2025

The condition of Polish cardiology in comparison with the European Union

IN THE CONTEXT OF THE POLISH PRESIDENCY OF THE COUNCIL OF THE EUROPEAN UNION

Report entitled:
The state of Polish cardiology

in the context of the Polish Presidency of the Council of the European Union.

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Authors

Prof. Marcin Czech
Dr Jakub Gierczynski, MBA
Prof. Robert Gil
Prof. Przemysław Mitkowski

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1 Introduction

The European Society of Cardiology (ESC) describes Poland as a high-risk cardiovascular country. About 180,000 people in Poland die from cardiovascular diseases, and cardiovascular diseases account for about 37 percent of all deaths.

The most common risk factor for cardiovascular disease in Poland is lipid disorder. The problem affects up to 21 million people in Poland, more than 60% of the adult population, and up to 70% of people over the age of 65. The scale of the problem is amplified by a very low awareness of this risk factor, with only 2 in 10 people able to quote the level of their total cholesterol and/or LDL cholesterol. There is still low awareness that this is a major cause of heart attacks and strokes.
By making small lifestyle changes, 80% of premature deaths from cardiovascular disease can be prevented. Therefore, it is essential to educate and build public awareness of the potential sources of risks. This stands in line with the statutory goals of the Polish Cardiac Society (PCS), which are the prevention and control of cardiovascular diseases, as well as the promotion and protection of health in cardiology and related medical fields and public health among the public.

2024 is a particularly important year for PCS, which entered its 70th year of activity this year.[1] At the same time, it has been declared the year of pediatric cardiology. Subsequently, 2025 will be the year of the Polish presidency of the Council of the European Union, where major health priorities such as preventive health care and digitization in health, and drug safety address the priorities both in Polish and European cardiology. On the other hand, several systemic solutions in the cardiology field implemented in Poland, such as "KOS Myocardial Infarction" and the education in the community of doctors, nurses, and patients can inspire other EU-27 countries.

[1] In memory. 70 years of the Polish Society of Cardiology in the memories of the presidents. PTK. Pulse of Medicine 2024. Accessed: https://pulsmedycyny.pl/medycyna/kardiologia/xxvii-miedzynarodowy-kongres-ptk-szczegolna-monografia-wydana-przez-puls-medycyny/

2 Epidemiology of major cardiovascular health problems.

POLAND IN COMPARISON TO THE EUROPEAN UNION

2.1 Cardiovascular disease is the leading cause of death in the European Union

According to the latest Eurostat data for 2021, cardiovascular disease is the leading cause of death in the European Union.[2] In 2021, there were 1.71 million deaths from cardiovascular disease in the European Union, accounting for 32.4% of all deaths. This percentage was much higher than for the second most common cause of death - malignant neoplasms, which accounted for 21.6% of all deaths.

Table. Deaths from cardiovascular diseases in 2021

Country	Number of deaths	Share of all deaths			Standardized mortality rates per 100,000 population.				
		Total	Men	Women	Total	Men	Women	< 65 yo	≥ 65 yo
European Union	**1 711 818,0**	**32,4**	**29,8**	**35,0**	**343,4**	**412,5**	**288,6**	**42,4**	**1 586,1**
Austria	31 430,0	34,9	31,8	37,9	343,3	409,2	293,2	29,1	1 640,5
Belgium	26 576,0	23,9	22,3	25,4	217,0	265,3	180,6	23,7	1 014,9
Bulgaria	79 948,0	54,5	50,9	58,3	1 211,0	1 491,3	1 013,8	180,7	5 464,3
Croatia	23 127,0	26,8	31,9	41,7	601,3	684,9	532,4	59,6	2 837,3
Cyprus	1 835,0	25,4	25,4	25,4	280,8	323,2	242,6	36,0	1 291,7
Czech Republic	47 939,0	34,4	31,4	37,6	525,6	649,9	437,7	57,3	2 459,1
Denmark	11 967,0	20,9	21,7	20,1	211,8	271,0	167,3	23,6	988,8
Estonia	8 391,0	45,6	37,9	52,4	599,4	774,5	495,4	71,6	2 778,5
Finland	18 856,0	32,8	33,3	32,3	304,0	406,7	231,6	36,8	1 406,9
France	137 969,0	20,9	19,6	22,1	169,9	222,3	132,4	22,6	778,1
Greece	46 429,0	32,4	30,6	34,2	339,5	394,3	290,6	49,3	1 537,6
Spain	188 730,0	26,4	24,1	28,8	213,0	260,9	174,3	26,9	981,1
Ireland	9 273,0	26,7	26,7	26,6	248,2	297,6	203,6	30,6	1 146,3
Iceland	679,0	29,6	30,5	28,6	252,4	303,9	210,0	22,6	1 201,4
Liechtenstein	85,0	32,1	29,4	34,9	266,6	290,0	234,9	18,5	1 291,0
Lithuania	23 001,0	48,7	43,2	53,8	900,7	1 041,3	653,6	114,9	3 631,8
Luxembourg	1 051,0	24,3	22,9	25,7	213,2	259,8	176,9	19,8	1 011,5
Latvia	16 938,0	49,3	44,2	53,9	859,5	1 127,0	693,6	153,7	3 773,1
Malta	1 228,0	29,5	27,8	31,2	271,8	298,6	245,1	38,0	1 237,0
Netherlands	36 146,0	21,3	21,0	21,6	219,9	264,3	186,2	21,2	1 040,1
Germany	3 416 060,0	33,3	31,0	35,6	345,1	416,9	288,5	34,6	1 626,5
Norway	10 184,0	24,9	25,1	24,6	208,1	250,2	173,2	18,5	991,2
Poland	**181 036,0**	**34,8**	**30,8**	**39,1**	**541,4**	**667,3**	**449,3**	**70,0**	**2 487,7**
Portugal	31 396,0	25,1	22,3	28,0	247,9	296,5	211,7	30,1	1 147,2
Romania	172 745,0	52,0	47,0	57,4	1 005,4	1 208,7	855,8	132,0	4 610,9
Serbia	56 669,0	41,6	37,9	45,6	884,4	971,6	807,5	102,2	41 133,3
Slovakia	26 274,0	25,8	33,1	28,7	641,2	765,9	543,0	86,9	2 929,7
Slovenia	7 651,0	33,5	28,0	39,2	361,2	422,0	311,9	27,1	1 740,5
Switzerland	19 751,0	27,8	26,3	29,4	220,6	267,2	185,5	17,7	1 058,2
Sweden	27 624,0	30,3	30,4	30,2	257,1	320,3	207,8	23,9	1 219,4
Turkey	187 038,0	33,3	30,8	36,4	528,0	617,0	461,9	60,8	2 456,9
Hungary	65 701,0	42,3	38,7	45,8	722,8	886,2	606,7	107,3	3 264,0
Italy	216 951,0	30,8	27,7	33,7	266,9	317,7	229,1	22,4	1 276,4

Source: own summary based on the Eurostat data

[2] Cardiovascular diseases statistics.
Eurostat Access: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Cardiovascular_diseases_statistics

Cardiovascular diseases are among the leading causes of mortality in every country in the European Union. In 2021, they accounted for over half of all deaths in Bulgaria and Romania. In contrast, less than a quarter of all deaths in France, Denmark, the Netherlands, Belgium, and Luxembourg were due to cardiovascular diseases. France had the lowest share of deaths, accounting for 20.9%.

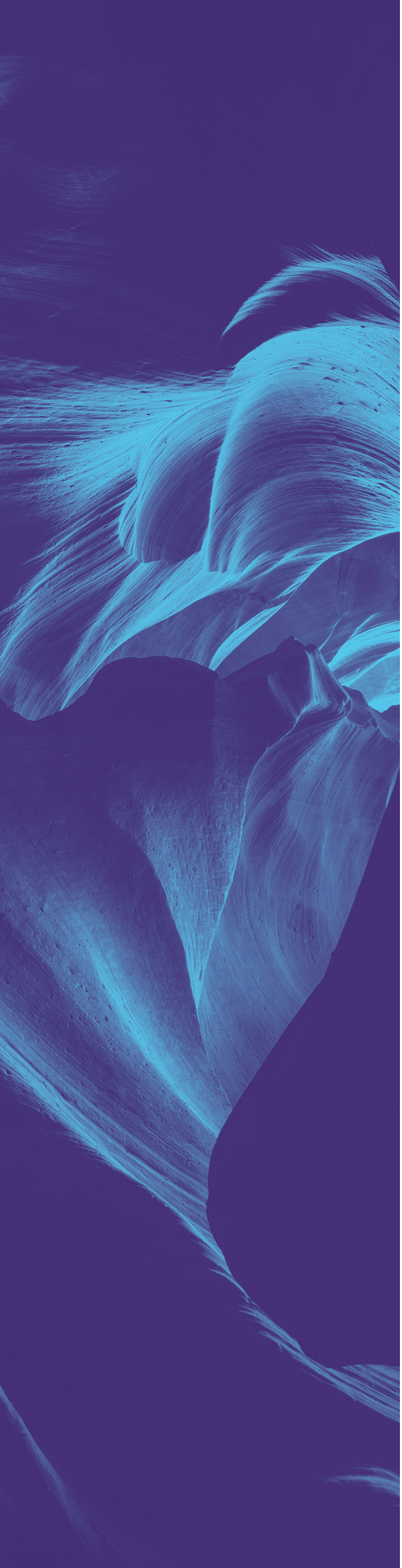
Poland, in 2021, recorded ca. 181,000 deaths, which accounted for 34.8% of all deaths and was 2.4 percentage points higher than the European Union average.

The most significant gender differences in the proportion of people dying from cardiovascular disease were observed in the three Baltic countries as well as Slovenia, Romania, and Croatia. In these EU countries, the proportion of women dying from cardiovascular disease in 2021 was between 9.7% and 14.5% higher than for men. These were the only EU countries that reported an imbalance of more than 9%. Only 4 EU countries had a higher percentage of men dying from cardiovascular disease than women - Denmark and Finland had 1.6% and 1.0% higher death rates for men than for women, respectively. More minor differences were observed in Sweden and Ireland. In Cyprus, the percentages were the same for men and women. Malta had the smallest gender difference in standardized cardiovascular mortality rates.

Standardized mortality rates are calculated as a weighted arithmetical mean of mortality rates by age, improving comparability over time and between countries. The standardized mortality rate for cardiovascular disease in the European Union was 343.4 deaths per 100,000 population in 2021, with the rate for men about 1.4 times higher than for women. In the same year, the standardized mortality rate for cancer in the EU was 235.

Standardized mortality rates for cardiovascular disease were consistently higher for men than for women in 2021 in all EU countries, although gender differences were relatively small compared to many other causes of death. The lowest absolute difference between men and women for standardized mortality rates from cardiovascular disease was recorded in Malta, at 54 deaths per 100,000 population. The following smallest differences, at about 80 deaths per 100,000 population, were recorded in the Netherlands and Cyprus. The largest difference was in Bulgaria, with 478 deaths per 100,000 residents.

In Poland, 667.3 deaths per 100,000 residents were recorded for men and 449.3 deaths per 100,000 residents among women, which translated into a difference of 218 deaths per 100,000 esidents.



Deaths from cardiovascular disease become more common in older people and this trend holds true for most causes of death. The standardized mortality rate from cardiovascular disease among people 65 and older in the EU in 2021 was 37 times when compared with people under 65, while for all causes of death the standardized mortality rate for people 65 and older was 21 times higher than for people under 65. It should be noted that women's risk of dying from cardiovascular disease under the age of 65 was particularly low. Across the European Union, standardized mortality rates for men were consistently higher than for women for all types of cardiovascular disease.

In Poland, standardized mortality rates under the age of 65 were higher than the European Union average, at 70.0 vs. 42.4 per 100,000 population. In the senior population - over 65 years of age - the standardized mortality rates in Poland were significantly higher than the EU average - 2,487.7 vs. 1,586.1 per 100,000 residents.

Standardized mortality rates for men in the European Union in 2021 were higher than mortality rates for women for each of the six causes of death shown below. For ischemic heart disease ICD-10 codes I20 to I25, the standardized mortality rate for men in the European Union was 1.9 times higher than the corresponding rate for women. The gender difference was less pronounced for other heart diseases, ICD-10 I30 to I51, cerebrovascular diseases, ICD-10 I60 to I69, and other cardiovascular diseases, ICD-10 I00 to I99.

Table. Standardized mortality rates - cardiovascular diseases per 100 000 inhabitants in 2021.

Country	Ischemic heart disease		Acute myocardial infarction, including myocardial infarction with complications		Other types of ischemic heart disease		Other heart diseases		Cerebrovascular diseases		Other cardiovascular diseases	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
European Union	**154,9**	**83,3**	**54,1**	**24,1**	**100,8**	**59,2**	**95**	**68,8**	**79,9**	**64,4**	**82,6**	**72,1**
Austria	190,5	97,5	69,8	39,6	120,7	67,9	91,2	75	54,4	45,5	73,2	75,3
Belgium	78	32,1	40,8	18,4	37,2	13,7	104,8	81,5	52,9	44,2	29,7	22,9
Bulgaria	318	181,9	124,9	52,6	193,1	129,3	513,2	350,9	419,3	309,6	240,9	171,4
Croatia	259,9	161,2	105,4	47	154,5	114,2	107,1	81	132,7	115,4	185,3	174,8
Cyprus	118,3	45,3	62,8	20,4	55,5	24,9	87,9	85,6	58,5	48,8	58,5	62,9
Czech Republic	324,5	187,2	50,2	21,3	274,3	165,8	138,4	95,1	86,1	69,6	100,9	85,9
Denmark	87,1	38,6	29,1	12,4	58	26,2	66,4	39,3	59,1	49,6	58,3	39,8
Estonia	233,7	113,5	55,2	22	178,5	91,5	140,5	80	99,1	63,6	301,3	238,2
Finland	216,7	89,4	50,4	21,7	166,2	67,7	39,6	21,1	71	57,6	79,5	63,5
France	64,6	23,1	26,8	10,5	37,7	12,6	76,6	49,2	45,1	34,1	36,1	26,1
Greece	153,4	76,1	78,8	33,2	74,6	42,9	83,3	76,2	92,8	85,6	64,9	52,7
Spain	80,6	32	36,7	15,6	43,9	16,4	81,7	62	51,6	39,3	47	40,9
Ireland	160,4	73,8	62	27,7	98,4	46,1	59,9	53,2	41,7	40,2	35,6	36,4
Iceland	146,9	61,7	49,1	16,7	97,8	45	84,9	62,5	44,4	50,6	27,8	35,1
Liechtenstein	99,9	95,4	23,6	14,5	76,3	80,9	68,2	62,2	61,7	33,7	60,2	43,6
Lithuania	660,3	389,2	64,7	21,6	595,6	367,6	47,8	17	207,7	160,2	125,5	87,2
Luxembourg	78,2	30	34,3	14,4	43,9	15,6	95,7	71,7	51,5	36,5	34,4	38,8
Latvia	517,4	266,8	71,3	26,8	447,1	240	142,9	63,5	305,5	243,6	160,2	119,7
Malta	168,4	111,3	86,1	61,4	82,4	49,9	48,7	17	207,7	160,2	125,5	87,2
Netherlands	70,9	31,2	40,7	19,3	30,2	12	99,6	75,3	57,3	52,4	36,6	27,3
Germany	176,8	84,1	66,8	30,2	110	54	103,6	81,1	59,3	48	77,2	75,3
Norway	98,4	48,7	44,1	23	54,3	25,6	64,5	51,2	47	39,1	40,3	34,2
Poland	**283,4**	**173,3**	**54,1**	**22**	**229,3**	**151,3**	**116,6**	**74,3**	**109**	**80,3**	**158,3**	**121,4**
Portugal	76,7	36,1	45,5	21,5	31,2	14,6	78,1	63,2	87,5	66,1	54,1	46,3
Romania	422,4	268,3	169,6	83,6	252,7	184,8	96,3	55,9	293,1	212,1	397	319,5
Serbia	164,2	103,3	84,2	41,5	79,9	61,8	412,1	342,8	155,9	132,4	239,5	229
Slovakia	471,9	338,4	79,2	30,5	392,6	307,9	88,3	58,9	140,5	99,4	65,2	46,4
Slovenia	133,1	56,7	85,4	32,7	47,8	24,1	107,7	102,1	100,5	78,3	80,7	74,8
Switzerland	104	47,7	36,8	16	67,2	31,7	65,9	50,2	40,6	34,4	56,7	53,1
Sweden	127,1	58,8	50,1	22,6	77	36,2	91,3	62,5	53,2	42,7	48,7	43,8
Turkey	279,5	172,5	192,8	124,7	86,8	47,8	138,5	110,9	110,7	93,7	88,2	84,8
Hungary	445,5	288,2	90,3	43,8	355,2	244,3	90,6	51	144	98,4	206,1	169,2
Italy	105,1	51,9	35,6	16,3	69,5	35,7	70,9	53,7	71,6	60,8	70	62,7

Source: own summary based on the Eurostat data

The standardized death rate from acute myocardial infarction, including myocardial infarction with complicated, was 54.1 per 100,000 population for men and 24.1 per 100,000 population for women as an average for the European Union, while in Poland it was 54.1 per 100,000 population for men and 22.0 per 100,000 population for women. In this category Poland reported better rates than the EU average.

and Hungary for women. In contrast, the lowest standardized mortality rates for men were recorded in France, followed by the Netherlands and Portugal. Women's lowest standardized rates were recorded in France, followed by Luxembourg and the Netherlands.

In Poland, the rate for men was 283.4 vs. 154.9 as EU average, and for women 173.3 vs. the EU average of 83.3 per 100,000 population, respectively.

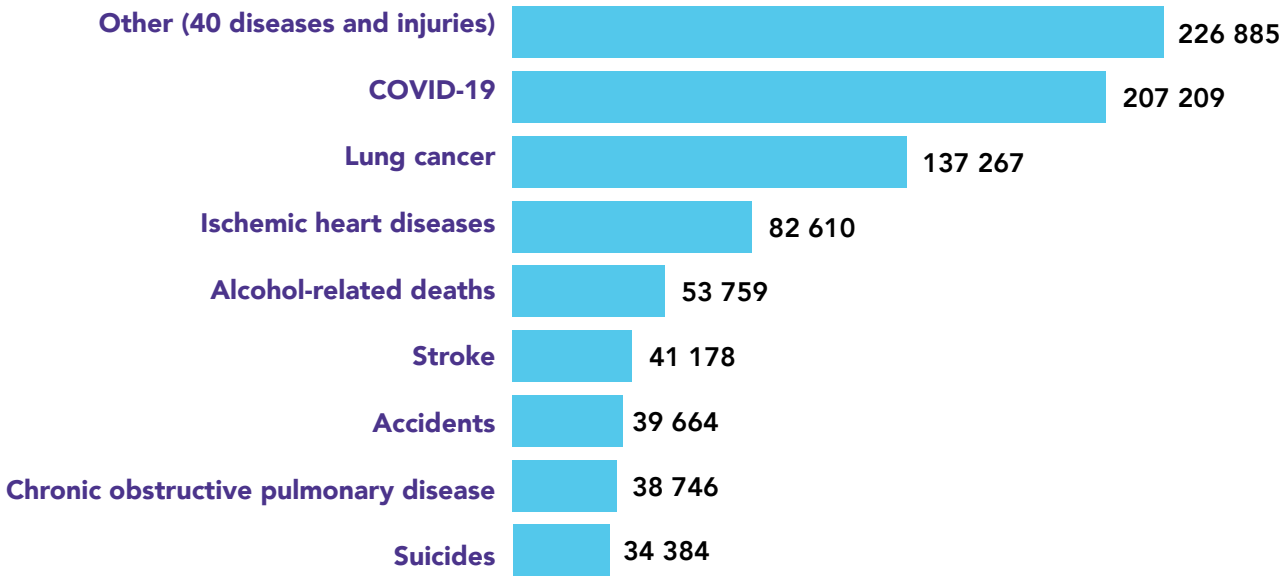
Some of the highest standardized mortality rates for ischemic heart disease were reported in the two Baltic countries: Lithuania had the highest rate in 2021 for men (660.3 per 100,000 male population) and women (389.2 per 100,000 female population), followed by Latvia and Slovakia for men and Slovakia

Changes in the number of cardiovascular disease-related deaths may have various causes, including preventive measures such as lifestyle changes in the population (e.g., reducing the number of smokers), improved screening for risk factors, and new surgical procedures and forms of treatment.

2.2 Cardiovascular diseases are among the top preventable deaths in the European Union

According to the latest OECD report, Health at a Glance, Europe 2024, cardiovascular disease was among the top preventable deaths in the European Union.[3] As many as 82,610 deaths from ischemic heart disease and 41,178 deaths from stroke could have been avoided in 2021.

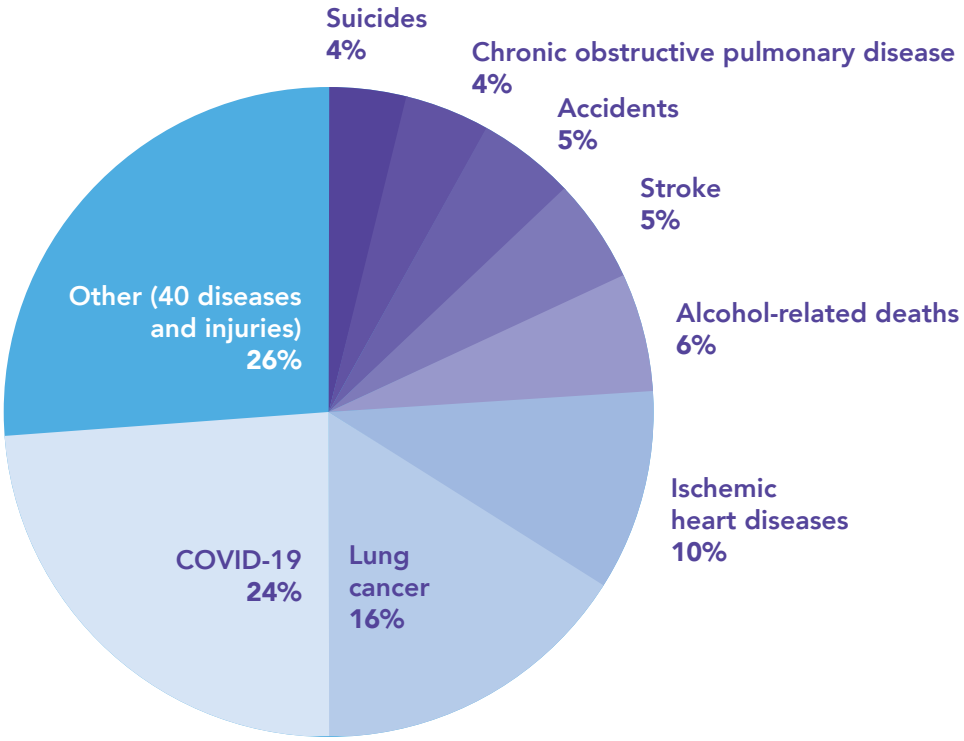
Figure. Main causes of avoidable deaths in the European Union in 2021



Source: own summary based on the "Health at a Glance: Europe 2024" report.

[3] OECD/European Commission (2024), Health at a Glance: Europe 2024: State of Health in the EU Cycle, OECD Publishing, Paris, https://doi.org/10.1787/b3704e14-en.

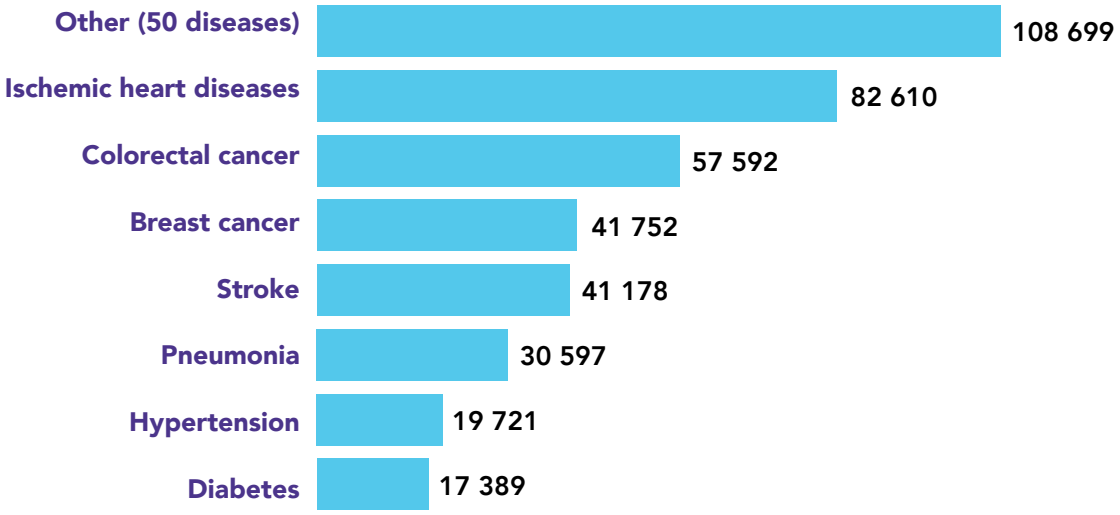
Figure. Percentage of the leading causes of avoidable deaths in the European Union in 2021.



Source: own summary based on the "Health at a Glance: Europe 2024" report.

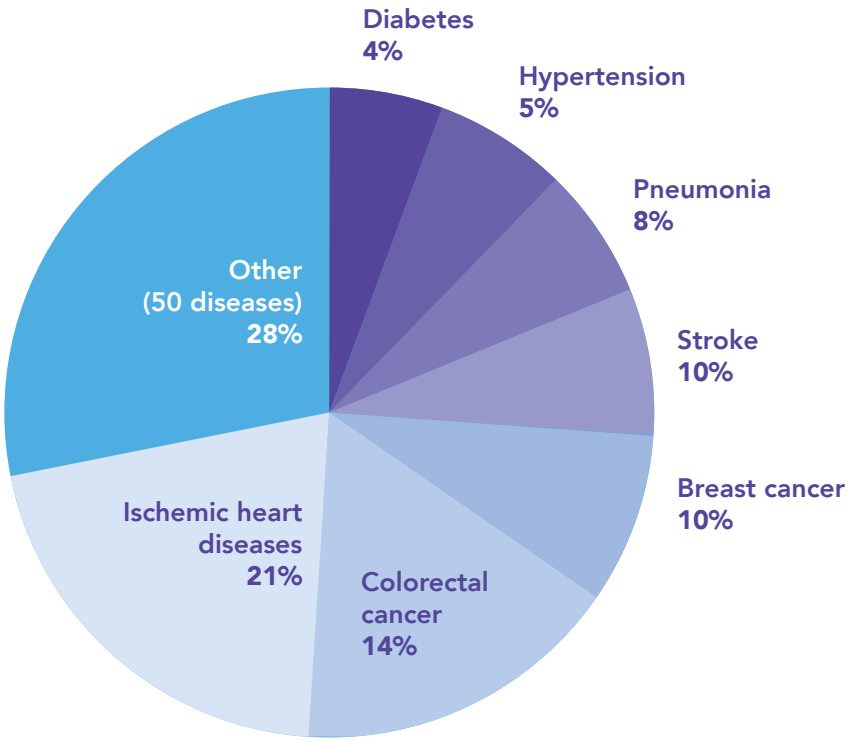
Preventable deaths due to patients' better access to effective therapy for ischemic heart disease included 82,610 cases. As many as 19,721 patients with arterial hypertension could have avoided death if effective treatment for this condition had been implemented.

Figure. Leading causes of treatable deaths in the European Union in 2021



Source: own summary based on the "Health at a Glance: Europe 2024" report.

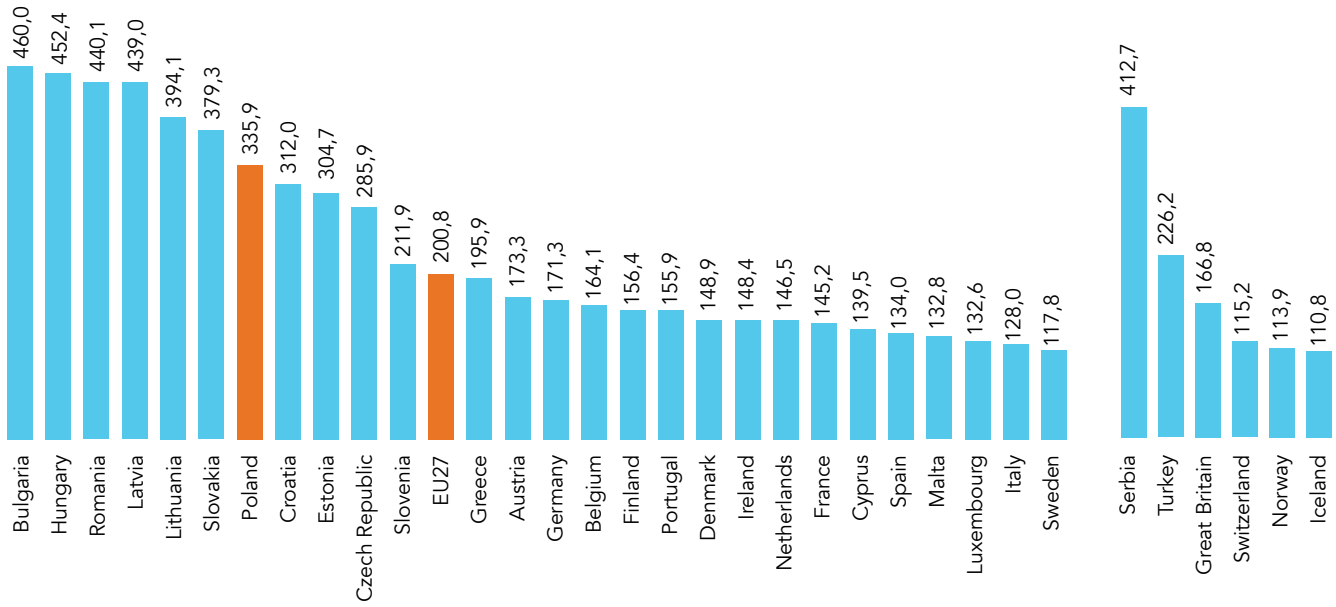
Figure. Percentage of the leading causes of treatable death in the European Union in 2021



Source: own summary based on the "Health at a Glance: Europe 2024" report.

In the ranking of countries that have introduced preventive and therapeutic measures to avoid deaths, **Poland still reports worse rates - 335.9 deaths per 100,000 vs. the EU average of 200.8 per 100,000, respectively.** Sweden reports 117.8 deaths per 100,000, Italy 128 deaths, and Spain 134 deaths per 100,000.

Figure. Mortality rates form avoidable causes, 2021, per 100,000 inhabitants.



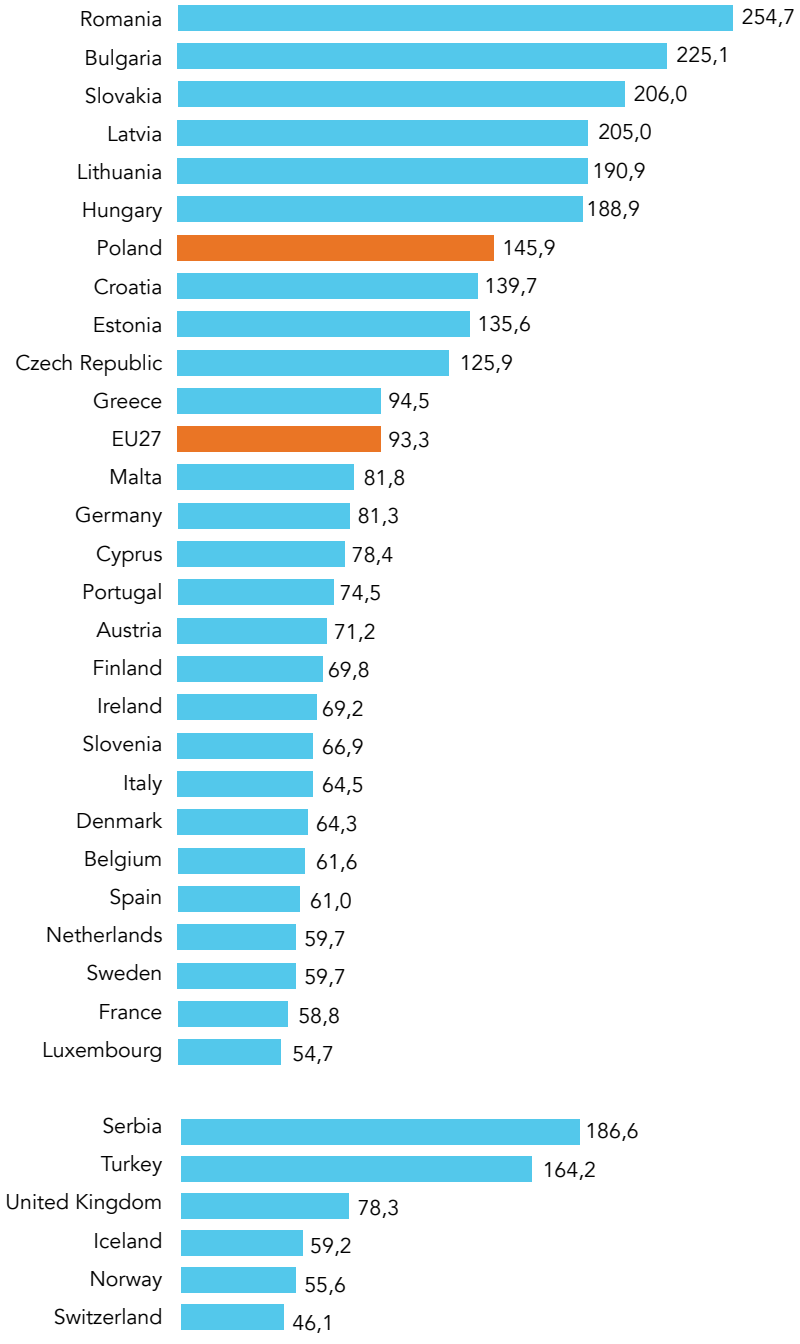
Source: own summary based on the "Health at a Glance: Europe 2024" report.

In the ranking of countries that have introduced therapeutic measures to avoid deaths,

Poland also reports worse rates, with 145.9 deaths per 100,000 vs. the EU average of 93.3 per 100,000, respectively.

France reports only 58.8 deaths per 100,000, Sweden 59.7, and Spain 61 deaths per 100,000.

Figure. Mortality rates form treatable causes, 2021, per 100,000 inhabitants.

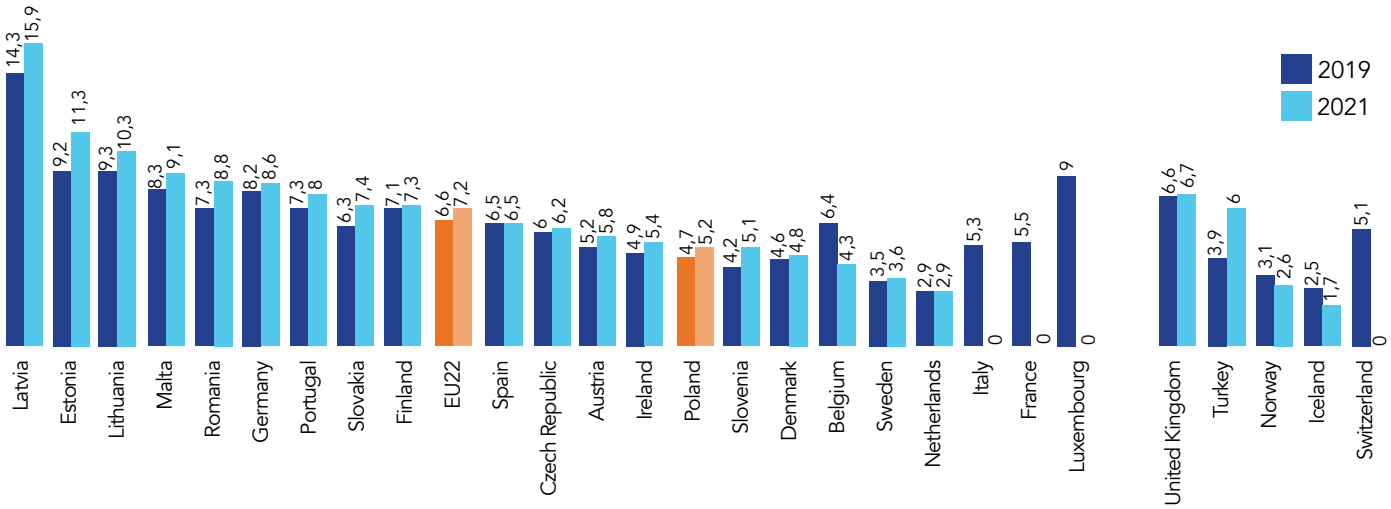


Source: own summary based on the "Health at a Glance: Europe 2024" report.

2.3 Thirty-day mortality after hospital admission for acute myocardial infarction

Thirty-day mortality after hospital admission for acute myocardial infarction, based on unrelated data, averaged for the European Union 6.6 deaths per 100 admissions for people aged 45 and older in 2019, while in 2021 - 7.2 deaths per 100 admissions for people aged 45 and older. **Poland reported 4.7 deaths per 100 admissions for people aged 45 and older in 2019, and 5.2 deaths per 100 admissions for people aged 45 and older in 2021.**

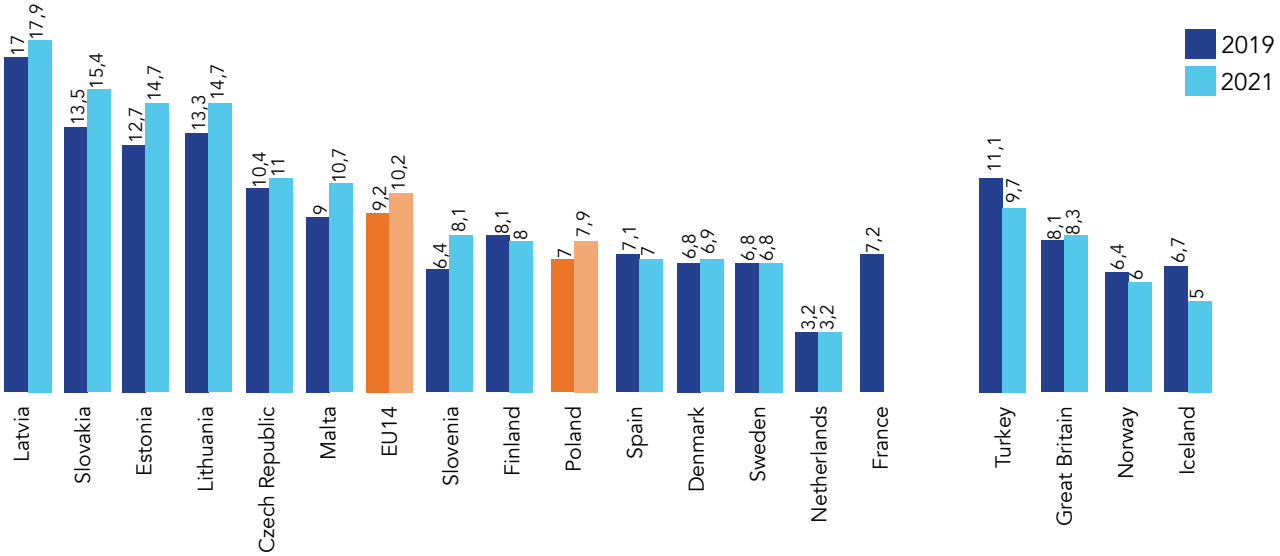
Figure. Thirty-day mortality after hospital admission for acute myocardial infarction based on unrelated data, 2019 and 2021 (or nearest year) per 100 admissions for persons aged 45 and older



Source: own summary based on the "Health at a Glance: Europe 2024" report.

Thirty-day mortality after hospital admission for acute myocardial infarction based on related data averaged for the European Union 9.2 deaths per 100 admissions for people aged 45 and older in 2019 and 10.2 deaths per 100 admissions for people aged 45 and older in 2021. **Poland reported 7.0 deaths per 100 admissions for people aged 45 and older in 2019 and in 2021 - 7.9 deaths per 100 admissions for people aged 45 and older.**

Figure. Thirty-day mortality after hospital admission for acute myocardial infarction based on related data, 2019 and 2021 (or nearest year) per 100 admissions for people aged 45 and older



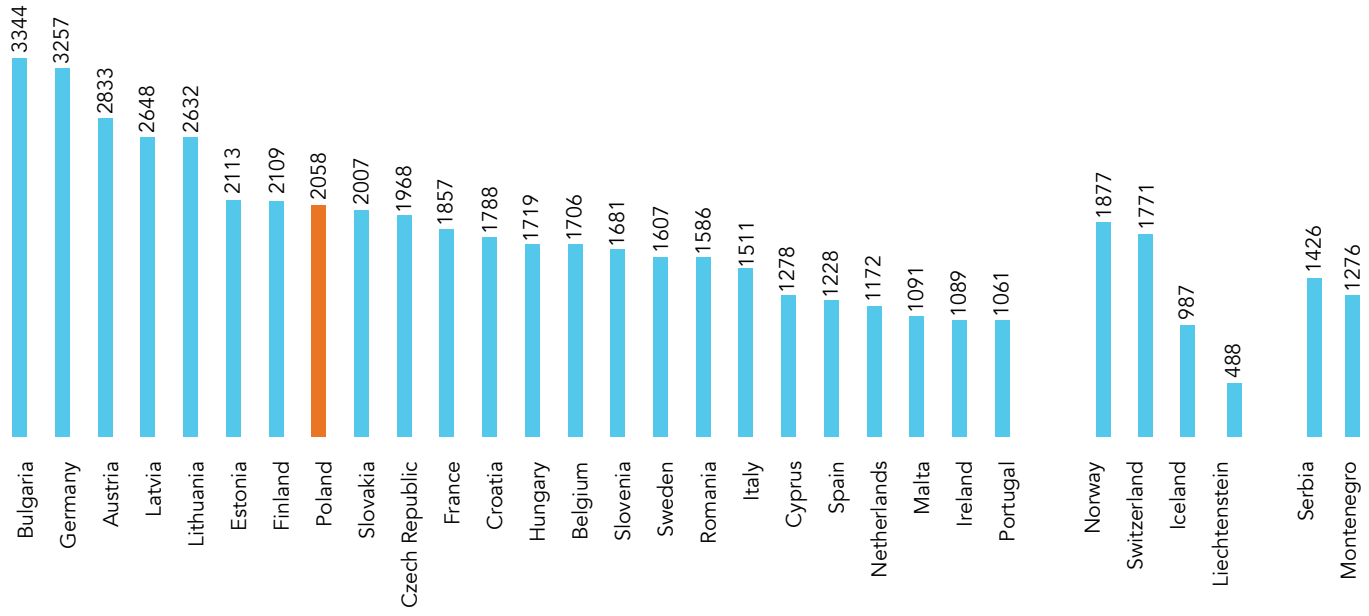
Source: own summary based on the "Health at a Glance: Europe 2024" report.

2.4 Number of patients hospitalalized with cardiovascular diseases in the European Union

The number of patients hospitalized with cardiovascular diseases across the European Union reached 8.6 million in 2021. The number of hospital discharges of patients hospitalized for cardiovascular diseases shows a significant variation across European Union countries. While absolute numbers of discharges are clearly related to the population in each country, the level of discharges may, among other things, also reflect the prevalence of each disease and differences in health care systems, such as the balance between daycare and inpatient treatment, as well as the availability of surgeons, hospital beds or emergency interventions, and a number of care facilities. In 2021, 8.6 million patients with cardiovascular disease were discharged from hospitals across the European Union (2020 data for Malta; no recent data available for Denmark, Greece, or Luxembourg). Bulgaria recorded the highest rate of hospital discharges per capita for patients hospitalized with cardiovascular disease. Bulgaria and Germany reported more than 3,000 hospital discharges per 100,000 residents among those treated for cardiovascular disease in 2021. Malta, Ireland, and Portugal reported the lowest rates - they were the only EU countries with fewer than 1,100 discharges per 100,000 residents.

Poland reported 2,058 hospitalizations for cardiovascular disease in 2021 per 100,000 residents vs. 1,061 hospitalizations in Portugal and 1,089 in Ireland.

Figure. Rates of hospital discharges for patients hospitalized for cardiovascular diseases in 2021 per 100,000 residents.



Source: own summary based on the Eurostat data

In 2021, across the European Union, patients hospitalized with ICD-10 I00 to I99 cardiovascular diseases spent 69 million days in the hospital (2020 data for Malta; no recent data available for Denmark, Greece, and Luxembourg).
Patients hospitalized in Germany accounted for the largest share - more than one-third of the total (34.9%), while Italy - 12.1%, and France - 11.6%, were the only other European countries to record double-digit shares. Patients hospitalized with cardiovascular disease in Hungary spent an average of 11.1 days in the hospital. Patients treated for cardiovascular disease tend to stay in the hospital for a relatively long period of time, reflecting the severity of some of these conditions.
Table below demonstrates the average length of hospitalization for patients suffering from cardiovascular disease in 2016 and 2021. The average length of stay in 2021 ranged from 4.1 days in Bulgaria to 11.1 days in Hungary. Relatively extended average hospital stays of patients hospitalized for cardiovascular disease were also recorded in Austria and Estonia - 10.4 and 10.3 days, respectively.

Poland reported the average length of hospitalization of patients due to cardiovascular diseases in 2021 at a level of 6.7 days (the length of hospitalization did not change compared to 2016). Hospitalizations for pulmonary heart disease and pulmonary circulation disease decreased to 8.5 days, 8.1 days for heart failure, 11.2 days for cerebrovascular disease, and 6.7 days due to atherosclerosis.

Table. Average length of stay of patients hospitalized for cardiovascular diseases in 2016 and 2021, in days

Country	Cardiovascular diseases		Pulmonary heart disease and pulmonary circulation diseases		Heart failure		Cerebrovascular diseases		Atherosclerosis	
	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021
Belgium	7,6	6,9	9,1	7,8	12	10,7	13,9	12,6	5,5	4,8
Austria	10,4	10,4	9,5	9,3	11,2	10,8	18,9	18,9	9,1	9,5
Bulgaria	4,2	4,1	6,1	5,3	4,7	4,6	5,2	5,3	3,8	3,5
Croatia	8,1	7,1	11,3	8,8	10,1	8,6	11,6	10,2	9,3	8
Cyprus	6,3	5,3	6	7,5	6,4	7	9	8,9	6,2	2,6
Montenegro	8	7,1	11,4	10,8	8,7	7,9	12,1	10,2	12,8	9,9
Czech Republic	11,2	10	9,8	8	11,7	10,6	21,9	18,8	15,4	15,2
Denmark	4,8	-	5,6	-	6	-	5,5	-	9,2	-
Estonia	9,9	10,3	-	-	-	-	14,7	15,6	-	-
Finland	9,7	8	7,2	5,8	8,8	8,1	20,5	15,1	10	8,3
France	6,7	6,3	7,9	7,1	9,3	9	9,8	9,2	7	6,3
Greece	-	-	-	-	-	-	-	-	-	-
Spain	8,3	8,5	9,3	8,8	9	9,6	11,7	12,9	11,1	11,4
Ireland	7,8	7,8	8,2	7,9	10,3	10,1	16,4	15,6	14,3	14,6
Iceland	9	8,7	5,4	7,3	10,3	10,5	15,6	15,4	9,9	11,8
Liechtenstein	4,8	4,4	9,6	4,2	9,9	9,5	8	1,8	10,8	7,7
Lithuania	7,6	8,5	10	8,5	8,9	9	10,9	13,3	8,8	9,1
Luxembourg	8,9	-	9,4	-	11,9	-	14,5	-	10,3	-
Latvia	6,9	8,2	9	7,6	7,8	9,1	10	10	10,1	8,6
Malta	9,8	9,3	9,8	8,4	10	8,7	24,4	24,9	17,8	7,5
Netherlands	5,5	5,3	4,6	4,5	7,7	7,4	6,5	6,1	5,6	4,7
Germany	9,3	8,9	9,6	8,5	10,4	10	16,2	16	10,3	9,5
Norway	4,6	4,3	4,6	4,2	5,7	5,5	7,2	6,9	5,4	5
Poland	6,5	6,7	9,2	8,5	8,3	8,1	11,4	11,2	7,1	6,7
Portugal	9,8	9,5	10,4	10,3	10,5	10,4	13,6	13,2	14,4	12
Romania	7,5	7,4	7,9	8,1	7,4	7,4	8,5	9,2	8,7	8,4
Serbia	8,4	7,7	13	9,8	9,4	9,7	10,8	9,5	8,2	7,3
Slovakia	7,2	6,5	8,9	7,5	8,7	7,9	10,5	8,8	8,6	6,6
Slovenia	8	7,4	9,5	7,9	10,7	9,9	16	14,5	7,5	5,2
Switzerland	8,7	8,3	7,7	7	11,3	10,1	15,5	14,2	8,8	7,5
Sweden	5,7	5,1	5,1	4,6	6,2	5,7	9,3	7,5	7,2	6,2
Turkey	5,3	-	10,4	-	7,7	-	11,7	-	5,5	-
Hungary	12,5	11,1	12,1	10,5	14,8	12,2	13,6	12,8	27,4	26,6
Italy	9,4	9,3	10,8	10,5	10,3	10,3	14,3	14,2	8,5	7,9

Source: own summary based on the Eurostat data

2.5 Operations and surgical procedures performed due to cardiovascular diseases

A table below provides an overview of the indicators - the number of surgeries and procedures performed both as inpatient and outpatient (one-day) procedure per 100,000 residents for two procedures related to cardiovascular disease: coronary artery bypass surgery and percutaneous coronary intervention. [4]

Table. Interventional procedures performed due to cardiovascular diseases per 100,000 population in 2017 and 2022

Country	Coronary artery bypass grafting		Percutaneous coronary angioplasty	
	2017	2022	2017	2022
Belgium	63,6	57,3	257,1	276,4
Austria	39,2	35,4	292,3	299,4
Bulgaria	42,6	37,4	191,8	378,4
Croatia	64,3	39,9	395,7	500,1
Cyprus	36,9	65,4	145,2	264,8
Czech Republic	45,3	41,2	216,6	206,2
Denmark	59,1	26,8	200,3	156
Estonia	35,2	30	222	215,2
Finland	31,6	24,6	194,3	235,2
France	28,9	25,7	267,2	292,2
Greece	-	-	-	-
Spain	16,8	15,4	123,2	125,9
Ireland	20,3	34,9	131,5	191,4
Iceland	22,4	17,5	236,8	182,5
Liechtenstein	0	0	234,4	0
Lithuania	55,2	41,9	297	295,9
Luxembourg	20,3	19,3	142,2	118,7
Latvia	-	22,6	-	341,7
Malta	25,9	19,9	198,3	189
Netherlands	53,1	43,5	225,6	219,6
Germany	57,5	44,3	413,2	379,3
Norway	28,6	22,5	223,9	203,9
Poland	30,7	24,6	121,6	144,3
Portugal	22,2	21,2	118,1	107,1
North Macedonia	32,4	36,8	210,9	172,2
Romania	22,2	22,1	120,7	133,7
Serbia	78,5	72,6	231,9	299,9
Slovakia	46,1	42,6	-	-
Slovenia	39,2	36,3	221,6	216,9
Switzerland	43,8	38,5	298,8	295,7
Sweden	30,4	25	205,1	173,2
Turkey	50,9	57,8	246,1	332,1
Hungary	28,7	21,4	233,5	237,4
Italy	34	29,5	215,6	224,3

Source: own summary based on the Eurostat data

[4] Cardiovascular diseases statistics.
Eurostat Access: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Cardiovascular_diseases_statistics

In 2022, a number of 136,100 coronary artery bypass surgeries were performed across the European Union, more than 26,000 less than in 2017. When comparing 2017 and 2022, the number of coronary artery bypass surgeries per 100,000 population decreased in all European countries except for Ireland and Cyprus. Germany recorded the highest number of operations, which is 37,100, having the third highest frequency standardized for the size of the population, i.e. 44.3 per 100,000 population, behind Cyprus at 65.4 per 100,000 population (data for the public sector only), and Belgium, at 57.3 times per 100,000 population. This procedure was least common in Spain, where it was performed an average of 15.4 per 100,000 residents. In 2022, a number of 44,3 coronary bypasses were conducted in Germany.

Poland reported 30.7 in 2017, and 24.6 procedures in 2021 per 100,000 residents, respectively.

In 2022, 1.06 million percutaneous coronary interventions were performed in the 25 countries of the European Union. This was 3,500 procedures more than in 2017. Germany performed 317,800 procedures, which is about 30% of interventions that took place in the European Union in 2022 and was significantly more than in any other EU country. France and Italy were the only other countries to report more than 100,000 procedures in total. Germany not only reported the highest number of such interventions, but also the second highest rate based on population size, with 379.3 coronary angioplasty procedures per 100,000 population. Croatia had the highest rate of 500.1 per 100,000 population. The lowest rate was reported in Portugal, with 107.1 procedures per 100,000 population.

Poland reported 121.6 percutaneous coronary angioplasty procedures per 100,000 residents in 2017 and 144.3 procedures per 100,000 in 2021.

2.6 The largest disease burden for men and women in the European Union is cardiovascular disease (CVD) and cancer

According to the 2023 Report by the Polish Academy of Sciences (PAN), the overall burden of a particular health problem on a population should be assessed using the Disability Adjusted Life-Years (DALYs).[5] The most prominent disease burden for men and women in the European Union is cardiovascular disease (CVD) and cancer. Among men in Poland, both groups of diseases contribute to a similar extent to health loss, whereas in EU countries the contribution of cancer is higher than CVD. However, among women the impact of CVD is more pronounced. The unfavorable difference in health burden in Poland and EU countries is more significant for CVD than for cancer. It is worth adding that – as our national reports show – higher mortality rate due to CVD in Poland than in other countries is the most crucial reason why Poles live shorter than the residents of most EU countries.

Table. Disease burden (DALY) due to major health problems for men in Poland and EU countries in total in 2019.

Health problem	Poland		European Union	
Cardiovascular disease	8,480.5 per 100,000	22.8% of total burden	6,284.9 per 100,000	19.9% of total burden
Cancer	8,453.9 per 100,000	22.8% of total burden	7,021.2 per 100,000	22.2% of total burden

According to the 2023 Health Needs Maps, cardiovascular diseases (I00-I99) accounted for 56,438,959 outpatient specialty care (pol. Ambulatoryjna Opieka Zdrowotna - AOS) services. They were second after musculoskeletal and connective tissue diseases (accounting for 68,105,108 visits) in the ranking of the number of AOS consultations in 2023.

Table. The number of consultations according to ICD-10 disease groups, within the scope of AOS, settled by the National Health Fund in 2023

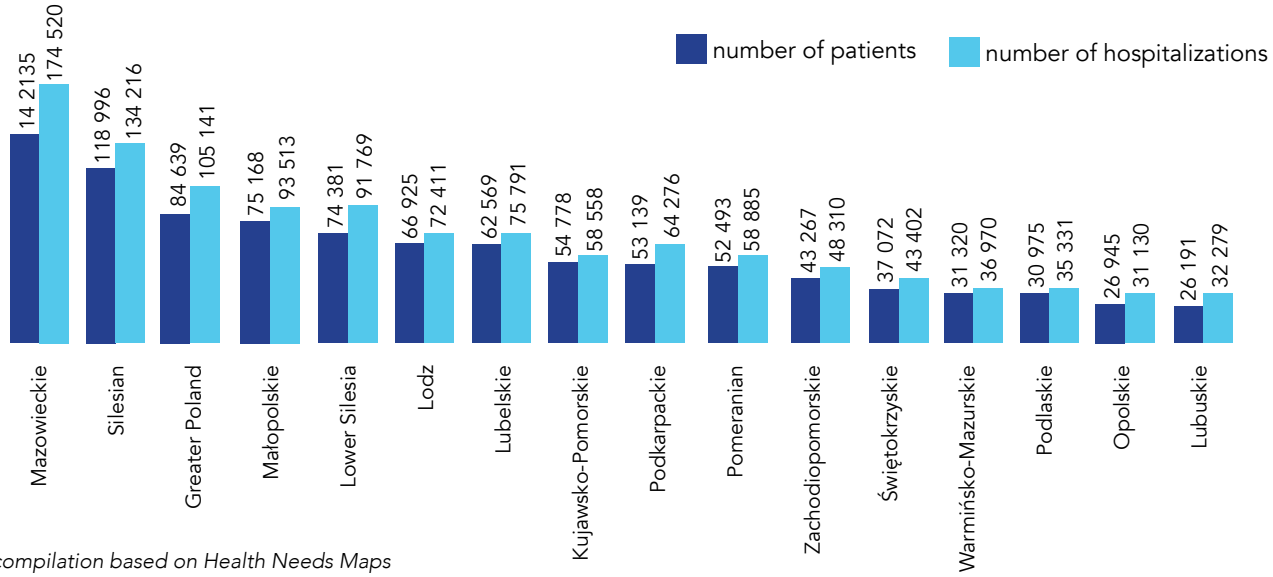
Grupa chorobowa	Liczba porad
Diseases of the musculoskeletal system, muscles and connective tissue (M00-M99)	68 105 108
Circulatory system diseases (I00-I99)	56 438 959
Diseases of the genitourinary system (N00 - N99)	56 151 578
Neoplasms (C00-D48)	53 480 862
Diseases of the eye and eye adnexa (H00-H59)	52 040 368
Respiratory diseases (J00-J99)	49 499 235
Factors influencing health status and contact with health services (Z00 - Z99)	47 153 154
Injuries, poisonings and other effects of external factors (S00-T98)	42 265 796
Endocrine, nutritional and metabolic disorders (E00 - E90)	39 275 707
Diseases of the skin and subcutaneous tissue (L00-L99)	36 356 752
Diseases of the nervous system (G00-G99)	33 942 172
Gastrointestinal diseases (K00-K93)	21 218 391
Symptoms, signs of disease and abnormal results of clinical and laboratory tests of diseases not elsewhere classified (R00 - R99)	18 192 238
Ear and mastoid diseases (H60 - H95)	17 160 780
Pregnancy, childbirth and postpartum period (O00-O99)	10 935 457
Some infectious and parasitic diseases (A00 - B99)	8 991 717

[5] Strategic recommendations for 2023-2027: Health situation and its monitoring - Polish Health 2.0. Daniel Rabczenko, Bogdan Wojtyniak, Tomasz Zdrojewski. PAN. Warszawa, September 2023. https://pan.pl/wp-content/uploads/2023/09/Rekomendacje_I.2.pdf

Hypertension (I10-I15) accounted for 15,326,334 AOS consultations, and other heart diseases (I30-I52) accounted for 13,212,714 AOS visits.

According to the Health Needs Maps, in 2022, the National Health Fund (pol. Narodowy Fundusz Zdrowia - NFZ) billed 1,156,502 cardiology hospitalizations, treating 964,084 patients. The average length of hospitalization was 5 days, and the percentage of one-day hospitalizations was 14%. [6]

Table 6. Number of hospitalizations and number of hospitalized patients for cardiovascular diseases (I00-I99) in 2022.



Own compilation based on Health Needs Maps

According to the NFZ, in 2023, there were 86,000 cases of acute coronary syndromes and 70,400 cases of myocardial infarction. There was a higher mortality rate for myocardial infarction than for acute coronary syndromes. In 2022, the annual mortality rate for patients after myocardial infarction was 16.6%, and for patients after acute coronary syndromes was 14.3%.[7]

According to the NHF, 70,800 cases of myocardial infarction were reported in 2022.[8] The Comprehensive Post-Myocardial Infarction Care Program (KOS-Myocardial Infarction) was established in October 2017 to cover the treatment of the acute phase of a myocardial infarction, but also post-myocardial infarction care, including cardiac rehabilitation and care in the cardiac outpatient clinic. In 2022, the program covered more than a quarter of myocardial infarctions in Poland. In 2023, the NFZ published a report on the Comprehensive Post-Myocardial Infarction Patient Care Program (KOS-Myocardial Infarction) performance. The KOS program covers several stages of treatment for a patient after a myocardial infarction: treatment of the acute phase of the heart attack, monitoring, cardiac rehabilitation, optional treatment with electrotherapy, and termination of therapy. The number of providers contracted to implement the program is steadily increasing. As of July 2023, 103 providers signed contracts for the program. The program is contracted in every province.

In 2022, the program covered 27% of myocardial infarction cases in Poland (excluding in-hospital fatal infarctions, the highest number in the Silesia province and the lowest in the Świętokrzyskie province). The patient population covered and not covered by the program differed in terms of patient characteristics and the treatment used, including the use of cardiac rehabilitation.
The report showed that a significantly higher percentage of patients in KOS had cardiac rehabilitation, which, among other things, translated into a better prognosis for patients. Cardiac rehabilitation also reduced the risk of heart failure after a heart attack.

[6] Health Needs Maps. 2024 Available: https://basiw.mz.gov.pl/mapy-informacje/mapa-2022-2026/analizy/leczenie-szpitalne/

[7] Mortality due to myocardial infarction and acute coronary syndromes. NHF 2024 Available: https://ezdrowie.gov.pl/portal/home/badania-i-dane/zdrowe-dane/zestawienia/zawal-smiertelnosc

[8] Functioning of the KOS-myocardial infarction program. NFZ 2023 Available: https://ezdrowie.gov.pl/portal/home/badania-i-dane/zdrowe-dane/raporty/kos-zawal

Heart failure (HF) is an epidemic of the 21st century due to the growing number of patients, but also associated social and economic problems.
Approximately 1.2 million people in Poland suffer from HF. Heart failure is a syndrome in which we observe increasing fatigue, shortness of breath, and fluid retention, usually in the lower extremities (the so-called lower limb edema), as well as in the lungs or abdominal cavity. The most common cause of HF is myocardial damage in the course of ischemic heart disease, valvular defects, or myocarditis.
In turn, its development is expedited by such factors as hypertension, diabetes, obesity, atrial fibrillation, female gender, or older age. Therefore, patient awareness and vigilance among general practitioners and other specialties are crucial for early detection and effective treatment of heart failure. Currently, we have four main pillars of heart failure treatment (4 groups of drugs), and therapeutic management continues after the patient is discharged from the hospital, which is why cooperation between the cardiologist and the general family doctor is essential. After all, up to 40% of patients within 60 days of leaving the hospital, need re-hospitalization or other medical intervention, which increases the risk of death. Therefore, if possible, it is crucial to monitor the patient in the first weeks after hospital treatment in the cardiology clinic and the general practitioner's office. Efforts are then made to optimize therapy and improve the patient's condition.[9]

[9] The heart is beating for the alarm - it may need your help. Detect and treat heart failure. Heart Failure Awareness Days 2024. Polish Society of Cardiology Available: https://ptkardio.pl/aktualnosci/801-https://ptkardio.pl/aktualnosci/801-serce_bije_na_alarm__moze_potrzebowac_twojej_pomocy_wykryj_i_lecz_niewydolnosc_serca_dni_swiadomosci_niewydolnosci_serca_2024

3 European Commission's cardiovascular disease priorities and strategy

The European Union has an unprecedented opportunity to fight CVD while increasing competitiveness in life sciences. On July 4, 2024, the first conference on cardiovascular health organized by the Hungarian Presidency of the Council of the EU, entitled "The High-Level Conference on Cardiovascular Health," took place.

The impact of CVD on mortality, society, and the economy is profound. In addition to being the leading cause of death in the EU, CVD can affect quality of life, impact productivity, and increase dependence on family and social support. In 2021 only, the EU economy lost 2% of GDP (eng. Gross Domestic Product) to the adverse effects of heart disease.

The urgency to address this problem stems from the fact that improvements in cardiovascular disease prevention and treatment outcomes recorded in recent decades have stalled despite the possibility of avoiding many myocardial infractions and strokes through effective prevention and treatment. In addition, the growing stress on our health care and social welfare systems can be alleviated by implementing European and national cardiovascular health (CVH) plans.

Most member states do not have up-to-date cardiovascular health plans. The leaders in this field are Spain and Poland. This is worrisome, but offers an opportunity to reinvigorate policy in this key area. European cooperation in this field can help raise standards for all, implementing policies and targets based on the latest evidence. National plans must address existing gaps in health systems, supported by a dedicated budget while supporting innovation through public-privat partnerships.

Conclusions of the Council and future CVH plans should prioritize innovation. Advances in diagnosis,prevention, and treatment have improved outcomes from generation to generation. However, further progress is not guaranteed, and we are concerned that improvements have stalled or, in some cases, reversed.[10]

The European Union Health Program 2021-2027 - a vision for a healthier European Union (EU4 Health Programme), or Health Action Program 2021-2027, established by Regulation (EU) 2021/522, among others, targets a 30% reduction in premature mortality from non-infectious diseases by 2030 and emphasizes prevention and health promotion in conjunction with efforts to strengthen the health systems of European Union member states. The authors emphasize that about 60% of deaths can be attributed to modifiable risk factors, such as smoking, low physical activity, unhealthy diet, overweight and obesity, or excessive alcohol consumption. Although these deaths are largely preventable by improving the risk factor profile, the expeditures on healthy lifestyle promotion and prevention does not exceed 3% of European countries' national health budgets.[11]

A few new drugs for treating cardiovascular diseases are entering the medical market in the European Union. According to EMA statistics, only 14 new molecule-indicated cardiovascular disease drugs were registered in the European Union between 2017 and 2024.

[10] Cardiovascular health: urgent action needed on EU's #1 killer
Available: https://efpia.eu/news-events/the-efpia-view/blog-articles/cardiovascular-health-urgent-action-needed-on-eu-s-1-killer/

[11] EU4Health program 2021-2027 - a vision for a healthier European Union.
Available: https://health.ec.europa.eu/funding/eu4health-programme-2021-2027-vision-healthier-european-union_en

Table. New drug molecules for the treatment of cardiovascular diseases registered in the European Union between 2017 and 2024, EMA.

Year	Molecule	Indication
2024	*1. Macitentan and tadalafil*	Replacement therapy for the long-term treatment of pulmonary arterial hypertension (PAH) in adult patients in WHO Functional Class (FC) II to III who are already being treated with the concomitantly administered combination of macitentan and tadalafil as separate tablets.
	2. Aprocitentan	Treatment of resistant hypertension in adult patients in combination with at least three antihypertensive drugs.
	3. Sotatercept	For the treatment of pulmonary arterial hypertension (PAH) in adult patients with WHO Functional Class (FC) II to III to improve exercise capacity in combination with other therapies.
	4. Apixaban	Treatment of venous thromboembolism.
2023	*5. Mavacamten*	Treatment of symptomatic (class II-III according to the New York Heart Association (NYHA) classification) obstructive hypertrophic cardiomyopathy (HCM) in adult patients.
	6. Enalapril maleate	Treatment of heart failure in children from birth to under 18 years of age.
	7. Spironolactone	Treatment of refractory edema associated with congestive heart failure and spontaneous hypertension.
2021	*8. Finerenon*	Treatment of chronic kidney disease (stages 3 and 4, with albuminuria) associated with type 2 diabetes in adults.
	9. Vericiguat	Treatment of symptomatic chronic heart failure in adult patients with reduced ejection fraction who are stabilized after a recent decompensation incident requiring intravenous therapy.
	10. Ethyl eicosapentaenoate	Reduce the risk of cardiovascular events in statin-treated adult patients at high cardiovascular risk, with increased triglyceride levels (≥ 150 mg/dL [≥ 1.7 mmol/L]) and confirmed cardiovascular disease or diabetes and at least one other cardiovascular risk factor.
2020	*11. Inclisiran*	In adults with primary hypercholesterolemia (heterozygous familial hypercholesterolemia and polygenic hypercholesterolemia) or mixed dyslipidemia as a dietary supplement: in combination with a statin or a statin along with other lipid-lowering drugs in patients in whom the target LDL-C concentration cannot be achieved with the maximum tolerated dose of satin or alone or in combination with other lipid-lowering medicines in statin-intolerant patients or in patients in whom the use of statins is contraindicated.
2019	*12. Angiotensin II acetate*	Treatment of refractory hypotension in adults in septic shock or other distributive (vasoconstrictive) shock whose hypotensive state persists despite restoration of adequate fluid volume and administration of catecholamines and other available vasoconstrictive drugs.
	13. Andexanet alpha	For adult patients treated with a direct coagulation factor Xa (FXa) inhibitor (apixaban or rivaroxaban) when anticoagulation needs to be reversed due to life-threatening or uncontrollable bleeding.
2017	*14. Edoxaban*	For the prevention of stroke and systemic embolism in adult patients with non-valvular atrial fibrillation with at least one risk factor, such as congestive heart failure, hypertension, age≥ 75 years, diabetes, history of stroke, or transient ischemic attack. For treating deep vein thrombosis and pulmonary embolism and preventing recurrent deep vein thrombosis and pulmonary embolism in adults (hemodynamically unstable patients with pulmonary embolism.

Own summary based on EMA data

4 Priorities and strategy of the European Society of cardiology

According to the European Society of Cardiology (ESC), cardiovascular disease is the biggest killer in Europe, causing 4 million deaths a year (47% of all deaths) and costing the EU economy an estimated €196 billion a year.

The mission of the European Society of Cardiology is to reduce the burden of cardiovascular disease. The ESC disseminates evidence-based scientific knowledge to cardiology specialists so they can better manage their patients. Every activity of the European Society of Cardiology leads to cardiovascular disease prevention, diagnosis, and treatment.[12]

The 2023-2028 Strategic Plan is a strong expression of the ESC commitment to cardiovascular medicine and its dedication to people: a devotion to patients with cardiovascular disease and to the healthcare professionals who provide care, as well as to the volunteers. The document is an informative but also a practical tool that we hope everyone in the cardiovascular field can use to navigate their work environment for the next five years.[13]

Table. European Society of Cardiology strategic plan for 2023 - 2028.

Strategic objectives	1. Friendly society with fair and transparent governance: nurturing inclusiveness, diversity, and clear structures for collective decision-making 2. Effective delivery of trusted knowledge: providing robust and unbiased, verified information in creative formats through communication channels tailored to the needs and preferences of a global audience 3. Membership experience rich in rewards and benefits: continue to build a strong community with valued year-round membership benefits for cardiovascular health professionals in national ESC cardiology societies and around the world 4. Focus on person-centered health care: emphasizing the patient's perspective in research, training, and education, as well as guidelines and scientific documents 5. High-quality data and research: support collaborative research and actively contribute to high-quality data collection 6. Environmental sustainability: awareness of environmental footprint and active pursuit of environmental sustainability in all ESC activities
Future scenarios	1. Demographic changes: aging of the population and increased multimorbidity 2. The future of cardiology: precision medicine through increasingly sophisticated diagnostic and therapeutic options 3. Cardiologist of the future: subspecialization shapes the professional landscape in cardiovascular medicine 4. Digital health: digital tools, artificial intelligence, and big data analytics play an important role in medicine and research 5. Emphasis on the patient's perspective: the patient is at the center of everything we do 6. Social change: evolving priorities and values include climate change and environmental sustainability, diversity and inclusivity, but also ethical conduct and freedom from bias and undue influence
Values	1. Integrity: Dignity of trust, transparency, and adherence to strong principles 2. Inclusiveness, respect, and empathy: Integrating all stakeholders in cardiovascular medicine in a community that is open and diverse 3. Innovation, agility, and creativity: Inspired adaptation to emerging needs and evolving trends; willingness to experiment 4. Pursuit of excellence: Focus on expert performance, our mission, our patients
Mission	The mission of the European Society of Cardiology is to reduce the burden of cardiovascular disease. The ESC disseminates evidence-based scientific knowledge to cardiology specialists so they can better care for their patients. Everything the European Society of Cardiology does contributes to improving the prevention, diagnosis, and treatment of cardiovascular disease

[12] What We Do. The ESC's mission is to reduce the burden of cardiovascular disease. ESC. Available: https://www.escardio.org/The-ESC/What-we-do

[13] ESC Strategic Plan 2023 - 2028. strategic guidance for success in a changing environment. ESC. Available: https://www.escardio.org/The-ESC/What-we-do/strategic-plan

5 Priorities and stratego of the Polish Society od cardiology

For the purpose of this report, we present the analysis of the implementation of the demands of the Polish cardiology community expressed in two decalogues of the Polish Cardiac Society: Decalogue of the PCS for 2021-2023 and Decalogue of the PCS for 2023-2025. The evaluation of the level of implementation was adopted arbitrarily as a percentage level (0-100%).

Table. Decalogue of Polish cardiology for 2021-2023

PCS postulates for 2021-2023	Implementation level
1. Removal of limits on cardiology and cardiac surgery procedures.	100%
2. Territorial expansions of the Cardiac Network program.	40%
3. Liberalization of inclusion criteria for hyperlipidemia treatment program.	50%
4. Reevaluation of pricing of cardiology procedures, especially interventional cardiology.	50%
5. Reimbursement of procedures with recognized benefits in improving patient prognosis.	50%
6. Rapid introduction of reimbursement for new non-drug technologies.	40%
7. Widespread access to new pharmaceutical technologies for heart failure treatment.	70%
8. Implementation of coordinated care programs.	30%
9. Cardiologists' ability to describe cardiac imaging results.	50%
10. Collegial management of the National Cardiovascular Disease Program.	50%

PCS materials

Table 10. Decalogue of Polish cardiology for 2023-2025

PCS postulates for 2023-2025	Implementation level
1. Fully launching the National Cardiovascular Disease Program nationwide and managing it transparently and collegially.	50%
2. Making the pricing of cardiology procedures more realistic, especially in interventional cardiology.	50%
3. Rapid reimbursement for procedures with recognized benefits in improving patient prognosis.	50%
4. Create a fast-track reimbursement pathway for new medical devices and drug technologies that significantly improve the effectiveness of therapy.	50%
5. Adoption of inclusion criteria for the National Health Insurance Program for the treatment of hypercholesterolemia based on the European Society of Europe guidelines and its merge with the KOS-infarction program.	40%
6. Creating a system to enable cardiologists to train and become competent in performing and independently evaluating cardiovascular CT and MRI scans.	30%
7. Creating a National Program for the Treatment of Patients with Cardiogenic Shock and After Sudden Cardiac Arrest.	50%
8. Establishment of a genetic diagnostic system for cardiology in Poland.	50%
9. Supporting the needs and intensifying the development of pediatric cardiology.	40%
10. Streamlining the functioning of the PTK through new structures and democratic statutory changes.	100%

PCS materials

6 Cardiovascular diseases as a health priority in Poland

In 2018, the Minister of Health published a regulation on health priorities, in which he established that the health priority would be: "1) reducing incidence and premature mortality from: a) cardiovascular diseases, including heart attacks, heart failure, and strokes." [14]

On December 6, 2022, the Council of Ministers adopted, and on December 28, 2022, the National Cardiovascular Disease Program for 2022-2032 (pol. Narodowy Program Chorób Układu Krążenia, NPChUK) was enacted. The program introduces comprehensive changes in Polish cardiology and related fields related to circulatory system diseases.[15]

The primary goals of the NPChUK are:

- reducing morbidity and mortality due to CVD, including reducing mortality in men of working age (25–64 years) and bringing health status indicators (life expectancy, number of deaths and morbidity) closer to the average EU indicators;
- reducing regional differences in morbidity and mortality due to CVD related to the availability of health services;
- reducing the level of classic CVD risk factors in the population, such as hypertension, smoking, lipid disorders, obesity, and diabetes;
- improving the organization of research in cardiology and increasing the potential of research and innovative projects in the field of, among others, identifying the populations at highest risk of developing CVD and the leading causes of CVD development, as well as developing diagnostic and therapeutic solutions.

The National Cardiovascular Diseases Program for 2022-2032 is a response to the current and projected increase in the incidence of CVD and its impact in the form of higher mortality. It was prepared in cooperation with experts from the National Institute of Cardiology. It constitutes a reform of Polish cardiology, cardiac surgery, vascular surgery, angiology, neurology, and other fields related to CVD, focusing activities in five areas that are crucial in achieving synergy and improving epidemiological indicators associated with CVD in Poland:

1. INVESTMENTS IN PERSONNEL:

- will increase the number of physicians with specialization in CVD
- will contribute to promote the knowledge and preventive, diagnostic, and therapeutic skills of medical staff in the field of health promotion, cardiological prevention, early detection of heart and vascular diseases, as well as prevention and care for CVD patients.

2. INVESTMENTS IN EDUCATION, PREVENTION, AND LIFESTYLE:

- support universal health education and promotion of a healthy lifestyle for children, adolescents, and adults, particularly in the area of physical activity, nutrition, and measures to combat obesity
- improve awareness of adult Poles regarding the impact of health-promoting attitudes on CVD
- enable the implementation of legal regulations supporting healthy nutrition and anti-tobacco policy.

3. INVESTMENTS IN THE PATIENT:

- facilitate access to screening tests, which will enable earlier detection of CVD

[14] Rozporządzenie Ministra Zdrowia z dnia 27 lutego 2018 r. w sprawie priorytetów zdrowotnych. Dz.U. 2018 poz. 469. Dostępne: https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20180000469

[15] Narodowy Program Chorób Układu Krążenia na lata 2022-2032. Dostępne: https://www.ikard.pl/narodowy-program-chorob-ukladu-krazenia/informacje.html

- enable the involvement of primary care physicians and occupational physicians in the identification and assessment of CVD risk factors
- improve the quality of care for patients with high and very high cardiovascular risk and those requiring specialist care.

4. INVESTMENTS IN SCIENCE AND INNOVATION:

- enable increased participation of CVD patients in clinical trials
- improve the organization of the research system in cardiology
- facilitate access to innovative therapies in cardiology and fields related to CVD.

5. INVESTMENTS IN THE CARDIOLOGY CARE SYSTEM:

- will increase access of patients with CVD to coordinated cardiology care
- will improve the quality of life of patients with CVD during and after cardiology treatment, including better access to various forms of rehabilitation
- will increase access to modern medical equipment
- will improve the organization of monitoring health needs, primarily through the creation and development of a system of medical records and screening databases
- will support the development of palliative and hospice care.

On October 25, 2024, the Draft Act on the National Cardiology Network (pol. Krajowa Sieć Kardiologiczna - KSK) was presented for public consultation.[16]

The submission of the draft act on the KSK aims to introduce regulations into the legal order, ensuring a stable system of coordinated and comprehensive health care in cardiology.

The draft act introduces a new organizational structure and a new model of cardiology care management, which will improve the organization of the system for providing health care services in the field of CVD. The expected effect of introducing the KSK is to enhance the safety and qualit of cardiology treatment, improve patients' satisfaction, and optimize the cost and organization of cardiology care.

KSK will be created by the healthcare entities that meet pre-specified in the document criteria. The structure of KSK will be formed by Cardiology Centres of level I of cardiological care, hereinafter referred to as "CC I", and Cardiology Centres of level II of cardiological care, hereinafter referred to as "CC II." Healthcare entities enrolled in KSK may create the Centres of Cardiology Excellence specialized in the diagnosis and treatment of a specific type or group of diseases within the scope of CVD. Healthcare entities not qualified to KSK, will be providing health care services according to their contract concluded with the National Health Fund, hereinafter referred to as "NHF," in the scope of primary health care or cardiological diagnostics and treatment, or cardiological rehabilitation or long-term care. These entities will be cooperating with centers qualified to the KSK in the scope of providing and coordinating cardiological care for the beneficiary and they will constitute the so-called cooperating centers. Only healthcare entities that are part of KSK will be entitled to provide guaranteed services in the field of electrophysiology and electrotherapy. Only KSK healthcare entities will be authorized to provide guaranteed services in interventional cardiology, except for emergency healthcare services. The KSK will deliver a standardized structure of CC I and CC II at two levels of cardiology care, with each level offering a comprehensive treatment of CVD. Therapeutic procedures at level I (CC I) will include treatment in the field of interventional cardiology and treatment of acute coronary syndromes. Simultaneously, the most complicated medical procedures, e.g. in the field of cardiac surgery and treatment

[16] Draft Act on the National Cardiology Network. Minister of Health. 25/10/2024 Available: https://legislacja.rcl.gov.pl/projekt/12390904/katalog/13090461#13090461

of complications of CVD treatment, will be carried out at level II (CC II). Additionally,
the cooperating centers ensure the continuity of treatment, including medical rehabilitation, and refer the patient to therapy within the KSK

Monitoring the quality of cardiology care within the KSK is carried out by the National Health Fund in cooperation with the KSK coordination center: the Stefan Cardinal Wyszyński National Institute of Cardiology - Research Institute in Warsaw, hereinafter referred to as "NIKARD-PIB."

The draft act establishes the National Cardiology Council, called the "Council," which will perform an advisory and consultative function for the minister responsible for health and the President of the National Health Fund.

Qualification for individual levels of KSK cardiology care will be a standardized process based on objective criteria relating to, among others, the number and qualifications of medical personnel and diagnostic and therapeutic potential, ensuring the appropriate quality and safety of the guaranteed services provided and the number and type of medical procedures performed or the number of beneficiaries to whom health care services are provided.

A 2-year grace period has been provided for healthcare entities to meet the requirements to join the KSK on the given level of cardiology care. Healthcare entities that have concluded an agreement with the National Health Fund on the provision of healthcare services in cardiology before the date of entry into force of the draft act will automatically enter the KSK, and agreements on the provision of healthcare services concluded before the date of entry into force of the draft act will remain valid. The first qualification for the specific level of the cardiology care system will be carried out within 2 months of the date of entry into force of the act, based on the criteria specified in the act and the detailed criteria specified in the regulation of the minister responsible for health, issued under the authorization contained in the act.

The qualification of cardiology centers for specific levels of KSK cardiology care system and periodic verification of the fulfillment of criteria by healthcare entities qualified for KSK that determine the affiliation to a given level of KSK cardiology care system will be carried out by the President of the National Health Fund, based on data processed in the KSK system and based on the criteria mentioned above. In the event of justified doubts about the fulfillment of the criteria by a healthcare entity that determine the affiliation to a given level of cardiology care system, the President of the National Health Fund may request an opinion from the Council.

Verification of the fulfillment by a healthcare entity qualified to the KSK for a specific level of cardiology care system of the criteria determining belonging to a given level of cardiology care system will be carried out every 2 years, except the verification of the first list of entities qualified to the KSK which is planned to be announced in 2025 after the completion of the first qualification round, which is carried out 1 year from the date of announcement of this list. The verification results will determine whether the healthcare provider remains at a given level of KSK cardiology care system, changes the level of cardiology care security to a higher or lower one, and will decide on the exclusions from KSK system.

Verification of compliance by a healthcare entity qualified for the KSK with the appropriate level of quality indicators of cardiological care, which determines the scope of cardiological care services eligible for financing of KSK, will be carried out by the Council every 2 years, starting from the date of the first calculation of the quality indicators of cardiological care, provided by the analysis of the level of quality of cardiological care conducted by the National Health Fund based on data obtained from the KSK system.

Healthcare entities enrolled in KSK will be required to transfer data to the KSK system, a system module referred to in the Act of 28 April 2011 on the health care information system (Journal of Laws of 2023, item 246). This system will, among other things, enable the generation of reports on the level of quality of cardiological care within the KSK.

The establishment of the KSK aims at increasing the effectiveness of CVD treatment, both nationwide and within local communities, thanks to the standardization and coordination of highly specialized procedures and quality monitoring. As a result, this will enable the reversal of unfavorable epidemiological trends and reduce the social costs of the burden of CVD.

The KSK is to ensure that no stage of cardiology care is omitted and that their implementation is carried out according to strictly defined key recommendations in cooperation with specialists from various fields of medicine.

The priority in this context is that every patient, regardless of their residence, receives cardiology care based on the same diagnostic and therapeutic standards, i.e. uniformly defined patient paths, and the system demonstrates a flexible responsiveness to their needs.

From October 1, 2022, primary care physicians in primary care facilities can provide health services in a new model called coordinated care.[17] As part of coordinated care, the primary care physicians cooperate with specialists, primary care nurses, and dietitians. They deal with the prevention, diagnosis, treatment, and education of the patient about the selected diseases in cardiology, diabetology, endocrinology, pulmonology, and nephrology. The cardiology path of coordinated care is dedicated for individuals with arterial hypertension, heart failure, ischemic heart disease, and atrial fibrillation.

The introduction of coordinated care in primary care facilities expands the list of diagnostic cardiological tests that family physicians can refer to including stress ECG, Holter ECG (24, 48, 72 hours), Doppler ultrasound of the lower limb essels, and echocardiography. A new solution is the possibility of consulting the patient's health condition by a primary care physician with a specialist. Two years after implementation, 38% of primary healthcare facilities implement coordinated care, thus covering 48% of the Polish population. According to the "My Pacjenci" Foundation report, primary healthcare facilities implementing coordinated care provide patients with access to diagnostic tests several times faster than via AOS – e.g., average waiting time for ECG 2.5 weeks vs. 16 weeks outside the coordinated care model.[18]

[17] Coordinated care in primary health care. Ministry of Health
Available: https://pacjent.gov.pl/aktualnosc/opieka-koordynowana-w-podstawowej-opiece-zdrowotnej
[18] Coordinated care in primary care – patient assessment – results of the first opinion survey. My Patients 2024
Available: https://mypacjenci.org/opieka-koordynowana-w-poz-ocena-pacjentow-wyniki-pierwszego-badania-opinii/

7 Cardiology in Poland according to health needs maps

7.1 Cardiologists

In 2022, Poland had 5,093 cardiologists (2,833 men and 2,260 women), corresponding to an average of 13.5 cardiologists per 100,000 population. The average age of a statistical Polish cardiologist was 51. Personnel of retirement age accounted for 19%, corresponding to 974 cardiologists.

The highest number of cardiologists per 100,000 population worked in the Masovian Voivodeship – 23.3 per 100 thousand population. The following provinces with the highest number of working cardiologists were Lesser Poland - 16.8 and Silesia Voivodeship - 16.6 cardiologists per 100,000 residents. The smallest number of cardiologists worked in West Pomeranian Voivodeship - 8.3 cardiologists per 100 thousand residents, followed by Lubuskie Voivodeship - 8.7, Opolskie Voivodeship - 9.0, Warmia-Masuria Voivodeship - 9.1 and Greater Poland Voivodeship - 9.6 cardiologists per 100,000 residents.

Table. Number of cardiologists working in Poland in 2022, divided by voivodeship, according to the Health Needs Maps

Voivodeship	Number of cardiologists	Number of cardiologists per 100 thousand
Masovian	1 286	23,3
Lesser Poland	575	16,8
Silesian	721	16,6
Lodz	385	16,2
Świętokrzyskie	178	15,1
Lublin	296	14,6
Lower Silesia	416	14,4
Pomeranian	322	13,7
kujawsko-pomorskie	251	12,5
Podlaskie	136	11,9
Subcarpathian	215	10,3
Greater Poland	335	9,6
Warmia Masuria	124	9,1
Opole	85	9,0
Lubosz	85	8,7
West Pomeranian	136	8,3

Based on Health Needs Maps

[19] Medical Personnel. Health Needs Maps. 2024
Available: https: https://basiw.mz.gov.pl/mapy-informacje/mapa-2022-2026/analizy/kadry-medyczne/kadry-medyczne/

7.2 Costs of cardiology services financed by the National Health Fund

According to the Ministry of Health, the cost of cardiac services financed by the National Health Fund in 2020-2022, differentiated by inpatient and outpatient specialized care and rehabilitation, grew from about PLN 4.2 billion in 2020 to PLN 7.1 billion in 2022.[20]

Table. Costs of cardiology services financed by the National Health Fund in 2020-2022 for inpatient treatment, AOS and rehabilitation.

NHF expenditures on cardiology services	2020	2021	2022
Hospital treatment	PLN 3 752 884 865	PLN 4 436 297 867	PLN 6 104 015 102
AOS	PLN 403 186 842	PLN 550 483 657	PLN 815 026 410
Rehabilitation	PLN 94 387 343	PLN 95 806 472	PLN 178 402 257
Total	**PLN 4 250 459 051**	**PLN 5 082 587 995**	**PLN 7 097 443 769**
Year-by-year dynamics	-	120%	140%

Own summary based on data from the Ministry of Health

Considering the NHF 2022 spending on inpatient health services at around PLN 67.6 billion in total, cardiology services at around PLN 6.1 billion accounted for only 9% of the spending. Similarly, expenditures on cardiology services in AOS and rehabilitation accounted for 7% and 3% of NHF total expenditure on these services, respectively.

Table. Share of expenditures on cardiology services in total NHF expenditures in 2022., differentiated by inpatient, AOS and rehabilitation.

Category	NHF expenditures in total	NHF expenditures on cardiology services	Percentage
Hospital treatment	PLN 67 654 891 000	PLN 6 104 015 102	**9%**
AOS	PLN 12 084 253 000	PLN 815 026 410	**7%**
Rehabilitation	PLN 5 470 475 000	PLN 178 402 257	**3%**
Total	**PLN 85 209 619 000**	**PLN 7 097 443 769**	**8%**

Own summary based on data from the Ministry of Health

[20] Draft law on the National Cardiology Network. Minister of Health. 25.10.2024
Available: https://legislacja.rcl.gov.pl/projekt/12390904/katalog/13090461#13090461

7.3 Reimbursement of drugs and medical devices in cardiology

Between 2021 and 2024, 37 new molecule-indicated drugs used in cardiology were reimbursed in Poland.

Table. Reimbursement of new molecule-indicated drugs used in cardiology, 2021-2024, Ministry of Health data.

Year	Molecule	Reimbursement indication
2024	*1. Tafamidis*	Treatment of cardiomyopathy in transthyretin amyloidosis (ATTR-CM) in adult patients, under drug program B.162. TREATMENT OF PATIENTS WITH CARDIOMIOPATHY (ICD-10: E85, I42.1).
	2. Mavacamten	Treatment of symptomatic (NYHA class II-III) constrictive hypertrophic cardiomyopathy (HCM) in adult patients, under drug program B.162. TREATMENT OF PATIENTS WITH CARDIOMIOPATHY (ICD-10: E85, I42.1).
	3. Evolocumab	Treatment of adult patients with homozygous familial hypercholesterolemia and treatment of pediatric patients (10 - 18 years) with homozygous and heterozygous familial hypercholesterolemia under drug program B.101. TREATMENT OF PATIENTS WITH LIPID DISORDERS (ICD-10: E78.01, I21, I22, I25)
	4. Alirocumab Evolocumab *5. Inclisiran* *6. Lomitapid*	Changing one of the inclusion criteria in the section on adult patients at very high risk of cardiovascular disease to change the LDL-C level from "LDL-C >100 mg/dl (2.5 mmol/L)" to "LDL-C >70 mg/dl (1.8 mmol/L)," resulting in an expanded beneficiary population.
	7. Empagliflozin	Expand the indication for empagliflozin in patients with heart failure by changing the left ventricular ejection fraction required to start treatment from ≤40% to ≤50%.
	8. Ezetimibe + atorvastatin	Expanding the indication for a combination drug in the prevention of cardiovascular events in patients with a history of ischemic heart disease and acute coronary syndrome.
2023	*9. Telmisartan + indapamide*	Treatment of primary arterial hypertension in adult patients whose blood pressure is adequately controlled when telmisartan and indapamide are used concomitantly in separate formulations at the same doses as in the combination formulation.
	10. Amlodipine + valsartan *11. Amlodipine + valsartan + hydrochlorothiazide* *12. Candesartan + hydrochlorothiazide* *13. Candesartan + amlodipine* *14. Indapamide + amlodipine* *15. Lysinopril + amlodipine* *16. Lysinopril + hydrochlorothiazide* *17. Losartan + amlodipine* *18. Losartan + hydrochlorothiazide* *19. Perindopril + amlodipine* *20. Perindopril + indapamide* *21. Ramipril + amlodipine* *22. Ramipril + felodipine* *23. Ramipril + hydrochlorothiazide* *24. Telmisartan + amlodipine* *25. Telmisartan + hydrochlorothiazide* *26. Valsartan + hydrochlorothiazide* *27. Telmisartan + indapamide*	Adding of an off-label indication for combination therapy which use, according to the registered indications, was limited to substitutive or adjunctive indications. Expanding the scope of reimbursement indications will make it possible to start treatment of hypertension upfront with a combined therapy.

2022	*28. Inclisiran* *29. Lomitapid*	Treatment of adult patients with familial hypercholesterolemia or very high risk of cardiovascular disease as an adjunct to diet in patients whose target LDL-C levels cannot be achieved with intensive statin therapy, including combination therapy with ezetimibe, as well as in patients intolerant to statins. Under drug program B.101. TREATMENT OF PATIENTS WITH LIPID DISORDERS (ICD-10 E78.01, I21, I22, I25).
	30. Alirocumab Evolocumab	Alignment of drug program provisions with current clinical guidelines. For example, the indications for alirocumab and evolocumab have been expanded to include patients with statin intolerance, the time since the last myocardial infarction has been extended from the current 12 months to 24 months, and a section has been added to allow drug switching according to specific rules.
	31. Dapagliflozin *32. Empagliflozin*	Chronic heart failure in adult patients with reduced left ventricular ejection fraction (LVEF≤40%) and persistent NYHA class II-IV disease despite therapy based on ACEi (or ARB/ARNi) and beta-blockers and, if indicated, mineralocorticoid receptor antagonists.
	33. Ezetimibe + atorvastatin	Adjuvant treatment for use with diet in adult patients with primary hypercholesterolemia (heterozygous and homozygous familial and non-familial) or mixed hyperlipidemia already controlled with atorvastatin and ezetimibe given at the same doses.
2021	*34. Alirocumab Evolocumab*	In the section on familial hypercholesterolemia, the eligibility criteria were amended to lower the LDL cholesterol threshold to 100 mg/dl and reduce the required duration of statin treatment to 3 months (including 1 month of ezetimibe).
	35. Selexipag	For the long-term treatment of pulmonary arterial hypertension (PAH) in adult patients with functional class II-III according to the WHO classification, as combination therapy in patients who have symptoms that do not respond to treatment with endothelin receptor antagonists (ERAs) and/or phosphodiesterase type 5 (PDE-5) inhibitors, or as monotherapy in patients who are ineligible for the use of these drugs. Under drug program B.31 Treatment of pulmonary arterial hypertension (TNP) (ICD-10 I27, I27.0).
2020	*36. Alirocumab Evolocumab*	In program B.101. OF PCSK-9 INHIBITORS FOR PATIENTS WITH LIPID DISORDERS (ICD-10 E78.01, I21, I22, I25) patients with lipid disorders, the target population has been expanded to include patients at very high risk for cardiovascular disease.
	37. Amlodipine + valsartan + hydrochlorothiazide	In the treatment of primary arterial hypertension.

Own compilation based on data from the Ministry of Health

According to the NHF, in 2023, pharmacy reimbursement for drugs used to treat cardiovascular conditions amounted to PLN 2.05 billion, accounting for 18% of total refunds. The four ATC groups listed below generated about 60% of all drug reimbursement costs incurred by the NHF in 2023.

Table. Structure of drug expenditures in 2023 by ATC Groups, (amounts expressed in thousands of PLN), NHF data.

ATC Group	Amount of refunds, thousands of PLN	Percentage of total expenditure
Cardiovascular system	2 047 933	18,0%
Gastrointestinal tract and metabolism	1 957 709	17,3%
Central nervous system	1 523 028	13,4%
Respiratory system	1 241 744	10,9%

Own compilation based on NHF data

In 2020-2023, the value of pharmacy reimbursement for drugs used to treat cardiovascular diseases increased. In 2020, it amounted to 1,747,801 PLN (19% of total spending), while in 2021 - 1,686,651 PLN (17.6%), in 2022 - 1,669,934 PLN (16.5% of total spending), and in 2023 - 2,047,933 PLN (18.0% of total spending).

Table. Value of pharmacy reimbursement for drugs used in the treatment of cardiovascular diseases in 2020-2023 (amounts expressed in thousands of PLN), NHF data.

ATC Group	2020	2021	2022	2023
Cardiovascular system	1 747 801	1 686 651	1 747 801	2 047 933

Own compilation based on NHF data

According to the NHF, in 2023, reimbursement for drugs used in the treatment of cardiovascular diseases under three drug programs amounted to about 229 million PLN.

Table. Reimbursement of drugs for the treatment of cardiovascular diseases under three drug programs in cardiology in 2023, PLN.

Name of the drug program	Drug expenses (PLN)	Expenses accompanying the implementation of drug programs (PLN)	Total spending on drug programs (PLN)
B.31. Treatment of pulmonary arterial hypertension (PAH)	162 481 807	14 181 888	176 663 695
B.74. Treatment of chronic thromboembolic pulmonary hypertension (CTEPH)	34 229 716	2 944 664	37 174 381
B.101. Treatment of patients with lipid disorders	14 137 131	1 023 571	15 160 702
Total	**210 848 654**	**18 150 123**	**228 998 778**

Own compilation based on NHF data

In 2023, 3,088 patients were qualified for treatment under three drug programs in cardiology.

Table. Ranking by number of patients treated in NHF drug programs in cardiology in 2023.

No.	Name of the drug program	Number of patients
B.31	Treatment of pulmonary arterial hypertension (PAH)	1 423
B.101	Treatment of patients with lipid disorders	1 216
B.74	Treatment of chronic thromboembolic pulmonary hypertension (CTEPH)	449
Total		**3 088**

Own compilation based on NHF data

As of December 2023, telemonitoring of implantable devices for patients with implantable cardioverter defibrillators (ICDs) and defibrillation-option cardiac resynchronization therapy (CRT-D) systems have been included in the basket of NHF guaranteed benefits. This group consists of patients who have had the devices implanted due to heart failure and also those under the age of 18 with any implantable cardiac device. As part of the reimbursement criteria, requirements relating to centers providing telemonitoring care have also been defined.

8 Indirect costs of cardiovascular diseases in Poland

8.1 Expenditures on social security benefits related to disability due to cardiovasculat diseases (I00-I99)

Expenses for social insurance benefits related to inability to work in 2023 due to cardiovascular diseases (I00 - I99) amounted to 3,676,134 PLN. They accounted for 7.5% of total the Social Insurance Institution (pol. Zakład Ubezpieczeń Społecznych – ZUS) disability expenses, which amounted to 49,202,305 PLN in 2023.

Expenditures on social security benefits related to disability due to cardiovascular diseases (I00 - I99) is the only category showing a decrease in 2012-2023.

Table. Expenditures on social insurance benefits related to inability to work due to cardiovascular diseases (I00 - I99) in comparison with other disease groups in 2012-2023, thousands of PLN, according to ZUS.

Disease groups/ thousand PLN.	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023 vs. 2012
Mental disorders and disturbances (F00-F99)	5 070 713	5 410 939	5 640 979	5 902 352	5 619 401	5 810 777	5 821 288	6 254 129	7 253 293	7 424 736	7 525 075	**8 324 778**	164%
Osteoarticular, muscular and connective tissue system diseases (M00-M99)	3 930 981	4 178 916	4 259 447	4 525 223	4 943 984	5 242 983	5 253 464	5 500 962	6 200 963	6 460 639	6 768 312	**7 559 593**	192%
Injuries, poisoning and other effects of external actions (S00-T98)	3 083 087	3 230 283	3 236 013	3 333 145	3 974 956	4 304 953	4 480 531	4 804 197	4 905 203	5 420 588	5 933 978	**6 818 337**	221%
Pregnancy, childbirth and postpartum (O00-O99)	3 187 692	3 407 328	3 771 255	4 148 950	4 398 228	4 744 521	4 872 578	5 165 743	5 275 467	5 537 285	5 561 250	**5 611 004**	176%
Respiratory diseases (J00-J99)	2 157 868	2 525 276	2 239 131	2 464 205	2 690 784	2 924 139	3 144 045	3 108 037	3 809 513	3 656 998	4 260 369	**4 397 671**	204%
Cardiovascular diseases (I00-I99)	**4 579 812**	**4 665 946**	**4 567 837**	**4 476 406**	**4 150 345**	**4 031 160**	**3 681 313**	**3 663 195**	**3 647 460**	**3 553 304**	**3 525 404**	3 676 135	**80%**
Diseases of the nervous system (G00-G99)	2 890 739	2 991 693	2 992 422	3 119 435	3 016 599	3 046 756	2 985 508	3 131 603	3 425 984	3 422 525	3 332 434	**3 432 577**	119%
Neoplasms (C00-D48)	1 528 796	1 673 521	1 545 419	1 473 653	1 706 968	1 762 323	1 732 188	1 812 901	1 815 498	1 885 746	2 050 345	**2 299 472**	150%
Diseases of the digestive system (K00-K93)	668 403	685 666	696 444	743 692	819 333	874 624	918 197	1 000 768	984 272	1 091 724	1 270 417	**1 402 621**	210%
Diseases of the genitourinary system (N00 - N99)	202 224	210 671	213 609	222 510	267 028	277 264	699 796	737 014	768 247	802 820	868 390	**947 238**	468%
Diseases of the eye and eye adnexa (H00-H59)	768 129	804 695	836 724	815 556	728 550	711 064	693 717	721 192	714 959	724 863	752 792	**788 989**	103%

Own compilation based on ZUS data

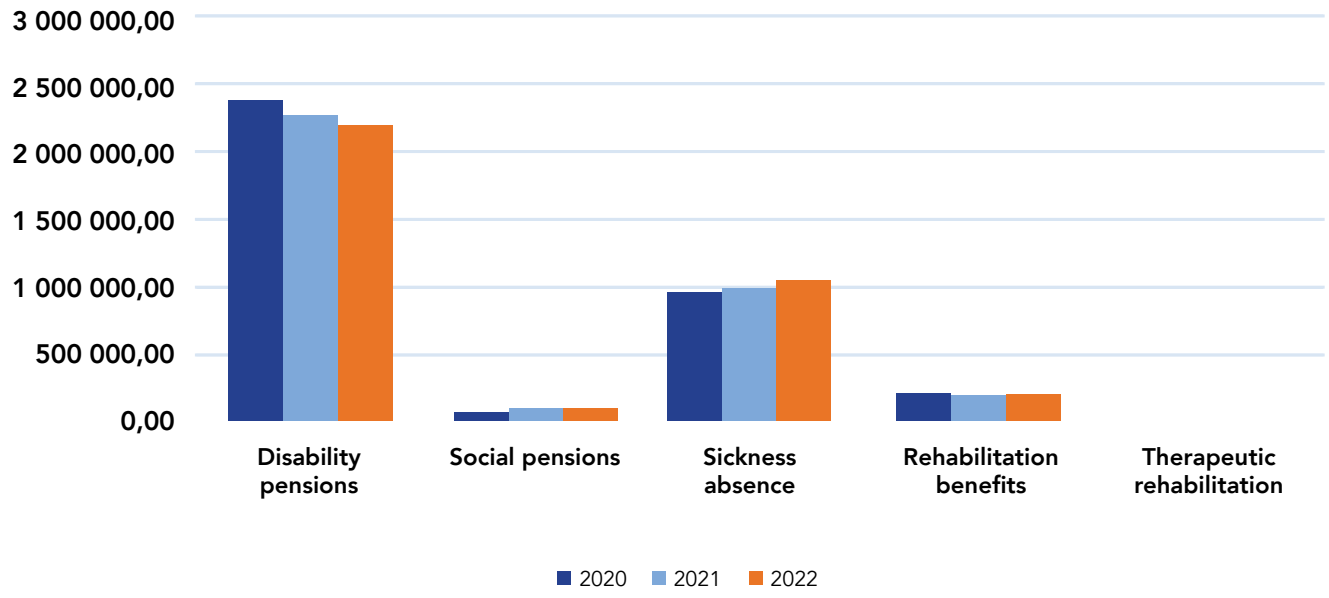
In 2022, spending on cardiovascular disease pensions (I00-I99) was lower, while expenditures for sickness absences were higher, compared to 2020, showing a positive trend in the change in the ZUS spending from pensions to sickness absences.

Table. Social security system expenditures for benefits due to cardiovascular diseases (I00-I99), in thousands of PLN. 2020-2022

Year	Total	% to Total	Disability pensions	Social pensions	Sickness absence	Rehabilitation benefit	Therapeutic rehabilitation
2020	**3 647 459,6**	8,58%	2 385 906,9	71 841,1	970 788,0	213 130,8	5 792,8
2021	**3 553 303,8**	8,00%	2 278 473,0	72 800,7	997 401,2	198 421,2	6 207,7
2022	**3 525 403,6**	7,65%	2 200 997,5	75 784,6	1 029 951,5	211 599,3	7 070,7

Own compilation based on ZUS data

Figure. ZUS expenditures for social security benefits due to cardiovascular diseases (I00-I99), in thousands of PLN, 2020-2022

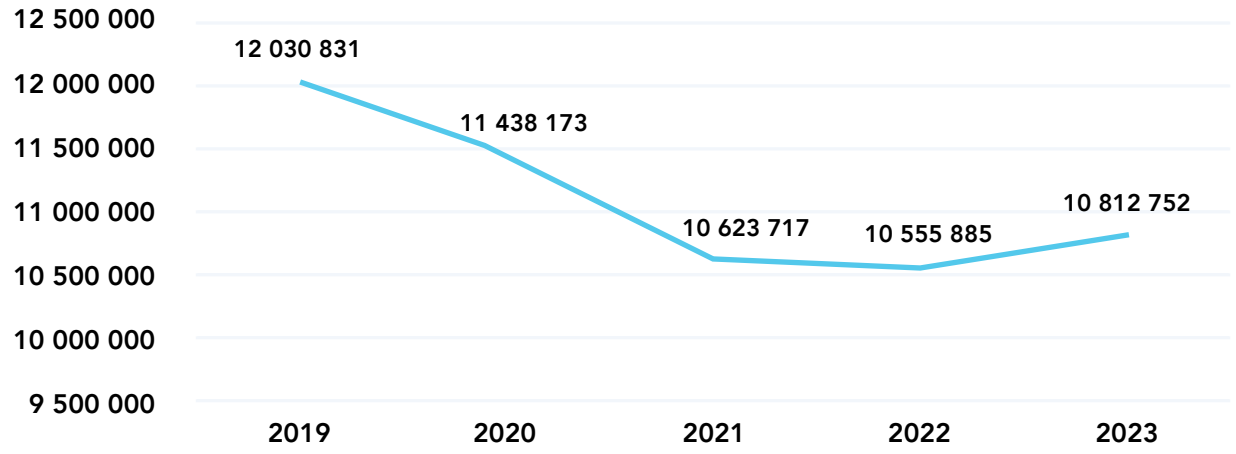


Own compilations based on ZUS data

8.2 Number of days of sickness absence due to cardiovascular diseases (I00-I99) in 2019-2023

In 2023, the number of days of sickness absence due to cardiovascular diseases (I00-I99) was about 10.8 million days, which was 1.2 million days down (10%) comparing to 2019. This shows a decreasing trend in sickness absenteeism due to cardiovascular diseases (I00-I99) over the past five years.

Figure. Number of days of sickness absence due to cardiovascular diseases (I00-I99) in 2019-2023.



Own compilation based on ZUS data

9 Priorities of Polish Presidency of the Council of the European Union

As of January 1, 2025 Poland will assume the presidency of the Council of the European Union for the second time, along with Denmark and Cyprus. The Ministry of Health has preliminarily defined the health priorities of the Polish Presidency of the Council of the European Union in 2025 as:

1. Digital transformation of healthcare
2. Mental health of children and adolescents
3. Promotion of prevention
4. Medication security

DIGITAL TRANSFORMATION OF HEALTHCARE

In the area of digital transformation of healthcare, the Polish presidency is planning activities:

1. Implementation of EHDS (European Health Data Space) legislation.
    - EHDS system architecture
    - digital transformation vs digital exclusion
    - primary and secondary data management

2. Cyber security of medical devices, including:
    - gathering experience and opinions on the application of the currently used devices
    - proposed law regulations, including those developed on the meetings of the Medical Device Coordination Group (MDCG),
3. Cooperation of EU member states in developing cross-border services in e-health.

MENTAL HEALTH OF CHILDREN AND ADOLESCENTS

In the area of mental health of children and adolescents, the Polish presidency is planning activities:

1. Promotion of mental health of children and adolescents in the era of digital development, new media in the context of opportunities and threats,

2. Prevention of mental disorders and diseases of children and adolescents,
3. Prevention of addiction (including behavioral addiction),

4. Adoption of the Council's conclusions

PROMOTION OF PREVENTION

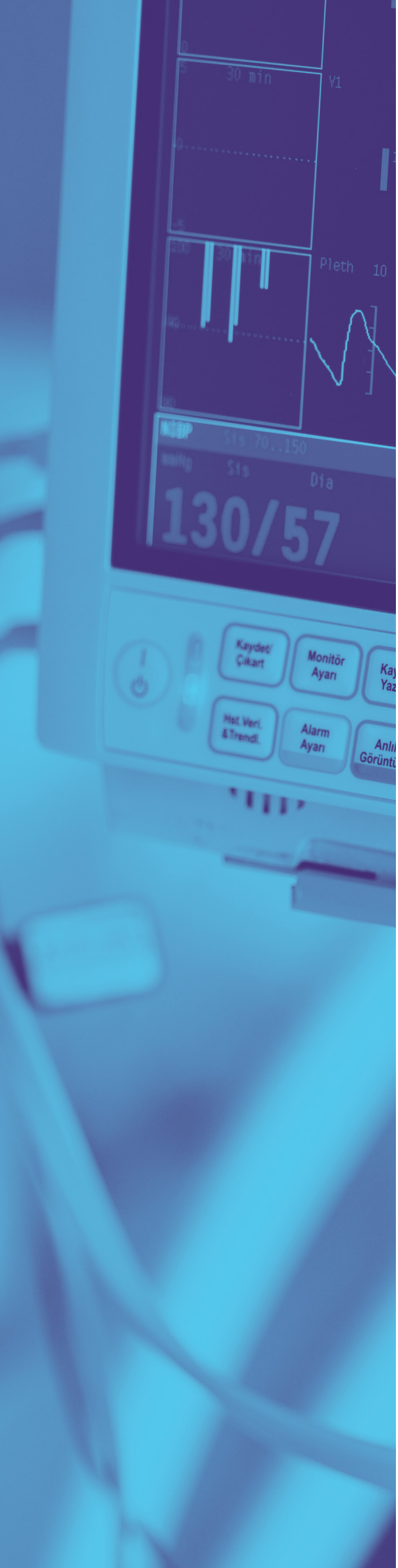
In terms of promoting prevention, the Polish presidency is planning activities:

1. Evaluate the effectiveness of health prevention strategies and programs implemented in EU countries,

2. Preparation of a catalog of good practices and solutions, as well as proposals for action at the national and community levels,
3. Assessing the effectiveness of public policies/prevention in the context of major health risk factors,
4. Integrated approach to prevention and education (promotion of interdisciplinary education)

MEDICATION SECURITY

In terms of medication security policy, it is recommended to secure the market supply as well as reimbursement for the drugs used in treatment of cardiovascular disorders.



10 Applications

1. **Importance of cardiovascular diseases in Poland and the EU:** Cardiovascular diseases remain the leading cause of death in Poland and the whole European Union, with Poland ranking above the EU average in terms of mortality rates. The high number of deaths is related to limited prevention, low health awareness, and difficulties in accessing modern therapies.

2. **Systemic problems in Poland:** Poland's higher mortality rate compared to other EU countries is due to inadequate organization of the health care system, lack of coordination of cardiac care, and limited access to modern medical technologies.

3. **Potential to improve public health:** Data indicate that 80% of premature deaths from cardiovascular disease can be prevented by increasing health awareness, investing in modern therapies, and implementing lifestyle changes.

4. **The role of digital transformation in cardiology:** Implementing new technologies, such as telemedicine and analytical tools, can improve the availability and efficiency of health services, especially in the early diagnosis and monitoring of at-risk patients.

5. **Importance of European cooperation:** As the country holding the EU Council Presidency, Poland may play a key role in promoting cardiovascular disease-related health priorities, such as digitization and prevention.

11 Recommendations

1. Increase investment in prevention and health education:

- Develop public awareness campaigns on risk factors and the need for regular preventive examinations.
- Promoting healthy lifestyles as a key componentof prevention.

2. Strengthening the cardiac care system:

- Introduce coordinated cardiac care at the primary care and specialty levels.
- Increasing access to modern medical therapies and technologies, including procedures such as coronary angioplasty.

3. Implementation of modern digital solutions:

- Developing telemedicine systems to enable remote monitoring of patients.
- Using analytical tools to identify high-risk patients.

4. Increase funding for research and innovation:

- Funding for research in the area of cardiovascular diseases.
- Support for the development of innovative treatment and prevention methods.

5. Harmonization of health policies within the EU:

- Cooperation with other EU member states to share experiences and implement best practices.
- Promote European guidelines for the treatment and prevention of cardiovascular disease.

These measures can significantly improve the efficiency of healthcare system in Poland and reduce the adverse health and economic impact associated with cardiovascular disease.

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