ADVANCING A PREVENTION AGENDA FOR CARDIOVASCULAR CARE IN IRELAND

Position paper

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ABOUT THIS POSITION PAPER

This position paper was developed to identify and drive the healthcare policy changes needed to improve prevention and management of cardiovascular disease (CVD) in Ireland, with a focus on atherosclerotic CVD, heart failure and heart valve disease. It sets out definitive actions for policymakers to prioritise cardiovascular health and take a preventive healthcare approach across the CVD population – from early detection of risk factors in primary care to long-term management in the high-risk population – preventing heart attacks, strokes and hospitalisations, and ultimately saving thousands of lives.

The medical prevention of CVD (i.e. actions that are taken at the healthcare system level to prevent CVD in the population) is the nucleus of this paper. The focus on a clinical approach should be seen as part of a wider strategy to improve population health.

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FOREWORD

The COVID-19 pandemic has reminded us that good health is not a luxury; it is an essential pillar of a prosperous and growing society. It also reminded us that leadership, investment and determination are needed from government and society acting together to secure the best health outcomes for all. For if health equals wealth, so too can ill health bring vast costs and societal setbacks. The premium afforded by investing in greater resilience in our healthcare system is now much easier for both decision-makers and citizens to grasp.

As we adjust to the post-pandemic 'new normal', our focus must turn to society's greatest undefeated killer, cardiovascular disease (CVD). CVD imposes a major health and economic burden in Ireland, and ischaemic heart disease is a leading cause of death. Most deaths from CVD are avoidable and, therefore, unacceptable.

While we have made great progress in tackling CVD over the past few decades, including considerable efforts and investment to develop cardiac and stroke services, consistent future progress is far from guaranteed. In the past two decades, we have failed to invest sufficiently in critical infrastructure to tackle CVD, such as comprehensive and standardised national audits and effective data-sharing models, and we have tolerated major gaps and unmet needs in CVD diagnostics, therapeutics and preventive care models. The deficit of visionary leadership has been most obvious in the absence of a national CVD strategy, although National Clinical Programmes have gone some way to achieving this goal.

At the same time, we face a multitude of rising CVD risk factors from population ageing and obesity, and new environmental threats from climate change. In addition, disruptions experienced during the COVID-19 pandemic and the pathology of the virus itself have further amplified CVD risks and will have a long-term legacy. These challenges, coupled with Ireland's present state of readiness to address CVD at the political and healthcare system level, can only

result in a growing burden of disease with deeply unequal impacts across society and devastating pressure on our healthcare system.

If we are to avoid these devastating impacts, we must first acknowledge persistent gaps in CVD prevention and management. We must then adopt a new and committed national plan that is focused on CVD prevention in all healthcare settings and led by the government, uniting society and stakeholders in a vision for change.

Now is the time to take meaningful action. We call on decision-makers from the Department of Health and the Health Service Executive to take renewed ownership of CVD and drive meaningful improvement to benefit patients, their families and our society as a whole.

Dr Angie Brown,
Medical Director,
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EXECUTIVE SUMMARY

Cardiovascular disease (CVD) is a leading cause of death in Ireland, but most of these deaths could be prevented. CVD claims the lives of almost 9,000 people in Ireland each year,[1] but it is estimated that 80% of premature CVD is preventable.[2] Reorientation of the Irish healthcare system to prioritise CVD prevention could save thousands of lives a year as well as avoiding considerable costs to society. This is critical as our population and healthcare system face unprecedented challenges, including recovery from the COVID-19 pandemic.

There are opportunities for prevention along the whole CVD continuum. Alongside population-wide approaches, there is much that can be done within the healthcare system to prevent disease progression and avoid hospital admissions and deaths from CVD. To fully realise this vision, key services must be provided at each stage of the patient journey.

Currently, CVD is not sufficiently prioritised by our political leaders, and many people are missing out on life-saving care. While Ireland has made good progress in CVD prevention and management, the most recent national CVD strategy, which expired in 2019,[3] has not been evaluated and is yet to be replaced. This means there is currently no overall national approach to preventing and managing this set of conditions. However, many aspects of CVD care are being addressed through the National Clinical Heart and Stroke Programmes in the acute, community and primary care settings.[4-7] While current integrated programmes aim to move away from an acute-focused system and improve the prevention and management of chronic disease in primary care and the community,[7] considerable gaps remain. For example, Ireland has the lowest hypertension detection rate in Western Europe,[8] and there is no specific case-finding approach for familial hypercholesterolaemia[9] – an important cause of premature cardiovascular death.[10]

For people who have been hospitalised with CVD, standardised prevention of repeat events and hospitalisations is paramount, yet many lack access to vital services. In hospitals, initiation of preventive services is inconsistent across regions and often falls short of national targets, and dedicated heart failure units are unequally distributed across the country.[11-13] Following discharge, access to cardiac rehabilitation is severely limited, with 40% of eligible patients waiting at least three months to begin a programme.[14]

Wider healthcare system reform is also needed to enable improvements in CVD care and to maximise potential benefits. Decision-makers in Ireland have demonstrated an ambition to transform the healthcare system through the development and initiation of Sláintecare. We must build on this momentum and ensure the wider healthcare system supports best-practice care in CVD and does so in a standardised way. Critical actions include:

- investing in robust systems for data collection and sharing, including the expansion of national CVD audits and the roll-out of individual health identifiers and integrated electronic health records
- expanding the roles of allied health professionals and ensuring staff work at the top of their licence
- improving access to care for disadvantaged groups
- expanding the digital health infrastructure to harness the full potential of digital healthcare technologies.

Greater prioritisation of CVD and preventive action across the disease continuum are urgently needed to slow, or even halt, disease progression and ultimately save thousands of lives. In support of these aims, we recommend that policymakers effect change in four key areas:

- Build on recent progress in the National Clinical Programmes to develop an up-to-date, comprehensive national plan for CVD, with a major emphasis on prevention across the spectrum of disease.
- Expand and innovate to address long-standing deficits in workforce capacity that drastically undermine CVD prevention services.
- Add to progress made through the Integrated Care Programme for the Prevention and Management of Chronic Disease and National Clinical Programmes by supporting improvements in clinical practice and prevention programmes along the whole CVD continuum.
- Innovate across the whole system to facilitate CVD prevention and improve health services overall.

1 CARDIOVASCULAR DISEASE AND THE HEALTHCARE POLICY CONTEXT

Burden and impact of cardiovascular disease in Ireland

Cardiovascular disease (CVD) is a leading cause of death in Ireland, but this does not have to be the case because most CVD is preventable. Each year, nearly 9,000 people in Ireland lose their lives to CVD,[1] and thousands more are living with its life-changing consequences.[15] While mortality from CVD, including stroke, has declined over time,[16] CVD remains one of Ireland's leading causes of death.[1] Yet an estimated 80% of premature heart attacks and strokes are preventable,[2] meaning that greater prioritisation of CVD prevention and management could save thousands of lives each year and ease the growing pressure on Ireland's already strained healthcare system.

We have to act now to reduce the burden of CVD cases, hospitalisations and deaths. The population of Ireland was among the youngest of the European Union (EU) Member States for decades, but it is now ageing faster than many other countries,[15] owing in part to increasing life expectancy.[17] While this is a testament to healthier lifestyles and advances in healthcare, population ageing introduces new challenges, such as driving higher prevalence of chronic diseases.[15] As the population continues to age, the burden of CVD will only increase[18] unless we see significant reforms in CVD care and investment in prevention strategies.

Action is needed to improve care for the whole CVD population and prevent unnecessary hospital admissions and deaths. This is critical for people living with existing conditions who are at the highest risk, such as those who have already had a heart attack or stroke and are at risk of a repeat event.[19] Currently, almost two thirds of people over 65 in Ireland are living with multiple chronic conditions;[20] people living with CVD frequently have additional chronic conditions, such as diabetes or chronic kidney disease, putting them at a greater risk of adverse outcomes and making their care needs more complex.[21,22] Much can be done to reduce the risk of a major event, such as a heart attack or stroke,

but it will often require closer, more coordinated and consistent support from healthcare professionals.

CVD prevention and management in national policy

This position paper focuses on the medical prevention of CVD (i.e. actions that are taken at the healthcare system level to prevent CVD in the population). The focus on a clinical approach should be seen as part of a wider strategy to improve population health. This wider strategy must also focus on public health actions that can be taken to prevent CVD. As long ago as 1985, Geoffrey Rose observed that, within a given population, most cases of CVD will affect individuals at only modestly increased risk, simply because they are vastly more numerous.[23] These individuals may not be engaged with the healthcare system, so public health actions are also vital. This fundamental observation has influenced health strategy decisions ever since. Since then, far more effective methods of detecting and treating high-risk subjects have been developed that are increasingly applied by healthcare systems, but the basic principle that complementary public health actions are also needed remains sound. Equally, across Europe, we know that some of the highest costs and mortality in CVD come from populations living for many years with chronic conditions or risk factors. For example, atrial fibrillation (AF) is thought to be the biggest single risk factor for stroke, responsible for at least one in five strokes, and strokes caused by AF are often the most severe.[24] Similarly, nearly half of all major cardiac events happen among people who have existing coronary heart disease,[25] and heart failure represents the leading cause of hospital admissions in people over 65.[26] Therefore, governments must bolster both high-risk and population-wide prevention efforts to secure the overall goal of a sustainable approach to CVD.

Ireland has made great strides in improving the health of its population and investing in CVD prevention. In 2004, Ireland became the first country in the world to introduce a blanket ban on smoking in enclosed workplaces, including restaurants, pubs and bars.[27] Since then, ambitious policies and programmes, such as Tobacco Free Ireland,[28] have been implemented, and Ireland is considered a world leader in smoking cessation.[29] Other key population health topics relevant to CVD, including diet and physical activity, are also prioritised through Healthy Ireland,[30 31] demonstrating the government's commitment to improving the wellbeing of the Irish population.

Ongoing investment in CVD management is visible in several national programmes and initiatives. The Health Service Executive (HSE) initiated the National Clinical Programmes in 2010,[32] with the Models of Care for stroke

and acute coronary syndrome published two years later.[5 30] Today, the National Heart Programme takes an integrated, whole-system approach to reduce illness and death from CVD by intervening along the entire patient journey,[4] and it is now linked with the important Integrated Care Programme for the Prevention and Management of Chronic Disease (ICPCD).[33] Similarly, the National Clinical Programme for Stroke has improved access to acute stroke treatment – for example, through increased provision of stroke units and the development of early supported discharge services.[34] The first chapter of the recently published National Stroke Strategy 2022–2027 addresses primary and secondary prevention.[35] Cardiac and stroke services, particularly in the acute setting, are being evaluated through national audits and a national review of cardiac services.[12 13 36] In addition, recent years have seen significant achievements in improving emergency and hyperacute care for cardiovascular events. These include staffing for 24-hour services and ensuring rapid, high-quality delivery of key interventions such as percutaneous coronary intervention, thrombolysis and thrombectomy.[33] However, acute treatment of cardiovascular events is beyond the scope of this position paper. Selected cardiovascular diseases are included in the ICPCD, involving acute, community-based and primary care services.[37]

> **The average person in the street dreads being diagnosed with cancer or dementia, but not CVD. They think they can just take a tablet. Even if they need a bypass, they think they'll have the bypass, take a few months off and be fine. This is a dangerous misunderstanding and an underestimation of the impact of CVD.'**
>
> **Pat O'Donnell, CVD patient**

Despite these successes, a renewed political commitment to CVD is urgently needed. Leading experts have noted that improved outcomes and a decline in premature death from CVD have resulted in misplaced optimism and the misunderstanding that CVD is no longer a public health priority across Europe.[38] Ireland, it seems, shares this dangerous misunderstanding: national CVD strategies were in place from 1999 to 2019, but the most recent strategy, *Changing Cardiovascular Health*,[3] has now lapsed, has not been formally evaluated and is yet to be replaced. While there have been a number of important developments in CVD, there is still no equivalent plan in terms of comprehensiveness and national strategic vision.

In comparison, policymakers have shown continued leadership in cancer, offering a template for similar leadership in CVD. Cancer causes a similar number of deaths to CVD in Ireland,[1] but cancer prevention and management benefit from ongoing development by the National Cancer Control Programme and a dedicated strategy that is evaluated annually to review implementation.[39] Decision-makers have shown a willingness to support the vision of improved cancer care with enhanced investment[40] and should be inspired by this leadership in addressing CVD. Although cancer may be more feared by the

public, and thus more politically charged, it would be short-sighted not to invest in CVD and its prevention given the huge burden it places on our healthcare system and society.

New national clinical improvement programmes are being rolled out, but they may not fully address major gaps in CVD prevention. The HSE has previously acknowledged that the approach to managing chronic diseases was 'relatively ineffective, inefficient and ultimately unsustainable', and that significant reform was urgently needed.[20] National improvement efforts are underway, such as the ICPCD (*Box 1*). However, a few limitations suggest that the implementation of this programme may not achieve the full vision of comprehensive prevention and universal access to required services. For example, the Chronic Disease Management Programme (CDMP) is exclusively for people with a medical card or general practitioner (GP) visit card and does not include a systematic approach to case finding.[41,42] The medical card and GP visit card schemes provide certain healthcare services free of charge to people aged over 70 and those with incomes below a certain threshold,[43,44] so the CDMP is likely to support opportunistic case finding in people from socioeconomically deprived backgrounds and those who are older, who are potentially at higher risk. However, only 43% of people aged 65–69 and 32% of people aged 55–64 hold a medical card,[45] meaning that many people who could benefit from the CDMP are excluded.

Ireland's leaders require comprehensive, standardised data to evaluate CVD prevention and care across the whole population. Established national healthcare audits relevant to CVD include the Irish National Audit of Stroke[46] and the Irish Heart Attack Audit.[12] Both audits include indicators on secondary prevention in hospital, but primarily aim to evaluate acute treatment.[12,46] There is also an international audit of risk factor control in people with established CVD: the Survey of Risk Factors (SURF). SURF is run by Trinity College Dublin and University Medical Center Utrecht in collaboration with the European Society of Cardiology.[47] The National Review of Specialist Cardiac Services is also underway; it appears to be focused on acute services[36] but will reportedly also address prevention.[48] Regarding primary care, the CDMP is providing new opportunities for data collection and reporting in chronic disease prevention and management, as demonstrated by the first report published in 2022.[42] Gaps remain, however, given that only a proportion of the population are eligible for the CDMP.[42] Ongoing political commitment is thus required to ensure the provision of CVD prevention and care in the community or primary care to all adults across Ireland, in accordance with stated national objectives that aim to limit hospital care to the most complex issues.[37]

Box 1 Current national initiatives aiming to improve prevention and management of chronic diseases, including CVD

Integrated Care Programme for the Prevention and Management of Chronic Disease (ICPCD): this programme aims to provide integrated care for four chronic conditions (CVD, chronic obstructive pulmonary disease, diabetes and asthma), favouring community and primary care settings.[20] Programme documents discuss the increasingly complex needs of people with more advanced diseases, highlighting the importance of intervening earlier while ensuring that appropriate services are available to meet the needs of the entire population, from low-risk to acute.[7 37]

Community ambulatory care hubs: these are a key component of the ICPCD to provide access to specialist services in the community for people with chronic diseases.[7] The hubs are currently being rolled out and are staffed by multidisciplinary teams of specialists to provide integrated, holistic care as well as access to diagnostics.[7] The teams should include specialist nurses, physiotherapists, cardiac rehabilitation specialists, clinical psychologists, dietitians, GPs with an interest in chronic disease, and specialist consultants who will split their time between the hubs and their affiliated hospitals.[7] They will liaise closely with the referring GP to maintain continuity of care across settings.[7]

Chronic Disease Management Programme (CDMP): opportunistic case finding (among adults with certain risk factors), prevention and ongoing management of specific chronic diseases, including CVD (heart failure, ischaemic heart disease, cerebrovascular disease and atrial fibrillation), have been incorporated into a new GP contract.[37 41 42] The CDMP is a component of the ICPCD that was initiated in 2020.[41] It provides a structured disease management pathway for people with a medical card or GP visit card, and a financial incentive for GPs to take part.[41] The programme has received international recognition, and the vast majority of GPs in Ireland have signed up to deliver it.[49]

2 PREVENTING CARDIOVASCULAR DISEASE ALONG THE PATIENT PATHWAY

The focus on acute care in Ireland's healthcare system is not sustainable. As in many countries, Ireland has traditionally allocated most of its healthcare spend to short-term management of acute events, with hospitals providing much of the care.[37] While it is essential that people receive swift and high-quality care in an emergency, and indeed Ireland has made substantial progress in this area,[33] too restricted a focus on reactive care often leads to avoidable hospitalisations. The HSE has acknowledged that this has historically been the case, highlighting that this model is 'neither patient-centred nor sustainable'.[37]

> 'Preventive strategies tend to be associated with reduced need for hospitalisations. And more often than not, preventing hospitalisations will save at least enough costs to cover the preventive intervention – if not more.'
>
> **Paddy Gillespie,**
> **Professor of Health Economics**

A preventive approach to CVD is needed at all stages of disease, from early identification and treatment of people at high risk through to comprehensive rehabilitation to reduce the risk of repeat cardiovascular events or further disease progression. There is excellent evidence to support investment in this approach, as many examples of preventive therapies, interventions and disease management models have resulted in improved outcomes and reduced hospitalisations.[50-54] *Figure 1* highlights opportunities for prevention along the CVD continuum within the healthcare system, covering clinical management of people with an elevated risk of CVD. An overview of the major types of CVD and their risk factors is included in the Appendix.

We need a new vision for CVD in Ireland that builds on existing policies but has a greater focus on prevention. Population-wide approaches (which are outside the scope of this paper) and strategies targeting people at elevated risk (which are the focus of this paper) are complementary, and both are critical to population health and societal prosperity. If the ICPCD points to a new political ambition in healthcare, then this is an opportunity to reorient the healthcare system towards a more prevention-focused, community-based model that is well equipped to care for the full spectrum of Ireland's ageing population with its increasingly complex healthcare needs.[37]

FIGURE 1. OPPORTUNITIES FOR PREVENTION ALONG THE CVD CONTINUUM

Preventing the progression of CVD across the disease continuum

People at increased risk of CVD

Population: People with CVD risk factors, including hypertension, high cholesterol, obesity, diabetes and certain genetic conditions, and people who smoke

Key goal: Prevent or delay development of CVD by effectively managing risk factors through lifestyle support and medical treatment

People with established CVD

Population: People living with atrial fibrillation, atherosclerotic CVD, heart failure or heart valve disease

Key goal: Diagnose the condition as quickly as possible and provide guideline-based treatment to prevent disease progression and cardiovascular events

People who are in hospital with CVD

Population: People who present to hospital with heart attack, stroke, worsening heart failure or other cardiovascular symptoms

Key goal: Leverage the opportunity while the person is in hospital to ensure they are receiving appropriate preventive care to avoid repeat admissions

People at increased risk of repeat events and hospitalisations

Population: People who have experienced a cardiovascular event (heart attack or stroke) and those with heart failure

Key goal: Improve cardiovascular health to prevent repeat events, rehospitalisations and deaths

Policy actions to achieve key goals

Early identification and management of risk factors

- Expand targeted case finding through primary care and community-based initiatives
- Improve access to lifestyle and treatment adherence support by leveraging existing models of care and implementing them across Ireland

Timely diagnosis and treatment of established CVD

- Boost biomarker usage by ensuring direct GP access and adequately resourcing laboratories
- Expand existing programmes to include all forms of CVD, including atrial fibrillation and valve disease
- Increase access to echocardiography for people who need it

Initiation or escalation of prevention in the acute setting

- Ensure public hospitals have specialist-led multidisciplinary CVD teams in place
- Build on existing audits to establish a comprehensive national programme of data collection for all aspects of cardiovascular prevention and care

Multidisciplinary care and prevention models post-discharge

- Expand access to prevention and rehabilitation programmes by delivering them in the community and providing telehealth options

System-wide solutions

Expand the digital health infrastructure
- Include self-monitoring and remote monitoring technologies in eHealth strategies

Invest in data collection and sharing
- Establish a comprehensive national CVD audit programme
- Roll out electronic health records

Expand the roles of nurses and allied health professionals
- Shift some elements of prevention, including case finding and medication titration, to pharmacists and nurses

Improve access and care for disadvantaged groups
- Develop targeted strategies to address geographic and socioeconomic inequalities
- Educate healthcare workers on the presentation of CVD in women to address sex disparities

3 COMPONENTS OF EFFECTIVE PREVENTION IN CARDIOVASCULAR DISEASE

Early identification and management of risk factors

Early identification and management of modifiable CVD risk factors are essential to improving outcomes. Modifiable risk factors for developing CVD include high blood pressure, raised cholesterol, smoking, obesity and diabetes.[55] Each of these factors is clearly linked with disease risk, and modifying them can slow or prevent the development of CVD. For example, high blood pressure is the second most significant cause of disease and disability in the world after poor diet, and accounts for around half of all strokes and cases of ischaemic heart disease.[56] Lifestyle modifications and medical treatment in line with international guidelines can lower blood pressure and significantly reduce the risk of developing CVD or experiencing a cardiovascular event.[55 57 58] A range of therapies is available to help manage other risk factors, such as raised cholesterol, and their use is recommended to reach the targets in European guidelines.[55]

Non-modifiable risk factors, such as genetic conditions, must also be identified early so that their impacts can be appropriately managed. Familial hypercholesterolaemia (FH), for example, is a genetic condition that causes high levels of cholesterol from birth and can lead to the development of CVD at a young age.[10] Early initiation of cholesterol-lowering medication is necessary to reduce this risk, but as FH is usually asymptomatic, early detection and diagnosis are dependent on screening.[9] Cascade screening of immediate family members of anyone diagnosed with the condition is a common approach that is highly cost-effective[59] and recommended in European guidelines,[60] but universal screening in childhood has also shown promising results in some European countries (*Case study 1*).[61 62] In either approach, screening involves clinical assessment and family history, followed by genetic testing in people with suspected FH.[60]

We have many tools to rapidly assess risk and guide treatment decisions. European guidelines recommend SCORE2[64] (for people aged 40–69) and SCORE2-OP[65] (for people aged over 70) to estimate the risk of CVD among

Case study 1

National screening programme for familial hypercholesterolaemia in Slovenia

Slovenia introduced a familial hypercholesterolaemia (FH) screening programme in 1995, making it the first country to implement such an initiative nationwide.[61] The programme was incorporated into the existing mandatory medical examinations of five-year-old children.[61]

Cholesterol levels are assessed during scheduled visits to primary care paediatricians, and children found to have elevated cholesterol are referred to a dedicated lipid clinic for genetic testing.[62]

Each year, 20,000 children are screened through this two-step approach, and FH is detected in almost half of referred children.[62] The programme has been identified as an EU Public Health Best Practice example for FH screening by the European Commission, alongside similar initiatives in the Czech Republic, Italy, the Netherlands, Norway, Spain and the UK.[63]

people without prior CVD, diabetes or other major health conditions.[55] QRISK3 is another CVD risk prediction tool that was developed using data from England[66] and is also used in Ireland.[67] These tools can be used effectively in primary care to estimate the ten-year risk of fatal and non-fatal cardiovascular events, based on a range of factors such as age, sex, smoking status, blood pressure and cholesterol.[64 65] The estimated risk should inform treatment decisions around the intensity of CVD prevention, alongside other factors such as potential risk modifiers, other existing conditions, treatment benefits and patient preferences.[55]

Where needed, we can conduct more detailed investigations for those at higher risk. Recent international guidelines outline the benefits of using non-invasive imaging techniques for risk assessment in certain people, even before clinical thresholds for disease are met.[60] Measuring atherosclerotic plaques through ultrasound scans of major blood vessels or using computed tomography (CT) can improve risk classification compared with traditional risk factors.[68] These approaches may be considered for people who are at low or moderate risk by traditional metrics but whose blood pressure or cholesterol is not sufficiently managed through lifestyle modification alone.[60]

We can provide better support to help people reach their health and wellbeing goals and reduce their CVD risk. Treatment decisions must

always be made in discussion with the person and consider their risk profile, their preferences and the potential benefits of treatment.[55] Once risk factors have been identified and management (lifestyle and/or medical) initiated, the person should be reassessed regularly to adjust treatment as necessary, identify additional risk factors and support treatment adherence.[55] Lifestyle modifications, including increasing physical activity, consuming a healthier diet and quitting smoking, are recommended to moderate risk factors, such as blood pressure and cholesterol, and reduce overall cardiovascular risk.[55] Interventions that include behaviour change techniques – such as goal setting, self-monitoring and prompts – have been found to be effective at increasing physical activity and improving diet quality.[69,70] In addition, when people who smoke receive specialist support and prescription medication, they are over three times more likely to quit successfully than those who try to quit with no support.[71]

Risk factor identification and management in Ireland

Important risk factors are underdiagnosed in Ireland, yet there is no systematic approach to case finding. Although the CDMP now includes opportunistic risk assessment in people over 65 who are eligible for the programme (and will extend this to people over 45 in 2023),[67] undetected CVD risk factors are common. For example, high blood pressure is more prevalent in Ireland than in most other Western European countries, while only 54% of women and 47.5% of men aged 30–79 are aware they have the condition – representing the lowest detection rate in Western Europe.[8] Similarly, data from The Irish Longitudinal Study on Ageing (TILDA) showed that although most people with CVD or diabetes were aware of having high cholesterol, about half of people without these conditions were unaware of having high cholesterol.[72]

Recent initiatives are improving detection and management for certain groups. Since the introduction of the CDMP, GPs in Ireland have been incentivised to routinely monitor people with certain types of CVD and to undertake opportunistic case finding and prevention activities for people at elevated risk.[41,67] This programme has considerable buy-in from GPs across the country.[49,73,74] However, it is specific to people who hold a medical card or GP visit card.[67] While this approach effectively targets people at a socioeconomic disadvantage and those aged over 70 – and therefore more likely to be at risk of chronic disease[73,75] – out-of-pocket payments for people without a medical card or private insurance could remain a barrier to preventive services,[76] even among people known to be at increased risk. The Long-Term Illness Scheme is another chronic disease programme that provides free treatment for people with certain chronic conditions, such as diabetes, but CVD and related risk factors are not currently covered.[77]

> The knock-on effect of young heart disease is economic, it's social and it's preventable. If you treat people with familial hypercholesterolaemia young enough, they have almost the same cardiovascular risk as anybody else.'
>
> Patricia O'Connor, Consultant in Internal Medicine and Lipid Clinic Director, St James's Hospital

FH and other lipid disorders are not sufficiently addressed. FH affects around 20,000 people in Ireland, but only a very small proportion of cases have been identified.[9] This means that thousands of people are at high risk of a heart attack at a young age, which could be prevented with earlier detection and appropriate management. However, FH is not addressed in the CDMP, and there is currently no specific case-finding approach in Ireland; detection is sporadic and generally depends on opportunistic identification of high cholesterol or awareness of family history of premature CVD death.[9] For lipid disorders more broadly (conditions that cause high levels of fats, such as cholesterol, in the blood), there are very limited specialist resources (e.g. lipid clinics) across the country,[78] and GPs may need more support to manage lipids in primary care.[9]

Ireland has made significant strides in managing modifiable risk factors, but challenges remain. Ireland is recognised as a world leader in smoking cessation, offering a range of tailored strategies for people who want to quit.[29] However, although the smoking rate at 17% is lower than the EU average,[37,79] international data suggest that the reductions in mortality achieved by reduced smoking and improved management of other risk factors are being offset to some degree by increases in obesity and diabetes.[80] Indeed, 23% of adults in Ireland are living with obesity and another 37% are overweight.[37] Among people who have already experienced a cardiac event, 84% are overweight or have obesity, and 33% report rarely or never engaging in exercise.[81] The ICPCD aims to address these risk factors with a range of interventions that can form part of routine contacts with healthcare professionals in the community.[37] These interventions include Making Every Contact Count – a widely used approach to behaviour change using brief advice and interventions.[82]

A national obesity programme is currently in place and has identified a number of gaps in available services. The National Clinical Programme for Obesity was established in 2017, and a Model of Care for helping people who have obesity or are overweight was published in 2020.[83] Aligned with Sláintecare and the ICPCD, this Model of Care sets out plans for management across all healthcare settings with a focus on preventing disease progression and the development of complications.[83] It highlights a number of gaps in the current system, such as lack of available services (e.g. dietetics and bariatric surgery), limited capacity to train primary care staff, and insufficient resources to implement and maintain multidisciplinary teams to care for people with more complex obesity.[83]

RECOMMENDED ACTIONS FOR IMPROVEMENT

Targeted case finding must be expanded through primary care and community-based initiatives.

- While the current international evidence base suggests that a universal health check may not be cost-effective,[84] the existing service delivered through the CDMP should be made available to all adults aged 45 and over, in line with the Sláintecare ambition to deliver a universal health service.
- In addition to offering health checks within their own clinics, health insurance providers should invest in prevention by funding preventive services delivered by GPs. This could increase uptake by making risk assessment and preventive care more convenient and accessible. It would also facilitate follow-up care within the public healthcare system for anyone found to be at increased cardiovascular risk.
- Assessments for high blood pressure and AF in people without an existing cardiovascular condition should also be made available in community pharmacies. This approach was piloted in 68 pharmacies in 2018; over a two-month period, 1,100 people aged 50 and over were checked, with 5.5% being found to have possible AF and 27% having high blood pressure.[85] This resulted in 4% of participants being started on medication for high blood pressure, AF or both.[85]
- FH screening – whether through systematic cascade screening, routine screening in childhood, or both – should be introduced and implemented across the country. This is done in different ways across Europe,[59 62 63] and the Department of Health, liaising with the National Screening Advisory Committee, should ask the Health Information and Quality Authority (HIQA) to perform a comprehensive review to identify the best approach for Ireland.
- GP education and a structured care programme may be required to facilitate management of diagnosed FH in primary care to avoid unnecessary specialist referrals.

RECOMMENDED ACTIONS FOR IMPROVEMENT

Access to lifestyle and treatment adherence support should be improved by further supporting existing models of care and implementing these across Ireland.

- Lifestyle modification strategies are in place, including the National Clinical Programme for Obesity,[83] but access remains limited. Greater investment in the implementation and evaluation of these programmes across the country is crucial to supporting early prevention of CVD.
- Sufficient resources must be allocated to tackling the identified barriers to comprehensive implementation of the National Clinical Programme for Obesity Model of Care.
- In line with the ICPCD ambition to deliver Making Every Contact Count in primary care,[37] all primary care staff should receive ongoing training and information to effectively support lifestyle modification and adherence to treatment, including referral to appropriate services.

Timely diagnosis and treatment of established CVD

Some people will go on to develop CVD, making timely diagnosis and treatment essential. As with many other conditions, timely diagnosis and appropriate treatment are key. They ensure that people receive care as early as possible to either slow or halt disease progression so that the best outcome is achieved.[86 87] Timely diagnosis also prevents the negative impacts of delayed diagnosis or misdiagnosis, which can include mental and emotional distress, difficulties in daily life and financial difficulties.[88]

Following the identification of suspected CVD in primary care or community settings, referral to specialist services may be needed for diagnosis. Investigations may include a coronary angiogram or CT calcium score and CT angiogram, to detect narrowing of coronary arteries and diagnose coronary heart disease.[89] Access to angiography and CT can be very variable, with long waiting lists in some areas. In heart failure, Irish and European guidelines state that an electrocardiogram and a blood test for N-terminal-pro B-type natriuretic peptide (NT-proBNP) should be performed and precede an echocardiogram to maximise efficiency and prioritise those at greatest risk.[90 91] In heart valve disease, a simple stethoscope check in primary care can detect a heart murmur, which should trigger referral for echocardiography.[87] As a definitive diagnosis of heart failure and heart valve disease is reliant on echocardiography (often called 'echo'), this procedure is essential to the initiation of the most effective therapies.[87 92] However, access to echo is limited[93] and different types of preliminary testing must be performed before referral to this specialist service.

AF should also be detected early to reduce the risk of stroke. AF is characterised by irregular activity in the heart, which can result in pooling and clotting of blood. If a clot leaves the heart and travels through the circulatory system, it can block an artery anywhere in the body, including the brain, causing a stroke.[13] The best way to manage this risk is to prevent clotting through treatment with anticoagulants ('blood thinners').[13] The risk of stroke in people with AF can be reduced by approximately 65% with anticoagulation treatment,[50] but this requires early identification of the condition, which is often asymptomatic.

Once CVD has been identified, prompt intervention and routine care are essential to reducing deaths, disability and avoidable costs. Treatment of CVD may involve medication, percutaneous intervention (a minimally invasive procedure to open clogged arteries) or surgical intervention. The condition also requires regular monitoring, risk factor management, routine review of medication with dose adjustment and patient education.[55 60] For people at the highest risk and with other conditions, this type of ongoing management and support may be delivered most effectively by a multidisciplinary team.[53 87]

Diagnosis and management of CVD in Ireland

Long waiting times for hospital-based services are a recognised issue in Ireland, as they are a major barrier to effective prevention and treatment. It has been reported that waiting times for diagnostic services, such as echo and angiography, can exceed a year in some public hospitals.[94] Even before the COVID-19 pandemic, waiting times for a first consultation with a cardiologist were as long as 14 months.[95] Conversely, people with private insurance are often able to access diagnostic services rapidly – within a few days[96] – driving inequalities in healthcare access and outcomes. In 2018, the HSE published a waiting list action plan for certain procedures,[97] but COVID-19 and other challenges have meant that waiting lists continue to grow. Various reports from 2021 revealed record numbers of people on hospital waiting lists, including lists for inpatient or day-case treatment and hospital outpatient consultations.[98-100]

The CDMP provides regular, standardised care for some people with CVD, but many cases remain undiagnosed. Ireland lacks a structured approach to detecting atherosclerotic CVD (ASCVD) and its risk factors before a cardiovascular event; in 75% of people who had a heart attack between 2017 and 2020, the heart attack was the first manifestation of disease.[12] People who are enrolled in the CDMP receive routine reviews of their condition, medication and overall health in line with established guidelines.[67] From 2023, people aged over 45 who are eligible for the programme will also be entitled to an opportunistic risk assessment, and those who are found to be at elevated risk will be enrolled in a prevention scheme that provides a care plan and annual review.[67] However, as noted previously, the CDMP excludes many people younger than 70.[6]

> ‘The Chronic Disease Management Programme is helping to address historical deficits in preventive care, but capacity in diagnostics and secondary care is still a major barrier.’
>
> **Dr Scott Walkin, GP**

Many cases of AF go undetected before they cause a stroke. In 2020, more than 1,200 people in Ireland who had an ischaemic stroke also had AF, but 40% of these cases of AF were undetected until after the stroke occurred.[13] In 2015, HIQA published a health technology assessment of opportunistic screening in primary care. It advised the HSE that opportunistic screening of men and women aged 65 and over in primary care, via pulse check followed by electrocardiogram, was likely to be cost-effective.[101] Pulse checks are now included in the CDMP,[41] so AF is likely to be detected more frequently as part of this programme. However, most people aged under 70 are ineligible for the CDMP,[41] so alternative strategies are needed to ensure more cases of AF are detected and treated before they cause a stroke.

Awareness of heart valve disease is low, and it is not addressed in current programmes. A survey in 2020 found that fewer than one in three people had a stethoscope check at every GP visit, and one in ten had never had one.[102] Similarly, a survey of Irish GPs found that fewer than one in five reported performing stethoscope checks on all patients over 60.[103] This is, perhaps, unsurprising as heart valve disease is not usually featured in national strategies. It was not addressed in *Changing Cardiovascular Health*,[3] nor is it included in current programmes such as the CDMP.[41]

New community ambulatory care hubs may improve access to CVD diagnostics and treatment, but they face many challenges. These hubs (see *Box 1*) are currently being implemented and are expected to provide direct GP access to diagnostics, such as echo, and community-based access to specialist care for people with established disease.[7 37] There are, however, some potential challenges, such as staffing gaps resulting from the need to maintain sufficient staffing in the affiliated hospitals while filling new posts in the hubs.[7] Recruitment has progressed since the ICPCD implementation guide was published, with the appointment of some cardiologists and healthcare professionals who are critical to each hub.[104] However, further recruitment of specialists may be hampered by limited interest in changing their current hospital contracts for a split post within a totally new model. In addition to a lack of adequate training in non-invasive and preventive cardiology,[105] there is a shortage of trained physiologists.

RECOMMENDED ACTIONS FOR IMPROVEMENT

Boost biomarker usage by ensuring direct GP access and adequately resourcing laboratories.

- As part of the Enhanced Community Care initiative, GPs in Ireland can now order NT-proBNP testing for people who: are enrolled in the CDMP with diagnosed type 2 diabetes, ischaemic heart disease or AF; or have suspected new or worsening heart failure.[106] This is a welcome development, which should help to detect possible heart failure in people with certain risk factors and which may also improve efficiencies by avoiding unnecessary referrals for echo among people with normal NT-proBNP levels. It is crucial that this plan is fully implemented and resourced in the long term to support early detection of heart failure and reduce avoidable hospitalisations.

Increase access to echo for people who need it.

- Following preliminary investigations, such as electrocardiogram or NT-proBNP testing, people requiring echo must be able to access the service rapidly to support timely diagnosis of heart failure or valvular heart disease and to help reduce healthcare inequalities. Plans to provide echo in community ambulatory hubs are very welcome, but this must be supported by greater investment in an adequately trained workforce, including cardiac physiologists and cardiologists with a special interest in imaging.[93]

Support detection and management of heart valve disease in primary care through existing programmes.

- A heart murmur, indicating possible heart valve disease, can quickly and easily be detected with a stethoscope check in primary care.[87] Stethoscope checks should be performed opportunistically during GP visits, along with the other opportunistic checks included in the CDMP.
- People who have heart valve disease, but are not yet suitable candidates for surgery, require routine monitoring and care.[87] This should be provided in the community care hubs or primary care by expanding the CDMP to include heart valve disease, with specialist support where needed.

Initiating or escalating prevention in the acute setting

People who present to hospital with heart attack, stroke or heart failure are at high risk of repeat events and hospitalisations. More people than ever are surviving the immediate emergency of cardiovascular events and going on to live longer with complex CVD.[107] While this increase in survival is clearly a cause for celebration, these people are at increased risk of further cardiovascular complications, hospitalisations and death. Data from Sweden show that, in the year following a heart attack, nearly one in five people die from a cardiovascular cause or experience a repeat heart attack or stroke.[25] Similarly, data from Norway suggest that nearly one in five people will be readmitted to hospital within 90 days of discharge following an ischaemic stroke and that two in five will be readmitted within a year.[108] Readmission rates in Europe for acute heart failure are over 40% within one year of discharge.[109]

Transient ischaemic attacks (TIAs) are an important indicator of increased stroke risk and should prompt diagnosis and treatment in the acute setting. Sometimes called a mini-stroke, a TIA is caused by a temporary disruption to the brain's blood supply.[110] Symptoms are similar to those of a stroke, but they last for less than 24 hours and there are usually no long-term impacts.[110] However, a TIA is often a signal of increased risk of stroke in the near future; within two days of a TIA, between 3.5% and 10% of people will have a stroke and up to 17% will have a stroke within 90 days of a TIA.[111] To prevent the worst outcomes, people with suspected TIA must be immediately referred for specialist assessment, seen within 24 hours and offered preventive medication as soon as possible.[112]

Effective prevention can begin in the hospital through multidisciplinary care and discharge planning. Prevention begins with multidisciplinary, specialist-led assessment and care, including identification of risk factors and other existing conditions, patient education, and initiation and adjustment of treatment.[19 53] Ideally, this type of care is provided in a specialist setting, such as a cardiology ward (e.g. for heart attack) or a stroke or heart failure unit.[13 113] Following a stroke, multidisciplinary rehabilitation should begin in hospital, with early supported discharge recommended wherever possible to improve outcomes and reduce the length of stay in hospital.[114 115] Before discharge, every person who has been admitted for a heart attack, stroke or heart failure should receive a tailored discharge plan, including referral to a rehabilitation or disease management programme and communication with primary care.[19 53] This approach has been trialled in various settings with positive results (*Case studies 2–4*).

Case study 2

Regional heart failure management programme, Barcelona, Spain

A team of healthcare professionals from the Hospital del Mar Heart Failure Unit in Barcelona developed an integrated, nurse-led heart failure programme, focusing on transition of care between hospital and community settings.[116] The programme aims to improve the patient care pathway by ensuring continuity of care.[117] The core elements of the programme are: an inpatient review and management plan, discharge planning, early review after discharge and structured follow-up care.[92]

Evaluations have found that, over three years, the risk of heart failure hospital readmission decreased by 18% and the risk of death by 12%.[92] The introduction of remote monitoring and consultations to the programme also reduced healthcare costs by more than €3,564 per person over six months.[116] Following this success, healthcare professionals from Barcelona have begun operating a dedicated training scheme, and several other medical centres have adopted the programme.[92]

Case study 3

Post-heart attack care programme, Poland

Introduced in October 2017 by the Polish Ministry of Health, the National Health Fund and the Polish Cardiac Society, the Managed Care in Acute Myocardial Infarction programme (KOS-zawał) creates a fully reimbursed, best-practice pathway to improve post-discharge prognosis after a heart attack.[54,118] The programme optimises the use of acute interventions, cardiac rehabilitation and 12-month outpatient cardiology follow-up care to prevent repeat events.[54]

Early data suggest that the programme has significantly increased participation in cardiac rehabilitation – from 14% to 98%. It reduced major cardiovascular events by 40%[54] and resulted in high levels of patient satisfaction.[119]

Case study 4

Person-centred approach to heart failure discharge planning, Gothenburg, Sweden

The Gothenburg person-centred care (GPCC) model is an internationally recognised approach to planning care across the heart failure patient pathway, including a comprehensive framework for hospital discharge and follow-up.[92 120] The discharge framework developed by The Gothenburg University Centre for Person-Centred Care is typically led by nurses, who develop a comprehensive health plan within 24–48 hours of hospital admission.[92] This follows an in-depth consultation with the person, closely considering their needs and resources, and information about their everyday life and symptoms before hospitalisation.[121] The person and healthcare professionals regularly evaluate this health plan along with municipal home care and primary care services.[120] When fully implemented, the GPCC approach to discharge planning for people with heart failure can significantly shorten hospital stays without compromising outcomes.[121]

Prevention and discharge planning in Irish hospitals

Following a heart attack, most people in Ireland receive basic prescriptions and referrals for preventive care on discharge, but there is significant room for improvement. Secondary prevention and rehabilitation are included in the Models of Care and the Audits of the National Heart and Stroke Programmes.[5 12 13 30] Data from the Irish Heart Attack Audit show that 90% of people who smoked received smoking cessation advice before discharge in 2020, meeting the set target.[12] However, only 76% of people were discharged with prescriptions for all five recommended preventive medications between 2017 and 2020 – falling well below the target of 90%.[12] Worryingly, only 69% of people were referred for cardiac rehabilitation following a heart attack, and it is not known how many attended the service or how quickly they were able to access it.[12] While the low referral rate may be partially attributable to the COVID-19 pandemic, the rate in 2019 was still just 77%.[12]

Many people are missing out on prevention and rehabilitation following a stroke. About half of Irish hospitals (24 of 47) provide acute stroke services, and all of these 24 have a specialist stroke unit, where a multidisciplinary care team provides comprehensive assessment, treatment and rehabilitation.[114] Ten hospitals have early supported discharge teams in place, but none of these teams is fully resourced according to the standards set out by the National

Clinical Programme for Stroke.[114] While all hospitals providing acute stroke care have a stroke unit, only two hospitals met the national target of 90% of stroke patients being admitted to a stroke unit for at least some of their stay in 2020.[13] Nationally, 71% of stroke patients were admitted to a stroke unit.[13] Regarding preventive medication, only 79% of people diagnosed with AF following a stroke were prescribed an anticoagulant medication on discharge, with the National Audit of Stroke stating that further evaluation is needed to understand the high proportion of people who were not given this type of treatment.[13]

Early intervention in TIA is recommended in national documents, but data on service delivery are limited. The *Changing Cardiovascular Health* strategy included a recommendation on TIA, stating that patients should be referred to a consultant-led, same-day prevention clinic with appropriate diagnostic and management facilities where they receive secondary prevention advice, medical management and access to surgery if needed.[3] More recently, the draft National Stroke Strategy 2020–2025 recommended that all hospitals providing acute stroke care have access to specialist-led rapid access stroke services with adequate staffing to see patients within 24 hours of the suspected TIA.[122] * While only four of 24 hospitals providing acute stroke services report having a TIA clinic, nearly all (21 of 24) routinely admit patients with TIA for investigation.[114] However, further information on TIA prevention and management, such as rapid specialist-led assessment or preventive treatment, is not included in the National Audit of Stroke.[13]

Heart failure units in Ireland are designed to provide best-practice care, but geographical distribution is inequitable. Where they exist, heart failure units aim to provide multidisciplinary, specialist-led care in line with established guidelines, as well as structured discharge planning and post-discharge follow-up.[11 113] However, such units are unevenly distributed across the country (half are located in Dublin),[11] and services are reportedly highly variable in hospitals that do not have them.[113] In the absence of a national heart failure audit, it is not possible to assess the current provision of preventive care and discharge planning for people with heart failure.

* This recommendation is retained in the National Stroke Strategy 2022–2027, published 29 October 2022.

RECOMMENDED ACTIONS FOR IMPROVEMENT

Ensure public hospitals have specialist-led, fully staffed, multidisciplinary CVD teams that can initiate prevention as swiftly as possible.

- Many hospitals have stroke units and dedicated heart failure services, but availability of, and admission to, these services is inconsistent across the country.[13 113] All hospitals providing acute stroke care and heart failure care, respectively, should have these services available and be fully staffed, and their delivery must be monitored through a national audit.

Implement a comprehensive national audit programme for all aspects of cardiovascular care, including hospital-based prevention and quality of discharge procedures.

- A comprehensive cardiovascular audit was recommended in *Changing Cardiovascular Health* in 2010,[3] and progress has been made in the form of the National Heart Attack Audit,[12] the National Audit of Stroke[13] and the National Audit of Stroke Organisational Audit.[114] However, many aspects of cardiovascular care, such as prevention and rehabilitation services, are not formally reviewed or evaluated. A national programme of CVD audit should include hospital-based services for acute and chronic CVD, as well as care delivered in the community. Data definitions in such a programme should be standardised across audits and healthcare settings.

Multidisciplinary care and prevention models post-discharge

Multidisciplinary prevention and rehabilitation programmes are recommended for people with more advanced CVD. European guidelines recommend multidisciplinary cardiac rehabilitation and prevention programmes following a cardiovascular event (e.g. heart attack) and for people with heart failure.[55] These programmes should begin as soon as possible after the event or hospitalisation and run for at least 36 sessions, totalling at least 1,000 minutes. They should include physical activity, patient education, risk factor modification, nutritional counselling and other types of support.[55] Following a stroke, multidisciplinary rehabilitation is critical and should begin as soon as possible after admission.[115] People who have experienced a stroke have diverse needs, and they may require support from a wide range of specialists to address the impacts of the stroke in addition to cardiovascular risk factors. For people with more stable CVD, pilot studies in the UK and Ireland have shown that structured, multidisciplinary support programmes can reduce cardiovascular risk and are cost-effective (*Case study 5*).

NHS MyAction, England; Croí MyAction, Ireland

The MyAction programme is a nurse-led 16-week lifestyle modification and therapeutic support programme targeted at people with CVD and those at high risk of developing CVD.[123] It focuses on a family-oriented approach and is supported by a multidisciplinary team of community-based dietitians, physiotherapists and cardiologists. The programme begins with an initial CVD risk assessment that is used to create a tailored support programme and objectives to reduce cardiovascular risk factors.[124]

First developed at Imperial College London for the UK National Health Service (NHS), the programme was later adapted in Ireland by Croí, securing funding from the HSE for a three-year pilot. Despite economic analysis showing a sixfold return on investment and significant evidence of risk factor modification, including a 51% reduction in smoking, HSE funding was discontinued early in year two. The programme is now fully funded by Croí.[124] Croí MyAction is a recognised best-practice example of a community-based CVD prevention programme by the European Commission.[125]

Multidisciplinary prevention and rehabilitation in Ireland

In the past, Ireland made significant progress in cardiac rehabilitation. Rehabilitation programmes for people with CVD were prioritised in the 1990s and 2000s in Ireland.[3] The benefits of comprehensive prevention and rehabilitation have long been recognised; implementation of cardiac rehabilitation across Ireland was a key aim and ultimately a success of the first cardiovascular strategy, *Building Healthier Hearts* (published in 1999).[3,126] By 2005, 95% of Ireland's hospitals had cardiac rehabilitation programmes, up from 29% in 1998.[3]

Access to cardiac rehabilitation has significantly declined from its peak at the beginning of the century, although post-discharge rehabilitation for stroke is improving. The 2010 *Changing Cardiovascular Health* strategy described cardiac rehabilitation as 'a very overstretched service, at risk of under-coverage of the increased population who need [it]'.[3] The services were not sufficiently supported or expanded and, since then, there have been further reductions in capacity and staffing. Currently, only 69% of eligible people are referred from the acute setting following a heart attack,[12] and a 2017 study concluded that there was national capacity to meet only 39% of the need for cardiac rehabilitation among people with coronary heart disease and heart failure.[127] In 2021, there was a national waiting list of more than 2,800 people, with 40% waiting at least three months after hospital discharge to begin a rehabilitation programme.[14] On the other hand, the most recent available data show that ten early supported discharge teams for stroke now provide at-home rehabilitation, which represents a considerable increase from four teams in 2015[114] and demonstrates meaningful progress towards improving post-stroke prevention and care.

> 'The care gap between hospital discharge and rehabilitation is significant, and results in rehospitalisations and premature deaths.'
>
> **David Wood, Professor of Cardiovascular Medicine**

Lifestyle support and attainment of management goals following a cardiac event are suboptimal and variable across Ireland. In line with the inadequate access to preventive care post-discharge, deficits in risk factor management have been identified up to two years after hospitalisation for acute coronary syndrome or coronary revascularisation.[81] In this population, over 40% of people had uncontrolled blood pressure and over 60% had uncontrolled cholesterol.[81] Furthermore, attainment of treatment goals varied significantly between hospital sites and between people with acute vs. chronic coronary heart disease.[81]

RECOMMENDED ACTIONS FOR IMPROVEMENT

Expand access to prevention and rehabilitation programmes.

- Following a major cardiovascular event such as a heart attack or stroke, a rehabilitation programme should commence as soon as possible. For any person in Ireland to have to wait as long as three months for cardiac rehabilitation, as is currently the case, should not be considered acceptable.
- In line with the National Audit of Stroke Organisational Audit, which assessed capacity in stroke units and early supported discharge, the HSE should urgently commission an updated audit of capacity in cardiac rehabilitation in light of the post-pandemic environment. This should roll over into a broader programme of CVD auditing in due course.
- Audit findings should guide an immediate programme of workforce expansion in this field, including training and recruitment of physiotherapists, rehabilitation providers and other community roles.
- When ambulatory care hubs are opened, they must include the provision of comprehensive multidisciplinary services, including rehabilitation, for people with all types of CVD.
- To address the current backlog, access to telehealth and other digital prevention and rehabilitation support options should be expanded, in accordance with European guidelines.[55]

4 SYSTEM-WIDE CHANGES NEEDED TO ENABLE PROGRESS IN CVD PREVENTION

Wider health system reform is needed to enable improvements in care along the CVD pathway and to maximise their potential benefits. Policymakers and other decision-makers in Ireland have demonstrated their will to transform healthcare organisation and delivery at a system level through the implementation of Sláintecare, the ICPCD and National Clinical Programmes. We must build on this momentum and go much further. There are system-level issues that should be addressed to optimise prevention of CVD, and this will likely also benefit other disease areas or indeed the healthcare system as a whole.

Expand the digital health infrastructure

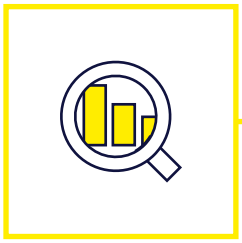
Digital health technologies can improve access and care for people with chronic diseases, including CVD. For example, telehealth enables remote consultation with GPs or specialists – as has become far more common since the start of the COVID-19 pandemic[128] – and could increase participation in structured disease management programmes.[55] Wearable technologies and other monitoring devices can be used to support self-monitoring as well as remote monitoring, where health data are collected and shared with a specialist nurse or physician for review.[129 130]

> 'Digital monitoring could improve care in the community without overwhelming the health and social care system.'
>
> **Paddy Gillespie, Professor of Health Economics**

Digital approaches can improve efficiency and help mitigate workforce shortages. Remote monitoring and digital data sharing can reduce the need for healthcare appointments and make existing appointments more efficient by ensuring practitioners have the information they require without having to perform basic assessments in person.[130] Virtual clinics have also been shown to reduce waiting times for diagnosis and treatment as well as demand for specialist consultations.[131] Virtual heart failure clinics have been

successful in supporting multidisciplinary care and facilitating management in primary care across Ireland.[132] A similar model could be applied to other types of CVD, such as lipid disorders.

Existing plans to deliver eHealth must be fully implemented, with the addition of more patient-centred strategies. The Department of Health has recognised the need to expand digital infrastructure and has included an eHealth programme in the Sláintecare implementation strategy.[133] Plans involve remote consultations and a number of other system-level technologies and pathways, which will support improvements in CVD care.[133] However, patient-focused technologies – such as self-monitoring and remote monitoring – do not appear to be included in current plans despite their demonstrated benefit to healthcare systems and people living with chronic diseases.[129 130]



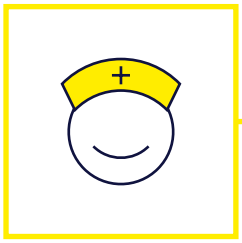
Invest in data collection, analysis and sharing

Comprehensive data on CVD incidence, prevalence, management and outcomes are urgently needed to support evaluation, inform health service development and ensure Ireland's health system is responsive to citizens' needs. *Changing Cardiovascular Health* included an ambition to develop a CVD registry and a national annual audit system for all aspects of cardiovascular care.[3] Although neither of these has been established, a comprehensive National Audit of Stroke[13] and a National Heart Attack Audit are both currently in place,[12] and an audit of the organisation of acute stroke care was published in 2022.[104] The CDMP is collecting data on structured reviews in general practice.[42]

> We need high-quality data on prevention and management of CVD. If we don't measure what we're doing and what the outcomes are, we have no basis on which to make changes to improve.'
>
> David Wood, Professor of Cardiovascular Medicine

The HSE must escalate its vision for the safe sharing of patient data through the development of electronic health records. The Sláintecare implementation strategy includes the development of electronic health records as part of its strategic action on establishing a modern eHealth infrastructure.[133 134] In January 2021, HIQA published its recommendations for the implementation of a national electronic patient summary.[135] In August 2022, it published a report outlining the persistent gaps in infrastructure to collect, use and share health and social care data, and calling for urgent action in four policy areas to support improvement.[136]

The COVID-19 pandemic has driven some key advances in data collection and sharing, and we must maintain momentum and continue to make progress. Developments to support expansion of the digital health infrastructure include the much-anticipated initiation of individual health identifiers (IHIs),[137] which have the potential to be used to track patient data across systems,[138] and the successful roll-out of a national COVID-19 app.[17] Legislation to allow for a national electronic prescription transfer system was also introduced.[139] All of these developments could pave the way for further advances in, for example, national registries and sharing patient records between healthcare providers. However, the healthcare system remains fragmented between settings, and further implementation of IHIs or electronic health records has reportedly been very slow, inhibiting progress towards a more integrated and patient-centred service.[140 141]



Expand the roles of nurses and allied health professionals

National goals to boost the workforce must gain urgent, high-level backing. There is a recognised shortage of medical professionals in Ireland.[100 142] The *Changing Cardiovascular Health* strategy identified workforce planning and staff shortages as key issues, and put forward a series of recommendations to address these challenges,[3] but shortages remain. In 2021, the HSE identified consultant vacancies in every discipline. It also reported that an average of 30% of consultants across healthcare settings were aged 55 or over, and would therefore need to be replaced within the next ten years just to maintain current numbers.[143] Similarly, the Irish College of General Practitioners has reported that more than 700 GPs will retire in the coming years, and more than 2,000 will be needed in the next decade to meet the demands of the growing population.[144] One of Sláintecare's aims is to increase the number of doctors in public hospitals, and the 2021 and 2022 Department of Health budgets have allocated funding for workforce expansion – aiming to increase the healthcare workforce by 4% and 6%, respectively, above projected year-end figures.[145]

As planned in the ICPCD, expanding the role of allied health professionals should support efficiency and improve access to key CVD prevention services. Increasing hospital staffing alone will not be enough to address gaps in CVD prevention and care along the whole patient pathway, nor will it facilitate the development of integrated community-based services for people with chronic disease. As recognised by the European Commission,[146] a more sustainable and efficient solution is to expand the roles of other healthcare professionals working in the community and ensure they are working at the top of their licence, potentially improving access to preventive care and contributing

to healthcare system sustainability. For example, community pharmacists are a valuable resource for delivering preventive advice and care,[147] and risk factor screening in pharmacies has been successful in Ireland and in other countries.[85] In addition, nurse-led heart failure management, including adjustment of medication, can significantly reduce hospital admissions and death compared with usual care.[148] Nurse-led models of cardiac rehabilitation have also been successful, as has physiotherapist-led exercise support for people with CVD.[149 150]

Improve access and care for disadvantaged groups

The Sláintecare pledge to provide universal healthcare must be realised to reduce inequalities in access. European surveys have found conflicting data on the level of unmet healthcare need in Ireland, but it is clear that there are major inequalities based on income, with the lowest-income group reporting significantly more unmet need than the highest-income group.[17] Ireland's two-tiered health system – where just under half of the population purchase voluntary health insurance, which can enable faster access to a range of services and cover some of the costs of care – has been highlighted as one of the factors contributing to inequalities in access.[17] Out-of-pocket payments for GP visits, inpatient services and emergency department visits may be additional barriers to access for people with lower incomes who cannot avail of free or subsidised services.[17] Implementation of universal free healthcare, or at least primary care, is essential to addressing some of these barriers.

Regional disparities in healthcare provision are also apparent, highlighting the need for investment in community-based services in many parts of the country. Data from 2014 showed significant variation among counties in the availability of eight different types of primary and community services, including GPs, community and public health nurses, allied health professionals, and other community-based specialists.[151] Specifically, Kildare and Meath had a supply at least 10% lower than the national average for all eight services, while Galway, Cork, Sligo and Westmeath had a supply equal to, or above, the national average for all eight services.[151] An analysis of cardiac rehabilitation provision in 2017 also identified considerable regional variation, in that the available capacity only met part of the total need (ranging from 9% to 75% of need by county).[127] Targeted strategies to increase provision of key services in historically underserved areas are needed to redress these inequalities.

Healthcare professional education could help address disparities in CVD diagnosis between the sexes. CVD in women is often underdiagnosed and undertreated around the world.[152] There are many probable reasons for this,

but limited understanding of how CVD develops and presents in women is a major issue.[152] In Ireland, a recent survey of people with heart failure showed that diagnosis took an average of five weeks for women compared with three weeks for men.[88] Women were also twice as likely as men to be diagnosed after admission to the emergency department,[88] suggesting that physicians are less likely to recognise the signs of heart failure in women. To address this issue, educational programmes on CVD in women could be developed and delivered through existing programmes, such as the continuing professional development (CPD) scheme for physicians.[153]

5 SPECIFIC ACTIONS FOR POLICYMAKERS

CVD is imposing a heavy and growing burden on the people, health services and economy of Ireland. Greater prioritisation of CVD and preventive action across the disease continuum are urgently needed to slow, or even halt, disease progression and ultimately save thousands of lives. In support of these aims, we recommend that policymakers take the actions listed below.

Build on recent developments in heart and stroke care to develop an up-to-date, comprehensive national plan for CVD, with a major emphasis on prevention across the spectrum of disease

- **Adopt a clear, consistent and evidence-based position on CVD prevention and management in Ireland**, framing current and future patterns of disability, mortality and healthcare need and their relevance to the Irish society and economy.
- **Set clear, measurable goals to reduce the burden of ill health and preventable costs in CVD** around which the government can frame investment and be accountable to citizens for use of public funds.
- **Establish a ring-fenced, long-term budget for standardised preventive healthcare,** guided by key gaps and opportunities, with consideration of incentive schemes for providers. This budget should be regularly reviewed to ensure optimal levels of investment in line with ageing and other population changes.
- **Establish a CVD policy lead within the Department of Health** with clear accountability for development and implementation of national initiatives to improve CVD prevention and management.
- **Appoint a formal, multi-stakeholder CVD prevention implementation task force,** from across Irish society and including front-line staff and

patients, to work with the Department of Health policy lead and the HSE on implementation of strategic goals.

Expand and innovate to address long-standing deficits in workforce capacity that drastically undermine CVD prevention services

- **Fund the expansion of comprehensive rehabilitation** by both ensuring appropriate staffing of services and utilising new virtual or digitally enabled delivery models that have been evaluated and shown to be effective in maximising capacity.
- **Continue to build the primary care practice-based nurse role** as a flexible and efficient resource to perform a variety of routine prevention services and lessen the pressure on GPs.
- **Expand clinical delegation to allied health professionals**, ensuring they are working at the top of their licence, whether in relation to cardiac and other rehabilitation programmes and routine management, coordination of care, or patient review. If necessary, institute regulatory changes to allow for expansion of their roles.
- **Fund accredited training and greater virtual support for primary care staff on key topics in preventive cardiology.** Examples include detecting and treating inherited dyslipidaemias such as FH, identifying possible heart failure and offering lifestyle support using evidence-based techniques.

Support improvements in clinical practice and prevention programmes along the whole CVD continuum

Risk assessment and case finding

- **Incrementally expand the CDMP in general practice** to include all cardiovascular conditions and the whole population from middle age onwards.
- **Implement permanent case finding programmes within community pharmacies.**
- **Develop a programme of FH screening,** informed by a formal HIQA review, and build up genetic testing infrastructure to process an increased number of detected cases.

- **Develop national awareness campaigns** on key drivers of CVD (raised cholesterol, high blood pressure, AF).
- **Include stethoscope checks for heart valve disease in the CDMP** to incentivise early detection.
- **Increase access to echo**, prioritising GP direct access and measures to streamline efficient referrals (e.g. NT-proBNP in suspected heart failure).

Acute care

- **Ensure hospitals have specialist-led multidisciplinary teams** in place to manage acute events, care for people with CVD and provide comprehensive discharge and rehabilitation planning.

Community-based services

- **Increase access to tailored lifestyle support services** (e.g. dietitian-led weight-loss services, smoking cessation services), which can be prescribed by GPs or other healthcare professionals.
- **Implement community-based prevention programmes** for people with cardiac risk factors (risk factor management programmes), to enable this component to be incorporated into rehabilitation and chronic disease management services.
- **Expand access to post-discharge care** by implementing rehabilitation programmes in the community setting and providing options for remote access.

Whole journey

- **Build on national audits of heart attack and stroke** to develop an audit of CVD prevention and care across the disease continuum, including further data from community and outpatient settings.

Innovate across the whole system to facilitate CVD prevention and improve health services overall

- Prioritise Sláintecare pledge to deliver **free universal healthcare**.
- **Expand the digital infrastructure** to support electronic record keeping and sharing.
- Include **patient-focused technologies**, such as remote monitoring, in national eHealth plans.
- Roll out **individual health identifiers**.
- **Introduce digital record-keeping in hospitals** and ensure records can be shared across the healthcare system.
- Facilitate **electronic referrals and communication** between providers.

APPENDIX: TYPES OF CVD, MAJOR RISK FACTORS AND OPPORTUNITIES FOR PREVENTION ALONG THE DISEASE CONTINUUM

Hypertension

Hypertension – or high blood pressure – is a major preventable cause of CVD, leading to around half of cardiac events and strokes.[55 56] Blood pressure can be managed effectively through a combination of lifestyle modifications and medical treatment. However, hypertension does not usually cause any symptoms, so the only way to identify it is to measure blood pressure.[55 154] European guidelines recommend at least opportunistic screening in people at elevated risk, such as people living with obesity or who have a family history of hypertension.[55]

Familial hypercholesterolaemia (FH)

FH is an inherited condition that causes high cholesterol from birth. Inherited dyslipidaemias are a group of genetic conditions that lead to lipid disorders (e.g. high cholesterol), and FH is a common example, affecting around 1 in 200–250 people.[60] FH results in very high cholesterol from birth; it can cause premature ASCVD and is associated with a high risk of heart attack and death at a young age.[155] Early initiation of cholesterol-lowering medication – potentially in childhood – is key to reducing the risk of these catastrophic outcomes, and this is only possible with early detection through screening.[60]

Atrial fibrillation (AF)

AF is a common type of arrhythmia, characterised by an irregular, usually rapid, heartbeat.[156] This can result in pooling and clotting of blood in the heart. If a clot leaves the heart and travels through the circulatory system, it can block a small artery anywhere in the body (including the brain, causing a stroke).[13]

The risk of stroke in people with AF can be reduced by approximately 65% with anticoagulation treatment,[50] but this requires early identification of the condition.

Atherosclerotic CVD (ASCVD)

ASCVD, which includes heart attack, stroke, transient ischaemic attack, peripheral arterial disease and stable angina,[157] is caused by the build-up of fatty deposits (plaque) in arteries over time.[158] It is the leading cause of death around the world and the underlying cause of around 85% of deaths from heart attack and stroke.[158] The main risk factors for ASCVD are high cholesterol, high blood pressure, smoking and diabetes[55] – all of which could be detected and managed in primary care before the disease develops.

For people with established ASCVD, guideline-based treatment and lifestyle modifications can significantly reduce the risk of a heart attack or stroke. For example, treatment with statins can reduce this risk by one fifth for every 1mmol/L reduction in cholesterol, which represents the average reduction in cholesterol after one year of treatment.[51]

ASCVD is often asymptomatic and may go undetected until a major event occurs.[158] When that happens, there is a high chance of a repeat event or death.[19] However, comprehensive, multidisciplinary rehabilitation programmes can significantly reduce these risks and are cost-effective or cost-saving.[19]

Heart failure

Heart failure occurs when the heart is unable to pump enough blood to meet the body's needs.[52] It can be caused by certain lifestyle factors, such as an unhealthy diet or smoking, and may be preceded by other conditions such as ASCVD, diabetes or obesity.[53 90] Effective prevention and management of these risk factors will help prevent heart failure.

Once established, heart failure is irreversible and can be life-changing.[53] It also incurs considerable costs to healthcare systems and society, which are largely attributable to frequent hospitalisations.[52] Heart failure is a leading cause of hospital admissions in Europe – many of which are avoidable[159] – and typically accounts for 1–2% of direct health expenditure.[26]

Quality of life and life expectancy can often be dramatically improved by early diagnosis and guideline-based disease management programmes. As care can be complex, many successful models are centred around clinic-based multidisciplinary teams, led by a nurse or physician specialising in heart failure.[52 53]

Heart valve disease

Heart valve disease occurs when one or more valves in the heart is damaged, affecting blood flow and forcing the organ to work harder to compensate.[87] If severe aortic stenosis (the most common type of heart valve disease) goes untreated, the death rate is around 50% within the first two years of symptoms appearing.[160]

However, timely detection and intervention, which usually involves surgical repair or replacement of the damaged valve, can significantly improve survival and quality of life.[87] A decade after valve replacement surgery, 94% of people still have a well-functioning valve.[161]

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