The Health Policy Partnership

Secondary prevention of

HEART ATTACK AND STROKE

Country profile for

Italy

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About this report

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EXECUTIVE SUMMARY

Heart attack and stroke are a significant societal concern in Italy. Heart attack is the most serious consequence of coronary heart disease (CHD), which is the leading cause of death in Italy alongside stroke. Annually, approximately 100,000 people die as a result of a CHD and 67,000 die as a result of stroke.[1] Taken together, CHD and stroke cause 22% of all deaths.[2]

Yet the vast burden of heart attack and stroke is preventable. Many heart attacks and strokes are repeat events.[3,4] Their incidence can be reduced by following effective secondary prevention models for high-risk patients.[4,5]

The demand is growing for effective long-term risk management among high-risk populations. In 2019, nearly 2.7 million people were living with a CHD and approximately 772,000 had survived a stroke.[1] Long-term growth in major risk factors for cardiovascular disease (CVD) (such as diabetes and obesity) is likely to lead to more heart attacks and strokes in the future.[6,7] Already, the healthcare costs of CHD and cerebrovascular disease (of which stroke is the most common condition) reach €2.7 billion and €3.2 billion per year respectively, equivalent to 4% of total Italian health expenditure in 2015.[8] Considering the growing risk factors, these costs are likely to increase further.

It is widely believed that Italy must urgently improve its healthcare system to prevent repeat heart attacks and strokes, if the growing costs and societal impacts are to be mitigated. Despite some signs of health system improvement, the Ministry of Health and other key experts note major geographical inequalities and broadly accept that the provision of secondary prevention in post-acute care is inadequate.[2,9]

During the acute stage, not enough stroke patients have access to specialist care or receive the appropriate medications to prevent repeat events. Less than one third of stroke patients are reported to be admitted to stroke units,[10] and antiplatelet therapy, oral anticoagulant therapy and cholesterol-lowering medications were all found to be underused in hospital patients.[11]

In heart attack, there is a large unmet need for cardiac rehabilitation and too few dedicated centres. Despite the proven role of cardiac rehabilitation in preventing repeat events, a lack of facilities has resulted in an estimated annual unmet need in

280,000 patients.[12] Referral is also suboptimal, with studies suggesting that only around 20% of heart attack patients are referred to these services.[13]

The regional organisation of Italy's healthcare system is a major factor behind uneven progress in efforts to improve secondary prevention. Almost half of regional stroke care pathways do not have a protocol that includes post-acute care,[14 15] and in heart attack many regional care pathways do not include outpatient care. This is despite the existence of central ministerial directives aimed at facilitating the development of comprehensive, integrated pathways.[16]

Regional leadership on secondary prevention appears to have stalled in the past decade, possibly as a result of changing national priorities. The latest iterations of major policy documents, such as the 2020 National Plan for Prevention, no longer include a specific focus on secondary prevention in CVD or cerebrovascular disease.[17] Regional planning has followed suit and the majority of plans do not recognise secondary prevention as a specific priority.[18-20] The short- and medium-term impact of this on healthcare system performance and on patient outcomes is uncertain and will require monitoring.

Effective health service planning at the national and regional levels is also being impacted by a lack of data. An absence of comprehensive heart attack and stroke registries providing data on care delivery and patient outcomes, at either the national or regional level, makes it extremely difficult to accurately assess service need and provision gaps.[21]

Nonetheless, Italy has many strengths to build on. The Italian Alliance for Cardio-Cerebrovascular Diseases, a collaboration between the Ministry of Health and a wide range of health professional societies and patient groups, is helping to link secondary prevention to the national prevention agenda through the development of intersectoral strategies.[22 23] Italy has established many best-practice models for discharge, transition and ongoing prevention,[24] and the national strategy for chronic disease offers an opportunity to create new care pathways in every region.[25] These existing models can serve as blueprints for healthcare decision-makers and aid them in their efforts to improve secondary prevention of heart attack and stroke.

INTRODUCTION

Heart attack and stroke are a significant societal concern in Italy. Cardiovascular disease (CVD), including CHD, and cerebrovascular disease, of which stroke is the most common condition, are the leading causes of death in Italy. Together, they account for 40% of overall deaths among women and 33% of overall deaths among men.[2] In 2019, nearly 2.7 million people were living with a CHD and approximately 772,000 had survived a stroke.[1]

Heart attack and stroke represent a significant cost to the public budget. CHD and cerebrovascular diseases cost the Italian healthcare system €2.7 billion and €3.2 billion respectively in 2015.[8]

The national government recognises the importance of managing CVD and cerebrovascular disease, including prevention in high-risk populations. This has been incorporated in main strategy documents and plans for prevention.[25] [26] However, it is Italy's regional healthcare systems that are a major factor in facilitating progress, and responsiveness to central policy priorities and regional leadership on secondary prevention appears to have stalled in the past decade.

While consistent data are often lacking on the performance of comprehensive care pathways in different areas, data that do exist suggest a range of routine systemic failures and missed opportunities in follow-up care. National trends highlight improving outcomes in preventing repeat heart attacks and strokes.[27] Much of this progress, however, appears to be the result of improvements in emergency interventions during the acute stage rather than in long-term management.[28]

Key definitions

CARDIOVASCULAR DISEASE (CVD) is an umbrella term which describes diseases of the heart, blood vessels and circulation (the flow of blood through the arteries). It includes coronary heart disease (often called ischaemic heart disease) and cerebrovascular diseases (i.e. those relating to arteries in the brain).

CORONARY HEART DISEASE (CHD) is characterised by atherosclerosis (a build-up of fatty substances) on the walls of arteries that serve the heart – coronary arteries. The most dangerous consequence of CHD is a heart attack.

HEART ATTACK happens when an obstruction in the coronary artery cuts off oxygen-rich blood. This deprives the heart of oxygen and, as a result, heart muscle tissues start to die (infarct). Heart attack is also called myocardial infarction.

CEREBROVASCULAR DISEASE is a group of conditions which affect the blood vessels of the brain. The most common type of cerebrovascular disease is stroke.

STROKE is caused when blood supply is blocked to a part of the brain, which leaves it deprived of oxygen. Most strokes are caused by blood clots (ischaemic), but some happen because of a burst blood vessel (haemorrhagic). As it is linked to the cardiovascular system, stroke is a type of cerebrovascular disease, but because of its effects on the brain and nervous system, the World Health Organization classifies stroke as a neurological disease.

SECONDARY PREVENTION describes preventive care that aims to stop an existing illness from progressing. In the context of heart attack and stroke, secondary prevention is a combination of interventions to prevent another heart attack or stroke from occurring. It typically spans lifestyle changes (dietary changes, increased physical activity and smoking cessation), risk-reducing medication, rehabilitation and psychosocial support.

THE CASE FOR CHANGE

Economic cost of heart attack and stroke

Direct healthcare costs from heart attack and stroke place a significant burden on the Italian healthcare system, whereas indirect costs are a burden on the society and economy. In 2015, direct costs, including inpatient and outpatient care, were €2.7 billion for CHD and €3.2 billion for cerebrovascular disease.[8] The combined direct costs of CHD and cerebrovascular disease accounted for approximately 4% of total Italian health expenditure in 2015.[8] Inpatient care for cardiac and cerebrovascular diseases generated more than 7.7 million days of hospital stay in 2016.[29] Indirect costs of CHD and cerebrovascular disease, including informal care, loss of productivity and disability allowances, are estimated at a further €5 billion.[30]

Table 1 provides an in-depth look at direct and indirect costs for these diseases, according to data from the European Cardiovascular Disease Statistics 2017.

Table 1. Coronary heart disease and cerebrovascular disease: direct and indirect costs to society in 2015[8]

	Direct cost	Indirect cost			Total
	Healthcare costs	Productivity losses due to mortality	Productivity losses due to illness	Informal care	
Coronary heart disease	€2,726,342	€1,129,765	€369,368	€3,358,476	€7,583,951
Cerebrovascular disease	€3,195,890	€498,187	€488,796	€2,566,381	€6,749,254
Combined cost	€5,922,232	€1,627,952	€858,164	€5,924,857	€14,333,205

Cost in thousands per year.

Epidemiology

In 2014, CHD and stroke were the two leading causes of death in Italy.[2] According to estimates from the Global Burden of Disease study, each year, close to 100,000 people die as a result of CHD and 65,000 die as a result of stroke (*see Table 2*).[1]

The vast burden of CHD and stroke is preventable. Many heart attacks and strokes are repeat events[3 4] which can be minimised by effective secondary prevention models. Such models can be designed around the needs of high-risk patients.[4 5]

Secondary prevention of heart attack and stroke is almost certain to increase as a societal priority. While Italy has had lower prevalence and mortality rates for heart attack and stroke than other European countries,[6] this alone is not enough in the face of future pressures. Rates of heart attack and stroke could increase due to the growing prevalence of their key risk factors, combined with demographic trends. For example, the rising rate of obesity, lack of exercise and changing diets are an increasing concern for Italian clinicians and health policy decision-makers.[26] Italy has also seen a considerable increase in the prevalence of diabetes: from 2.5% of the population in the late 1980s to 3.9% by 2001[7] and 4.9% in 2017.[6]

Table 2. Coronary heart disease and stroke (2019): epidemiological data for Italy[1]

	Coronary heart disease[a]	Stroke[b]
Number of people living with the disease (prevalence)	2,757,143	772,098
Number of new cases per year (incidence)	319,847	94,074
Deaths	101,158	67,292

a. Including heart attack.
b. Ischaemic and haemorrhagic stroke.

POLICY PRIORITIES

Achieving national policy leadership in secondary prevention of heart attack and stroke

Policy leadership

> Prevention is never made a priority in health plans because it is a long-term investment. It may be acknowledged at the political level, but it's not made a priority as it does not have any short-term gains.
>
> PROFESSOR PASQUALE PERRONE-FILARDI, FEDERICO II UNIVERSITY HOSPITAL, NAPLES

Over the past two decades, central policy has had some success in guiding regions to improve secondary prevention in heart attack and stroke. Earlier versions of the National Plan for Prevention[26 31] have established the strategic importance of secondary prevention in CVD, which subsequently featured in several regional plans after 2005.[32 33] This was followed by further high-level strategic reviews, which recognised the importance of secondary prevention in CVD. The most recent editions of the Country Health Report, a key element of the health planning cycle in Italy, published in 2011 and 2014, stress the importance of secondary prevention in CVD and the prominent role of individual prevention based on global risk assessment.[34 35]

However, in the past decade central leadership has shifted to frame prevention activities more broadly, thus stalling regional progress on secondary prevention of heart attack and stroke. Since 2008, the focus of central healthcare planning has moved to prevention re-envisioned in more general terms.[26 31 36] This is reflected in the 2020 National Plan for Prevention, which no longer focuses on secondary prevention.[17] Instead, specific actions around secondary prevention are left to the regions, which decide on regional healthcare priorities. This includes prioritising certain disease and

population areas as well as developing new care pathways.[9 26] Most regional plans launched for the period of 2014–2018 did not address secondary prevention of CVD, despite the obvious demographic and policy drivers to do so. When regional leadership has occurred, it is often in regions with an existing legacy of investment and prioritisation of CVD secondary prevention.[37]

While the main emphasis of central policy on prevention is currently broad, there are still important opportunities to be seized. The Ministry of Health is collaborating with a wide range of health professional societies and patient groups to promote an integrated approach to the prevention of CVD and cerebrovascular disease.[22] This is helping to link secondary prevention to the national prevention agenda.[23] Recent ministerial directives are encouraging the development of integrated regional care pathways for both acute and outpatient care. The government has, for example, identified disease-based 'hospital networks' to facilitate continuity of care between pre-hospital, hospital and post-hospital settings.[15] The National Plan for Chronic Disease supports establishing integrated health and social care pathways (percorsi diagnostico, teraputico assistenziali – PDTAs) to structure care for patients with a chronic condition.[25] Although it does not focus on secondary prevention in CVD or cerebrovascular disease, the plan advocates for integration between community pharmacies and general practitioners (GPs) to raise awareness and support adherence among at-risk patients.[25]

Despite this national direction, comprehensive integrated care pathways remain rare. Few regional heart attack care pathways incorporate outpatient care[28] and a significant number of regional stroke care pathways overlook the post-acute stage.[14]

See *Table 3* for a summary of existing national policies for heart attack and stroke.

Table 3. Heart attack and stroke: summary of key policies for secondary prevention

	Key policies
Heart attack	**National Plan for Prevention** (2020–2025) – earlier versions established the strategic importance of secondary prevention in cardiovascular disease (CVD), which subsequently featured in several regional plans.[32 33] In the current version, specific actions on secondary prevention are left to the regions.
Stroke	**Country Health Report** (2014)[34 35] – periodically presented by the Ministry of Health to the parliament and the public to highlight the achievements of the health system and its future priorities. The most recent edition stresses the importance of secondary prevention in CVD. **Prevention of Cerebrovascular Diseases Along the Life Course** (2019),[23] published by the Italian Alliance for Cardio-Cerebrovascular Diseases, focuses attention on the key elements of primary and secondary prevention of repeat cerebrovascular events, particularly stroke.

Guidelines and clinical leadership

There is a high level of leadership activity among clinical societies and associations on heart attack and stroke secondary prevention.

Medical societies, patient organisations and the government are working together to progress an integrated approach to the prevention of CVD and cerebrovascular disease, including secondary prevention. In 2017, the Ministry of Health established a collaboration with 32 federations/societies spanning cardiology, neurology, primary care, internal medicine, paediatrics, pharmacy and patients. The aim is to promote an integrated approach to the prevention of chronic non-communicable diseases, including in people who have overcome acute events such as heart attack and stroke.[22] Known as the Italian Alliance for Cardio-Cerebrovascular Diseases, it develops intersectoral strategies and promotes the adoption of healthy lifestyles as well as providing guidance on clinical interventions to address cardio-cerebrovascular risk.[23]

In heart attack, the Italian clinical community has made considerable efforts to align national guidelines covering secondary prevention with internationally validated evidence. National experts have reported that guidelines from the European Society of Cardiology (ESC) are regularly translated into Italian. They are made accessible to medical professionals through the main cardiological journals, scientific meetings and courses.[38-40]

The Italian Society for Cardiovascular Prevention published a joint consensus document on cardiovascular disease prevention in 2018. The document presents a modern, integrated approach to CVD prevention, based on multidisciplinary management of total CVD risk, rather than on disjointed treatment of individual risk factors.[41 42] From this perspective, primary and secondary prevention lie on the same continuum, determined by the overall level of individual risk.

The need for an approach to care that addresses the complexity of patients who have previously experienced a heart attack has also been recognised by clinicians and scientific societies. The Italian Association for Cardiovascular Prevention and Rehabilitation (GICR-IACPR) in 2018 stressed the need for cardiac rehabilitation and prevention to evolve towards a more holistic and patient-centred approach. This joint approach across prevention and rehabilitation is necessary in order to respond to the increasingly complex needs of a multimorbid population. Proper multidisciplinary management becomes the norm, possibly supported by the development of eHealth and appropriate care pathway planning.[43]

The Italian clinical community is also active in secondary prevention of stroke. The Italian Stroke Organization – Stroke Prevention and Educational Awareness Diffusion (ISO-SPREAD) group is a national collaboration of 46 scientific and four patient associations which are involved in the prevention and care of stroke.[44] In 2016, it released the 8th edition of the national guidelines on the prevention and treatment of stroke. They contain up-to-date, evidence-based recommendations on the most effective therapies for the prevention of repeat stroke.[44]

Finally, the Ministry of Health recognises the need to integrate long-term and acute treatment into the clinical governance of stroke, and to regularly assess patients in outpatient clinics after discharge. A consensus paper published in 2012 defined the approach to acute stroke and post-acute management. It paved the way for the regional and sub-regional care pathways (percorso diagnostico terapeuticos (PDTs) and PDTAs) that were launched and implemented in subsequent years.[14 45]

Existing national clinical guidelines on secondary prevention in heart attack and stroke are summarised in *Table 4*.

Table 4. Heart attack and stroke: national clinical guidelines for secondary prevention

Heart attack	Stroke
Translation of the European Society of Cardiology (ESC) European guidelines on cardiovascular disease prevention in clinical practice (2016) [39 40]	**Cerebral stroke: Italian guidelines for prevention and treatment** (2016),[44] 8th edition of the national guidelines which dedicate a chapter to secondary prevention
Consensus document and recommendations for cardiovascular prevention in Italy[41 42] (2018), Italian Society of Cardiovascular Prevention	
Cardiac Prevention and Rehabilitation "3.0": From acute to chronic phase. Position Paper of the Italian Association for Cardiovascular Prevention and Rehabilitation (GICR-IACPR)[43] (2018). The paper recognises the need to make cardiac rehabilitation and prevention more holistic and patient-centred	
The Italian Federation of Cardiology endorses ESC clinical guidelines, including a range of updated guidelines which place greater emphasis on management of key risk factors to reduce repeat events: • diabetes, pre-diabetes and cardiovascular disease (2019) • dyslipidaemias (2019) • chronic coronary syndromes (2019)[46]	

Advocacy and awareness raising

> There is currently no activity at the advocacy level to raise political and public awareness of secondary prevention of heart attack. There are also no efforts from patient organisations to improve patient education. To tell you the truth, I have never seen an event for patients that was focused on the optimisation of secondary prevention.
>
> PROFESSOR PASQUALE PERRONE-FILARDI,
> FEDERICO II UNIVERSITY HOSPITAL, NAPLES

Awareness around secondary prevention for heart attack and stroke appears to be low, and advocacy efforts are limited. The apparent lack of activities to increase public and political awareness of secondary prevention is worrying, given the absence of public health policy dedicated to secondary prevention and the current health service gaps.

The Italian Association Against Stroke (ALICe Italia Onlus) plays a prominent role in raising awareness and advocating for the rehabilitation of stroke patients. It supported the founding of a stroke advocacy group within the Italian Parliament in 2014 and is also part of the Italian Stroke Organisation.[47]

ALICe co-produced a report emphasising the importance of long-term management for high-risk stroke patients. In collaboration with the Italian Stroke Organisation, the Istituto Superiore di Sanità and the European Stroke Association, ALICe formed the Italian Observatory on Stroke, which published an extensive report in 2018 on the current situation around prevention and care for stroke.[14] While focusing mainly on acute care, the report emphasised the importance of long-term management for high-risk patients, suggesting innovative models of primary care provision as a key factor in delivering efficient prevention strategies. The report also described the extent to which each region has implemented the national care pathways and whether or not they include post-acute management.

Cittadinanzattiva is a citizens' rights organisation that has been active since the late 1970s and has a specific focus on healthcare. In recent years, it has strongly advocated for the adoption of PDTs and PDTAs in stroke.[48] In 2017, the organisation published a report on the care available for stroke in Italy, mapping the existing care pathways.[49]

Ensuring availability of comprehensive data

Consistent national data collection in heart attack and stroke is very limited. This is restricting the assessment of service provision and performance for secondary prevention and potentially having a negative impact on regional decision-making. The central government retains responsibility for national strategic planning and monitors regions against the essential levels of care (livelli essenziali di assistenz*,* LEAs), which incorporate a set of indicators and benchmarks that regions are expected to meet.[50 51] However, data collected on secondary prevention in heart attack and stroke are extremely limited – care quality appears to be solely assessed by measuring the rate of repeat cardiovascular and cerebrovascular events at 12 months.[52]

In heart attack, very little national or regional data related to secondary prevention appear to be consistently collected. Although it would allow the benchmarking of services and drive accountability, a national heart attack registry does not appear to exist. Data on secondary prevention are instead drawn from fixed-term local registries and studies[13 53] (see *Table 5*). Significant local initiatives have been undertaken, which could provide a model for expansion into a national system. An example is the EYESHOT (EmploYEd antithrombotic therapies in patients with acute coronary Syndromes HOspitalized in iTaly) post-heart attack registry. It was a prospective, observational, nationwide study which evaluated the management of post-heart attack patients one to three years from the event. Several types of data relevant to secondary prevention were collected, such as the timing and use of interventions and the prescription of medication.[53]

In stroke, oversight of the quality and effectiveness of secondary prevention measures is being impeded by a lack of a national stroke registry with consistent, reliable data. The lack of stroke patient registries, either at the national or at the regional level, makes it extremely difficult for regions to assess service need and gaps in provision.[10 21 54] National experts have argued that the lack of data on the organisation and effectiveness of rehabilitative services in particular is helping to maintain a lack of focus on post-acute stroke care within regional health legislature.[21] While local-level registries give an insight into stroke care for secondary prevention[55] (*see Table 5*), these are usually fixed term, giving a snapshot of care provision over a particular time period, rather than assessing ongoing care.

Table 5. Cardiovascular disease registries in country

Registry	Description
Essential levels of care (LEAs)	Regions are monitored against the LEAs.[50 51] From 2019, the indicators include the rate of recurrent cardio and cerebrovascular events at 12 months for both heart attack and stroke.[52]
Fixed-term heart attack registries	A number of fixed-term heart attack registries have been set up across Italy.[13 53 56] An example is the BLITZ-4 registry, which collected data from 163 coronary care units between 2009 and 2010. It measured 32 performance indicators at admission and at 6 months, including medication adherence, smoking, exercise rates and dietary intake.[13]
Fixed-term stroke registries	A notable example of fixed-term stroke registries in Italy[55] is the Lombardia Stroke Registry. It gathered demographic, clinical and procedural data of stroke patients admitted to stroke units in the Lombardy region. The data included information on medications used for secondary prevention.[55]

Initiation of secondary prevention in the acute care setting

In heart attack, the quality of acute care has improved over the past decade and in-hospital mortality rates are among the lowest in the EU. Since 2007, the 30-day post-heart attack death rate (age and sex standardised) has dropped significantly. In 2017, it stood at 7% in Italy, compared with the average of around 9% in the 13 EU member states which have joined since 2004.[57] Inequalities persist, however, with a regional study finding that low educational attainment was significantly associated with an increased risk of 30-day mortality in all age groups, and an increased risk of 30-day hospital readmission in people aged 75 and over.[58]

Improved patient outcomes have partly been facilitated by a significant increase in the use of medications to reduce repeat events, yet gaps remain. The vast majority of heart attack patients now appear to receive the appropriate secondary prevention medications at discharge. A large-scale study on a sample of 11,706 patients found that 95.1% were prescribed aspirin, 88% thienopyridines, 85.8% dual antiplatelet therapy, 85.9% angiotensin-converting enzyme inhibitors (ACE-I)/angiotensin II (ATII) antagonists, 89.1% beta blockers and 92.7% statins.[13] Yet a further analysis of post-heart attack patients at discharge/end visit from cardiology centres found low-density lipoprotein (LDL) cholesterol management to be poor, with only around 40% of patients reaching the levels set by international guidelines.[59]

However, it is worrying that few heart attack patients are directed to post-discharge secondary prevention programmes by the acute care team. In the same study, only 27.4% of patients were referred to nurse-directed counselling, 21.6% to smoking cessation and just 15.9% to cardiac rehabilitation.[13]

In stroke, the 30-day mortality rate has fallen over the past decade, but gaps in acute care are having a negative impact on patient outcomes. While direct admission to a stroke unit is seen as vital to ensuring patients have access to specialist care, including secondary prevention, less than one third of stroke patients in Italy are reported to be admitted to these facilities.[10] Data from 2010 suggest significant regional differences in access. Only 11% of stroke units are located in southern Italy, a region that accounts for 34% of Italy's population.[10] With the fatality rate of stroke patients on general wards more than double that of patients on stroke units (14.7% vs. 6.9%), and the 30-day mortality rate around a third higher (20.9% vs. 14.2%), this gap is having an acutely negative impact on patient outcomes.[60]

Too few stroke patients appear to receive the appropriate secondary prevention medications, both while in hospital and at discharge. A prospective observational study of acute stroke patients in four Italian regions found that antiplatelet therapy, oral anticoagulant therapy and cholesterol-lowering drugs were only used in 63.9%, 12.3% and 33.9% of inpatients, despite the established role of these medications in preventing recurrent strokes.[11] The underuse of antiplatelet therapy during the acute phase is of concern, as it is a significant predictor of six-month mortality in stroke patients.[11] Medication issues appear to continue at discharge, with a study from Lombardy finding that fewer than half of patients were prescribed statins at this point in care.[55]

Early mobilisation of stroke patients also appears to be underused in Italy. A study of acute stroke patients reported that early mobilisation was only provided to 45.9% of patients. As delayed mobilisation is a significant predictor of six-month mortality, such low rates are of concern.[11]

Securing participation in structured secondary prevention programmes

> The need for cardiac rehabilitation is not very well recognised among doctors (cardiologists, GPs). They often believe that increased physical activity is all that is needed to facilitate patients' recovery.
>
> PROFESSOR PASQUALE PERRONE-FILARDI, FEDERICO II UNIVERSITY HOSPITAL, NAPLES

In heart attack, there is a large unmet need for cardiac rehabilitation in Italy, stemming from too few specialist centres. While the number of cardiac rehabilitation services has steadily grown over the past 30 years,[43] this has not been enough to meet demand. In-hospital cardiac rehabilitation departments appear to be absent in some regions,[61] leaving an estimated 280,000 patients annually without access.[12]

Despite the proven efficacy of cardiac rehabilitation in preventing repeat events, referral is suboptimal. National experts have noted that doctors often do not recognise the importance of cardiac rehabilitation to recovery after a heart attack.[61] A study of 9,692 heart attack patients discovered that just 22.1% were referred to cardiac rehabilitation in the six months after being released from hospital.[13] Other studies have put the figure even lower, indicating that just 12–18% of patients received follow-up support in dedicated cardiac rehabilitation facilities.[28] Inequalities in access also exist, with older age, being single and living far from rehabilitation centres all found to further reduce a person's likelihood of starting cardiac rehabilitation after a heart attack.[43]

Cardiac rehabilitation is gradually playing a greater role in post-heart attack care and could help to fill the gap in service provision. Cardiac rehabilitation has received more attention in the medical community in recent years and the number of dedicated facilities has increased.[62] These services have been shown to significantly improve patient outcomes, including mortality and hospitalisations.[63]

In stroke, access to structured post-acute rehabilitation services varies across Italy due to differing assessment practices and pathways. While post-acute rehabilitation is available in a range of settings which each offer different levels of care (e.g. long-term care hospitals, skilled nursing facilities), regions often use different referral criteria.[10 21] In addition, operative details for two post-acute rehabilitation levels formalised by most Italian regions (high- and low-intensity rehabilitation) are lacking. It is thus unclear which clinical criteria to apply to identify the optimum setting for each patient and the required number of beds per rehabilitative facility.[21]

The impact of this variation in care provision on patient care and outcomes is difficult to assess, because the absence of national or regional registries means that data are missing. The data that do exist suggest that stroke patients often face barriers when trying to access these services. A survey in the Florence area showed that while a significant proportion of stroke patients were prescribed outpatient rehabilitation, 31.3% were unable to take advantage of these services, with logistical reasons such as transportation issues often a key factor.[64]

Increasing primary care capacity for long-term risk management

> Communication between GPs and specialist doctors is almost entirely lacking, so care for secondary prevention is very fragmented.
>
> PROFESSOR PASQUALE PERRONE-FILARDI, FEDERICO II UNIVERSITY HOSPITAL, NAPLES

Few regional heart attack and stroke care pathways include primary care, potentially affecting care continuity for secondary prevention. While integrated care pathways for post-acute and social care in heart attack have been implemented at the regional level,[16] recent analysis found that few mention the follow-up phase in the outpatient setting.[28] The lack of protocols addressing post-acute care is likely impacting care quality – for example, around 50% of patients are reported to miss out on regular risk management assessments while in primary care.[61]

In stroke, a significant number of regional care pathways appear to overlook the post-acute stage. In 2018, stroke care pathways in eight of Italy's 20 regions did not have protocols in place for long-term follow-up.[14] Experts have warned that even where comprehensive care pathways cover primary care, there is a risk that they are not being fully implemented unless all relevant health professional groups have been involved in their development.

Long-term management post-heart attack has yet to experience improvements seen during the acute stage. While the 30-day mortality rate of heart attack patients significantly fell between 2010 and 2016 (from 9.5% to 7.9%), the one-year mortality rate saw only a slight decrease in the same period (from 10.6% to 10.1%).[28]

> Adherence is like an additional risk factor for people with CVD. We need to find a way to increase patient adherence to ensure intensive control of risk factors.
>
> PROFESSOR PASQUALE PERRONE-FILARDI,
> FEDERICO II UNIVERSITY HOSPITAL, NAPLES

For patients managed by cardiologists, initial prescription rates appear high, yet patients may struggle to consistently take their risk-reducing medication in the long term. While a nationwide study of patients managed by cardiologists one to three years post-heart attack found that high numbers were prescribed the guideline-recommended medication for secondary prevention,[53] regional studies showed that adherence to risk-reducing medication was low.[65] For example, only 27% of patients in Sicily were found to adhere to this set of medications in the two years after the event, with the rate slightly better for Lazio (63%) and Tuscany (59%), but still well below optimum levels.[65] Reasons for low levels of adherence are unclear, but it has been suggested that greater patient and health professional education is needed and that greater use of combination therapies, where several kinds of medicines are delivered via a single pill, may also help to increase adherence by reducing patients' medication burden.[61]

Risk factor management needs to be better prioritised, as too few heart attack patients are reaching optimum blood pressure and LDL cholesterol levels. Despite most heart attack patients being prescribed blood pressure medication and statins as part of their long-term management, many are being put at risk of repeat events by poor medication management from healthcare professionals. Experts have noted that GPs are not always aware of the benefits of intensive risk factor management, and suggested that targeted educational efforts are needed to bring practice in line with the most recent ESC guidelines.[61] A study of 11,706 post-heart attack patients found that, while 90% adhered to their medication regimen at six months, only 74% met the guideline-recommended blood pressure target and 76% met the LDL target.[13]

Greater emphasis is needed on patient education around behavioural risk factors. Too many patients are continuing unhealthy behaviours after experiencing a heart attack or stroke, even though this increases their risk of a repeat event. Experts have suggested that the limited face-to-face time that GPs have with each patient means that they often overlook patient education on behavioural risk factors.[61] A large-scale study of post-heart attack patients showed that, while behavioural risk factors improved during the first six months, many patients were continuing their unhealthy habits. Smoking and insufficient exercise were observed in 27% and 59% of patients respectively, while inadequate fish intake was seen in 55% and inadequate intake of fruit and vegetables in 23% of the sample.[13] In another study analysing younger stroke patients (aged 18–45), 46.6% of those who experienced a repeat event were found to be current smokers.[66]

Too few stroke patients continue long term with medications prescribed at discharge, a situation that is putting them at an increased risk of recurrent strokes. A study of younger first-time stroke patients (aged 18–45) found that the intake of medication prescribed at discharge decreased over time and was associated with an increased risk of repeat events.[66] The reason for this was unclear, but discontinuation of these medications was found to strongly predict long-term risk of stroke recurrence in those people.

In CVD and cerebrovascular disease generally, a clear consensus has emerged in recent years for the importance of strengthening primary care to improve patients' long-term management for secondary prevention. This includes the vision adopted by the National Alliance for Cardio-Cerebrovascular Diseases.[9] Developing primary care is considered crucial to the future of secondary prevention. New models of multidisciplinary care are needed, with GPs posed to be more involved in follow-up and secondary prevention. This would involve larger group practices, capable of employing nurses and administrative staff.

Experts have identified several systemic obstacles to a greater role for primary care in best practice secondary prevention during patient's long-term care:

- **Limited capacity is an issue, especially where more complex organisational models are not yet implemented and GPs work mainly as single-point providers.** Financial constraints faced by the whole system in the past decade have had a crucial impact on generational turnover in practitioners, and there are not enough GPs to tackle the increasing needs of an ageing population.[67]
- **Prescription limitations affect the opportunity for GPs to play a primary role in following up some patients.** This includes patients who need specific medications that are only distributed by the Servizio Sanitario Nazionale (e.g. PCSK9 inhibitors) through 'therapeutic plans' that must be approved by specialists.[68]
- **Defensive practices may also play a role.** This includes reports of GPs facing increasing risk of medical litigation, which may create psychological pressure to err on the side of caution and refer to specialists an increasing number of patients qualifying for secondary prevention.[67]
- **Cultural factors are indicated by experts as playing a crucial role in shaping patients' behaviour.** The successes and growing capability of acute interventions may hinder secondary prevention. A speedy recovery may lead patients to believe that they have fully regained their health and therefore underestimate their risk.[67]

> Thanks to angioplasty and innovative treatments, people are often back home five days after a heart attack. But this means there is not much time to educate these patients about medication adherence, healthy eating, smoking cessation and daily physical activity. Some patients underestimate the risk of a recurrent event. Evidence shows that secondary prevention after a heart attack is also important for risk of stroke.
>
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CASE STUDIES

1. Regional excellence: Friuli-Venezia Giulia's integrated care pathways for post-acute and social care (PDTAs)

Friuli-Venezia Giulia's PDTA on heart attack includes a section on post-discharge and follow-up care, where the main goal is ensuring continuity of care, coordinated across all community and primary care providers (general practitioners, rehabilitation specialists and community cardiology). Risk stratification at discharge is a key tool to distinguish the different pathways between low clinical risk, high clinical risk and high thrombotic risk. According to the PDTA, both high-risk groups should be referred to a cardiac rehabilitation centre within 15–20 days of discharge, and close follow-up with checks should occur at 6 and 12 months from the event. For patients with high thrombotic risk, the importance of an intensive secondary prevention programme is emphasised.[16]

Friuli-Venezia Giulia's PDTA on stroke offers a very detailed description of the patient pathway. This is structured around the pre-hospital, hospital and post-hospital phase.[15] [69] The post-acute phase encompasses community, hospital outpatient and residential care, and rehabilitation settings.[69] Discharge is described in detail and includes patient and carer education, with specific actions and care providers outlined. Pharmacological therapy is covered, with the first phase initiated by the multidisciplinary team that includes the ward specialist, psychiatrist, nurse, case manager, physiotherapist and a representative from community care.[69] The document provides templates of the discharge letter and follow-up plan, and a map of the community services involved in the care.

2. ALLEPRE: A fully nurse-coordinated intensive intervention programme for the secondary prevention of cardiovascular disease

The Alliance for the Secondary Prevention of Cardiovascular Disease in the Emilia-Romagna region (ALLEPRE) is a multicentre trial of a nurse-led, structured secondary prevention programme.[70] The trial evaluates patients' long-term outcomes and risk profiles. It is undertaken in both inpatient and outpatient clinics. Patients receive nine sessions with experienced nurses, who aim to facilitate healthy lifestyle changes, reduce risk factors and increase medication adherence. The sessions occur just before discharge and then after 1, 3, 6, 12, 18, 24, 36 and 48 months. Patients are followed up for a mean period of five years.

OUTLOOK

In Italy, repeat heart attack and stroke currently present an unacceptable risk. Significant opportunities exist to improve patient outcomes.

A range of gaps in the use and availability of guideline-recommended care for secondary prevention are contributing to this increased risk. Addressing these gaps can help improve patient outcomes and reduce costs of care. Expanding the availability of stroke units could increase the number of patients accessing specialist acute care for secondary prevention. The underuse of cardiac rehabilitation currently represents a missed opportunity, with too few facilities and too few patients being referred. Bringing medication use for the control of risk factors in line with European guidelines is another area where improvement could be sought, with risk factor control currently suboptimal during both the acute stage and long-term care.

To take advantage of these opportunities, both national and regional leadership will likely be needed. The National Plan for Prevention could be updated to cover secondary prevention. The development of intersectoral strategies linking secondary prevention to the national prevention agenda, created by the Italian Alliance for Cardio-Cerebrovascular Diseases, is an encouraging step in this direction. Greater national direction may help to encourage the development of regional policy in this area, and in turn address the significant differences in care standards that exist between the regions. Considerable expansion of national data collection around secondary prevention may also be required to inform policy development and improve the monitoring of service need and provision gaps across regions.

If concerted action is taken to address the gaps in secondary prevention of heart attack and stroke, it is likely that patient outcomes can be significantly improved and national health expenditure reduced.

APPENDIX

Leading organisations and data sources consulted for this report

Many leading organisations and sources of information were identified across the course of the research. These include:

Osservatorio Ictus Italia
Italian Stroke Organization – Stroke Prevention and Educational Awareness Diffusion
Istituto Superiore di Sanità
Intergruppo Parlamentare per i problemi sociali dell'ictus
Società Italiana di Cardiologia
Società Italiana per la Prevenzione Cardiovascolare
Associazione Italiana di Cardiologia Clinica, Preventiva e Riabilitativa GICR-IACPR
Annali dell'Istituto Superiore di Sanità
Rivista della Società Italiana di Medicina Generale
Giornale Italiano di Cardiologia
Journal of Cardiovascular Medicine
Monaldi Archives for Chest Disease

A significant volume of epidemiology data came from the Global Health Data Exchange. More information on this tool can be found here: http://ghdx.healthdata.org/gbd-results-tool

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