and Research.¹¹⁶ The programme targets children aged roughly 7 to 14 years across different study phases. It delivers nutrition education and physical activity training within the normal school day. The intervention content covers knowledge about healthy eating, practical sessions on food preparation and food choices, physiology lessons on the effects of lifestyle on the body, and structured sports and movement sessions. Sessions are delivered by physicians, nutritionists and sports scientists, and are supported by psychologists to ensure age-appropriate delivery.



City of

Vienna, Austria

Population (2025): 2m

*City GDP per capita
(2021): EUR 48 400*

Implemented by:

University of Vienna

Period: 2012 -

Outcomes

Children who went through the programme knew significantly more about healthy nutrition by the end of it, with knowledge scores up by more than a fifth on average. Their weekly consumption of fast food, sweets, salty snacks and instant meals all dropped measurably compared to children who did not take part. Physical fitness improved modestly. A year after the programme finished, with no further sessions or support, children who had participated were still growing at a healthy rate.¹¹⁷ Their weight relative to their age had not crept upward, and their waist size relative to their height stayed within healthy bounds.

Key Takeaways for LRAs

- **Schools are a practical delivery platform for primary prevention:** LRAs with responsibility for school environments can integrate nutrition and physical activity interventions into existing school structures at relatively low marginal cost.
- **Focus on behavioural change in childhood:** Significant improvements in nutritional knowledge and dietary habits were documented, and healthy weight trajectories were maintained one year after the programme ended without ongoing support.
- **Multidisciplinary teams can be assembled within existing institutions:** EDDY draws on physicians, nutritionists and sports scientists. LRAs can link existing university and public health expertise into a school-based delivery model.

Case #1.9: Extending Austria's Green Fields to Citizen Plates

Background

Austria is a global leader in organic farming, with over 25% of its agricultural land dedicated to ecological farming.¹¹⁸ Yet, despite being surrounded by organic agriculture, Austrian citizens face a nutrition and CVD health crisis. In 2021, CVDs caused 34.8% of all deaths in Austria,¹¹⁹ and 36% of all deaths can be traced back to preventable lifestyle habits.¹²⁰ In fact, poor diet alone contributes to 15% of all deaths in Austria (12 600 deaths per year).¹²¹ When it comes to eating healthy, recent data reveals a worrying trend: Only 6% of Austrian adults met the recommended five-a-day fruit and vegetable target in 2019, placing the country fourth from the bottom in the EU.¹²² These bad habits are being passed to the next generation. In 2022, almost two-third of 15-year-olds reported that fruits and vegetables are missing from their daily meals entirely.¹²³ The City of Vienna was indeed aware of the importance of healthy diets many years ago. Already in 1998, they launched the *ÖkoKauf Wien* (EcoBuy Vienna), a pioneering sustainable public food programme designed to change what the city buys and serves to its citizens. The programme set ambitious targets: at least 30% organic food in municipal and nursing homes, and at least 50% organic food in public schools and kindergartens. The programme has consistently been updated, such as the 2010 “*natürlich gut Teller*” (naturally good plate), which is a label that identifies dishes that are particularly environmentally friendly and of high (often organic) quality.¹²⁴



City of Vienna, Austria

Population (2025): 2m

*City GDP per capita
(2021): EUR 48 400*

Implemented by:

City of Vienna

Period: 1998 –

Outcomes

An assessment study performed by the FAO in 2018 found that the initiative makes it possible to provide 100 000 citizens with ecological warm meals every day, and that the policy has successfully reached its goals of procuring 30% organic food by the City.¹²⁵ Sub-categories, such as the *natürlich gut Teller* accounts for 800 000 meals a year, of which 56% were vegetarian, and where the total consumption consisted of 87% vegetables, salads, and fruits.¹²⁶ However, it is important to note that public procurement initiatives such as **ÖkoKauf Wien** alone was not enough to reverse the trend; decades after the programme's launch, poor eating choices remain a key root-cause of CVD mortality in Austria.

Key Takeaways for LRAs

- **Public procurement creates healthy islands but has limited “spill-over” effects:** Vienna's *ÖkoKauf Wien* successfully provided plant-based, ecological meals in public spaces for decades – yet the dietary crisis persisted as reflected by recent data. To alter dietary risks, LRAs might need to go further than providing healthy options in public spaces.

Case #1.10: Parks in Motion in Czechia

Background

Cardiovascular disease is the leading cause of death in Czechia, and physical inactivity is a significant driver of this burden. Czech population data show that insufficient physical activity is associated with a 60% higher risk of cardiovascular mortality in the country.¹²⁷ *Parky v pohybu* (Parks in Motion) is a nationwide health promotion initiative launched in 2016 by the National Institute of Public Health (SZÚ) and Palacký University Olomouc, with support from the Czech Ministry of Health.¹²⁸ Originally structured as an open challenge from the national government to cities, municipalities, city districts, associations, and organisations to take part, share experiences, and activate urban parks and green spaces for movement, the initiative grew into a sustained national programme.¹²⁹ The challenge was created in the context of the 2016/17 World Health Day theme of diabetes prevention. Sessions are free, outdoor, beginner-friendly, led by trained instructors, open to all age groups, and require no equipment. Workouts rely solely on bodyweight, with a focus on correct breathing, posture, walking technique, and balance training. By the beginning of 2018, 13 parks across the country were involved and the initiative remained ongoing in certain cities including Jihlava up until 2025.¹³⁰



Multiple cities in Czechia, such as Praha, Střední Čechy, Jihozápad, Severozápad, Jihovýchod, Střední Morava, Moravskoslezsko

Implemented by:

National Institute of Public Health and municipalities nationwide

Period: 2016 - present

Outcomes

The initiative operates as a low-barrier, high-reach primary prevention model. By removing the most common obstacles to exercise (cost, equipment, skill prerequisites, advance booking), the initiative creates an entry point to regular physical activity. Sessions attract an average of 15 participants, with notably strong turnout for yoga-format sessions in Prague-Pankrác and senior-focused sessions in Jihlava.¹³¹ The intergenerational mix has the added benefit of social contact alongside physical activity, particularly important for elderly populations. Annual instructor training sessions were organised by SZÚ to ensure quality and consistency. During conferences hosted at the National Institute of Public Health in Prague, instructors were brought together from different sites and instructors of the year were recognised as part of a peer-learning model.

Key Takeaways for LRAs

- **Low-cost:** Free, low-infrastructure physical activity programmes in publicly accessible urban spaces are an effective and replicable model for primary CVD prevention.
- **Encouraging participations from all generations:** The intergenerational design generates social cohesion as a co-benefit, models healthy behaviour across age groups. This cross-cutting design is relevant for LRAs facing demographic ageing alongside high rates of physical inactivity.
- **Involving universities and health institutes:** They can act as practical anchors for community-level prevention, as their institutional credibility helps sustain uptake over time.

Case #1.11: Targeted behavioural health programme aimed at disadvantaged communities, Ireland	
Background	
Cardiovascular disease (CVD) is estimated to be the cause of 26.5% of deaths in Ireland per year, and 40% of deaths are estimated to be attributable to preventable lifestyle factors.¹³² Prevention targeting high-risk groups is therefore important. A study, ‘High risk prevention project (HRPP)’,¹³³ piloted a 6-week behaviour change programme targeting patients with a high-risk for CVD (including factors such as high blood pressure, obesity, Type 2 diabetes, high cholesterol) in socioeconomically deprived areas. The project was delivered through 6 GP practices. Patients had weekly one-to-one sessions with either a general practice nurse or health promotion professional. Assessments were conducted at baseline, 6 weeks, 3, 6, and 9 months. For evaluation, assessments were conducted at 12 months after the completion of the programme, accompanied by interviews with the healthcare delivery staff and patients to assess the feasibility of the programme. The 6-week programme adopted a patient-centred approach, whereby patients together with the professionals determined its aims, objectives and procedures according to their personal health goals and situation. A total of 270 patients across the 6 general practices completed the programme. As a small pilot, the study aimed to provide evidence of the clinical effectiveness of the targeted behaviour change interventions to support the design and delivery of a broader implementation.	 <i>East and Midland and Southern, Ireland</i> <i>Total Regional Population (2022): 4.26m</i> <i>Average Regional GDP per capita (2024): EUR 114 400</i> <i>Implemented by: 6 GP practices across two regions, targeted at disadvantaged areas. Supported by HSE and Irish Heart Foundation</i> <i>Period: 2021 – 2022</i>
Outcomes	
Twelve months after completion of the programme, patients on average had a reduced BMI. There were also improvements in mental health and well-being, reduced waist circumference and lowered triglyceride scores. • The research did not compare the results to a control group. Further research would be needed to confirm the potential of HRPP compared to standard delivery of care for high-risk patients. • The intervention was found to be feasible by both patients and healthcare professionals in interviews to support the study’s evaluation¹³⁴. However, some staff at GP practices reported additional workload associated with participation in the study. • 17 out of 18 patients interviewed self-reported perceived positive lifestyle changes.	
Key Takeaways for LRAs	
• General practice as the entry point: The study shows that GP can be where interventions happen, leveraging the trust patients have in their GPs. • Cost-effectiveness of different measures should be better measured: While HRPP seems costly that added extra burden onto the GP practices, researchers and authorities should better measure cost-effectiveness of different measures before reaching a conclusion. More personal healthcare and advice through GPs might achieve more lasting effects than some advice from public authorities.	

Case #1.12: Let's Live Healthily! Pomurje Region, Slovenia

Background

Pomurje is a rural region characterised by high unemployment, lower levels of education, and poverty. Apart from the limited healthcare provision in the region, unhealthy habits, such as poor diets and regular exposure to second-hand smoke, had a negative impact on the overall health of the population. In 2001, the Murska Sobota Institute of Public Health launched the *Let's Live Healthily!* programme in nine rural communities, aimed at reducing health inequalities.¹³⁵ It focused on changing lifestyle behaviours through a bottom-up approach: encouraging people to take part actively, and designing culturally appropriate activities, adapted based on local needs and interests. The project also targeted vulnerable populations in the region and focused on improving lifestyle habits, a major factor behind health inequalities in the region. Local organisations (i.e. schools, food stores, pharmacies, civil society) were also involved in the activities.¹³⁶



Pomurje Region, Slovenia

NUTS2 (SI04) Regional

Population (2025): 1.11m

*NUTS2 (SI04) Regional GDP
per capita (2024): EUR 25 300*

Implemented by:

*Murska Sobota Institute of Public
Health (lead organisation), in
partnership with relevant local
actors, Co-funded by EU
programmes, including Interreg
Period: 2001 – 2010*

Outcomes

The project grew from 9 communities in 2001 to 50 by 2006, delivering approximately 1 500 workshops with an average of 50 to 60 participants each.¹³⁷ Activities included healthy cooking workshops, group walks, communal gardening, and CVD risk-factor screening in shopping centres.¹³⁸ Self-support groups for physical activity were also created in all communities. Participants reported sharing what they had learned with family and neighbours, extending the programme's reach beyond direct attendees.¹³⁹ Evaluations showed improvements in eating habits, physical activity, and awareness of healthy lifestyle among participants. A community intervention study in Beltinci found significant improvements in both lifestyle and risk factors after one year.¹⁴⁰ A comparison of regional health data showed that deaths and hospital admissions related to CVDs declined more rapidly in Pomurje than in the rest of Slovenia, though not able to prove that this was a direct consequence of the project.¹⁴¹ From 2010, the initiative was transferred to all Slovenian regions as part of the National Health Programme.¹⁴²

Key Takeaways for LRAs

- **Customised measures for local communities:** Projects are more likely to succeed when they are tailored to the needs of local communities. Activities that reflect local interests and traditions are better received and attract more participants.
- **Working with local organisations:** It helps embed health promotion activities within the community, making them part of everyday life.
- **Be realistic:** Starting with small pilots, setting measurable objectives, and demonstrating tangible results within a short timeframe can help build the evidence needed to convince decision-makers to expand successful initiatives on a larger scale.

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Pillar 2 - Early detection and screening

Early detection and screening aim to identify CVD and its risk factors at an early stage, improving opportunities for timely intervention and better health outcomes. In the European Union, screening and risk assessment programmes support the early identification of conditions such as high blood pressure, high cholesterol, and atrial fibrillation, enabling healthcare providers to initiate preventive measures and treatment before more serious complications occur. By promoting regular check-ups and improving access to diagnostic services, EU health systems seek to reduce the burden of CVD and prevent avoidable illness and premature deaths.

Cases under Pillar 2 include:

Case #2.1: Targeting Youth in Sofia Municipality, Bulgaria

Case #2.2: Women Health Bus in Luxembourg City, Luxembourg

Case #2.3: Implementing WHO Global HEARTS, Morocco

Case #2.4: Tyrolean stroke pathway, Austria

Case #2.5: Decentralised screening practice under a common identity, Poland

Case #2.6: Cardio50, Veneto, Italy

Case #2.7: Coimbra United for the Heart, Coimbra, Portugal

Case #2.8: Telemedical Diagnostics linking regions and cities, Croatia

Case #2.9: Pharmacy-based targeted screening for cardiovascular risk, Hauts-de-France Region, France

Case #2.1: Targeting Youth in Sofia Municipality (Pillar 2)

Background

Bulgarian regions are among those with the heaviest CVD burden. To put it in perspective, even the Bulgarian region with the lowest CVD rate (Yugozapaden) is still almost 2.4 times higher than the average across European regions. Bulgaria was the only EU Member State where CVD mortality increased between 2011 and 2021.¹⁴³ This crisis is heavily driven by unhealthy habits. Smoking is still very much widespread in Bulgaria and tobacco contributes to 18% of all deaths while poor dietary lifestyle behaviours account to 29% of all deaths.¹⁴⁴ Fewer than 60% of Bulgarian citizens benefit from state-funded annual checkups, allowing high blood pressure to silently affect 1 in 8 young citizens between 20 to 40 years of age.¹⁴⁵

In 2024, Sofia Municipality launched the **“120/80. Choose your heart number”** campaign to target busy or unaware youth during their daily commutes, by opening free-of-charge, automated blood pressure stations inside the Municipality’s highest-traffic hubs: Sofia University, Serdika, NDK, and Central Market Hall metro stations.¹⁴⁶

This initiative was set up as a partnership between Sofia Municipality, medical technology firm Microlife Bulgaria, the transit operator Metropolitan EAD, and Dark Radio, with a leading cardiologist Svetlin Tsonev serving as the clinical face of the initiative. To expand community awareness and literacy, the initiative employed high-profile youth ambassadors, including Formula 3 driver Nikola Tsolov and Olympian gymnast Margarita Vasileva, to advocate for cardiovascular checks among their youth audience. The clinics were also promoted on social media platforms popular with the target age group.



Sofia Municipality, Bulgaria
City

Population (2022): 1.2M

City

GDP per capita (2021):

EUR 20 000

Implemented by:

*Sofia Municipality,
Transit Operator Metropolitan
EAS, Microlife Bulgaria, Dark
Radio*

Period: 2024–

Outcomes

Initial screening data gathered with the Association of Medical Students in Bulgaria revealed that 14.9% (nearly 1 in 7) of screened youth between 15–29 suffered from high blood pressure. The vast majority were completely unaware of their condition prior to testing of the “120/80. Choose your heart number” initiative.^{147 148} The strategy proved that 'meeting young people where they are' is the best way to get health information to those who need it most. A second screening was launched in 2025 covering 7 malls, with results yet to come.¹⁴⁹

Key Takeaways for LRAs

- **Meet the target group where they are:** Instead of expecting young people to visit traditional clinics, this approach brings health care to them by placing automated medical kiosks right where they commute (e.g. university metro stations).
- **Boost engagement through alternative channels:** It uses social media campaigns and partners with ambassadors to widen community awareness and health literacy.
- **Leverage existing public services:** It extends the already existing public service (public transportation system) to facilitate early CVD screening, demonstrating the potential of partnerships of public services.

Case #2.2: Women Health Bus in Luxembourg City	
Background	
In 2021, CVDs were the leading cause of death among women in Luxembourg, accounting for 25.3% of female deaths (540 deaths) and the second leading cause among men.¹⁵⁰ Women who are in vulnerable situations or too busy often face practical and personal barriers that stop them from using traditional, fixed healthcare clinics. In October 2024, Luxembourg City launched the “<i>Women’s Heart Bus</i>” for a period of 3 days. The initiative aimed to raise awareness of CVDs among women and to improve early detection through free on-site screening and consultations. The bus sets up a temporary health prevention and promotion site where women can receive cardiovascular health advice, risk assessments and consultations with healthcare professionals. The initiative combines promotion, prevention and accessible screening in a single outreach format, bringing services directly into public space.¹⁵¹	 <i>Luxembourg City, Luxembourg City</i> <i>Population (2025): 137 696</i> <i>City</i> <i>GDP per capita (2022): EUR 118 700</i> <i>Implemented by:</i> <i>City of Luxembourg, the Women’s Cardiovascular Healthcare Foundation, and local health stakeholders</i> <i>Period: 2024</i>
Outcomes	
The Women’s Heart Bus provided a short-term but intensive mobile promotion, prevention and screening intervention in Luxembourg City. It delivered a global health offer combining cardiovascular screening, medical consultations, and prevention advice in a single setting, allowing participants to access multiple health services within a short timeframe. The outreach model enabled a high number of consultations. Approximately 200 appointments were planned. Around 30 women were registered on the first day, indicating strong uptake for a three-day preventive intervention. By concentrating multiple medical encounters into a single visit, including cardiologists, general physicians and gynaecologists, the initiative significantly reduced the need for multiple separate appointments. More than just providing medical services, the initiative helped find people with 'hidden' or undiagnosed health risks. Health professionals reported that many women who visited the outreach programmes had multiple risk factors for heart disease that required follow-up care.¹⁵²	
Key Takeaways for LRAs	
• Deploy mobile models for low-engagement groups: Mobile “health bus” are highly effective for increasing awareness and delivering care outside traditional healthcare settings, particularly for hard-to-reach demographics. • Make it easy with the “one-stop” design: By bringing health checks and consultations together into one quick visit in a public space, “health bus” makes it much easier for people to get preventive care. It tackles major issues like tight schedules, long appointment delays, a lack of confidence in seeking help, and unfair gaps in specialist care. • Address gender gaps in prevention: Designing services to explicitly target women naturally increases their visibility and engagement among female patients.	

Case #2.3: WHO Global HEARTS in Morocco

Background

CVDs account for 38% of all deaths in Morocco.¹⁵³ This burden is driven by severe risk factors – such as a 45-50% tobacco smoking rate and a 21.1% physical inactivity rate in the Moroccan population.¹⁵⁴ These numbers are compounded by a high poverty rate and an unprepared healthcare system.¹⁵⁵ Crucially, LRAs face a big communication barrier: with nearly 25% of the population not being able to read.¹⁵⁶ They face significant problem informing citizens of their healthcare risks through awareness campaigns or policy initiatives.

To help this situation, Morocco launched the **WHO Global HEARTS** initiative in 2020 as part of its national strategy for the prevention and control of non-communicable diseases. The HEARTS initiative was implemented in 4 pilot centres in the Tangier-Tetouan-Al Hoceïma region to strengthen primary-level prevention.¹⁵⁷ The initiative integrated uniform protocols for cardiovascular risk assessment, high blood pressure, and diabetes management, and made lifestyle counselling an included part of primary care. Besides, the initiative introduced a dedicated information system, utilising unique patient identifiers to track socioeconomic status, medical history, and CVD risk scores to guide clinical decision-making.¹⁵⁸



Tangier-Tetouan-Al Hoceïma, Morocco

Population (2024): 4M

GDP per capita (2024): EUR 3 610

Implemented by:

Ministry of Health and Social Protection, Directorate of Epidemiology and Disease Control, World Health Organization, Faculty of Medicine & Pharmacy and the National School of Public Health of Rabat, and healthcare centres

Period: 2020 –

Outcomes

Patient data showed that 96.9% of patients received healthy lifestyle advice, and 98.5% received counselling on correct medicine usage.¹⁵⁹ Secondly, improving overview and available patient data in the healthcare system improved local supply chains – 76.3% of health professionals reported that the initiative successfully strengthened the local availability of essential medicines and diagnostic technologies in primary healthcare centres.¹⁶⁰ However, the evaluation of the initiative also revealed an implementation bottleneck: in practice, a low number of patients were registered in the digital platform due to technical issues, limited training among healthcare staff (only 25.6%), and general difficulties in medicine supply and coordination across the health system.¹⁶¹

Key Takeaways for LRAs

- **Face-to-face counselling is effective in regions with high illiteracy:** When illiteracy is high, adopting uniform protocols and CVD risk assessments for face-to-face consultations may be more effective in reaching patients.
- **Be aware of bottlenecks when implementing digital:** Rolling out new digital health systems in areas with limited resources is never easy, and local councils should expect delays. To keep things on track, they need to plan ahead for common setbacks like poor internet connections, delivery delays, and staff shortages caused by rapid changes.

Case #2.4: Tyrolean stroke pathway

Background

Stroke is Austria's third leading cause of death and the leading cause of permanent disability.¹⁶² Beyond timely care, many stroke patients also go on to experience repeat strokes, cognitive decline, depression, or long-term fatigue, underlining the need for strong post-acute care alongside emergency treatment.¹⁶³ In Tyrol, stroke patients are treated across eight public acute hospitals and three specialist facilities. The geographic features of the region mean dispersed populations and difficult terrain stretch out prehospital response chains, and highly time-sensitive treatments depend on rapid, standardised emergency management to work. To address this, in 2009 the Tyrolean Health Care Fund, in partnership with the Medical University of Innsbruck and all district hospitals, launched the **Tyrolean Stroke Pathway**.¹⁶⁴ The goal was to standardise the entire stroke care chain, from emergency call to home rehabilitation. The pathway was built to develop targeted actions at four levels: (1) prehospital: public awareness campaigns (including commercials and education raising on radio and TV broadcasts), standardised dispatcher and paramedic protocols, and smarter ambulance routing; (2) in-hospital acute management: standardised treatment protocols at all hospitals, with advanced procedures at the Innsbruck centre; (3) inpatient rehabilitation handovers, including improving handover points such as forwarding of the therapy report to the next responsible institution; and (4) statewide outpatient home rehabilitation.¹⁶⁵



Tyrol, Austria

Population (2025): 777 660

NUTS2 Regional GDP per capita (2024): EUR 57 700

Implemented by:

Tyrolean Health Care Fund and University of Innsbruck

Period: 2009 -

Outcomes

The first major evaluation tracking nearly 5000 patients between 2010 and 2013 found that more patients received clot-dissolving treatment on time, the gap in care quality between Tyrol's nine counties roughly halved, and rates of complications such as pneumonia fell. The pandemic was also a stress test, as Tyrol was one of Europe's first COVID-19 hotspots, and stroke admissions were the highest ever recorded.¹⁶⁶ When district hospitals were overwhelmed, patients were rerouted to the central stroke centre, and acute care quality remained. Thrombolysis rates were unchanged, and endovascular treatment rates were higher than in the four prior years.¹⁶⁷ By 2022, more than 10000 patients had been treated under the pathway; statewide outpatient home rehabilitation has been operational since 2020.

Key Takeaways for LRAs

- **Public awareness saves lives.** The Tyrolean pathway built public awareness campaigns into its emergency response system to teach people to recognise stroke symptoms and call emergency services immediately.
- **Standardising transitions between care stages** improves stroke outcomes. LRAs should map the stroke chain stage by stage, identify which transitions (prehospital–hospital, hospital–rehabilitation, etc.) are losing lives, and focus on improving handover points.
- The **Stroke Action Plan for Europe 2018–2030¹⁶⁸** is a **blueprint** for LRAs. It explicitly recommends national and regional stroke care plans encompassing the entire chain of care.

Case #2.5: Decentralised screening practice under a common identity

Background

Biale Soboty (White Saturdays) refer to locally organised or sponsored, free screening and health promotion events in various cities and regions in Poland. *Biale Soboty* emerged locally in Polish cities in the 1990s and gradually became regular events in different cities. It is believed that healthcare providers hijacked the old folk religious day and transformed it into a public health event. Although *Biale Soboty* are a commonly understood name for health events in Poland, the implementation is highly decentralised and LRAs together with healthcare providers are able to design their own programmes and activities. *Biale Soboty* mobilise screening services to the communities and provide various types of healthcare. In Poznan, free testings were offered to citizens, including cholesterol and glucose level testing, blood supply assessment, heart rate and blood pressure measurement, BMI calculation, and risk assessment for myocardial infarction.¹⁶⁹ In Suchan, the *Biale Soboty* in 2024 had a focus on CVDs and provided free body health analysis and information about preventive programmes.¹⁷⁰ Events are often organised as a fun carnival with food and drinks, as well as entertainment activities, such as music performance.¹⁷¹ Poznan in 2026 has planned 7 *Biale Soboty* and integrated them into Poznan Family Day and Poznan Women's Week.¹⁷²



Multiple cities, Poland

Implemented by:

*City authorities, local
healthcare providers*

Period: 1990s -

Outcomes

These events are usually quite successfully, regularly followed by next editions. Many reports state that doctors and nurses discover potential patients with CVDs from the crowd. In a small town Wolsztyn with a population of roughly 54 000, 168 citizens were given cholesterol and glucose tests, 80 people were provided with medical consultations, plus many other tests.¹⁷³ In Limanowa, a city of 14 000 population, 60 people were given cardiological examinations during a day of *Biale Soboty*, and 25 of them were recommended to visit a cardiology clinic.¹⁷⁴

Key Takeaways for LRAs

- **Benefit from a commonly known brand:** By establishing a common identity ("*Biale Soboty*"), citizens across Poland could easily understand the purpose of the events.
- **Common but decentralised:** The decentralised approach under a common identity allows LRAs and local healthcare providers design their activities according to the resources available.
- **Resource inequalities should also be addressed:** These events can draw attention from citizens. Yet, such a practice may not address the regional disparities as less affluent regions may not be able to provide the best screening services.

Case #2.6: Cardio50	
Background	
CVDs are the leading cause of death in the Veneto region. In 2023, they accounted for more than 15 000 deaths (30.7% of all deaths). In the Province of Belluno alone, served by the Local Health Authority ULSS 1 Dolomiti, 794 people died from CVD, representing 32.1% of all deaths.¹⁷⁵ To address this challenge, the Veneto Regional Prevention Plan 2020-2025 introduced the Cardio50 screening programme across several local health authorities. <i>Cardio50</i> aims to prevent cardiovascular diseases by identifying people at high risk before symptoms develop and helping them adopt healthier lifestyles. The programme targets adults aged 50-51, an age considered particularly suitable for encouraging positive lifestyle changes. People already diagnosed with CVDs are not invited to participate in the programme, as they are already being followed by the healthcare system. The case study focuses on Province of Belluno province but the programme has been implemented across Region of Veneto.	 <i>Veneto, Italy</i> <i>NUTS2 Regional Population (2025): 4.85m</i> <i>NUTS2 Regional GDP per capita (2024): EUR 41 500</i> <i>Implemented by:</i> <i>Local Health Authority ULSS 1 Dolomiti</i> <i>Period: 2024 –</i>
Outcomes	
In 2024, ULSS 1 Dolomiti invited 2 694 eligible residents born in 1974 to participate in <i>Cardio50</i> for a free cardiovascular health check. A total of 1 746 people took part, corresponding to a participation rate of 64.8%. During the appointment, trained professionals measured blood pressure, sugar levels, cholesterol, weight, and other indicators, while also collecting information on smoking, physical activity, diet, and alcohol consumption. Based on the health checks, participants were classified according to their cardiovascular risk and received a personalised assessment and advice on improving their health. Where needed, they were referred to specialised services, such as smoking cessation clinics, dietitians, physical activity programmes, or addiction services. The first-year results showed that 78.3% of participants needed targeted support or lifestyle changes.¹⁷⁶ Participants were invited for a follow-up visit six months later to review their progress and, if necessary, adapt the support provided.	
Key Takeaways for LRAs	
• Very targeted age-specific screening: Population screening can identify cardiovascular risk before symptoms appear, allowing preventive action at an early stage and reducing the likelihood of disease insurgence in the future. • Offer an all-round healthcare: Inviting people proactively, providing the service free of charge, and offering follow-up appointments can encourage high participation and support lasting lifestyle changes. • Combine screening and prevention: Combining health checks with personalised counselling and referrals to local services helps turn screening into a practical prevention programme rather than a one-off medical examination. This tailored approach allows interventions to be adapted to a person's needs, increasing the chance of success in cardiovascular prevention.	

Case #2.7: Coimbra United for the Heart

Background

The Coimbra United for the Heart (CUH) project started in 2016 as a community awareness and screening initiative run by the Centro delegation of the Portuguese Heart Foundation, working with the city's hospital and primary care services.¹⁷⁷ Running as an informal collaboration for several years, the municipality joined as a partner and the project was formalised in 2022 through a protocol between 7 entities.¹⁷⁸ The CUH project helps prevent cardiovascular diseases by building a community health network that finds people at risk, raises awareness about healthy lifestyles, and provides better follow-up and monitoring.¹⁷⁹ The Municipality of Coimbra runs a range of initiatives within the CUH project to improve health promotion and prevention,¹⁸⁰ including touring screening vans for hypertension,¹⁸¹ the 'May is Heart Month' awareness campaign,¹⁸² and CVD risk assessment for municipal workers.¹⁸³ The project falls within the Municipal Health Strategy, which is used as a planning tool at the local level and includes the Municipal Health Profile and Municipal Health Plan, which together define priority actions according to the needs of residents.¹⁸⁴



Coimbra, Portugal

City Population (2025):

146 899

City GDP per capita (2021):

EUR 192 000

Implemented by:

Municipality of Coimbra

together with other entities

Period: 2016 -

Outcomes

The CUH project has increased rates of identifying and referring citizens for cardiovascular monitoring, and its ongoing expansion points to demand for community-based prevention. In 2023, Coimbra also screened its own municipal staff (around one in five of those invited). Half had high cholesterol and a third had high blood pressure, with little prior awareness in either case. More than a third were at moderate or higher ten-year risk of a heart attack or stroke.¹⁸⁵ Yet most of those flagged as very high risk still rated their own lifestyle as good, and staff overall had higher rates of high blood pressure, high cholesterol, obesity, and smoking than the surrounding population, something researchers suggested was linked to busy working adults skipping routine checkups. The city used the findings to shape a workplace health plan and referred high-risk individuals for follow-up.

Key Takeaways for LRAs

- **Convening power is a key strength of municipalities:** Coimbra's role in bringing together different entities with the clinical capacity and screening equipment is a replicable governance model for LRAs.
- **Workplace screening is a cheap way to surface at-risk individuals:** Since employees are an easy population to reach without new outreach infrastructure, and self-reported risk is not always a trustworthy indicator of who needs care.

Case #2.8: Telemedical Diagnostics linking regions and cities in Croatia

Background

Croatia's healthcare system faces the structural issue of too few specialists relative to need, with the unmet need particularly severe in rural and island areas, where the population is older and hospitals are difficult to reach. CVD causes roughly half of all deaths in Croatia, with mortality burden worse in remote areas.¹⁸⁶

The **Telecordis** project was built to close this gap of insufficient availability of specialist cardiology services in remote populations, with a national digitisation initiative funded through Croatia's National Recovery and Resilience Plan, under the EU's NextGenerationEU recovery instrument.¹⁸⁷

From March 2022 to March 2023, it procured 12-channel ECG machines, ECG and blood pressure monitors, and spirometers, installing them at 40 primary care access centre locations in remote and

rural areas plus 4 specialist reading centres staffed by cardiologists.¹⁸⁸ The clinical workflow was streamlined by beginning the use of telecardiology in the general practitioner's office, where a patient is fitted with a Holter monitor¹⁸⁹ or the heart rate is locally recorded with the ECG machine, then the data is transmitted digitally to a specialist, and the diagnosis and treatment recommendation are sent back, with referral to the nearest hospital only if needed. The clinical backbone behind Telecordis, the Polyclinic for Cardiovascular Disease Prevention and Rehabilitation (SRČANA) in Zagreb, has been implementing telemedicine since 2019, growing from 3 centres then to 23 by early 2024. By December 2025, Croatia's broader telemedicine network 'HealthNet' connects 248 centres nationally, with TeleCordis cited as a key part of that infrastructure, which now also incorporates AI-supported analysis.¹⁹⁰



Croatia

Country Population (2025): 3.87m

*Country GDP per capita (2024):
EUR 22 200*

*Implemented by: Croatian Institute
of Emergency Medicine*

Period: 2022 -

Outcomes

Waiting times dropped from up to 5 months to an average of 3 weeks in some regions.¹⁹¹ Overall the expanded telemedicine network has resulted in reduced complications, better chronic disease management, lower hospitalisation and travel costs, and improved patient satisfaction due to the enhanced monitoring mechanisms both thanks to the physical equipment improvements and the digitised care pathways.

Key Takeaways for LRAs

- **Integrate primary care telecentres with specialist hubs:** The network speeds up diagnosis and expands access, particularly outside of cities. Cheap diagnostic equipment at the primary care level, paired with a small number of remote specialist hubs doing the interpretation, can be a solution for LRAs operating in rural areas with limited resources rather than trying to recruit scarce cardiologists into every rural clinic.
- **Collaborate across regions:** To benefit from the expertise concentrated in some cities, regions should facilitate healthcare collaborations together with the use of telemedicine that helps reduce regional health inequalities.

Case #2.9: Pharmacy-based targeted screening for cardiovascular risk

Background

Cardiovascular diseases remain a major public health challenge, especially for populations who are isolated and have limited contact with the healthcare system. Therefore, to prevent cardiovascular diseases and reduce any complications, identifying risk factors such as hypertension, diabetes, and obesity as early as possible is important. The patients identified as being at risk can then be referred by the pharmacist into a coordinated care pathway led by their general practitioner^{192,193}. This initiative was the result of a partnership between the Regional Health Agency (ARS) and the Regional Union of Health Professionals: Pharmacists (URPS Pharmaciens) of the Hauts-De-France region in France¹⁹⁴. It was built on an earlier pilot conducted in the Lens-Hénin area, including 37 participating community pharmacies. In that pilot, 471 patients were screened, nearly half of them presented at least two cardiovascular risk factors, and 80% were referred to their general practitioner for further assessment and management¹⁹⁵. The programme identifies eligible patients in their patient base and offers them a screening. The screening includes blood pressure measurement, capillary blood glucose testing, body mass index assessment, waist circumference measurement, and questions on physical activity, and tobacco consumption¹⁹⁶. Pharmacists also offer prevention advice and coordinate referrals to the patient's general practitioner when a risk is detected. Pharmacists are compensated (EUR 25) for each screening consultation¹⁹⁷.



*Hauts-de-France Region,
France*

*NUTS2 Regional Population
(2025): 5.97m*

*NUTS2 Regional GDP per
capita (2024): EUR 32 900*

*Implemented by: URPS
Pharmacists and the Regional
Health Agency Hauts-de-
France*

Period: 2019 -

Outcomes

The initiative demonstrated the important role of community pharmacies in cardiovascular risk detection and prevention. Since the start of the action in March 2019 and until August 2024, 218 pharmacies across 9 participating areas registered to offer screening services; 140 pharmacies actively carried out at least 1 screening; and out of the 636 patients screened, 486 were referred to their general practitioners. The programme has been progressively extended to additional departments within the Hauts-de-France region, therefore increasing access to preventive services through existing community pharmacy networks¹⁹⁸.

Key Takeaways for LRAs

- **Leverage community pharmacies as local screening hubs:** As a highly accessible point of care, community pharmacies can help identify cardiovascular risk factors among individuals who are distant from healthcare services, facilitating earlier detection and referral.
- **Build on existing networks:** Expanding cardiovascular risk detection through community pharmacies offers a scalable and cost-effective approach. To maximise impact, local and regional authorities should invest in pharmacists' training, resources and capacity to deliver screening and prevention activities alongside their routine responsibilities.

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Pillar 3 - Living with the disease

Living with CVDs requires long-term management to maintain a good quality of life and prevent complications. In the European Union, integrated care models support people with CVD through regular monitoring, medication management, lifestyle counselling, and access to cardiac rehabilitation services. These approaches aim to help patients manage their condition effectively, reduce the risk of recurrent events, and improve physical, mental, and social well-being. By promoting coordinated, patient-centred care across healthcare settings, EU health systems seek to support individuals in living healthier and more independent lives with CVD.

Cases under Pillar 3 include:

Case #3.1: Heart Safe Cities, Greece and North Macedonia

Case #3.2: CARDIOSCOPE, Romania and Moldova

Case #3.3: ‘STEMI’ Smartphone-Based Pre-Hospital ECG Communication Network, Slovakia

Case #3.4: Streamlining Scattered Municipal Rehabilitation Policies, Denmark

Case #3.5: Integrated care and rehabilitation at State Heart Hospital, Southern Transdanubia, Hungary

Case #3.6: HeartNet Cross-border telecardiology network and referral, Pannonia, Croatia, and Vojvodina, Serbia

Case #3.7: Connect@Heart – mobile technology for CVD treatment and prevention, South Holland, the Netherlands

Case #3.8: Climate Shelter Network, Barcelona, Spain

Case #3.9: MOSAR: cooperation agreement for emergency care in the SaarMoselle Eurodistrict, France and Germany

Case #3.1: Heart Safe Cities

Background

In Greece and North Macedonia, limited access to basic health care treatment – largely due to poverty – causes preventable deaths from heart attacks, which are also increasingly affecting younger people.¹⁹⁹ In addition, Greece has one of the lowest survival rates in Europe for out-of-hospital cardiac arrests, mainly because few laypersons are trained in cardiopulmonary resuscitation (CPR)²⁰⁰ – an emergency technique used when someone’s heart stops to keep blood and oxygen moving. Improving survival depends on faster first aid and CPR from trained citizens in the first minutes before emergency services arrive. The *Heart Safe Cities* project addressed this by building a community response system across two pilot cities, Kalamaria and Ohrid. The cross-border project trained citizens and medical staff, installed automated external defibrillators (AEDs) in public places, improved medical equipment, and raised public awareness about prevention and early action.



5 Greek NUTS-3 Regions (Thessaloniki, Pella, Kilkis, Serres and Florina) and 4 North Macedonian NUTS-3 Regions (Pelagonia, Vardar, Southeast and Southwest)

Implemented by:

4 partners representing Greece and North Macedonia, co-funded by Interreg IPA

Timeline: 2018 – 2020

Outcomes

The project installed 37 AEDs in the Municipality of Kalamaria and 10 in Ohrid^{201 202} More than 2 326 individuals took part in life support training activities²⁰³ which teaches skills such as CPR and how to respond to life-threatening emergencies. Overall, more than 1 800 people received this training, making trained citizens a key resource.²⁰⁴ 243 healthcare professionals were certified in Intermediate Life Support (ILS), which provides more advanced skills for handling medical emergencies,²⁰⁵ creating a local network of trainers able to continue delivering CPR and first-aid training in the future.²⁰⁶

Key Takeaways for LRAs

- **Establish a first line of response:** Where health services are under pressure or poverty limits access to care, training ordinary citizens in CPR gives communities a first line of response. It is also a relatively cost-effective intervention. Training instructors creates a multiplier effect: once qualified, they can keep delivering trainings to new people.
- **Enhance cross-border collaborations:** Cross-border regions that share similar economic and health challenges are well placed to benefit from EU-funded programmes, which allow common standards to be developed and avoid duplication of effort on both sides of the border.

Case #3.2: CARDIOSCOPE²⁰⁷

Background

Romania has been a country with a very high cardiovascular mortality rate – more than two and a half times the EU average and second only to Bulgaria – a situation that remains the same in recent statistics.²⁰⁸ The project documentation noted that CVDs accounted for approximately 60% of deaths in Romania and 58% in Moldova, well above the EU average of 46%.²⁰⁹ Despite their national CVD policies, implementation had been limited and preventive activities were not yet systematically embedded in primary care.²¹⁰ **CARDIOSCOPE** contributed to addressing these challenges through EU-funded cross-border cooperation aimed at implementing a common framework for prevention, detection and treatment of CVDs.²¹¹ The project established an institutional network that helps subsequent initiatives build upon its results – including medical protocols, screening and monitoring programmes, training activities, and best practices for prevention and early detection – to ensure these tools could be transferred and replicated.²¹²



*Iași County, Romania, and
Ungheni District, Republic of
Moldova*

NUTS2 (RO11) Regional

Population: 2.54m

*NUTS2 (RO11) Regional GDP per
capita (2024): EUR 17 100*

Implemented by:

*The Order of Nurses, Midwives and
Medical Assistants in Romania Iași
Branch, Public Medical Sanitary
Institution the Ungheni Region
Hospital*

Period: 2020 – 2021

Outcomes

The project developed a range of practical tools and resources to strengthen the prevention, early detection and management of CVDs. These included a methodology for risk assessment,²¹³ regional risk maps,²¹⁴ medical guidelines for prevention,²¹⁵ and standardised protocols for screening, treatment and follow-up.²¹⁶ Training materials were also created for both doctors²¹⁷ and nurses²¹⁸. The project trained 300 healthcare professionals through both theoretical and practical courses in CVD management and primary care.²¹⁹ In addition, 1 000 people from the two regions participated in a pilot screening programme and received personalised information on their risk factors and advice on how to adopt healthier lifestyles.²²⁰ **CARDIOSCOPE** also worked to raise public awareness of CVD prevention through the information campaign “Take Care of Your Heart!”²²¹ which shared key messages via the project website and dedicated social media channels. The project also developed a Joint Strategy for Cardiovascular Disease Management,²²² with the cross-border network committing to its monitoring and implementation²²³.

Key Takeaways for LRAs

- **Leverage EU funding opportunities:** EU funds help bridge the financial gap in cross-border initiatives.
- **Make detection part of everyday care:** Family doctors and nurses should be equipped with practical and reusable tools for screening and prevention.
- **Formalise collaborations:** It helps ensure that practices are maintained over time, monitored, and eventually scaled to other regions facing similar challenges.

Case #3.3: ‘STEMI’ Smartphone-Based Pre-Hospital ECG Communication Network

Background

Slovakia has one of the EU's heaviest CVD mortality burdens, with around 15% of patients dying within a year of ‘STEMI’, which refers to segment elevation myocardial infarction.²²⁴ The reason is largely geographic, as the majority of Slovaks live in rural areas or small towns, while specialist hospitals are clustered in a few cities.²²⁵ Analysis of the Slovak registry of Acute Coronary Syndromes (SLOVAKS) found that more than a third of all emergency heart procedures were performed outside the recommended time limit, with a median total ischemic time (interval from onset of symptoms to care) of around 230 minutes, driven largely by patients being transported first to a hospital that could not perform the necessary procedure, then transferred again.²²⁶ Eastern Slovakia suffers particularly from this problem, as patients in this more rural and lower-income area frequently lost critical time to secondary transport rather than reaching a specialist centre directly.²²⁷ The **STEMI app**, developed by the Cardiology Clinic of Prešov and piloted in 2016, was designed to address this with a straightforward digital tool. Paramedics in the field can send a patient's ECG reading directly to a cardiologist at the Prešov heart centre and speak to them in real time to confirm the diagnosis, agree a destination, and begin appropriate treatment *en route*.²²⁸



Eastern Slovakia

NUTS2 Regional Population (2025):

1.59m

*NUTS2 Regional GDP per capita
(2024): EUR 17 100*

Implemented by:

Cardiology Clinic of Prešov

Period: 2016 –

Outcomes

Compared with the 2015 baseline, patients were markedly less likely to be sent to the wrong hospital first (misdirected transfers fell from 34% to 13%), and the total time from a patient's first symptoms to opening the blocked artery dropped by an hour, from 241 to 181 minutes.²²⁹ In a condition where every minute of delay costs heart muscle, this is a clinically significant gain. On the basis of these results, the Ministry of Health rolled out the STEMI app to every EMS ambulance in Slovakia and connected them with treatment and stroke centres from September 2017. The main challenges remaining include sustaining cardiologist availability for live consultations.

Key Takeaways for LRAs

- **Interoperability is the key:** When different healthcare systems can't share information with each other, it can cause just as many problems as having no healthcare services at all. Aligning actors and institutions around a shared protocol and a single communication platform can yield bigger improvements in outcomes than infrastructure investment alone could.
- **Digital pre-hospital ECG systems are relatively low-cost:** LRAs can implement agreements between regional ambulance services and specialist heart centres. The STEMI case demonstrates that a low-cost digital tool, when built around existing infrastructure rather than new physical capacity, can close acute care gaps in rural regions.

Case #3.4: Streamlining Scattered Municipal Rehabilitation Policies

Background

Denmark has one of the lowest CVD mortality rates in the EU. Rightfully so, Denmark is highly successful at saving patients from heart attacks. Thanks to a nationwide “Heart Runner” CPR app that alerts nearby citizens to give CPR if a person in their close radius suffers from a heart attack, the emergency heart attack survival rates jumped from 7.4% in 2001 to 21.6% in 2016.²³⁰ However, once patients left the hospital, their long-term recovery was scattered in 98 different local municipalities. It was a “postcode lottery” that the quality of rehabilitation depended heavily on where a patient lived, with 17% of heart patients with no idea of where to go for help after leaving the hospital.^{231 232} To respond to the health inequalities, the Association of Danish Regions published a joint report that they recommended to streamline rehabilitation on the local level. It recommended to open local “Heart Rooms” – neighbourhood local spaces where patients, especially from low socio-economic groups, could get medical and rehabilitation guidance without relying on expensive transport to a regional hospital. To ensure cross-municipal alignment, the joint report recommended the launch of an automated nation-wide database (DHRD) to instantly share health data between hospitals, family doctors, and local town halls without adding extra paperwork for healthcare staff.^{233 234}



Association of Danish Regions, Denmark

*Implemented by:
Association of Danish Regions, Danish Heart Foundation and local municipalities*

Period: 2019 –

Outcomes

The report became a cornerstone in the 2024 Danish Health Reform, creating 17 Health Councils to mandate the joint planning of rehabilitation between regions and municipalities, attempting to end the “postcode lottery”. The equal rights to rehabilitation for patients with CVD will be implemented by 2029.²³⁵ The implementation of the Danish Clinical Quality Program (RKKP) and municipal database (DHRD²³⁶) now tracks the rehabilitation uptake across municipalities, allowing LRAs to peer-learn and ensure equal rehabilitation quality for their citizens. Although the database is still not finally implemented, the 2024 Annual Report for the DHRD found that **63% of Danish territories already fulfil the goal of 70% CVD patients participation in rehabilitation on the municipal level, compared to 61% in 2023 and 47% in 2022.**²³⁷ The report recommends to further boost this number by the use of digital tools (i.e., phone calls from hospital) to remind patients of their rehabilitation rights, making it clear for all patients that rehabilitation is an integrated part of their healthcare rights.

Key Takeaways for LRAs

- **Bottom-up change can be impactful:** Decentralised countries suffering from “postcode lotteries” can form regional consortia can push for national cooperation plans.
- **Automate data sharing to safeguard equal treatment:** A single, nationwide, automated database collecting regional and local health data (from regional hospitals to local family doctors) ensures equality, uptake, and peer-learning of best practices.

Case #3.5: Integrated care and rehabilitation at State Heart Hospital

Background

Hungary has one of the highest cardiovascular mortality rates in the EU²³⁸ with considerable regional variation in cardiac rehabilitation uptake.²³⁹ Nationally, around one-third of patients who survive a heart attack go on to receive institutional cardiac rehabilitation, with rates for men slightly higher than for women.²⁴⁰ Veszprém county serves as an exception to this. A study tracked post-myocardial infarction patients in Veszprém county and compared survival between those who attended cardiac rehabilitation and those who did not. Patients treated at the regional heart hospital had a rehabilitation uptake of 51%, well above the national average.²⁴¹ Three structural factors explain this: 1) bed capacity: the county has more than six times as many publicly financed cardiac rehabilitation beds per capita as the national average; 2) integration: the Balatonfüred State Heart Hospital carries out both acute heart attack treatment and rehabilitation; 3) the benefit of integration: a patient admitted following a heart attack is already at the institution that will rehabilitate them, removing a critical handover point where patients are routinely lost. The rehabilitation programme follows the national Comprehensive Cardiac Rehabilitation (CCR) framework²⁴²: supervised physical exercise, patient education on smoking cessation, diet and medication adherence, and diagnostic risk stratification during the stay. CCR referral occurs at the point of hospitalisation, and enrolment takes place during that admission or within 30 days.



Southern Transdanubia
NUTS2 Regional Population
(2025): 845 970
NUTS2 Regional GDP per
capita (2024): EUR 14 100
Implemented by:
Balatonfüred State Heart
Hospital
Period: 2018-2021

Outcomes

People who took part in cardiac rehabilitation were far less likely to die in the period after their heart attack, both in the short and longer term. In the first month, rehab participants were nearly nine times less likely to die than those who didn't take part. A year on, they were still around three times less likely to have died.²⁴³ The more patient education sessions a patient attended, the lower their risk of dying within a year. Co-locating acute cardiac care and rehabilitation in one institution produced higher uptake than the national norm.

Key Takeaways for LRAs

- **Rehabilitation bed capacity is foundational:** It must be treated as essential infrastructure requiring dedicated resources, as referrals cannot be fulfilled without it.
- **Integrated pathways increase uptake:** Institutions treating acute events and providing rehabilitation at the same site mean patients do not have to be transferred or re-referred.
- **Quick referral and rehabilitation enrolment are essential:** Starting rehabilitation within 30 days of a heart attack leads to better survival and overall a more effective clinical intervention.
- **Education sessions have independent survival value:** Sessions on medication, diet, smoking and emergency response are associated with better one-year survival.

Case #3.6: HeartNet Cross-border telecardiology network and referral

Background

The Croatian Serbian cross-border territory covered by *Heart Net* (Pannonian Croatia and the Autonomous Province of Vojvodina in Serbia) has among the highest rates of CVDs in Europe. The two health systems share similar structural problems, including constrained budgets unable to sustain adequate specialist investment and sustained emigration of medical staff. In practice, patients requiring specialist cardiology care had to travel to the Institute of Cardiovascular Diseases Vojvodina in Sremska Kamenica, Serbia. To address this, the “Heart Net” initiative was set up, funded under Interreg IPA CBC Croatia-Serbia with a total budget of EUR 1.2 million.²⁴⁴ The two project partners were the Institute of Cardiovascular Diseases Vojvodina (Serbia) and the National Memorial Hospital Vukovar (Croatia), and the network connected five hospitals in the cross-border regions, with the Vojvodina Institute acting as the specialist reference hub. It provided remote examination, diagnosis and teleconsultation; transfer of clinical expertise from the reference centre to the regional hospitals; joint specialist training for medical staff; joint rapid-response protocols; and secure storage and exchange of patient data and vital sign monitoring.



Pannonia, Croatia, and Vojvodina, Serbia

NUTS2 Regional Population: 982 159 (HR02) | 1.7M (RS12)

NUTS2 Regional GDP per capita: EUR 15 100 (HR02)

Implemented by:

Institute of Cardiovascular Diseases Vojvodina and the National Memorial Hospital Vukovar

Period: 2019 – 2021

Outcomes

The network improved access to CVD care for approximately 10000 patients in the cross-border region. Thirty medical staff across the five hospitals were trained and prepared for cross-border collaboration and emergency response. Operationally, the network reduced unnecessary transfers of patients to the reference centre, and reduced outpatient migration driven by a perceived absence of local specialist services, and saved clinician travel time. Physical equipment improvements occurred alongside the digital infrastructure setup. The National Memorial Hospital in Vukovar received a new defibrillator and resuscitation.

Key Takeaways for LRAs

- **Telecardiology networks can pool capacity** without requiring either country/region to build new infrastructure such as reference centres.
- **A single reference centre can serve multiple regional hospitals.** The Vojvodina Institute supported four regional hospitals simultaneously through teleconsultation, joint protocols and shared training. LRAs do not need parity of specialist capacity across all hospitals, but a well-connected hub and reliable digital links to the spoke sites.
- **Interreg IPA CBC funding**²⁴⁵ can support cross-border health cooperation with non-EU partners. LRAs in border regions with EU candidate countries should leverage Interreg IPA CBC as a viable funding route for similar initiatives.

Case #3.7: Connect@Heart – mobile technology for CVD treatment and prevention, South Holland, the Netherlands

Background

The **Connect@Heart** project brought together local healthcare services, technology providers and researchers to create a digital platform that would link existing technologies to improve the effectiveness and efficiency of CVD care.²⁴⁶ The platform allows primary care practitioners to monitor and treat a large number of patients who previously were likely to have required chronic treatment in specialist medical practices. The digital platform is made up of four parts: (1) an exchange of data between wearable technologies, GPs and cardiologists; (2) software to identify and follow patients; (3) a dashboard for consultation between doctors; and (4) smart technologies in the patient's home.²⁴⁷ The study included both patients with a history of CVD and those identified to be at high risk. They were equipped with either a blood pressure monitor (BPM) or a 'Life Box' which contained a scale and activity tracker in addition to the BPM. The digital platform provided digital support and measurements to a dedicated patient lifestyle app, as well as sending average measurements to healthcare providers every three months who could remotely monitor and adjust medication protocols. Patients were advised to contact their practitioners if there were worrying signs, for example: very high or consistently high blood pressure scores. Specific consideration and technological support were given to try and accommodate those with reduced digital literacy. An ongoing study is being conducted to investigate barriers to use regarding the Connect@Heart system and aims to guide an implementation strategy specifically for patients with limited digital or health literacy.



South-Holland, the Netherlands

NUTS2 Regional

Population (2025): 3 86m

NUTS2 Regional GDP per capita (2024): EUR 60 000

Implemented by:

Project consortium includes Stizon, Health Base, Zorg & Zekerheid, Leiden

University Medical Centre, National eHealth Living Lab and GP partners

Period: 2022-2024

Outcomes

Healthcare providers generally positive about the intervention, citing time-saving as a positive outcome. Although the measurements resulted in some increases to workload at specific times, this was balanced with a reduction in the number of patient visits. A reduction in high blood pressure medication was observed after six months. Yet, as a considerable amount of assistants was employed to help onboarding and follow-up, scaling-up a similar initiatives would require sufficient resources for healthcare providers and patient support.²⁴⁸

Key Takeaways for LRAs

- **Adopting digital tools:** Integrated digital monitoring systems can support remote patient care and support blood pressure management while reducing patient visits to healthcare facilities.
- **Benefiting from the EHR system:** Digital tools together with an EHR system allow easier health data sharing and follow-ups.

Case #3.8: Climate Shelter Network, Barcelona, Spain

Background

Climate change is increasing the frequency, intensity and duration of heatwaves across Europe, creating significant public health risks. Extreme heat has an impact on cardiovascular morbidity and mortality, especially among the elderly and individuals with chronic diseases. Between 2013 and 2022, Spain experienced an additional 39.9 heat-related deaths per 100 000 inhabitants, compared to 17 on average in Europe.²⁴⁹ To address these risks, Barcelona City Council launched the Climate Shelter Network in 2019 as part of its climate adaptation strategy.²⁵⁰ The initiative offers accessible spaces where residents can find relief during periods of extreme heat. Climate shelters include libraries, schools, civic centres, parks and gardens, offering shade, drinking water, seating and air-conditioned indoor areas. The programme operates annually between 15 June and 15 September and is integrated into the city's Heat Plan.²⁵¹ In addition to climate shelters, Barcelona has introduced complementary measures including climate micro-shelters (e.g. pharmacies, shops), public drinking fountains, urban shading initiatives and digital tools (e.g. map²⁵²) helping residents locate cooling spaces across the city²⁵³.



*Barcelona, Catalan
Region, Spain*

Population (2025): 8.1M

GDP per capita (2024):

EUR 332 334

*Implemented by: Barcelona
City Council, Public Health
Agency of Barcelona,
Barcelona Education*

Consortium, ISG Global

and other local stakeholders

Period: 2019 -

Outcomes

The Climate Shelter Network initiative is expanding. It started from 70 shelters in 2020²⁵⁴ to more than 500 shelters in 2026.²⁵⁵ According to Barcelona City Council, 99.2% of residents now live within a 10-minute walk of a climate shelter.²⁵⁶ The city has also prioritised expansion in neighbourhoods with higher vulnerability to heat, achieving coverage of 99.5% of residents within a 10-minute walk and 80.3% within a 5-minute walk.²⁵⁷ Approximately 320 500 vulnerable residents, including older people and individuals with chronic conditions such as cardiovascular diseases, live within a 10-minute walk of a climate shelter.²⁵⁸ The initiative has contributed to improving access to cooling spaces. In addition, evaluations of passive cooling measures implemented in participating schools found improvements in students' satisfaction with indoor temperatures and air quality.²⁵⁹ The Barcelona model became a recognised reference for climate adaptation and health protection policies. Similar approaches have been adopted in other Spanish cities,²⁶⁰ but also across Europe, including in Paris, Berlin, Vienna and Bucharest^{261,262}. These extensions highlight the increasing recognition of climate shelters as an effective local tool for protecting populations from extreme temperatures.

Key Takeaways for LRAs

- **Use existing public infrastructure to protect population's health:** Local public facilities can be used as climate shelters without requiring new infrastructure investments.
- **Integrate climate challenges into cardiovascular disease prevention:** As extreme heat affects cardiovascular health, local heat-adaptation measures should be integrated into regional and local public health strategies.

Case #3.9: MOSAR: cooperation agreement for emergency care in the SaarMoselle Eurodistrict, France and Germany

Background

For inhabitants in some border regions, particularly in rural areas, specialist care facilities across the national border may be closer than the nearest domestic ones. The Eurodistrict SaarMoselle is a cross-border territory of approximately one million inhabitants within Saarland (Germany) and Lorraine (France) regions.²⁶³ In 2019, the Eurodistrict introduced the MOSAR cooperation agreement²⁶⁴ to facilitate access to cross-border care for certain emergency conditions, initially for a trial period of three years. This formalised various local agreements since 2007. The **MOSAR agreement** now forms part of a broader set of initiatives supporting cross-border healthcare collaboration. If a French citizen living near the border has a sudden, serious heart problem, they don't lose precious time travelling to distant French specialist hospitals in cities like Metz, Nancy, or Strasbourg, but emergency service will take them straight to the SHG-Kliniken Völklingen hospital in Saarland. It ensures patients get life-saving cardiac care as quickly as possible.²⁶⁵ It also ensures follow-up procedures and information sharing for on-going care, and that patients do not face any additional administrative steps and can follow their usual health reimbursement procedures.²⁶⁶ In addition, the agreement includes initiatives to support long-term collaboration between the regional healthcare facilities, including language courses for medical and care professionals, and knowledge and skills sharing between professionals across the border. A second project, MOSAIC, aims to address the administrative challenges arising from cross-border healthcare, including simplifying patient admission and invoicing, and improving information sharing between different healthcare actors and insurance companies.²⁶⁷ Several initiatives supporting the MOSAR agreements implementation, expansion and evaluation have received funding from the EU Interreg programme.²⁶⁸



Saarland, Germany, and Lorraine, France

NUTS2 Regional Population (2025): 1m

(DEC0) and 2.3m (FRF3)

NUTS2 Regional GDP per capita (2024):

EUR 42 200 (DEC0) and EUR 31 300 (FRF3)

Implemented by: Eurodistrict- SaarMoselle

Period: 2019 -

Outcomes

Between 2019 and 2022, 314 French patients were treated for cardiac arrest at SHG Kliniken Völklingen due to the MOSAR agreement.²⁶⁹ Saarland Heilstätten states that over 1000 patients have benefitted from cross-border cardiac care.²⁷⁰ The cooperation agreement was agreed to be implemented indefinitely in 2024. Its success is demonstrated by its expansion into further trials in other healthcare areas such as access to nuclear medicine facilities (2024),²⁷¹ and urgent treatment of stroke (2026).²⁷²

Key Takeaways for LRAs

- **Work with your neighbours:** Cross-border cooperation allows more efficient allocation of resources and also facilitates more timely emergency care.
- **Make use of EU regional funding:** EU funding can finance cross-border healthcare that would otherwise be financially less possible for individual nations to manage alone.

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5. Recommendations

The study shows that when it comes to health and safety, a ‘one-size-fits-all’ strategy usually fits no one. Every region is made up of its own local weather, geographical landscape, and urban design, as well as its specific industries and food traditions. Because these factors vary from one region to another, LRAs cannot simply rely on a generic national handbook. Instead, they must take the lead, designing specific prevention and detection policies that match the unique characteristics of their populations.

- 1. Implementing Health-in-all-policies:** Public policy decisions should not be made in isolation. Whether policymakers are planning new city streets, setting environmental rules, or designing school programs, they need to ask one simple question: "How will this affect people's health?". Instead of only focusing on quick profits or economic growth, LRAs should put the long-term public well-being at the heart of their plans. After all, a thriving economy means very little if the people living in it are not healthy.
- 2. Raising awareness of CVD risk factors:** Many people are unaware of the hidden risks and early signs that lead to CVDs, sleepwalking into serious health problems. This is why clear, honest health education is so vital: it prevents CVDs from developing. While public awareness campaigns are a great tool, they only work if they reach everyone. Authorities must make an extra effort to ensure these life-saving messages reach people living in remote and rural areas.
- 3. Investing in detection capabilities:** Detecting CVDs often requires specialised medical equipment that is not always available in rural or smaller communities. Mobile units can bring high-tech tools directly to the people who need them. LRAs should embrace telemedicine and AI-powered tools, allowing specialists to screen patients and detect early warning signs from afar.
- 4. Preparing for long-term care:** Modern medicine means heart disease is often a chronic condition rather than an immediate threat to life. To support people managing these conditions long-term, LRAs must abandon 'quick fix' approaches in favour of long-term, sustainable health strategies that protect citizens for years to come.
- 5. Opening to a wider range of stakeholders:** While LRAs have varying degrees of competence, institutional boundaries shouldn't limit what LRAs can achieve in healthcare. Their success relies on opening doors to

collaboration. Local initiatives from hospitals and research teams gain immense traction when LRAs step up to co-design and implement them.

- 6. Taking initiatives:** Our case studies show that local and regional initiatives can successfully upscale to the national level. This observation encourages LRAs to take on more projects and 'dream bigger', knowing that their local actions can reshape the national landscape.
- 7. Involving communities:** LRAs are very often limited by resources and expertise on their own. Empowering local communities and associations offers a practical solution. Training the public in healthcare and first-aid techniques, alongside improving general health literacy, is incredibly valuable, especially when budgets are tight.
- 8. Mobilising EU funds:** Initiatives are very often funded by EU projects, such as the EU Framework Programmes (for example, Horizon Europe). Interreg funds are also especially useful for financing cross-border initiatives. While we see many successful projects of this kind, LRAs may not yet have fully explored their potential.
- 9. Customising approaches and practices:** Regions differ in their demographics, economic conditions, and levels of urbanisation. Regional and local CVD strategies should adapt to local needs and available resources, leveraging existing networks of stakeholders and public policies.
- 10. Measuring and reflecting on the effectiveness:** LRAs should aim to measure the success of a policy, even if they can only capture short-term effects. Doing so helps them reflect on the policy, adjust it if needed, and upscale it where useful. More timely reflection also allows funds to be allocated more efficiently and enables regions to share lessons learned.
- 11. Bringing healthcare to the public:** Proactive measures work best. Case studies show that bringing healthcare services directly into public spaces achieves excellent results. These one-stop events allow people to access essential health tests and expert consultations all in a single visit.
- 12. Beginning prevention at an early age:** Prevention in children is the first defence. Childcare, as well as child and parent education are useful instruments for preventing children from becoming overweight and encouraging healthier habits. Enforcing smoking bans and establishing car-free zones around schools are measures which could reduce air pollution and boost children's health.

6. Conclusions

Cardiovascular diseases (CVDs) account for most of the deaths in the EU. This group of diseases, though common, is rather special since they are often chronic and gradually worsen one's health, and/or could become acute, requiring first-aid and emergency care. As CVDs develop gradually, people may not be aware of their conditions until they worsen or, in some cases, become irreversible. To effectively protect public health, public policies and measures should be innovative and 'think out of the box', while also being comprehensive enough to encompass the whole care pathway of these diseases, from prevention and screening, to treatment and long-term care. The traditional passive healthcare approach is increasingly inadequate, even less so in this world of fast-paced lifestyles. Effective approaches are those that meet people where they are - not only physically but also mentally and socially; understand and target their needs; and successfully cut through the noises of their own daily concerns.

Innovative ideas are out there, already being implemented in real-world settings. It is therefore important that LRAs and other stakeholders, including healthcare providers and researchers, come together and share their experiences, discuss challenges, and come up with practical solutions.

One vital lesson for LRAs is to never limit their strategic imagination. The study highlights several inspiring cases where bottom-up initiatives, initially launched with minimal resources at a local level, successfully scaled to become national practices. This proves that local experimentation is often the essential testing ground for innovative ideas.

Another lesson is that prevention can start anywhere and at any age. LRAs should not wait for problems to appear but proactively anticipate challenges and prepare to act for the future. Even though benefits may only become visible in the next generation, policymakers should move beyond the usual short-term political thinking and embrace long-term healthcare planning guided by the principle of 'Health-in-all policies'. CVD prevention and health promotion therefore do not only concern older populations, but also children, teenagers and young adults. While medical diagnoses and treatments can be expensive, planting an idea of healthy living in one's mind is far less costly, though it requires smart planning and innovative initiatives.

The good news: innovative ideas and diverse local initiatives are abundant and can be shared instantly at no cost.

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Annex I: Standardised mortality rate of circulatory diseases

Table 1 - Regions (NUTS 2) of 25 Highest and 25 Lowest Mortality Rate of Circulatory Diseases (2023)

25 EU Regions with the Highest Mortality Rate of Circulatory Diseases				
Rank	NUTS2	Region	CVD Mortality Rate	GDP per capita
1	BG31	Severozapaden	1 014.90	9 800
2	BG34	Yugoiztochen	987.37	12 500
3	BG32	Severen tsentralen	963.87	10 100
4	BG42	Yuzhen tsentralen	939.41	9 500
5	BG33	Severoiztochen	930.52	11 500
6	BG41	Yugozapaden	823.64	23 500
7	HU31	Észak-Magyarország	820.19	13 000
8	RO22	Sud-Est	816.96	13 000
9	RO32	Bucureşti-Ilfov	815.89	40 800
10	RO41	Sud-Vest Oltenia	801.46	13 300
11	RO11	Nord-Vest	795.83	15 600
12	RO42	Vest	792.99	17 300
13	RO31	Sud-Muntenia	784.52	12 100
14	RO21	Nord-Est	773.18	10 500
15	HU33	Dél-Alföld	757.39	14 600
16	HU32	Észak-Alföld	748.69	13 400
17	LV00	Latvija	725.96	21 000
18	HU21	Közép-Dunántúl	723.82	18 000
19	RO12	Centru	710.44	15 700
20	HU22	Nyugat-Dunántúl	707.10	18 200
21	HU23	Dél-Dunántúl	697.91	13 500
22	HU12	Pest	696.91	17 600
23	LT02	Vidurio ir vakarų Lietuvos regionas	679.54	20 100
24	SK03	Stredné Slovensko	650.65	18 700
25	SK02	Západné Slovensko	642.68	21 100
25 EU Regions with the Lowest Mortality Rate of Circulatory Diseases				
Rank	NUTS-2	Region	CVD Mortality Rate	GDP per capita
1	FR10	Ile de France	132.10	66 800
2	FRL0	Provence-Alpes-Côte d’Azur	142.69	40 500

3	FRK2	Rhône-Alpes	145.98	42 400
4	ES30	Comunidad de Madrid	153.37	42 600
5	FRM0	Corse	153.79	36 000
6	FRY2	Martinique	153.94	28 500
7	FRI1	Aquitaine	159.49	36 800
8	FRJ2	Midi-Pyrénées	162.90	37 600
9	FRJ1	Languedoc-Roussillon	163.07	32 400
10	FRY1	Guadeloupe	164.43	27 500
11	FRG0	Pays de la Loire	164.50	36 700
12	FRC2	Franche-Comté	166.61	31 200
13	ES22	Comunidad Foral de Navarra	167.38	37 000
14	ES41	Castilla y León	169.34	29 300
15	FRB0	Centre — Val de Loire	170.46	34 800
16	FRK1	Auvergne	171.24	33 600
17	FRC1	Bourgogne	174.83	34 700
18	FRI3	Poitou-Charentes	175.66	34 500
19	FRF2	Champagne-Ardenne	175.67	37 000
20	ES13	Cantabria	176.50	28 400
21	ES21	País Vasco	178.13	39 000
22	FRD1	Basse-Normandie	179.64	33 900
23	FRH0	Bretagne	180.44	35 400
24	FRF3	Lorraine	180.61	30 500
25	FRI2	Limousin	181.31	31 500

Sources: Eurostat

Annex II: Glossary

Atrial fibrillation is an irregular and often very rapid heart rhythm.

Disability-Adjusted Life Years (DALYs) is a statistical measure used in public health to quantify the total burden of disease within a population.

Dyslipidaemia is a medical term for having abnormal levels of lipids (fats) in the blood.

Hypertension is the medical term for high blood pressure.

Hypercholesterolaemia is the medical term for having high levels of cholesterol in the blood.

High fasting glucose means that a person's blood sugar level is higher than normal after not eating for several hours.

Ischemic heart disease (also called coronary artery disease) is a condition where the heart muscle does not get enough oxygen-rich blood.

Menopause is a natural biological process that marks the permanent end of a woman's menstrual cycles and reproductive years.

Nuclear medicine is a highly specialised branch of medicine that uses small, safe amounts of radioactive materials, called **radiopharmaceuticals** or radiotracers, to diagnose, evaluate, and treat various medical conditions.

Preeclampsia is a serious, multi-system medical condition that can develop during pregnancy, typically after the 20th week of gestation (or occasionally in the postpartum period).

Standardised death/mortality rate is an adjusted statistic used to compare death rates fairly between populations with different age.

Oxidative stress happens when the body has too many “unstable” molecules and not enough defences to neutralise them, which can lead to cell and tissue damage over time. Many factors can lead to oxidative stress including smoking, alcohol, poor diet and exposure to environmental factors.

Visceral adipose tissue means fat stored deep inside the abdomen, surrounding internal organs like the liver, intestines, and heart.

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