

A decorative red curved banner at the top of the page contains several white circular icons. These icons include a dumbbell, a heart with an ECG line, a clipboard, a doctor in a white coat with a cross, a stethoscope, and a crossed-out cigarette.

Secondary prevention of
**HEART ATTACK
AND STROKE**

Country profile for
Poland

About this report

This country profile is part of a multi-year policy project on the secondary prevention of heart attack and stroke in Europe. It is based on interviews and consultation with national experts as well as an analysis of data and research for Poland.

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EXECUTIVE SUMMARY

Heart attack and stroke have long been a major burden on the Polish healthcare system and society. Coronary heart disease (CHD), of which heart attack is the most serious consequence, was the biggest cause of death in 2016, accounting for 10% of all deaths. Stroke was the second-biggest cause of death that year and accounted for 8% of all deaths.¹

Direct and indirect costs of CHD and cerebrovascular disease – of which stroke is the most common condition – impose a significant cost on the Polish healthcare system.

Overall, they cost Poland €4.1 billion per year, accounting for 5% of total healthcare expenditure, significantly more than the 2% average in the European Union (EU).²

Heart attack and stroke patients are at an increased risk of repeat events, but much can be done to mitigate this risk. Timely application of measures for secondary prevention, such as structured rehabilitation and the appropriate management of long-term cardiovascular risk factors, is important.

Currently, care gaps and inequalities exist in the use of guideline-recommended care for secondary prevention in Poland. A major factor is the inconsistent implementation of appropriate heart attack and stroke care pathways.^{3–6} In stroke, for example, the vital link from acute to primary care appears to be lacking from many patient pathways,³ and a significant number of hospitals are not following accepted protocols and recommendations for stroke care.⁵

These gaps and inequalities span the entire care continuum, from acute to long-term care, and are putting heart attack and stroke patients at an unnecessarily high risk of repeat events. It has been reported that too few heart attack patients receive appropriate medications for secondary prevention during the acute stage. In-hospital use of these medications is below both the European Society of Cardiology's (ESC's) guideline recommendations and European averages.⁷

Cardiac rehabilitation is a well-recognised strategy for secondary prevention in heart attack in Poland, but its availability is low and delivery is suboptimal. A lack of cardiac rehabilitation centres has resulted in an estimated annual unmet need of over 216,400 cardiac patients,⁸ with access varying widely across regions.^{9,10} This is compounded by the fact that heart attack patients wait too long to start their rehabilitation. Cardiac rehabilitation is too reliant on inpatient/residential services and few programmes are medically coordinated by cardiologists.¹¹

In stroke, the availability of comprehensive rehabilitation is extremely limited. Only 25% of patients are referred to rehabilitation.¹² Out of over 100 rehabilitation wards which care for post-stroke patients, only 17 have been found to offer comprehensive rehabilitation that attends to a range of needs.³

In both heart attack and stroke, data draw a varied picture of the quality and outcomes of secondary prevention delivered over the longer term. Overall, despite some successful initiatives, adherence to guidelines in clinical practice is low and significant gaps in risk factor management endure. A high proportion of heart attack and stroke patients are not reaching treatment targets after hospital discharge.^{13 14}

More could be done to strengthen the role of primary care to deliver secondary prevention. In stroke, for example, the key role of general practitioners in long-term risk-factor control is recognised, but they do not appear to receive sufficient support to provide secondary prevention.^{15 3} The sector itself is also seen to be underfunded.¹⁶

Given the range of inequalities in access to guideline-recommended care, it is worrying that secondary prevention is not recognised in current high-level policy. While national policy strategies on cardiovascular disease (CVD) exist, they do not include any specific goals dedicated to secondary prevention.¹⁷

There is reason to hope that this situation may soon change, as a recent government drive to improve care coordination has created a significant opportunity to strengthen follow-up care for heart attack patients. This drive has resulted in the development of a fully reimbursed, best-practice pathway to improve post-discharge prognosis for heart attack patients.^{6 18} Early data suggest that the pathway significantly increases the uptake of cardiac rehabilitation, improves follow-up care and reduces major adverse events at 12-month follow-up.⁶

While encouraging, the effective monitoring and evaluation of services for secondary prevention, as well as the development of appropriate policy at the national and regional level, continues to be impacted by a lack of data. In heart attack, registries mostly focus on acute care outcomes, with secondary prevention comprehensively monitored only in some regions.¹⁹ In stroke, a national registry on prevention and treatment feeds into a national audit⁵ and collects some data related to secondary prevention,²⁰ but participation in the registry is voluntary.²¹

INTRODUCTION

Heart attack and stroke are two of Poland's leading causes of death and therefore a huge societal concern. Heart attack is the most serious consequence of coronary heart disease (CHD) and stroke is the most common condition among cerebrovascular diseases. In 2016, CHD and stroke were, respectively, the biggest and second-biggest causes of death in the country.¹

Poland is a country with a high risk profile for cardiovascular disease (CVD) and in recent years decision-makers have acknowledged action on CVD and stroke as policy priorities. Efforts to improve prevention and treatment over the past two decades have led to significant successes. Between 2006 and 2012, the standardised death rate from heart attack fell by 30% and the standardised death rate for stroke decreased by 18%.²²

Despite advancements, many people still die prematurely because of a heart attack or stroke, highlighting the need for better long-term risk-factor management to improve outcomes. Rates of premature mortality for heart attack and stroke are still significantly higher in Poland than the average for countries in the Organisation for Economic Co-operation and Development (OECD).²³ Some risk factors are also more prevalent, on average, than in other OECD countries,²³ and demographic and epidemiological changes are likely to increase the burden.¹⁶

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

Heart attack and stroke constitute a significant cost to the Polish healthcare system and to the wider economy. CHD costs in Poland have been estimated at over €800 million in direct costs and over €1.6 billion in indirect costs per year.² The direct cost of cerebrovascular disease, including stroke, has been estimated at more than €500 million per year, and the indirect cost at more than €1 billion.² Overall, CHD and cerebrovascular disease cost Poland €4.1 billion per year and account for 5% of total healthcare expenditure – significantly more than the EU average of 2%.² However, this does not necessarily reflect higher spending per CVD patient. For example, the cost per patient with cerebrovascular disease is €15, which is below the EU average of €39.²

Table 1 provides an in-depth look at direct and indirect costs for CHD and cerebrovascular disease, according to data from the European Cardiovascular Disease Statistics.²

Table 1. Coronary heart disease and cerebrovascular disease: direct and indirect costs to society in 2015²

	Direct cost		Indirect cost		Total
	Healthcare costs	Productivity losses due to mortality	Productivity losses due to illness	Informal care	
Coronary heart disease	€835,943	€453,083	€200,444	€973,989	€2,463,459
Cerebrovascular disease	€561,333	€298,059	€188,838	€626,073	€1,674,303
Combined cost	€1,397,276	€751,142	€389,282	€1,600,062	€4,137,762

Cost in thousands per year.

Epidemiology

In comparison with other European countries, the incidence of CHD and stroke in Poland is high. Around 85,000 cases of CHD and 74,000 strokes occurred in 2019, figures which accounted for a higher proportion of the population than in other EU countries.²⁴ *Table 2* provides a summary of epidemiological data.

Poland’s mortality rates for CHD and stroke have steadily decreased since 2000, but both conditions remain the leading causes of death. In 2016, CHD was the leading and stroke the second-leading cause of death, accounting for 10% and 8% of all deaths respectively.¹ While mortality rates have improved, they remain unfavourable within the EU, sitting just below the European average for both conditions (three-year average between 2013 and 2015),²⁵ with around 97,000 people dying as a result of CHD and 45,000 dying as a result of stroke in 2019.²⁴

The number of people affected by heart attack and stroke in Poland is rising, which creates a greater demand for appropriate follow-up care to manage them in the long term. Cardiac disease is predicted to increase by 13% by 2025¹⁷ and Poland is projected to have the largest absolute increase in stroke cases in Europe – over 27,300 new cases between 2015 and 2035.¹² The country’s ageing population is partly responsible for this increase, with Poland forecast to have the ninth highest percentage of people over the age of 65 within the OECD-35 by 2050.²⁶ Slow progress in addressing behavioural risk factors is also a serious concern. Nearly half (47%) of all deaths in Poland are estimated to be attributable to behavioural risk factors, such as tobacco use, alcohol consumption, dietary risks and low levels of physical activity.¹

Table 2. Coronary heart disease and stroke (2019): epidemiological data for Poland²⁴

	Coronary heart disease ^a	Stroke ^b
Number of people living with the disease (prevalence)	1,491,616	623,986
Number of new cases per year (incidence)	85,753	74,455
Deaths	97,188	45,104

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

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In the past, the Polish Cardiac Society succeeded in convincing policymakers that CVD is the most important group of diseases to invest in and focus on. Unfortunately, there is now an approach among policymakers that the biggest problems concerning CVD have been resolved.

PROFESSOR PIOTR JANKOWSKI

Over recent decades, heart attack and stroke became health policy priorities in Poland, resulting in major national health programmes covering secondary prevention; however, the past few years have seen this focus lessen. CVD and stroke have long been a major public health challenge in Poland. Strong advocacy from medical associations, universities and other opinion leaders led many policymakers to recognise that more action in the prevention and management of CVD and stroke was needed.^{27,37} This resulted in major national health programmes with heart attack- and stroke-specific goals for secondary prevention.¹⁷

Previous national policy strategies on CVD included goals for improving secondary prevention of heart attack and stroke, while their most recent iterations do not address this important aspect of care. Experts interviewed for this report have suggested that Poland's success in improving acute care for heart attack and stroke has led many policymakers to believe that these conditions no longer pose a major threat to public health, and their focus has now shifted to other conditions, such as cancer.²⁸ Prevention was a priority in the 2009 National Cardiovascular Disease Prevention

and Treatment Programme (POLKARD), which aimed to improve monitoring of CVD and to establish new prevention and rehabilitation programmes. For heart attack, goals included developing and implementing a model of comprehensive cardiac rehabilitation, providing more training for professionals and fitting cardiac rehabilitation units with better equipment.²⁹ As part of these efforts, a needs assessment of cardiac rehabilitation was performed in different regions.⁹ In the case of stroke, the programme aimed to extend the network of specialist acute and rehabilitation units.²⁹ However, while this has put preventing repeat events on the political agenda, the most recent iteration of POLKARD (2017–2020) does not include any goals related to secondary prevention.¹⁷

While heart attack and stroke secondary prevention is less recognised in current high-level policy, a recent government drive to improve care coordination has resulted in a major new programme to improve care post-heart attack. Introduced in October 2017 by the Polish Ministry of Health, the National Health Fund and the Polish Cardiac Society, the Managed Care after Acute Myocardial Infarction (KOS-zawał) programme creates a fully reimbursed, best-practice pathway to improve post-discharge prognosis in heart attack patients.^{6,30} The programme optimises the use of acute interventions, cardiac rehabilitation and 12-month outpatient cardiology follow-up to prevent repeat events,⁶ with the provision of coordinated care incentivised for healthcare providers. Hospitals, for example, may receive financial bonuses if a post-heart attack patient has been able to return to work within four months after the event, and the contracting process gives preferential treatment to providers delivering complex care. Early data suggest that the programme significantly increases the uptake of cardiac rehabilitation, improves follow-up care, reduces repeat events⁶ and results in high levels of patient satisfaction.³⁰

The impact of the KOS-zawał programme is currently being impeded by limited roll-out of the scheme; however, uptake may improve after further financial incentives have been introduced. The programme is reported to be available in 76 facilities across Poland,³¹ which account for around half of all cardiac centres; however, in many of these centres spaces on the programme are very limited. As a result, just 13–14% of eligible patients are estimated to participate in the programme nationally.²⁸ Experts have suggested that many hospitals do not see post-acute care as their responsibility, and thus limit the programme to a small number of patients. They report that the National Health Fund has introduced financial bonuses to improve uptake of the programme, with centres that achieve at least 50% patient participation receiving an extra 2% in funds.²⁸

In stroke, funding for secondary prevention appears to be insufficient. Gaps in funding for the development and modernisation of rehabilitation programmes have been noted, and may be a reason behind unequal access for post-stroke patients.⁹

On a regional level, there is limited evidence to suggest that local authorities engage in secondary prevention. One notable exception is the secondary stroke prevention programme in Kraków. The programme aims to cover comprehensive, multidisciplinary follow-up care, including risk-factor modification, rehabilitation and support, while not creating additional costs for the health system.³² This is part of the initiative ‘Good health programmes’ (Dobre Programy Zdrowotne) by the Central and Eastern European Society of Technology Assessment in Health Care (CEESTAHC), which supports the implementation of health programmes at the local level.³³

Table 3 summarises key policies that include goals for secondary prevention of heart attack and stroke in Poland.

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

	Heart attack	Stroke
	The most recent iteration of POLKARD (2017–2020) does not include any goals related to secondary prevention. ¹⁷	
Key policies	Managed Care after Acute Myocardial Infarction (KOS-zawał) programme (2017) creates a fully reimbursed, best-practice pathway to improve post-discharge prognosis of heart attack patients. ⁶	

Guidelines and clinical leadership

In heart attack, the Polish Cardiac Society (Polskie Towarzystwo Kardiologiczne) has made considerable efforts to align national guidelines covering secondary prevention with internationally validated evidence. The Society translates European Society of Cardiology (ESC) guidelines into Polish and provides context-specific commentary (see *Table 4* for a summary of current guidelines). A dedicated working group is responsible for disseminating and promoting the guidelines among doctors and the guidelines play a fundamental role in future cardiologists’ residency training.³⁴

Coordinated care of post-heart attack patients has been recognised by clinical leaders as key to reducing long-term mortality. The Polish Cardiac Society and the Agency for Health Technology Assessment (Agencja Oceny Technologii Medycznych i Taryfikacji, AOTMiT) have developed a model for coordinated care for heart attack patients, with a 12-month follow-up. Its aim is to reduce mortality within the first year after the event and improve allocation of financial resources.³⁵ The model includes coordinated acute treatment as well as education, rehabilitation and frequent consultations. It has now taken form in the KOS-zawał programme.

Best-practice secondary prevention in stroke has been progressed through the dissemination of international guidelines through professional publications and online platforms. Medycyna Praktyczna (Medicine in practice), which distributes resources and medical publications frequently used by doctors for clinical decision-making, published the translated 2008 European Stroke Organisation guidelines that highlighted secondary prevention.³⁶ More recent recommendations for secondary stroke prevention are also discussed on professional medical portals, such as guidelines by the American Stroke Association published by Neurologia Praktyczna (Neurology in practice).³⁷

In primary care, the Polish health professional community has come together to progress best-practice secondary prevention by co-creating national risk-factor-specific guidelines which include recommendations for secondary prevention in both heart attack and stroke. The 2016 guidelines for the management of dyslipidaemias (abnormal cholesterol levels), for example, were co-created by the Polish Lipid Association (PoLA), the College of Family Physicians in Poland (Kolegium Lekarzy Rodzinnych w Polsce) and the Polish Cardiac Society. They contain recommendations for the treatment of raised low-density lipoprotein (LDL) cholesterol in post-heart attack and post-stroke patients.³⁸

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

Heart attack	Stroke
<p>ESC guidelines for the prevention of cardiovascular disease in clinical practice 2016, supplemented by country-specific commentary.³⁴</p>	<p>European and American guidelines covering secondary prevention are published and/or discussed by professional medical publications and online platforms.^{36 37}</p>
<p>The Polish Cardiac Society endorses a range of recently updated ESC guidelines which place greater emphasis on management of key risk factors to reduce repeat events. These include:</p> <ul style="list-style-type: none"> • diabetes, pre-diabetes and cardiovascular disease • dyslipidaemias • chronic coronary syndromes • arterial hypertension.³⁹ 	<p>Diagnosis, treatment and secondary prophylaxis of ischaemic stroke and seizures of transient cerebral ischaemia (2010)³⁶ is a Polish translation of the 2008 guidelines from the European Stroke Organisation. The guidelines discuss the management of ischaemic stroke and transient ischaemic attack, and cover secondary prevention.</p>
<p>Polish Forum for Prevention Guidelines on Cardiovascular Risk Assessment: update 2016⁴⁰ created by the Polish Forum for the Prevention of Cardiovascular Disease.</p>	
<p>Guidelines for the treatment of hypertension in the elderly (2013),⁴¹ primary care guidelines.</p>	
<p>Guidelines for the Management of Dyslipidaemias for Family Physicians (2016),³⁸ primary care guidelines.</p>	

Advocacy and awareness raising

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Most people in Poland are still dying due to cardiovascular disease. But if you ask an average person about their main health-related fear, they will say it's cancer.

PROFESSOR PIOTR JANKOWSKI

There appear to be limited advocacy efforts around secondary prevention for heart attack and stroke. The apparent scarcity of activities to increase public and political awareness of secondary prevention is worrying, given the health service gaps that currently exist. In heart attack, patient education is one of the objectives of the Polish Cardiac Society,⁴ which is behind the creation of an online educational platform for post-heart attack patients (see *Case study 1*). In stroke, there is some evidence that patient organisations engage in education and awareness raising for secondary prevention of stroke,³ with the Polish Stroke Foundation developing a website for stroke patients about risk factors and access to post-stroke rehabilitation.⁴²

Ensuring availability of comprehensive data

Over the past decade, a number of heart attack and stroke registries have been set up in Poland. The establishment of registries has been a priority of POLKARD since its first edition in 2008. Improvements have been made in recent years in implementing process and outcome indicators and in monitoring heart attack and stroke care and outcomes in both inpatient and outpatient settings.²³

In heart attack, national registries monitor cardiac care, but they often lack data relevant to secondary prevention. A number of registries collect data on cardiological interventions, hospitalisations and deaths.⁴³ The Polish Registry of Acute Coronary Syndromes collects data on secondary prevention at hospital discharge; however, it is missing data relevant to many quality indicators recommended by the ESC, such as the proportion of patients provided with advice on smoking cessation and/or counselling at discharge.⁴⁴ On the other hand, Kraków municipality has a registry dedicated specifically to secondary prevention.^{19 45}

In stroke, apparent data gaps in the national stroke registry are affecting accountability and the benchmarking of services for secondary prevention. While the National Stroke Prevention and Treatment Registry serves as a national audit⁵ and collects some data related to secondary prevention (12-month mortality rates,²⁰ treatment with antiplatelets and anticoagulants), the registry lacks comprehensive data because participation is voluntary.²¹

Table 5 outlines some of the key national registries with relevance to heart attack or stroke.

Table 5. Cardiovascular disease registries in Poland

Registry	Description
Polish Registry of Acute Coronary Syndromes (PL-ACS) ^{46 47}	Provides information about characteristics, treatments and outcomes of patients with acute coronary syndromes in Poland and on secondary prevention at discharge. It has been ongoing since 2003, but does not include all hospitals
National Database on Acute Myocardial Infarction (AMI-PL) ⁴⁶	Data on hospitalisations, procedures and deaths due to a heart attack for all Polish patients treated in public hospitals
National Register of Percutaneous Interventions in Cardiology (ORPKI) ⁴³	Provides information about percutaneous cardiology procedures performed; data published yearly
WOBASZ registry ⁴⁸	Registry of cardiovascular disease risk factors
National Stroke Prevention and Treatment Registry ⁵	Serves as a national audit but input by healthcare providers is voluntary ^{12 49}
Regional stroke registries ^{12 21}	Some regions have their own stroke registries, e.g. Warsaw, Zabrze, Krosno, Kraków ¹²

Initiation of secondary prevention in the acute care setting

Improvements in acute cardiac care have noticeably reduced post-heart attack mortality in Poland, resulting in a greater proportion of patients surviving the acute stage compared with many other EU countries. Between 1991 and 2005, the risk of death post-heart attack was reduced by 37% through improvements in cardiological treatment.¹⁷ These improvements have continued over the past decade, with almost all heart attack patients reported to now be treated in acute cardiac care units.³¹ This has likely contributed to the 30-day mortality rate for heart attack patients of 7.7 per 100,000 population, significantly below the EU average of 9.4.¹

Despite these advancements, too few heart attack patients receive appropriate secondary prevention medications during hospitalisation, putting them at an increased risk of repeat events. A study of people under 45 years old hospitalised with heart attack between 2010 and 2014 found that in-hospital use of medications for secondary prevention fell below both ESC guideline recommendations and European averages.⁷ Four groups of medications (acetylsalicylic acid, beta-blockers, angiotensin-converting enzyme inhibitors (ACEIs) and statins) were prescribed less often during hospitalisation than at discharge, despite the early initiation of ACEIs and statins being proven to reduce the risk of death post-heart attack both in the short and in the long term.⁷ Significant regional differences were also noted in the use of beta-blockers (ranging from 50.0% to 79.6%) and statins (ranging from 53.4% to 85.7%).⁷

In stroke, acute care has seen significant improvements in recent years, yet high hospital mortality rates suggest it still needs to be improved. While the past decade has seen the number of stroke units rise from 105 to 150, with 70% of stroke patients now treated in these specialist settings,^{3,23} high in-hospital mortality rates for first-ever and recurrent stroke have been observed.⁵⁰ In the Silesian province, for example, in-hospital mortality rates were at 17.3% and 17.7% for first-ever and recurrent stroke patients respectively in 2015.⁵⁰

Securing participation in structured secondary prevention programmes

Cardiac rehabilitation is a well-recognised strategy for secondary prevention in heart attack. Cardiac rehabilitation in Poland follows the widely acknowledged three-phase model (inpatient, outpatient and long-term care).⁵¹ There are recognised benefits: participation in a cardiac rehabilitation programme has been identified as one of the main determinants for reaching treatment targets.¹³ The Polish Cardiac Society has developed a 'model for optimal cardiac rehabilitation' in which nurses play a key role, and this has been implemented in some regions (e.g. Kraków).⁵²

Despite recognising its value, there is a large unmet need for cardiac rehabilitation resulting from too few cardiac rehabilitation centres. While cardiac rehabilitation has been proven to prevent repeat events, a lack of facilities has resulted in an unmet need of around 216,400 cardiac patients.⁸ From 2009 to 2012, just 22% of post-heart attack patients received comprehensive cardiac rehabilitation.⁴⁶ While more recent data (2018)

on more severe heart attacks (ST-elevation myocardial infarction -STEMI) suggested that this figure was higher (54.3%), this is still significantly below the ESC guideline recommendation that all post-heart attack patients receive cardiac rehabilitation.^{44 53 54} Additionally, experts have reported that hospital-based cardiologists do not always fully appreciate the benefits of cardiac rehabilitation or see post-acute care as their responsibility. They suggest that this is likely impacting the development of new hospital-based cardiac rehabilitation centres, as well as referral to the centres that do exist.²⁸ However, it is encouraging that the Polish National Centre for Research and Development (Narodowe Centrum Badań i Rozwoju) is currently assessing the potential of telemedicine to deliver cardiac rehabilitation. There is hope that this may lead to improved access, with a major long-term clinical trial underway to test these technologies.⁵⁵

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There are a lot of acute cardiac centres where patients are just discharged and left on their own. Therefore, it is often the responsibility of the patient and their family to contact a cardiac outpatient clinic and to initiate rehabilitation.

PROFESSOR PIOTR JANKOWSKI

Geographical inequalities lead to variations in the availability of and access to cardiac rehabilitation. Cardiac rehabilitation is more easily accessible in urban than in rural areas¹⁰ and innovative models of care are often only implemented in bigger cities.¹³ In 2011, a review found that in the voivodeship of Opolskie, over 75% of all patients with acute coronary conditions benefited from cardiac rehabilitation, while in all other voivodeships this proportion was below 40%.⁹ Inequalities in access based on patient characteristics have also been noted, with patients below the age of 65 and men more likely to receive cardiac rehabilitation.⁴⁶

Greater roll-out of the KOS-zawał programme may help to improve national cardiac rehabilitation prescription and uptake rates. No national protocol exists to direct the care of heart attack patients once they leave hospital; the KOS-zawał programme is helping to fill this gap. Participating centres are required to have a discharge protocol and an individual discharge plan for each patient.²⁸ A study conducted in a centre that has implemented the programme found that it significantly increased the percentage of post-heart attack patients enrolled in early cardiac rehabilitation compared with standard care (98.3% vs. 14.2%).⁶

Issues identified in the provision and delivery of cardiac rehabilitation need to be addressed to bring services up to guideline-recommended standards. A recent ESC survey of phase II cardiac rehabilitation found that, on average, heart attack patients wait too long to start rehabilitation (6–12 weeks), cardiac rehabilitation is reliant on inpatient/residential services, and less than half of programmes are medically coordinated by a cardiologist.¹¹ The majority of centres are also reported to focus exclusively on providing exercise sessions and rarely cover patient education (for a programme that provided an exception, see *Case study 2*).²⁸

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There are not many hospitals in Poland where they systematically refer patients to rehabilitation centres after stroke. In most cases, they just discharge patients home.

PROFESSOR PIOTR JANKOWSKI

In stroke, the availability of comprehensive rehabilitation is severely limited.

Out of over 100 rehabilitation wards which offer services for stroke patients, only 17 have been found to offer comprehensive rehabilitation that attends to a range of rehabilitation needs.³ Moreover, only about 25% of patients are referred to rehabilitation.¹² Despite care pathways being recognised as integral to stroke care, they are not yet widely implemented in Poland.^{3 56} In the regions (voivodeships) where comprehensive care pathways have been established successfully, patients are receiving improved quality of care.⁵⁶

The lack of referral to structured services for secondary prevention is likely contributing to high rates of repeat events among stroke patients and a high 12-month post-discharge mortality rate. In 2015, 20.1% of strokes in the Silesian province were repeat events.⁵⁰ Nationally, in 2013 the 12-month post-hospital mortality rate for ischaemic stroke was found to be 19.3%, with little change recorded since 2009.²⁰

A lack of funding in some regions and high out-of-pocket spending could be a barrier to achieving equal access to structured secondary prevention. Rehabilitation programmes for heart attack and stroke are often not covered by national health insurance, instead relying on out-of-pocket financing. Poland's high out-of-pocket spending places a heavy burden on patients, particularly those on lower incomes.¹⁶ Overall, insufficient funding for the development and modernisation of rehabilitation programmes has been noted, and may have contributed to unequal access for both post-heart attack and post-stroke patients.⁹

Increasing primary care capacity for long-term risk management

Too few heart attack patients appear to be receiving specialist care during their long-term management. Less than half of heart attack patients with left ventricular ejection fraction (LVEF) were found to see an outpatient cardiologist in the first 12 months after discharge, with care mostly provided by general practitioners (GPs).⁵⁷ Further roll-out of the KOS-zawał programme may help to improve this situation. In with a single-centre study, the programme significantly increased the provision of outpatient cardiology visits (81.5% vs. 56.5%), more than doubled the average number of outpatient visits per patient, and significantly shortened the time to first post-heart attack visit (41 days vs. 67 days) in comparison to usual care.⁶

The lack of specialist care is worrying, as CVD risk factor control in patients under GP care has been shown to be poorer than under specialist care. Experts have noted that new guidelines and research are introduced into everyday practice more quickly among cardiologists than GPs.²⁸ In coronary artery disease, for example, the proportion of patients with LDL cholesterol level above their recommended goal has been found to be higher under GP care than in those under cardiologist care.⁵⁸ This is likely influencing the high rates of rehospitalisation experienced by heart attack patients in Poland. Evidence suggests that approximately 1 in 10 patients discharged after a heart attack die within 12 months, with rehospitalisation rates ranging from 38% to 46% in the first year post-heart attack, and 62% of those due to CVD.⁴⁶

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When you look at the reasons for the differences in lifespan between Western Europe and Poland, the main difference is not in the acute treatment of heart attack or stroke, it is in the control of risk factors such as hyperglycaemia, obesity and hypertension.

PROFESSOR PIOTR JANKOWSKI

Overall, risk-factor management post-heart attack appears to be insufficient. While high numbers of patients who have experienced a heart attack have been found to be receiving a single type of medications for risk-factor control 6–18 months after hospitalisation,⁵⁹ only 27% of CVD patients in Poland – including those who had suffered a heart attack – were prescribed the three or more guideline-recommended secondary prevention medications.⁶⁰

The underuse of medications for secondary prevention is likely contributing to a high proportion of heart attack patients who are not reaching treatment targets after hospital discharge. A 2015 study found that, 6–18 months after discharge, 43.5% of post-heart attack patients did not reach their blood pressure goal, 71.1% did not reach their LDL cholesterol goal and 79.1% did not reach their target body mass index (BMI).¹³ A later study looking at patients with established coronary artery disease, including those who had experienced a heart attack, found that the five main lifestyle and clinical risk factors were well controlled in just 2.3% patients 6–18 months post-hospitalisation.⁵⁹

In stroke, long-term patient outcomes could be compromised by a lack of follow-up care. For stroke patients, the risk of mortality is high one year after the event – and significantly higher than for heart attack patients. This may be attributable to a lack of access to specialist care, which can lead to suboptimal risk-factor management.²² Patients' long-term care is often left to family members, with little input or follow-up from clinicians.⁶¹

More could be done to support primary care clinicians in delivering secondary prevention. GPs do not currently have direct access to patients' hospital records, with experts suggesting that this is one of the main barriers to patients receiving appropriate follow-up care.²⁸ In general, GPs play a key role in managing pharmacotherapy, regular check-ups and supporting patients with lifestyle modification and wellbeing. However, they do not appear to receive sufficient support to provide secondary prevention and long-term risk-factor management, as has been noted in particular with regard to stroke.¹⁵ Insufficient funding of the long-term care sector and healthcare workforce overall may be a contributing factor.¹⁶

Risk-factor control among stroke patients seems to be insufficient, even after repeat strokes. Data from a regional study in 2015 showed that even though risk-factor control had improved over the past two decades, only 59% of patients received statins and 21% did not receive antithrombotic medications recommended in risk-factor management for stroke.⁶² Similarly, data from the national stroke registry show that people who have survived a stroke do not have their risk factors (such as hypertension, abnormal cholesterol and high blood pressure) well controlled.⁵ In certain patient groups, such as older patients with a history of atrial fibrillation, prescription rates are particularly low.²²

It is encouraging, however, that in regions which have made improvements in this area hospitalisations for repeat strokes have significantly decreased. In the Silesian province, for example, the use of antiplatelet and antihypertensive medications increased between 2009 and 2015, while simultaneously hospitalisations due to recurrent stroke reduced from 23.1% to 20.1% (as a percentage of all stroke hospitalisations).⁵⁰

CASE STUDIES

Online platform: 'Co po zawale'

1. This comprehensive online platform (<http://copolozawale.pl>, 'What next after a heart attack?') aims to inform patients who have experienced a heart attack about potential risks.⁶³ It advises them how to keep their risks under control and signposts them to rehabilitation and sources of support for self-care.

It addresses questions such as 'What will happen after I leave the hospital?', 'How do I continue with my life after a heart attack?' and 'Why do I constantly need to take medication?'. It also offers advice on physical activity, a heart-healthy diet and what to do if a person cannot afford their medication.

A patient club for secondary prevention

2. Recognising a gap in the availability of continual education on risk-factor management for people with an acute coronary syndrome, the Cardiovascular Center Foundation in Kraków, a Polish–Norwegian non-governmental organisation, set up the Patient Club initiative.⁶⁴

The programme was run in addition to regular cardiac rehabilitation. Participants received educational materials and advice from a specialist nurse at hospital discharge, then regularly attended Patient Club meetings with other patients.

The programme generated low cost and resource use, and, most importantly, proved successful. Participation had significant benefits for the patients in terms of improving their dietary habits, levels of physical activity and overall risk-factor control as recommended in the ESC guidelines.

However, even though participation in the Club was free of charge, only one third of eligible patients attended.

OUTLOOK

Significant opportunities exist to improve patient outcomes in heart attack and stroke in Poland by addressing gaps in the availability of guideline-recommended care for secondary prevention.

The underuse of structured rehabilitation in particular is a missed opportunity to improve patient outcomes, with the lack of cardiac rehabilitation centres significantly constraining heart attack and stroke patients' access to this vital intervention. Significant benefits could also be gained by bringing medication use for the control of long-term risk factors in line with European guidelines, as these medications currently appear to be underused across all care sectors.

A significant tool is available to take advantage of these opportunities in the form of the new best-practice pathway for post-discharge heart attack care, fully reimbursed by the Ministry of Health. This may also provide a model for future developments in stroke. To ensure that this and other improvement efforts have nationwide impact, national leadership will likely be needed, with strategic plans covering secondary prevention developed to direct the service improvements called for. Considerable expansion of national data collection around secondary prevention may also be needed in order to effectively evaluate and benchmark services.

Repeat heart attack and stroke currently present an unacceptable risk to patients in Poland. With concerted action, however, 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:

Polish Cardiac Society (Polskie Towarzystwo Kardiologiczne)

Polish Society of Internal Medicine (Towarzystwo Internistów Polskich)

Polish Society of Hypertension (Polskie Towarzystwo Nadciśnienia Tętniczego)

Polish Society of Neurology (Polskie Towarzystwo Neurologiczne)

College of Family Physicians in Poland (Kolegium Lekarzy Rodzinnych w Polsce)

Polish Forum for the Prevention of Cardiovascular Diseases

Polish Heart Journal (Kardiologia Polska)

Polish Archives of Internal Medicine (Polskie Archiwum Medycyny Wewnętrznej)

Arterial Hypertension

Polish Journal of Neurology and Neurosurgery (Neurologia i Neurochirurgia Polska)

Family Medicine Topics (Problemy Medycyny Rodzinnej)

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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FOR MORE INFORMATION, PLEASE CONTACT:

The Health Policy Partnership

68–69 St Martin's Lane, London, WC2N 4JS, United Kingdom
info@hpolicy.com

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