

Legal and medical problems of health care in Poland in the field of cardiology

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Abstract: The study deals with legal and medical health care problems in the field of cardiology in Poland. The development of cardiology around the world in the past few decades has made it possible to effectively treat cardiovascular diseases, prolong the lives of patients, and often also allow them to return to full fitness. The epidemiology of these diseases in comparison with the high costs of treatment exceeds the financial capacity of the majority of patients. It is also a serious challenge for public authorities in terms of legal regulations, financial resources, training of medical staff, and securing infrastructure. These problems are also visible in the Polish healthcare system, which, aspiring to ensure a high level of patient care, is limited by various deficiencies.

Key Words: cardiology, public health, Polish medical law, medical statistics, heart attack.

INTRODUCTION

Cardiac treatment in an outpatient and inpatient system is an important part of the Polish healthcare system due to the heart disease mortality rate as well as high costs of treatment. Cardiovascular diseases are one of four non-communicable diseases responsible for 67% of the 57 million deaths that occur annually in the world [1]. In the past 50 years technology, industrial and social changes in developed countries, called as modifiable risk factors, had led to a pandemic of coronary artery disease and its manifestation as ACS [2]. In Poland, in 2014, cardiovascular diseases caused about 50% of deaths among women and 40% of deaths among men. The probability of death caused by cardiovascular diseases in Poland is about 60% higher than the EU average [3]. In 2016, cardiovascular diseases caused 43.7% of deaths in Poland, with ischemic heart disease alone causing 10.2% of deaths (in 1980 it was 47.4% and 9.2%, respectively, the drop was minimal). In the infants group, congenital heart disease was the cause of 5.2% deaths (22.4% in 1980) [4]. Prophylaxis and

the treatment of heart diseases constitute a significant organizational and financial challenge for public authorities (in terms of legislation, economics, and public health) and for medical personnel responsible for patient care and conducting scientific research (in the area of medical sciences).

The study presents the organizational and legal bases of health care protection in Poland, the organization of heart disease treatment with particular focus on macroeconomic factors, and statistical data on the availability and use of cardiological care in Poland. The study is focused exclusively on the problems of non-operative and interventional cardiology, and the references regarding cardiac surgery are only supplementary and comparative. The base year for the presented information is 2016 due to the full availability of statistical and macroeconomic data at the time of completion of the study (January 2019). Referencing data from previous or subsequent years is due to the lack of available data for 2016 or the usefulness of newer information in the context of the subject matter.

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THE ORGANIZATIONAL AND LEGAL ASPECTS OF HEALTH CARE IN POLAND

The Constitution of the Republic of Poland of April 2, 1997 [5], guarantees everyone the right to health care, which includes equal access of citizens to health care services financed from public funds. The right to health care is also guaranteed in international agreements adopted by the Republic of Poland, in particular in art. 12 of the International Covenant on Economic, Social and Cultural Rights of December 16, 1966, art. 11 of the European Social Charter of October 18, 1961 and art. 35 of the Charter of Fundamental Rights of the European Union of December 13, 2007. The legal guarantees resulting from the provisions of domestic and international law allow for defining a standard to be achieved by the public authorities, however, they do not always correspond to the factual circumstances. However, studies on the implementation of law will determine the real value and usefulness of legal provisions. The provisions in force are only a general framework allowing the emergence of law, and only concrete decisions and the resulting social relations are of real significance [6]. In each case, these studies have an interdisciplinary dimension, assuming as a starting point the diagnosis of real social needs and legal regulations regarding the possibility of satisfying or mitigating them by public authorities.

In Poland, as in most EU countries, public funds are the main source of financing health care. Since 1999, these funds have been for the most part derived from insurance premiums (usually compulsory) and are managed by a central governmental agency - the National Health Fund. Polish law does not make compulsory or voluntary health insurance in the National Health Fund dependent on the possession of Polish citizenship. Foreigners residing in Poland are also eligible [7]. At the end of 2016, 33,786,253 people were covered by state health insurance in Poland [8]. In addition, health services provided in private institutions can be financed by the patients themselves through additional commercial insurance or direct payment, which generally ensures a higher standard of treatment and a shorter waiting time. In 2015, only 70% of healthcare expenditure was financed from public funds, while formal and informal direct payments of households accounted for 23% of all healthcare expenditure in Poland (the EU average is 15%). Most of the private expenses of patients were on medicinal products due to high prices and small refunds from the state [3]. The lack of sufficient funds for health care results from low earnings in Poland (the mandatory contribution is 9% of income, compared to 15.5% and 13.55% respectively in Germany and France) and the weak purchasing power of the Polish currency with high dependence on the importing of medicines and medical supplies. Taking into account all sources of health care funding, the share of total public and private funds

allocated to health care in Polish GDP rose from 5.3% in 2000 to 6.3% in 2015 (the EU average was 9.9% in 2015). In 2015, the average amount of annual state expenditure on health care in Poland amounted to approximately 1,425 USD per capita, with a lower result recorded only in four EU Member States [2]. For this reason, state authorities have planned a gradual increase in the state expenditure on health care services to 6% of GDP in 2025 [9], or approximately 32 billion USD (according to values from early 2019).

THE ORGANIZATION OF HEART DISEASE TREATMENT IN POLAND

Since the 1960s, there has been a dynamic development of diagnostic and therapeutic methods in Poland in cardiology and cardiac surgery. However, it faces obstacles related to insufficient funding. The first pacemaker implantation in Poland took place in Gdansk on September 12, 1963, which is only 5 years after the first operation in Sweden [10]. Initially, these procedures were carried out with the participation of surgeons. In 1974, the transesophageal atrial stimulation technique was developed, in 1986 the first defibrillator in Poland was implanted in Katowice, and in 1995 in Gdansk the first cardioverter-defibrillator (ICD) was implanted. Currently, the implantation of so-called cardiac resynchronization devices (CRT, CRT-D, CRT-P) are performed in hospitals in all major cities around Poland [10]. Polish hemodynamics has also been developing rapidly. In 1965, the first Polish coronary angiography was carried out in Warsaw (7 years after the first such procedure in the world) and in 1968 the first selective coronary angiography was performed [11]. The first percutaneous transluminal coronary angioplasty (PTCA) was performed in Warsaw in April 1981, four years after the first such procedure in Zurich [12]. In 1985, the first in Poland primary PTCA procedure was performed. In 1987, PTCA procedures were carried out for the first time in a 24-hour duty mode [13]. The University Clinical Hospital in Opole became the second center in 1999 with 24/7 haemodynamics duty. An important stage for the development of Polish cardiology and cardiac surgery was the opening of specialized research and treatment facilities, including the Institute of Cardiology in Warsaw in 1979 [14] and the Provincial Center of Cardiology in Zabrze in 1972 (which became the Silesian Center for Heart Diseases in 1996).

In Poland, cardiology and cardiac surgery constitute independent medical specializations (respectively from 2007 and 2002). Previously, they were available only to specialists in internal medicine and surgery. As of 31 October 2018, 4,342 specialist doctors in the field of cardiology and 339 in the field of cardiac surgery were active in Poland (2% and 0.18% of all Polish doctors, respectively) [15]. However, these figures do not

include retired specialists, doctors undergoing 6 years of specialization training, or doctors of other specializations who are involved in the treatment of heart diseases to a limited extent (including primary care physicians and internal medicine specialists). In Poland, the number of doctors and nurses in relation to the number of inhabitants is the lowest in the EU (5.2 and 2.3 per 1,000 inhabitants respectively) [3].

Cardiology is one of the key areas of medicine in Poland in the 21st century due to the prevalence of this disease, constantly increasing possibilities of treatment, and the risk of death. The treatment of heart diseases takes place in an outpatient and inpatient system, which in turn may take the form of conservative, interventional, or surgical treatment. As part of ambulatory treatment, mainly hypertension, stable coronary heart disease, chronic heart failure, mild arrhythmia, and hypercholesterolemia are treated. In contrast, procedures in invasive cardiology include, in particular, hemodynamics, electrophysiology, and minimally invasive percutaneous treatment of valvular heart disease. In 2012, the National Health Fund spent almost 3 billion PLN on hospital treatment of heart diseases (about 997 million USD), which accounted for over 11% of the total expenditure on hospital treatment in Poland and almost 0.2% of the then Polish GDP [16].

THE AVAILABILITY AND USE OF CARDIAC CARE IN POLAND

Surveys carried out in 2016 by the Statistics Poland (central governmental office) on a weighted sample of 9,951 people indicate that heart examinations were undergone most often by elderly people. Among the participants of the survey who underwent imaging examinations in 2016, the ECE test was carried out by 56% of people aged 60-69 and 69% of people aged 70 or more, echocardiography of the heart respectively: 23% aged 60-69 and 28% aged 70 or more, and the 24-hour ECG Holter monitor test, respectively 8.3% aged 60-69 and 12.8% aged 70 or more. Of all persons surveyed, 13.2% underwent ECG tests (14.2% women and 12.2% men), 4.8% echocardiography, and 2.0% ECG Holter monitor tests. In addition, 3.8% of the respondents had computed tomography and 2.3% had magnetic resonance, but there is no data on how many of these studies concerned the heart [17]. The majority of patients undergoing cardiac examinations are elderly and the need for diagnostics

will increase due to the prolongation of human life and adverse environmental factors (Table 1).

The financing structure of cardiological tests indicates an insufficient percentage of funds from the state health insurance system. In 2016, the National Health Fund financed 100% of positron emission tomography examinations, but only 85% to 88% of Holter, ECG and computed tomography examinations as well as 74% of magnetic resonance imaging tests. The tests most commonly funded by the patients themselves included magnetic resonance imaging (19%), echocardiography (14%) and computed tomography (10%) [17]. A small number of examinations were financed from additional commercial health insurance (1.4%-6.2% depending on the type of tests) or performed as part of the occupational medicine service financed to a large extent by employers (slightly more than 5% of ECG tests) [17].

In 2016, beds in cardiology wards accounted for 4.8% of all beds in Polish hospitals, and 13.4% of beds were located in internal medicine departments, which also deal with non-operative treatment of heart diseases [18]. In cardiac departments, 7% of Polish patients were treated (587,700 people, 0.7% more than in 2015), while patients of internal medicine departments constituted 12.4% of all patients (1,048,100 people, 2.8% less than in 2015) [18]. A similar share of cardiology in the health care system is presented in the statistics of calls for emergency helicopters in 2016. Similarly to previous years, flights to myocardial infarctions accounted for 6.5% of all interventions by emergency teams (563 patients), while 491 times helicopters were called to patients in a state of sudden cardiac arrest [18]. The comparison of the presented data and the daily experience of doctors indicate a small deficit in the number of cardiological beds in Polish hospitals (Figs 1, 2).

In 2016, invasive cardiology procedures were performed in 210 hospitals in Poland, 75% of which were public hospitals (run by the state or local government units), whereas hospitalizations planned in practice were conducted exclusively by public hospitals [19]. In the given year (from January 1 to November 30) in Poland there were 202,844 hospitalizations in interventional cardiology related to the performance of ACS (26,817) or planned coronary angiography (64,005) and coronary angioplasty in acute coronary syndrome (OCT) (72,044) or planned angioplasty (39,978). 1,392 coronary angiography (30% ACS and 70% planned) and 2,950 angioplasty procedures (64% ACS and 36% planned)

Table 1. Selected imaging studies in 2016 in Poland, taking into account the age of the respondents. Own study based on text no. [17]

Imaging scans	Respondents Total	• patients aged 60-69	• patients above 70
ECG	13.2%	56.0%	69.0%
Echocardiogram	4.8%	23.0%	28.0%
ECG Holter	2.0%	8.3%	12.8%
Computed tomography	3.8%	no data	no data
Magnetic resonance imaging	2.6%	no data	no data

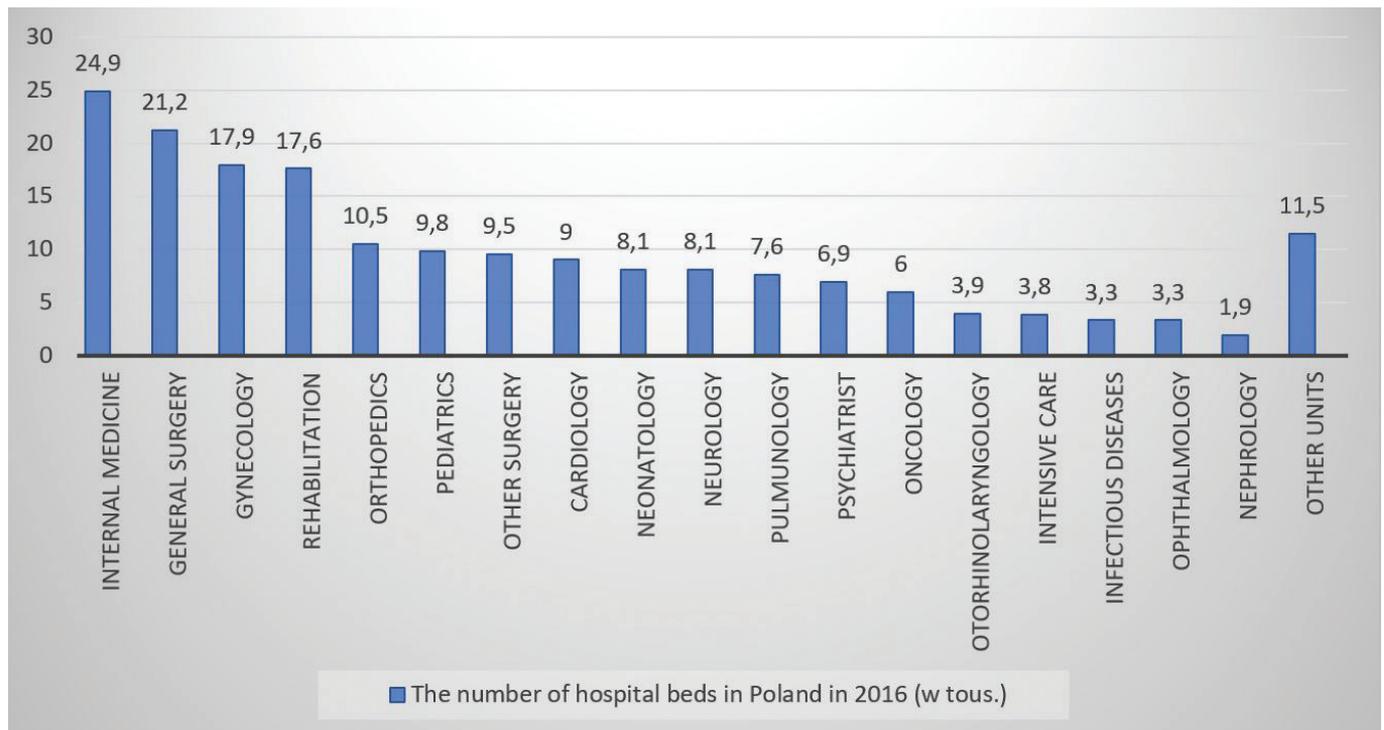


Figure 1. The number of beds in Polish hospitals in 2016 according to selected hospital wards. Own study based on text no. [18]

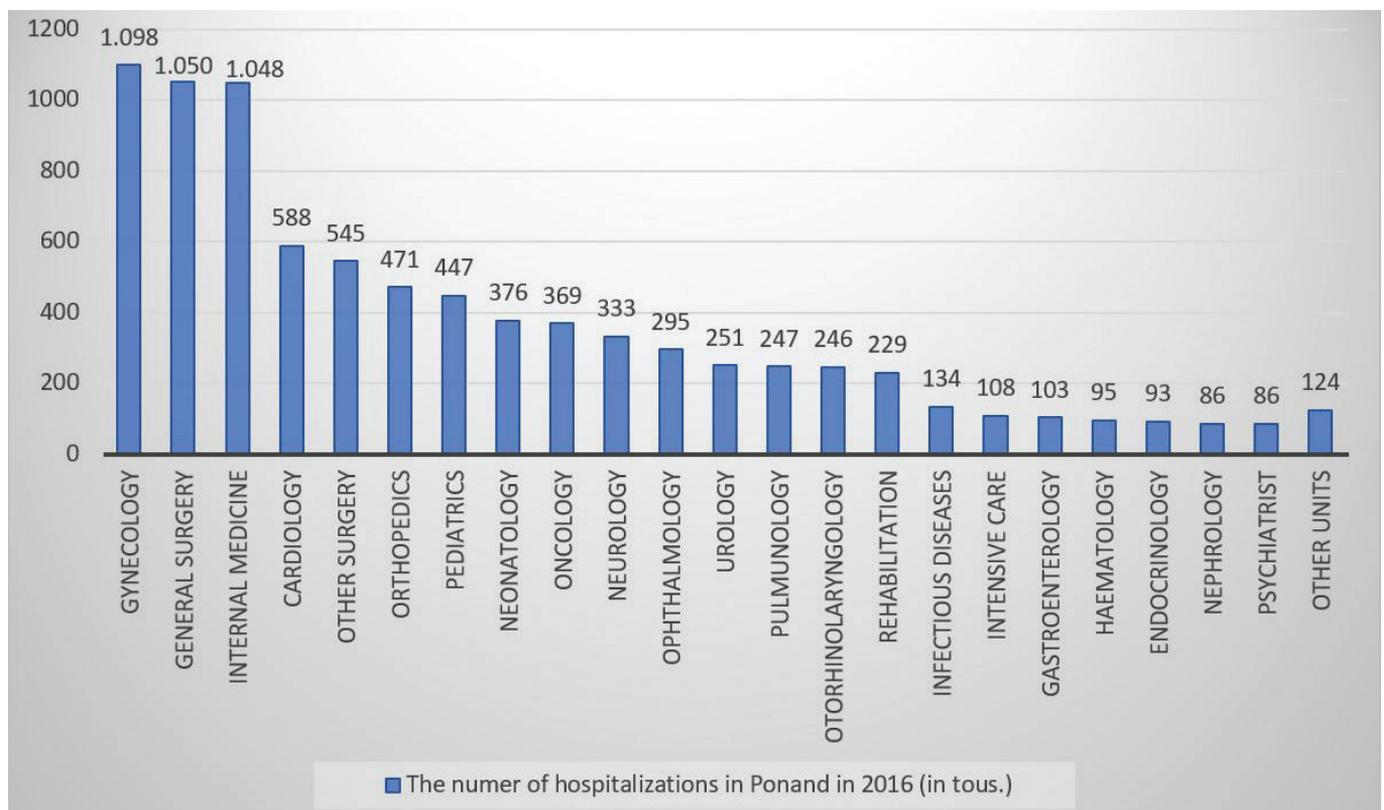


Figure 2. The number of patients in Polish hospitals in 2016 according to selected hospital wards. Own study based on text no. [18]

were performed per 1 million Polish inhabitants. These proportions may result from the poorer level of financing planned operations by the National Health Fund. The total value of completed hemodynamic procedures exceeded 1.5 billion PLN (over 360 million USD). The average level of rehospitalization was 15.75%, whereas in the group "acute after acute" it was 2.69%. Interestingly,

on Saturdays and Sundays there was a significant drop in re-admissions [19].

Patients with ACS sign up themselves, are transferred by a medical emergency team, or are transferred from another hospital, whereas planned admissions are based on referrals [19]. On the basis of the information provided, it is not possible to determine

Table 2. The number of selected invasive cardiology procedures in Poland in the period 01.01 - 30.11.2016. According to admission types. Own study based on text no. [19]

Admission type	Coronary angiography		Coronary angioplasty	
	Total	per 1 million	total	per 1 million
Acute coronary syndrome (ACS)	26.817	718	72.044	1.888
Planned type (referral)	64.005	1.674	39.978	1.062
Total	90.822	2.392	112.022	2.950

what percentage of coronary angiography was performed together with angioplasty, but in practice this applies to ST-segment elevation myocardial infarction (STEMI). A greater number of coronary angioplasty procedures in relation to the number of coronary angiography procedures may result from performing several angioplasty procedures on the same patient in short intervals, especially in acute coronary syndrome. On the other hand, there is a significantly smaller number of these procedures performed on patients with planned coronary angioplasty surgery because in their case coronary angiography is often just a control measure (Table 2).

Romanian research shows the in-hospital mortality is frequently correlated with the female gender, STEMI myocardial infarction and multivessel disease. Patients resuscitated out-of-hospital after the cardiac arrest caused by Acute Myocardial Infarction presents higher in-hospital death rates [20]. Sometimes hospital death caused by ACS is the subject of lawsuit concerning medical malpractice.

The effectiveness of interventional cardiology has increased patients' survival rate. However, according to data from 2016, within a year from a heart attack, about 38% of all deaths in Poland had a cardiovascular background. For this reason, since 2017, a comprehensive program of specialist care after myocardial infarction (KOS-infarction) has been implemented in Poland, which includes infarction diagnostics, therapy in accordance with clinical indications, and outpatient specialist care and cardiac rehabilitation within 12 months of the infarction [21, 22]. Adoption of a yearly period of patient care performed by the hospital alone or in cooperation with another healthcare provider (e.g. a sanatorium) results from the recognition of this period as decisive for the patient's further fate.

The National Health Fund guarantees free cardiac rehabilitation in the case of several dozen types of cardiovascular diseases [23]. Rehabilitation can take place in a stationary form (usually in specialized centers), in a day hospital, or in a hybrid form (divided into a stationary phase and so-called telerehabilitation). Studies show that the greatest effectiveness in reducing the risk of death or hospitalization due to heart disease (secondary prevention) is achieved by the rehabilitation model, which includes physical exercise and health education (even by several dozen percent) [24]. Education is an inherent element of prophylaxis, because the introduction of a healthier lifestyle reduces

the risk of recurrence of cardiovascular events in patients with coronary heart disease, which further improves the length and quality of their lives. Meanwhile, in 24 European countries, on average, almost half of smokers of both sexes do not give up smoking after a heart attack [25]. In Poland, only every fifth Polish patient underwent cardiac rehabilitation before comprehensive specialist care after a heart attack was introduced [26]. The new system requires mandatory referral for rehabilitation of patients after a heart attack, but leaves them the final decision and the option to choose a center of their preference. In the first month of 2019, there was not yet any reliable data on the number of patients after myocardial infarction undergoing cardiac rehabilitation as part of comprehensive specialist care.

In conclusion, health care in cardiology is rapidly developing and its cost efficiency is increasing. The successes of cardiology and cardiac surgery in the second half of the 20th century and in the first decades of the 21st century include the extension and improvement of the quality of life and the decrease in mortality due to cardiovascular diseases. While in 1980 acute myocardial infarction was the cause of 6.6% of deaths, in 2016 it was 3.3% [4]. Darshak M. Sanghavi cites the results of studies which indicate that the improvement of the population's health was also significantly influenced by prophylaxis consisting of controlling blood pressure, reducing the consumption of tobacco products, improving care after a heart attack, and increasing physical activity in society [27]. Polish health care institutions are prepared in terms of organization and substance to provide specialized assistance to patients. The development of cardiological knowledge is progressing, the availability of treatment is increasing, and systemic solutions are introduced to improve the health of the population. Polish cardiology does not diverge in terms of quality and potential from the level of Western Europe. However, it encounters obstacles related to insufficient funding and an insufficient number of specialist doctors.

Insufficient financial outlays from public funds are a problem in all areas of health care in Poland. Its consequence is the extension of waiting time for an appointment with specialist doctors and for research financed from state health insurance (even up to several months) and the low level of state participation in the purchase of drugs. As a result, the patients themselves cover a large part of the costs of treatment while at the same time being charged with health insurance premiums. In Poland, health insurance premiums are also collected

from retirement and disability pensions, which means that the funds already collected by the state are taxed again. Due to the constant development of expensive technologies and therapeutic measures, the possibilities of counteracting the existing financial deficits remain limited in the Polish economic situation, although legal changes are introduced to increase funding.

The lack of an appropriate number of specialist doctors results from the relatively low wages in Poland, which prompted a large number of doctors to emigrate. From the point of view of the Polish state, this is a harmful phenomenon, because it is associated with a general loss of population, wasted public funds

allocated to the doctor's education, a lack of personnel, and overloading of health care workers employed in Poland. Often doctors work in both a hospital ward and an emergency room. There are also shortages of nurses and medical secretaries, which is why doctors are often required to keep medical records.

Conflict of interest. The authors declare that there is no conflict of interest.

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