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Anna Owczarczyk
Luiza Trzcińska
Justyna Grześ Bukłaho
Piotr Baczar

Health security management of Polish citizens in the context of the post-pandemic condition of the health care system

Zarządzanie bezpieczeństwem zdrowotnym obywateli Polski w kontekście postpandemicznej kondycji systemu opieki zdrowotnej

Managing health security and ensuring adequate health care in a post-pandemic and economic crisis is becoming an ongoing challenge faced by health care managers, decision-makers and medical staff, especially in Poland, where the functioning of the entire health care system is a highly controversial topic of public debate.

The aim of this paper is to assess health security management in the current state of the publicly funded health care system in Poland. To explore the research problem, such research methods as critical analysis of the literature and legal acts on the subject, analysis of statistical data and surveys of public opinion conducted by independent institutions were used. The generally adopted measures included: absolute values expressed in national and foreign currency, per capita values and values in relation to gross domestic product (GDP). The analysis covered the year 2022 or, in the absence of data, 2021.

Key words: health care, management, health care financing, health care problems, health security

Zarządzanie bezpieczeństwem zdrowotnym i zapewnienie adekwatnej opieki zdrowotnej w okresie po pandemii i kryzysie gospodarczym staje się ciągłym wyzwaniem, przed którym stają menedżerowie opieki zdrowotnej, decydenci i personel medyczny, zwłaszcza w Polsce, gdzie funkcjonowanie całego systemu opieki zdrowotnej jest wysoce kontrowersyjnym tematem debaty publicznej.

Celem artykułu jest ocena zarządzania bezpieczeństwem zdrowotnym w obecnym stanie systemu ochrony zdrowia finansowanego ze środków publicznych w Polsce. Do zgłębienia problemu badawczego wykorzystano takie metody badawcze, jak krytyczna analiza literatury przedmiotu i aktów prawnych, analiza danych statystycznych oraz badań opinii publicznej przeprowadzonych przez niezależne instytucje. Wykorzystano również ogólnie przyjęte mierniki, tj: wartości bezwzględne wyrażone w walucie krajowej i międzynarodowej, wartości per capita, wartości w relacji do produktu krajowego brutto (PKB). Analiza obejmuje 2022 r., a w przypadku braku danych – 2021 r.

Słowa kluczowe: opieka zdrowotna, zarządzanie, finansowanie opieki zdrowotnej, problemy opieki zdrowotnej, bezpieczeństwo zdrowotne

Introduction

In recent years, most countries in the world have experienced or are still experiencing economic turbulence, both due to the ongoing armed conflict in Ukraine and the earlier COVID-19 pandemic. The latter put health care systems to the test, showing their inefficiency in various aspects. The pandemic caused a sudden, unplanned increase in health care expenditure, which, combined with the decline in economic activity, increased spending in that area of OECD countries from 8.8% of GDP in 2019 to 9.7% of GDP in 2020. The pandemic has also highlighted the problem of the persistent shortage of health care workers. The "Health at a Glance"[1] report indicated that shortages of medical staff and long-term health care workforce continue to be a more significant factor than a lack of hospital beds or medical equipment. The pandemic has pointed to the

[1] OECD Report, *Health at a Glance 2023; State of Health in the EU, Poland: Country Health Profile* 2023, OECD 2023, p.10 https://www.oecd.org/health/health-at-a-glance/ (access: 20.01.2024).

need for investment, especially in primary health care, with a particular focus on preventive health care, as – according to the report – health care spending has so far focused mainly on treatment rather than disease prevention and health-promoting measures. Spending on disease prevention in OECD countries remains relatively low, accounting for only 2.7% of health care expenditure[2]. Another problem resulting from the pandemic was the need to reorganise health care systems to provide medical services focused mainly on COVID patients. This, in turn, significantly hindered the process of providing health care to patients with other diseases.

The analysis of the condition and management of the health care system is a key issue for ensuring the health security of citizens.

Health is perceived as a common (public) good and not just an individual issue. All developed countries pursue policies aimed at developing a system that ensures health security for the whole population. "The key determinants of health security are, first of all, the right to health care, which is guaranteed by the state institutions, and, secondly, equal and equitable access to health care services, which reflects the level of health security and is a fundamental challenge for policy-makers"[3]. Health care management, in turn, is basically about ensuring appropriate quality standards in the provision of health care services, taking into account three aspects [4]:

1. Structure – the environment in which health care is provided (broadly defined infrastructure, including equipment, personnel, institutions and financial resources).
2. Process – the activities undertaken to achieve a specific health care goal (assessment of the activities undertaken by individuals and institutions involved in the provision of medical services).

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[2] I. Konarska, *Raport OECD: Pandemia przetestowała odporność systemów opieki zdrowotnej [OECD report: The pandemic tested the resilience of health care systems],* https://www.termedia.pl/koronawirus/Raport-OECD-Pandemia-przetestowala-odpornosc-systemow-opieki-zdrowotnej, 2022,44346.html (access: 25.10.2023).

[3] P. Grzywna, *Bezpieczeństwo zdrowotne w nauce o polityce społecznej : wprowadzenie do dyskusji [Health security in social policy science: an introduction to the discussion]*, Wydawnictwo Uniwersytetu Śląskiego, Katowice 2017, pp. 33–34.

[4] A. Donabedian, *Evaluating the Quality of Medical Care*, Milbank Q. 2005 Dec; 83(4): pp.691–729. doi: 10.1111/j.1468-0009.2005.00397.x https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690293/ (access 25.10.2023); A. Owczarczyk A. *Koordynowana i zintegrowana opieka medyczna – co warto wiedzieć [Coordinated and integrated healthcare – useful information].* [in:] M. Bogdan, A. Owczarczyk, P. Żuk, A. Prusaczyk, S. Karczmarz. [Eds.]. *Koordynowana opieka zdrowotna w praktyce*, *od POZ do POZ+* [Coordinated healthcare in practice, from POZ to POZ+], WoltersKluwer, Warszawa 2023, pp. 38–39.

3. Outcome – the result of medical care analysed for an individual patient or population groups.

The aim of this paper is to assess health security management in the current state of the publicly funded health care system in Poland. To explore the research problem, such research methods as critical analysis of the literature and legal acts on the subject, analysis of statistical data and surveys of public opinion conducted by independent institutions were used. The generally adopted measures included: absolute values expressed in national and foreign currency, per capita values and values in relation to gross domestic product (GDP).

Health care management, health security and the condition of public health care systems are very broad issues and the scope of this paper does not allow to analyse all of their aspects. Hence, for the purposes of this article, the following assumptions have been made:

(a) health care management primarily consists in the organisation of medical activities aimed at the continuous improvement of the health of the population, taking into account the financial and infrastructural resources available. These activities should be carried out both by the managers of individual health care service providers, the decision-making and executive bodies of local authorities, as well as politicians.

(b) health security management encompasses such activities as:

– ensuring equal access to medical services.
– developing and effectively implementing health care policy programmes based on the identified needs and the health status of citizens.
– ensuring appropriate standards of the infrastructure (premises, equipment etc.) and personnel in institutions providing health care services (appropriate number of personnel, their qualifications and competences etc.).
– establishment, effective management and supervision of health care providers (i.e. medical entities and professional practices).

(c) the condition of the public health care system is reflected in the state of infrastructure, tangible and financial assets, as well as human resources.

This paper discusses issues concerning:

(1) the organisation of the health care system in Poland,
(2) public finance management in health care,
(3) selected problems of health care,

(4) measures aimed at improving the functioning of the health care system in Poland.

Organisation and financing of the polish health care system

Health care is one of the key areas of social policy of the state. In most countries, health care services are mainly provided by public institutions[5]. However, the health status of the population is not solely determined by the level of accessibility to health services, but mainly by the quality and outcomes of the health care provided and the health policy, which reflects a strategy adopted with regard to the development of the health care sector[6]. The amount of spending on health care is not a sole factor which should be used to assess the condition of the health care system. Other important factors include the appropriate management, efficient and rational use of the funding. It is worth to recall here M.Porter's Value-based Health Care concept, which is currently perceived as one of the principal mechanisms capable of transforming the health care system. It addresses the major problems of contemporary health care systems, including their fragmented nature, reduced quality of health care (especially from the patient's perspective) and dynamically increasing costs[7].

In view of the challenges that health care systems are currently facing, the management and the organisation of all health care should be effective, efficient and aimed at improving the health of the entire population. This is an important task not only for health care personnel, but also for managers of medical entities and politicians, who are responsible for systemic solutions ensuring the health security of Polish citizens.

According to the WHO, the task of health care systems is promoting, restoring and maintaining health. What is understood as a health care

[5] P. Ucieklak-Jeż, A. Bem*, System ochrony zdrowia – finansowanie, efektywność, restrukturyzacja [Healthcare system – financing, efficiency, restructuring],* Wyd. Akademia Imienia Jana Długosza, Częstochowa 2014, p. 11.

[6] K. Wielicka*, Zarys funkcjonowania systemów opieki zdrowotnej w wybranych krajach Unii Europejskiej [Outline of the functioning of healthcare systems in selected European Union countries],* „Zeszyty naukowe Politechniki Śląskiej" Seria: Organizacja i Zarządzanie, nr 70, Gliwice 2014, pp. 492–493. https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-6b2ddcba-fc31-458e-86de-6527cfdb11a1/c/Wielicka_OiZ_70_2014.pdf (access: 25.10.2023)

[7] Termedia, *Ochrona zdrowia oparta na wartości – na przykładzie modelu opieki dla chorych na POChP. [Value-based health care – an example based on a model of COPD patient care*.], 2021, https://www.termedia.pl/mz/Ochrona-zdrowia-oparta-na-wartosci-na-przykladzie-modelu-opieki-dla-chorych-na-POChP,43163.html (access: 20.10.2023)

system is a wide range of organisations and institutions, tangible, intangible and human resources related to health care. The main responsibility of the state is to optimally arrange such a system to protect the health of its citizens, viewed as a public good[8]. The health care system can also be defined as an organised set of activities aimed at the provision of preventive, medical and rehabilitation services and benefits so as to restore and improve the health of individuals and the entire society. M. Kolowitz[9] states that the health care system with its environment is made up of the government, local governments, medical resources and patients, and its primary purpose is to protect the health of citizens.

The literature on the subject identifies four conventional models of health care based on the criterion of the source of funding:

- Bismarck model (e.g. the Netherlands)
- Beveridge model (e.g. Denmark)
- residual model (e.g. more than 50% of the US population; there is no single health care system in the country)
- Semashko model (the former USSR).

It is important to note that none of the above models is used in their pure form. As a result of increasing health needs, changes in the demographic structure of societies and financing schemes, health care systems are evolving into hybrid concepts.

The current model of health care financing in Poland is dominated by a system of compulsory health insurance, which is supplemented by financing from the state and local government budgets. The most important source of funding for universal public health care is the obligatory health insurance contribution paid to the National Health Fund (NFZ), in the amount of 9% of the salary and other income subject to contributions (pensions, unemployment benefits, etc.).

[8] eREGION. *Health care, Western Pomerania,* http://eregion.wzp.pl/obszary/ochrona-zdrowia (access: 19.09.2023)

[9] M. Kolowitz, *Polski system ochrony zdrowia – perspektywy i możliwości zastosowania systemów ochrony zdrowia innych państw Unii Europejskiej [The Polish Healthcare System - perspectives and possibilities for using the healthcare systems of other European Union countries],* „Annales Academiae Medicae, Stetinenss", nr 56, Pomorski Uniwersytet Medyczny w Szczecinie, Szczecin 2010, pp.131–143. https://www.academia.edu/27792940/Polski_system_ochrony_zdrowia_PersPektywy_i_mo%C5%BCliwo%C5%9Bci_zastosowania_system%C3%B3w_ochrony_zdrowia_innych_Pa%C5%84stw_UNII_EUROPEJSKIEJ_ThE_POLISh_hEALThCARE_SYSTEM_PERSPECTIvES_AND_POSSIbILITIES_fOR_ADOPTION_Of_hEALThCARE_SYSTEMS_fROM_OThER_COUNTRIES_Of_ThE_EUROPEAN_UNION (access: 25.10.2023).

In EU countries the dominant systems are those based on public funding (from the state and/or local budgets) and health insurance premiums. According to the data presented by Eurostat, the combined share of government schemes and compulsory schemes/accounts in total current health care expenditure exceeded 85.0 % in: the Czech Republic (87.7 %, which was the highest share recorded), Luxembourg, Sweden and Germany. Also in Norway it was above 85.0 %. In the Polish health care system, the contributory health insurance schemes and compulsory medical saving accounts and government schemes constitutes more than 72% of total health care expenditure by financing scheme (9.8% gov. schem., 62.4% - contributory health ins.). Almost 20% comes from household out-of-pocket payments. What is meant as out-of-pocket payments are expenses in connection with visits to private specialist practices, mainly due to the limited availability of public medical services (very long waiting times for a publicly funded health care). These expenses are the main burden on Polish patients, which will be discussed in more detail later in this article.

According to the National Health Accounts, preliminary estimates[10] of current expenditure on health care in 2022 amounted to PLN 205.6 billion (representing 6.7% of GDP) and was higher than in 2021 by approximately PLN 36.1 billion (compared to preliminary data[11] for 2021, which amounted to PLN 169.4 billion). An increase was observed both in terms of public and private expenditure. Current public expenditure on health care amounted to PLN 154.0 billion in 2022, which was PLN 31.2 billion higher than in 2021, and accounted for 5.0% of GDP. Private expenditure, in turn, increased by PLN 5.0 billion and amounted to PLN 51.6 billion in 2022. One of the factors that contributed to the increase

[10] The preliminary estimates of the National Health Accounts take into account total current expenditure on health care in the previous year and are classified into three main categories: HF.1: Public expenditure, HF.2: Private expenditure excluding direct household expenditure and HF.3: Direct household expenditure. The methodological description can be found in the file submitted annually with the questionnaire "Explanatory Notes to T-0 JHAQ", entitled: "T-0 JOINT OECD, EUROSTAT AND WHO HEALTH ACCOUNTS (SHA 2011)" in the section "Scope and approach to the T-2 data collections". Preliminary estimates are based on 2022 data.

[11] The results presented in 2021 National Health Accounts (treated as preliminary data pending the publication of the announcement of the President of Statistics Poland) are compiled according to the so-called Joint Health Accounts Questionnaire (JHAQ) and include health expenditure classified into four dimensions: health care financing (HF), health care functions (HC), health care providers (HP) and financing sources (FS). The preliminary data was submitted at the end of April to international organisations, but is subject to validation by the International Panel of Experts on National Health Accounts (IHAT). Hence, the final figures may be different from those presented. The preliminary data (not validated by the OECD) was produced for 2021.

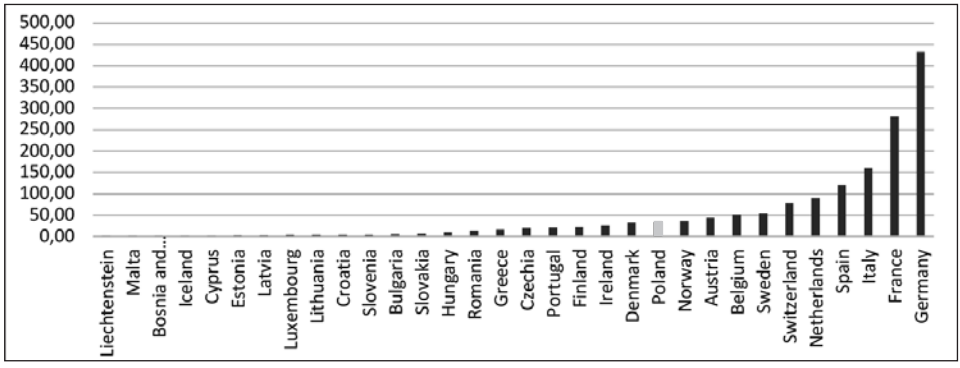
in private health care expenditure was an increase in direct household expenditure, which amounted to PLN 37.0 billion, and was 3.3 billion (9.9%) higher than in 2021[12].

The largest stream of funding in 2021 was allocated to hospitals, accounting 38.4% of the amount of current expenditure on health care (40.4% in 2020). Another group of health care providers, were outpatient healthcare facilities, which received 25.3% (25.8% in 2020) of the funds spent, followed by vendors and other suppliers of medical goods - 20.2% (21.3% in 2020). Among this group, the largest proportion of funds was allocated to pharmacies[13].

Data from Eurostat or the OECD on health care expenditure allows a comparative analysis of this aspect. However, unfortunately also in the case of these sources, the data is not up to date, with the most recent data available for 2020, which was a year of increased health care spending due to the COVID-19 pandemic.

At that time, the total health care expenditure in Poland amounted to EUR 34,182 million compared to the EU average of approximately EUR 58,500 million. Poland ranked 11th among the 27 Member States.

Chart 1. Health care expenditure – all financing schemes (2020, in thousand EUR).



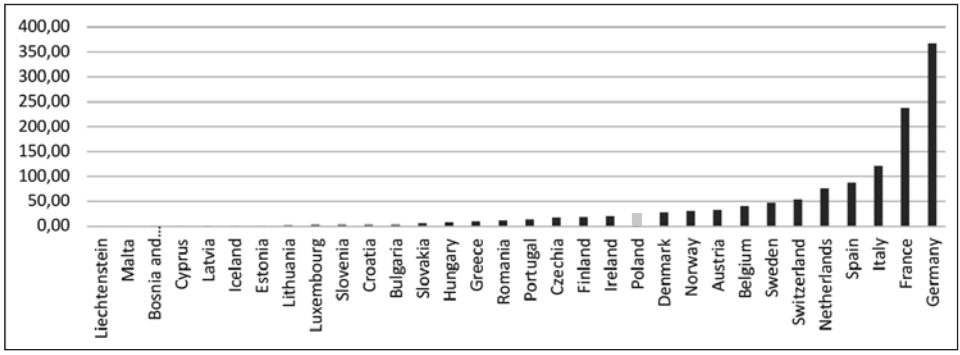
Source: own elaboration based on Eurostat.

[12] Główny Urząd Statystyczny, *Health care expenditure in 2020–2022, Statistics Poland.* https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie/wydatki-na-ochrone-zdrowia-w-latach-2020-2022,27,3.html (access: 25.10.2023)

[13] Ibidem.

When it comes to public expenditure only (i.e. government schemes and compulsory contributory health care financing schemes), Poland ranked 12th out of 27 countries (EUR 24,702 million, with an EU average being EUR 47,262 million).

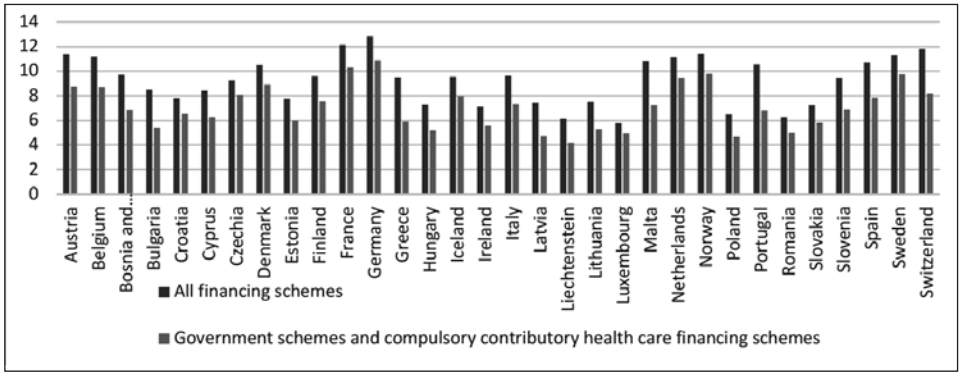
Chart 2. Public expenditure on health care (2020, in thousand EUR).



Source: own elaboration based on Eurostat.

Unfortunately, when it comes to the percentage share of total expenditure on health care in GDP, Poland ranks 4th from the bottom (6.49% of GDP), and in the case of the share of public expenditure in GDP – 2nd from the bottom (4.69% of GDP). Germany has the highest share of public expenditure on health in GDP (10.91%), followed by France (10.30%) and Sweden (9.77%).

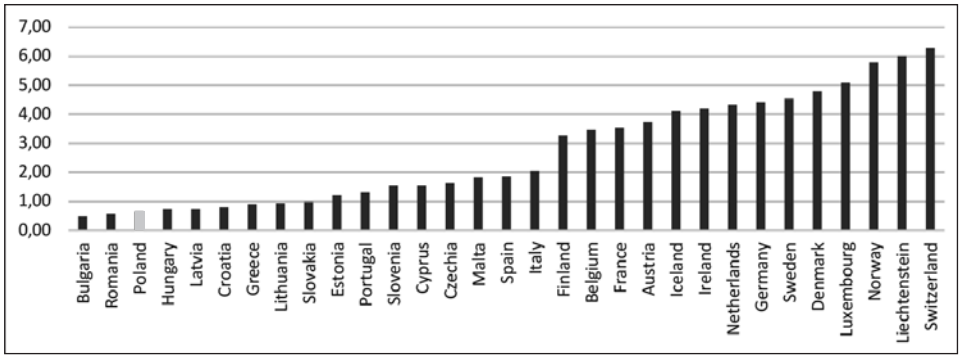
Chart 3. Healthcare expenditure as percentage share of gross domestic product (2020).



Source: own elaboration based on Eurostat.

When analysing public expenditure on healthcare per capita, Poland does not perform better. It ranks 3rd from the bottom with the figure of EUR 651.8, while the EU average is EUR 2,655.20. Only Bulgaria and Romania are lower in the ranking.

Chart 4. Government schemes and compulsory contributory health care financing schemes per inhabitant (2020, in thousand EUR).



Source: own elaboration based on Eurostat.

It should be noted, however, that the amount of financial resources allocated to health care does not necessarily reflect the quality of services provided to citizens. The latter is also influenced by:

– appropriate management of funds allocated for financing health care,
– implementation of programmes aimed at preventing diseases and minimising their consequences, thus relieving the health care system,
– organisational and infrastructural changes introduced by health care providers to optimise the process of providing medical services,
– raising the level of health awareness among citizens.

Selected problems of the polish health care system

The primary purpose of health care management is to meet the health-related needs of patients in the optimal way, within the limit of financial and infrastructural resources available to entities forming part of the health care system. It must represent a balanced approach, taking into account both economic aspects that affect the profitability of the

entity in question, as well as the well-being of the patients and respect for social justice[14].

Analysing the main problems faced by the health care system in Poland, it is possible to identify areas where adequate management processes should be implemented. The most frequently mentioned problems include:

– accessibility to medical services, including excessively long waiting times for an appointment, diagnostic procedures, planned hospitalisation or rehabilitation,
– insufficient number of medical staff and its uneven distribution,
– mismatch between the competencies of medical staff and the changing age structure of the population,
– fragmented nature of health care and inadequate data flow between different tiers of the health system

The majority of Poles use public health care services. According to a CBOS survey, nearly two-thirds of Poles (64%) use the services of a general practitioner under the universal health insurance, while only less than one-fifth (18%) use services that are not financed by the National Health Fund[15]. However, as the 2021 CBOS survey shows, as many as 66% of the respondents are not satisfied with the functioning of the health care system in Poland[16].

In patients' opinion, the most urgent problem are the queues for specialists. According to CBOS, 82% of the respondents found it difficult to book an appointment with a specialist under the National Health Fund, while 66% believed it was difficult to have diagnostic tests done. According to the 2022 Watch Health Care Report[17], the waiting time for a single health service in 2022 was 3.6 months. In order to book an appointment with a specialist or a diagnostic test, the average waiting time was 4.1 months and 2.5 months, respectively. The longest waiting time for medical services were recorded in the area of neurosurgery (10.4 months), orthopaedics and traumatology (10.2 months), dentistry

[14] bia24, *Dlaczego sprawne zarządzanie w ochronie zdrowia jest tak istotne? [Why is efficient management in health care so important?]*, 2022, https://bia24.pl/kategorie/dom-i-zdrowie/dlaczego-sprawne-zarzadzanie-w-ochronie-zdrowia-jest-tak-istotne.html (access: 16.10.2023)

[15] CBOS survey report, Nr 101/2023, *Use of health services and insurance*, Warszawa 2023 (access: 02.11.2023).

[16] Polish Press Agency, *Polacy niezadowoleni z opieki zdrowotnej [Poles dissatisfied with the health care system] based on CBOS survey report 2021* https://www.pap.pl/aktualnosci/news%2C975913%2Cpolacy-niezadowoleni-z-opieki-zdrowotnej-nowy-sondaz.html (access: 20.10.2023).

[17] Barometr WHC, *Polacy w kolejkach, stan na listopad 2022 [WHC Barometer. Poles queueing, as of November 2022].* https://www.gov.pl/attachment/bb888f27-bc5f-478c-9def-bb1703c682d8 (access: 22.10.2023).

(8.4 months) and plastic surgery (8.4 months). The shortest waiting times, in turn, were observed for neonatology (0.7 months) and radiation oncology, where the average waiting time did not exceed half a month (0.4 months)[18].

According to the CBOS report, the patients surveyed were also dissatisfied with the administration of medical facilities. 54% of respondents were of the opinion that administrative staff did not serve patients quickly and efficiently enough.

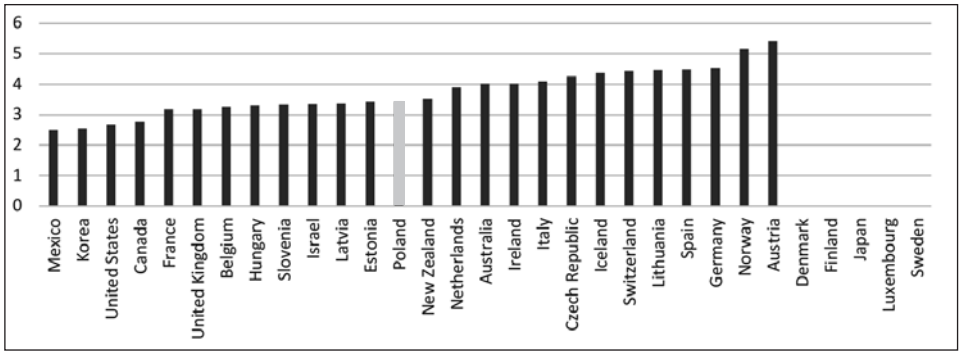
Another problem pointed out by both analysts and patients is the shortage of medical staff, which has a direct impact on the availability of medical services. Based on Eurostat data, Poland has 2.4 doctors per 1,000 inhabitants, which is one of the lowest figures in the EU. Based on the data of Statistics Poland, on the other hand, there are 3.4 doctors per 1,000 inhabitants[19]. According to the Central Register of Physicians, there were 150,899 doctors practising in Poland as at 30 April 2023, which means that there were 4 doctors per 1,000 inhabitants[20]. Given so many divergent results, it is difficult to conclude whether the figure is actually close to the EU average or is trailing behind. Charts 5 and 6 show Poland's position among OECD countries in terms of the number of doctors and nurses per 1,000 inhabitants. Unfortunately, the data for 2021 is incomplete, while that for 2022 is hardly available.

[18] Ibidem.

[19] M. Chruścińska-Dragan, *Mamy problem z policzeniem lekarzy w Polsce. Co zestawienie, to inny wynik. Nowy zespół ma uporządkować statystyki [We have a problem counting doctors in Poland. Every time we get a different result. The new team is to put the statistics in order]*. "Rynek Zdrowia", Published on: 1 January 2023 https://www.rynekzdrowia.pl/Polityka-zdrowotna/Mamy-problem-z-policzeniem-lekarzy-w-Polsce-Co-zestawienie-to-inny-wynik-Nowy-zespol-ma-uporzadkowac-statystyki,240798,14.html (access: 22.10.2023).

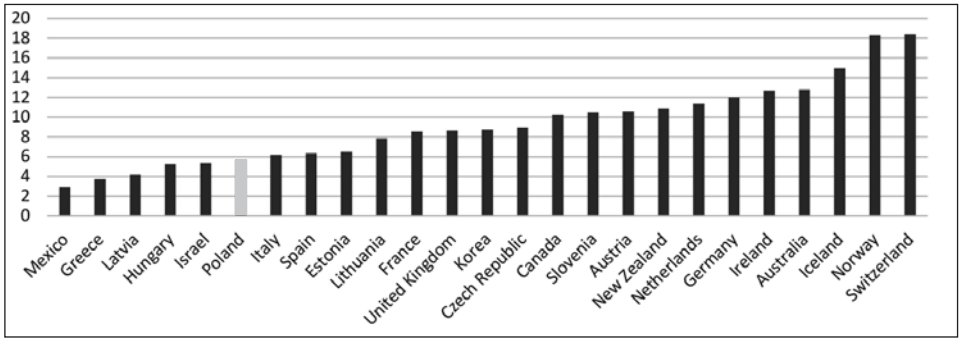
[20] Centralny Rejestr Lekarzy. *Zestawienie liczbowe lekarzy i lekarzy dentystów wg przynależności do okręgowej izby lekarskiej i tytułu zawodowego [Central Register of Physicians, List of physicians and dentists by membership in a district chamber of physicians and professional title]*, 2023, https://nil.org.pl/rejestry/centralny-rejestr-lekarzy/informacje-statystyczne (access: 25.10.2023).

Chart 5. Number of physicians per 1,000 inhabitants in OECD countries (2021).



Source: own elaboration based on OECD.

Chart 6. Number of nurses per 1,000 inhabitants in OECD countries (2021).



Source: own elaboration based on OECD.

The average number of nurses per 1,000 inhabitants in Poland is not enough. Poland ranks 6th from the bottom in this regard, which is a very poor result compared to other OECD countries. The nurses' self-governing body points out that nurses are overworked (which is actually the result of staff shortages) and not necessarily fairly paid[21]. Other causes of staffing shortages among nurses include: retirement of a large number of staff, with inadequate replacement rates, as well as a lack of qualified

[21] K. Fortak-Karasińska, K. Sikorska, M. Wysocka-Drozdowska, *Ile zarobią pielęgniarki i położne od 1 lipca 2023 roku? [How much will nurses and midwives earn from 1 July 2023?]* https://politykazdrowotna.com/artykul/ile-zarobia-pielegniarki/1073856 (access: 25.10.2023).

staff. The staffing shortages among this profession are also evidenced by the data in the Occupation Barometer 2022. Only in 35 out of 314 districts does the number of job offers for nurses match the number of potential candidates. According to the projections by the Head Chamber of Nurses and Midwives, the number of employed nurses and midwives is likely to decrease by 7% by 2025 and by nearly 16% by 2030. The Chamber's data also shows that the average age of nurses and midwives is 51, while in Lubuskie and Warmińsko-Mazurskie provinces it is over 55. This means that a significant proportion of nurses will soon be retiring, which will further exacerbate the staffing shortages in this profession. The simplified path to obtaining the right to practice as a nurse for those who obtained their qualifications outside the European Union does not solve the problem either[22].

Detailed information on the distribution of medical staff can be found also in the Health Needs Maps prepared for the period 2022-2026 by the Ministry of Health[23].

The number of physicians in each province, which illustrates the uneven territorial distribution of this profession, as well as the actual demand in this regard, is presented in table 1.

Table 1. Number of physicians per 1,000 inhabitants by province (2022)

Province	Number of physicians	per 1,000 inhabitants
Lubuskie	**2300**	**2.33**
Opolskie	**2300**	**2.42**
Warmińsko-Mazurskie	3500	2.55
Podkarpackie	5900	2.83
Wielkopolskie	10200	2.91
Kujawsko-pomorskie	6100	3.02
Świętokrzyskie	3700	3.12
Zachodniopomorskie	5400	3.27
Pomorskie	8400	3.56
Małopolskie	12300	3.59
Śląskie	16200	3.70

[22] J. Ojczyk, *Pielęgniarki nie chcą pracować w Polsce, szpitalom grozi paraliż [Nurses do not want to work in Poland, hospitals are at risk of paralysis],* 2022, https://www.prawo.pl/zdrowie/w-szpitalach-brakuje-pielegniarek,513431.html (access: 25.10.2023).

[23] Health Needs Maps, https://basiw.mz.gov.pl/mapy-informacje/.

Province	Number of physicians	per 1,000 inhabitants
Dolnośląskie	10800	3.73
Lubelskie	7800	3.83
Podlaskie	4600	4.00
Mazowieckie	**22800**	**4.14**
Łódzkie	**10200**	**4.26**

Source: own calculations based on Statistics Poland.

As regards the number of physicians per 1,000 inhabitants, the Łódzkie and Mazowieckie provinces ranked first and second (with 4.26 and 4.14 physicians per 1,000 inhabitants respectively). The lowest number of physicians per 1,000 inhabitants was recorded in the Lubuskie (2.33) and Opolskie (2.42) provinces.

Table 2. Number of nurses per 1,000 inhabitants by province (2022)

Province	Number of nurses	per 1,000 inhabitants
Lubuskie	**4100**	**4.16**
Warmińsko-Mazurskie	**6000**	**4.36**
Wielkopolskie	16400	4.69
Zachodniopomorskie	8100	4.91
Opolskie	4700	4.95
Kujawsko-pomorskie	10200	5.06
Pomorskie	12800	5.43
Dolnośląskie	15800	5.45
Śląskie	25000	5.71
Łódzkie	14500	6.05
Małopolskie	21000	6.12
Podkarpackie	12800	6.14
Mazowieckie	34900	6.33
Świętokrzyskie	7600	6.40
Podlaskie	**7400**	**6.44**
Lubelskie	**13700**	**6.72**

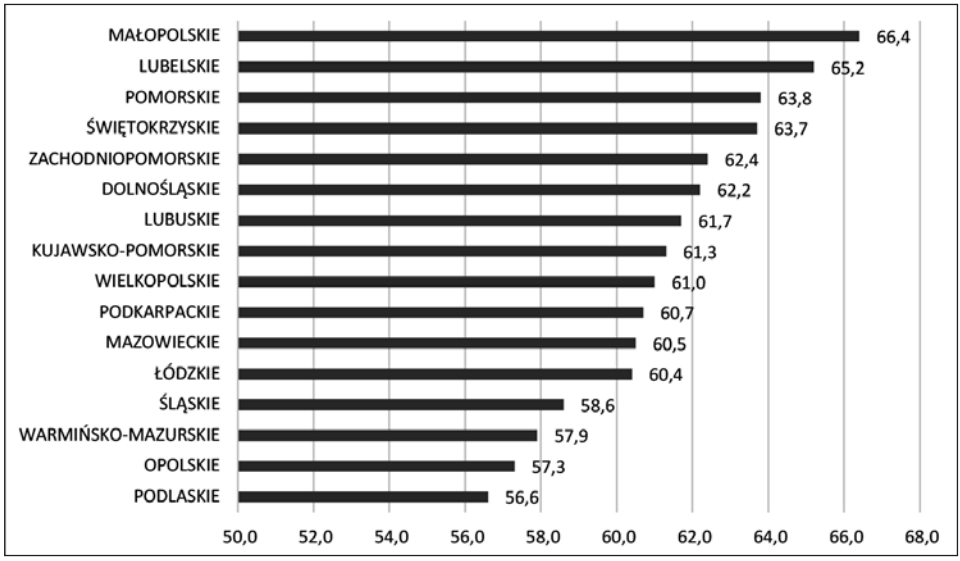
Source: own calculations based on Statistics Poland.

As regards the number of nurses per 1,000 inhabitants, Lubelskie (6.72) and Podlaskie (6.44) provinces ranked first. The lowest number of nurses per 1,000 inhabitants was recorded in the Warmińsko-Mazurskie (4.36) and Lubuskie (4.16) provinces.

In terms of medical infrastructure, one of the most frequently discussed issues is the number of hospitals and the number of beds per capita. Currently, the number of hospitals in Poland is sufficient. There are even suggestions to reduce their number, following the example of Denmark[24], due to declining number of patients in specific groups and the unprofitability of these entities. This applies mainly to gynaecology-obstetrics and paediatric wards.

According to the Statistics Poland, the number of hospitals in Poland in 2021 was 899, while the number of hospital beds was 168,447. The Śląskie and Mazowieckie provinces have the largest number of hospitals and the largest number of hospital beds. However, the most important aspect is the actual use of hospital beds and the occupancy rate, as it reflects the effectiveness and economic justification of this tier of medical facilities.

Chart 7. Hospital bed occupancy rate in general hospitals (in %, 2021).



Source: own elaboration based on Statistics Poland.

The occupancy rate of hospital beds does not exceed 70%, with the figures being similar across all provinces. The highest occupancy rate was

[24] In Denmark, which has a population of 5 million people, 116 facilities have been closed and there are now 16 hospitals.

recorded in the Małopolskie (66.4%) and Lubelskie (65.2%) provinces, while the lowest one in the Opolskie (57.3%) and Podlaskie (56.6%) provinces. As typically the occupancy rate at the level of 80-85% is considered economically justified, this means that the resources available are not fully utilised.

Another issue illustrating the situation in the health care system is the amount of medical equipment in health care entities. Its quantity and quality are one of the key aspects of managing the health security of Polish citizens. Medical apparatus and equipment allows to provide effective medical care, diagnostics and treatment.

Data from the Statistical Bulletin of the Minister of Health for 2021 indicates a significant improvement in the number of medical entities equipped with highly specialised medical apparatus (including tomographs, MRIs, angiographs, gamma cameras). In connection with the pandemic, the number of ventilators in medical entities also increased to 14,414 units in total. As the detailed statistics show, the distribution of medical equipment varies greatly between provinces, with the largest number recorded in the Mazowieckie and Śląskie provinces and the smallest one in the Lubuskie and Opolskie provinces[25].

In 2022, the Supreme Chamber of Control inspected the use of medical equipment in selected health care entities (17 health care entities in total, including 15 run as independent public health care institutions and two research institutes)[26].The majority of the controlled entities did not make full use of the purchased highly specialised medical equipment, which was the result of a number of factors, including a limited scope of contracts with the National Health Fund in this regards, poor organisation of the provision of services, a shortage of physicians, as well as equipment failure rates. What was also observed was poor procurement planning of medical equipment, which may indicate the lack of efficiency on the part of managers of health care entities.

Other problems of the health care system are its fragmentation or focus on short-term emergency treatment.

[25] Ezdrowie, *Statistical Bulletin of the Minister of Health 2022* https://ezdrowie.gov.pl/portal/home/badania-i-dane/biuletyn-statystyczny (access: 16.10.2023).

[26] NIK, *Zakup i wykorzystanie wysokospecjalistycznej aparatury medycznej w podmiotach leczniczych. [Purchase and use of highly specialized medical equipment in medical entities],* 2022, https://www.nik.gov.pl/plik/id,25877,vp,28651.pdf (access: 25.10.2023).

Fragmented nature of the provision of medical services is a problem that often sets in motion a spiral of multiple visits, identical diagnostic procedures and treatments unnecessarily performed several times, as well as long queues to specialists. It is caused by such factors as:

- the lack of close cooperation between primary care physicians and specialists, mainly inadequate information flow between the different health care segments and the lack of financial responsibility for diagnostic and therapeutic decisions[27],
- duplication of diagnostic procedures in patients admitted to hospital with examinations performed prior to admission on the recommendation of a primary care or outpatient specialist care physician,
- lack of medical care continuity in the case of discharged patients,
- fragmented implementation of specialised medical procedures without taking into account the complexity of the patient's health situation,
- use of incomplete medical data, often compiled for settlement purposes,
- reluctance to systematic work quality and efficiency measurement testing.

Such fragmentation leads to significantly increased health care costs and ineffective patient care.

Other problems and challenges that can be enumerated and become of critical importance in terms of ensuring health security for Poles are: the changing age structure, preventive health care, civilisation diseases, multiple long-term conditions, mental illnesses and progressing demographic changes.

Methods and tools recommended to improve the functioning of health care

Taking into account the above-mentioned elements of the health care system in Poland, it is necessary to indicate the actions undertaken

[27] I. Czerska, A. Trojanowska, T. Korpak, *Przyszłość opieki zdrowotnej w Polsce – nowe horyzonty [The future of health care in Poland – new horizons]* [in:] Wyzwania ekonomiczne i społeczne [eds.] W. Nowak, K. Szalonka, e-Monografie, no. 153, E-Wydawnictwo. Prawnicza i Ekonomiczna Biblioteka Cyfrowa. Wydział Prawa, Administracji i Ekonomii Uniwersytetu Wrocławskiego, Wrocław 2019, DOI 10.34616/23.19.120 (access: 29.09.2023).

to improve the health security of Polish citizens. Awareness of the shortcomings and limitations with respect to the availability of medical services, growing expenditures on health care, inefficient use of the allocated funds can help decision-makers and managers of health care entities introduce a number of initiatives aimed at improving the overall condition of the health care system.

These include:

1. The dynamic development of e-health services aimed at optimising the processes of providing and exchanging data on health care services. The Electronic Platform for Gathering, Analysis and Distribution of Digital Resources on Medical Events (so-called P1), established in 2017, has introduced such tools as:
   - e-prescription,
   - e-referral,
   - Electronic Medical Records and the Register of Medical Events,
   - 40+ prevention programme for post-pandemic population health assessment
   - health care for school-aged children (student health records)
   - digital vaccine record
   - e-registration for vaccination currently available for influenza, COVID-19 and HPV vaccination (launched on 1 June 2023).
   - IPOM (Individualised Plan of Medical Care) dedicated to providers of coordinated care as part of primary health care
   - e- referral to a sanatorium
   - Internet Patient Account application (pacjent.gov.pl) together with the mojeIKP mobile application
   - gabinet.gov.pl - an open platform for medical service providers and other solutions aimed at optimising the processes of planning and implementing health care services.

These tools support the management processes in medical care units, optimise the daily work of medical staff and public administration responsible for the functioning of the health care sector in Poland. They also provide patients with digital solutions supporting and facilitating the access to health care and managing their own health.

2. The introduction of coordinated care in primary health care entities, which represents a process-based approach to the provision of health care services in the most common chronic diseases and in diagnostic and preventive treatment, provides, from the primary health care tier,

rapid access to diagnostic tests, specialist consultations, treatment and health education. It was launched in October 2022 and consists of coordinated, holistic activities which are part of a continuous process of patient care – starting with prevention, patient education and cooperation, through diagnostics, to continuous monitoring of the patient's health condition in order to ensure the treatment process continuity. The activities undertaken as part of this type of care are led by a coordinator. The purpose of the introduction of coordinated care is primarily to reduce the fragmentation of health care, by shortening the diagnostic pathway for the most common chronic diseases, the treatment of which accounts for the highest proportion of health care expenditure (including diabetes, asthma, hypertension, circulatory insufficiency, thyroid disease and chronic renal failure). As a result, the burden of diagnosis and treatment is shifted from the outpatient specialist care level to the primary health care level. The assumption of coordinated care is to provide easier access to services and reduce queues to specialists.

3. Prevention programmes are aimed at the early detection of diseases and disease predisposition. Prevention, which is still underestimated in Poland, plays an important role in the long-term perspective: it limits the incidence of disease, reduces the level of expenditure on health care, reduces social costs (e.g. by allowing patients diagnosed sufficiently early to maintain their professional activity). Among the programmes introduced so far, the ones that are characterised by the highest effectiveness and health outcomes include[28]:
   - Breast cancer prevention – breast cancer is the most common malignant neoplasm in women, which accounts for about 23% of all cases of cancer and 14% of deaths. The objective of the programme is to: (1) reduce the mortality rate due to breast cancer in Poland to the level of the EU average, (2) increase the level of awareness concerning breast cancer prevention and early diagnosis, (3) introduce nationwide standardised principles of diagnostic procedures.
   - prevention of cardiovascular diseases (CVD) – despite the increasing quality level of diagnostics and state-of-the-art treatment methods, mortality in Poland due to cardiovascular diseases is one

[28] Serwis Ministerstwa Zdrowia i Narodowego Funduszu Zdrowia, *Programy profilaktyczne [Disease prevention programmes]* https://pacjent.gov.pl/programy-profilaktyczne (access: 25.10.2023).

of the highest in Europe. In 2021, it accounted for nearly 35% of deaths[29].(Chruścińska-Dragan) The objective of the programme is to (1) reduce the morbidity and mortality due to cardiovascular diseases by approximately 20% in the patients covered by the programme through early detection and reduction of the prevalence and intensity of risk factors, (2) increase the detection rate and effectiveness of treatment of cardiovascular diseases (CVD), (3) ensure early identification of people at increased risk of CVD, (4) promote a healthy lifestyle with proper nutrition and physical activity, as well as no addictions.

– Cervical cancer prevention – cervical cancer is the sixth most common cancer in Polish women, which accounts for more than 10% of cancers in this group. If detected at an early stage, it is 99% curable. The objective of the programme is to: (1) reduce the mortality rate of women due to cervical cancer to the EU average, (2) increase women's awareness of cervical cancer prevention and introduce a standardised diagnostic procedure model throughout the country.

4. The development of Health Needs Maps[30], which are detailed lists of health system resources and their allocation according to predefined needs. The maps constitute a set of statistics, analyses, conclusions and recommendations concerning the demographic and epidemiological situation, services provided, as well as human resources and medical equipment in Poland. They serve as the basis for forecasting future needs of individual provinces and the entire country in order to optimise the planning processes and implementation of changes in the health care system and its individual entities. The maps are developed by the Analyses and Strategies Department of the Ministry of Health, and their aim is to effectively manage resources in the health care system. They allow individuals involved in health care management processes to make decisions concerning such aspects as the implementation of investments, changes in the offer and contracted services, the development of procurement plans or the list of guaranteed benefits.

[29] M. Chruścińska-Dragan, *Na te choroby Polacy umierają najczęściej. Jest najnowszy raport NIZP-PZH [Diseases that are the most common cause of death of Poles. The latest report by the National Institute of Public Health – National Research Institute].* https://www.rynekzdrowia.pl/Serwis-Choroby-Pluc/Na-te-choroby-Polacy-umieraja-najczesciej-Jest-najnowszy-raport-NIZP-PZH,241423,1022.html (access: 22.10.2023).

[30] Baza Analiz Systemowych i Wdrożeniowych, *Mapy potrzeb zdrowotnych 2021 [Health Needs Maps]* https://basiw.mz.gov.pl/mapy-informacje/ (access: 22.10.2023).

Health needs maps are also used in a number of other countries (e.g. Österreichischer Strukturplan Gesundheit in Austria or Plan Regional De Sante Publique in France) and are an important tool to support the evidence-based management both in terms of ensuring sustainability (in the sense of partial independence from the political processes and making decisions based on objective analyses), as well as explaining the pursued social policy to citizens, which in the area of health policy is particularly difficult[31].

5. Implementation of the Instrument for the Assessment of Investment Applications in the Health Sector (IOWISZ). The introduction of this ICT tool is aimed at the optimisation of the investment processes in the health care sector and developing a rational and effective system of spending public funds. The IOWISZ system allows for filling in an application for an assessment and opinion on a specific investment in health care units and receiving such opinions issued by the Minister of Health and provincial governors[32]. A positive result of the assessment enables the health care provider to develop in a prospective manner consistent with local health needs. The introduction of the IOWISZ system has eliminated the problem of oversupply of certain medical services and helped to adjust them to the actual needs of inhabitant. As a result, the effectiveness of public spending increased[33].
6. Introduction of the Patient Safety and Quality Improvement Act (of 16 June 2023, no. 1692) improving the quality of health care services. The aim of the aforementioned act is to implement legal and organisational solutions that will allow to regulate quality issues in a comprehensive manner. The draft concerns the internal quality and safety management system, the processes of authorisation, accreditation and medical registers. As indicated by its originators, the Act should improve the effectiveness of diagnosis and treatment through systematic assessment of clinical quality indicators; improve patient

[31] B. Więckowska, *Mapy potrzeb zdrowotnych jako narzędzie evidence based management w systemie ochrony zdrowia w Polsce [Health needs maps as a tool for evidence-based management in the health care system in Poland].* [in:] M. Jarosiński. [Ed.] Współczesne wyzwania organizacji ochrony zdrowia [Contemporary challenges of health care organisations], Wyd. SGH, Warszawa 2017, p.14.

[32] Opolski Urząd Wojewódzki. *Opinia o celowości inwestycji w sektorze zdrowia – IOWISZ [Implementation of the Instrument for the Assessment of Investment Applications in the Health Sector (IOWISZ)].* https://www.gov.pl/web/uw-opolski/opinia-o-celowosci-inwestycji-w-sektorze-zdrowia---iowisz (access: 16.10.2023)

[33] ezdrowie. *Instrument Oceny Wniosków Inwestycyjnych w Sektorze Zdrowia [Instrument for Assessment of Investment Applications in the Health Sector],* 2023, https://ezdrowie.gov.pl/portal/home/systemy-it/instrument-oceny-wnioskow-inwestycyjnych-w-sektorze-zdrowia (access: 29.09.2023)

safety and satisfaction by recording and monitoring adverse events; and achieve comparability of services provided in terms of the quality and effectiveness. Moreover, the Act will oblige hospitals to obtain authorisation from the National Health Fund, which will be a basic condition for concluding a contract for the financing of services by the National Health Fund. The authorisation will be issued for 5 years[34].

The above-mentioned activities undertaken and implemented by individual entities of the health care system are aimed at improving the quality of health care and ensuring a better health security of Polish citizens. Their implementation requires managerial competence and the ability to effectively allocate limited resources (personal, material and financial ones) to ensure basic constitutional rights related to health care.

Conclusions and recommendations

The COVID-19 pandemic has highlighted a number of challenges which decision-makers, managers of medical entities and the society as a whole are facing. These include staffing shortages and inefficient management of public resources in health care. At the same time, these challenges provide an opportunity to implement digital, organisational and managerial innovations.

The condition of the Polish health care system, presented in this article, points to numerous potential threats to health security of the citizens. Despite the implementation of a number of tools and actions aimed at improving the availability of medical services and the efficiency of resource management, the Polish health care system, decision-makers and managers in that area are still facing a number of challenges, including:

– staffing shortages which require increasing the replacement rates,
– demographic changes related to the ageing of the population, necessitating the development of health and social services for the elderly,

[34] *Ustawa o jakości w opiece zdrowotnej wchodzi w życie. Szpitale mają 6 miesięcy na przygotowanie się do autoryzacji [The Act on Quality in Healthcare enters into force. Hospitals have 6 months to prepare for authorization]* „Puls Medycyny", 2023, https://pulsmedycyny.pl/ustawa-o-jakosci-w-opiece-zdrowotnej-wchodzi-w-zycie-szpitale-maja-6-miesiecy-na-przygotowanie-sie-do-autoryzacji-1195000 (access: 23.10.2023)

as well as the creation of long-term care and palliative-hospice care institutions,
– problems with the insurance-based financing process of the system due to the reduction of the revenue base of the National Health Fund as a result of the declining working-age population, the spiralling labour cost of medical staff, the increasing cost of new medical technologies and increased social expectations due to increased life expectancy
– new anti-vaccination social movements, increased economic and climate migration.

These phenomena are complex in nature and cannot be solved by measures introduced in the health care sector alone. Priority should be given to increasing the efficiency of medical service provision.

Some of the recommendations in this respect include:

1. Changes in the system of financing medical care – limitation of the capitation rate and other forms of lump-sum payments and the introduction of factors dependent on the effects of the provided health services (the so-called cappuccino model).
2. Restructuring of district hospitals with simultaneous reduction of short-term beds (mainly in obstetric and paediatric wards) in favour of long-term beds.
3. Transferring diagnostic procedures, drug programmes from inpatient procedures to same-day procedures.
4. The development of an evaluation system of the services provided through a common and uniform set of indicators and benchmarking.
5. Deinstitutionalisation of care for chronically ill patients (especially the elderly). Cooperation between social workers (MOPS, GOPS) and community nurses.
6. Reorganisation of the primary health care as part of the development process of coordinated care, improving access to medical services, while at the same time relieving the burden on hospitals.
7. Improving access to rapid diagnosis by increasing the scope of the budget allocated for the coordinated care in primary health care units.
8. Introduction of health education and disease management programmes for people with chronic diseases as part of coordinated care in primary health care units.
9. Integrating prevention programmes based on a standardised screening questionnaire database, merging the databases of such programmes

as: CVD, 40+, oncology screening (cervical, breast, colorectal, lung cancer),

10. Increased use of e-health data for more comprehensive patient's summary, treatment outcome control, spending control and counteracting criminogenic activities.

Bibliography

Literature:

Grzywna P., *Bezpieczeństwo zdrowotne w nauce o polityce społecznej : wprowadzenie do dyskusji [Health security in social policy science: an introduction to the discussion]*, Wydawnictwo Uniwersytetu Śląskiego, Katowice 2017.

Owczarczyk A., *Koordynowana i zintegrowana opieka medyczna – co warto wiedzieć [Coordinated and integrated healthcare – useful information],* [in:] M. Bogdan, A. Owczarczyk, P. Żuk, A. Prusaczyk, S. Karczmarz, [Eds.], Koordynowana opieka zdrowotna w praktyce, od POZ do POZ+ [Coordinated healthcare in practice, from POZ to POZ+], WoltersKluwer, Warszawa 2023.

Ucieklak-Jeż P., Bem A.*, System ochrony zdrowia – finansowanie, efektywność, restrukturyzacja [Healthcare system – financing, efficiency, restructuring],* Akademia Imienia Jana Długosza, Częstochowa 2014.

Więckowska B., *Mapy potrzeb zdrowotnych jako narzędzie evidence based management w systemie ochrony zdrowia w Polsce [Health needs maps as a tool for evidence-based management in the health care system in Poland].* [in:] M. Jarosiński. [Ed.] Współczesne wyzwania organizacji ochrony zdrowia [Contemporary challenges of health care organisations], Wyd. SGH, Warszawa 2017.

Internet sources:

Barometr WHC, *Polacy w kolejkach, stan na listopad 2022 [WHC Barometer. Poles queueing, as of November 2022].* https://www.gov.pl/attachment/bb888f27-bc5f-478c-9def-bb1703c682d8 (access: 22.10.2023).

Baza Analiz Systemowych i Wdrożeniowych, *Mapy potrzeb zdrowotnych 2021 [Health Needs Maps]* https://basiw.mz.gov.pl/mapy-informacje/ (access: 22.10.2023).

bia24 *Dlaczego sprawne zarządzanie w ochronie zdrowia jest tak istotne? [Why is efficient management in health care so important?]*, 2022, https://bia24.pl/kategorie/dom-i-zdrowie/dlaczego-sprawne-zarzadzanie-w-ochronie-zdrowia-jest-tak-istotne.html (access:16.10.2023).

CBOS survey report, Nr 101/2023, *Use of health services and insurance*, Warszawa 2023 (access: 02.11.2023).

Centralny Rejestr Lekarzy, *Zestawienie liczbowe lekarzy i lekarzy dentystów wg przynależności do okręgowej izby lekarskiej i tytułu zawodowego [Central Register of Physicians, List of physicians and dentists by membership in a district chamber of physicians and professional title]*, 2023, https://nil.org.pl/rejestry/centralny-rejestr-lekarzy/informacje-statystyczne (access: 25.10.2023).

Chruścińska- Dragan M. *Mamy problem z policzeniem lekarzy w Polsce. Co zestawienie, to inny wynik. Nowy zespół ma uporządkować statystyki [We have a problem counting doctors in Poland. Every time we get a different result. The new team is to put the statistics in order].* "Rynek Zdrowia", Published on: 1 January 2023

https://www.rynekzdrowia.pl/Polityka-zdrowotna/Mamy-problem-z-policzeniem-lekarzy-w-Polsce-Co-zestawienie-to-inny-wynik-Nowy-zespol-ma-uporzadkowac-statystyki,240798,14.html (access: 22.10.2023).

Chruścińska-Dragan M., *Na te choroby Polacy umierają najczęściej. Jest najnowszy raport NIZP-PZH [Diseases that are the most common cause of death of Poles. The latest report by the National Institute of Public Health – National Research Institute].* https://www.rynekzdrowia.pl/Serwis-Choroby-Pluc/Na-te-choroby-Polacy-umieraja-najczesciej-Jest-najnowszy-raport-NIZP-PZH,241423,1022.html (access: 22.10.2023).

Czerska I, Trojanowska A., Korpak T., *Przyszłość opieki zdrowotnej w Polsce – nowe horyzonty [The future of health care in Poland - new horizons]* [in:] Wyzwania ekonomiczne i społeczne [eds.] W. Nowak, K. Szalonka, e-Monografie, no. 153, E-Wydawnictwo. Prawnicza i Ekonomiczna Biblioteka Cyfrowa. Wydział Prawa, Administracji i Ekonomii Uniwersytetu Wrocławskiego, Wrocław 2019, DOI 10.34616/23.19.120 (access: 29.09.2023)

Donabedian A., *Evaluating the Quality of Medical Care*, Milbank Q. 2005 Dec; 83(4), doi: 10.1111/j.1468-0009.2005.00397.x https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690293/ (access 25.10.2023)

eREGION, *Health care, Western Pomerania,* http://eregion.wzp.pl/obszary/ochrona-zdrowia (access: 19.09.2023).

Ezdrowie, *Statistical Bulletin of the Minister of Health 2022* https://ezdrowie.gov.pl/portal/home/badania-i-dane/biuletyn-statystyczny (access: 16.10.2023).

ezdrowie. *Instrument Oceny Wniosków Inwestycyjnych w Sektorze Zdrowia [Instrument for Assessment of Investment Applications in the Health Sector],* 2023, https://ezdrowie.gov.pl/portal/home/systemy-it/instrument-oceny-wnioskow-inwestycyjnych-w-sektorze-zdrowia (access: 29.09.2023).

Fortak – Karasińska K., Sikorska K., Wysocka -Drozdowska M *Ile zarobią pielęgniarki i położne od 1 lipca 2023 roku? [How much will nurses and midwives earn from 1 July 2023?]* https://politykazdrowotna.com/artykul/ile-zarobia-pielegniarki/1073856 (access: 25.10.2023)

Główny Urząd Statystyczny, *Health care expenditure in 2020-2022, Statistics Poland.* https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie/wydatki-na-ochrone-zdrowia-w-latach-2020-2022,27,3.html (access: 25.10.2023).

Health Needs Maps, https://basiw.mz.gov.pl/mapy-informacje/.

Kolowitz. M., *Polski system ochrony zdrowia – perspektywy i możliwości zastosowania systemów ochrony zdrowia innych państw Unii Europejskiej [The Polish Healthcare System - perspectives and possibilities for using the healthcare systems of other European Union countries],* „Annales Academiae Medicae, Stetinenss", nr 56, Pomorski Uniwersytet Medyczny w Szczecinie, Szczecin 2010, https://www.academia.edu/27792940/Polski_system_ochrony_zdrowia_PersPektywy_i_mo%C5%BCliwo%C5%9Bci_zastosowania_system%C3%B3w_ochrony_zdrowia_innych_Pa%C5%84stw_UNII_EUROPEJSKIEJ_ThE_POLISh_hEALThCARE_SYSTEM_PERSPECTIvES_AND_POSSIbILITIES_fOR_ADOPTION_Of_

hEALThCARE_SYSTEMS_fROM_OThER_COUNTRIES_Of_ThE_EUROPEAN_UNION (access: 25.10.2023).

Konarska I., *Raport OECD: Pandemia przetestowała odporność systemów opieki zdrowotnej [OECD report: The pandemic tested the resilience of health care systems],* https://www.termedia.pl/koronawirus/Raport-OECD-Pandemia-przetestowala-odpornosc-systemow-opieki-zdrowotnej, 2022,44346.html (access 25.10.2023).

NIK, *Zakup i wykorzystanie wysokospecjalistycznej aparatury medycznej w podmiotach leczniczych. [Purchase and use of highly specialized medical equipment in medical entities],* 2022, https://www.nik.gov.pl/plik/id,25877,vp,28651.pdf (25.10.2023).

OECD, *Health at a Glance 2023; State of Health in the EU, Poland: Country Health Profile* 2023, OECD 2023, https://www.oecd.org/health/health-at-a-glance/ (access 20.01.2024).

Ojczyk J., *Pielęgniarki nie chcą pracować w Polsce, szpitalom grozi paraliż [Nurses do not want to work in Poland, hospitals are at risk of paralysis],* 2022, https://www.prawo.pl/zdrowie/w-szpitalach-brakuje-pielegniarek,513431.html (access: 25.10.2023).

Opolski Urząd Wojewódzki *Opinia o celowości inwestycji w sektorze zdrowia – IOWISZ [Implementation of the Instrument for the Assessment of Investment Applications in the Health Sector (IOWISZ)].* https://www.gov.pl/web/uw-opolski/opinia-o-celowosci-inwestycji-w-sektorze-zdrowia---iowisz (access: 16.10.2023).

Polish Press Agency, *Polacy niezadowoleni z opieki zdrowotnej [Poles dissatisfied with the health care system] based on CBOS survey report 2021* https://www.pap.pl/aktualnosci/news%2C975913%2Cpolacy-niezadowoleni-z-opieki-zdrowotnej-nowy-sondaz.html (access: 20.10.2023).

„Puls Medycyny", *Ustawa o jakości w opiece zdrowotnej wchodzi w życie. Szpitale mają 6 miesięcy na przygotowanie się do autoryzacji [The Act on Quality in Healthcare enters into force. Hospitals have 6 months to prepare for authorization]* 2023, https://pulsmedycyny.pl/ustawa-o-jakosci-w-opiece-zdrowotnej-wchodzi-w-zycie-szpitale-maja-6-miesiecy-na-przygotowanie-sie-do-autoryzacji-1195000.

Serwis Ministerstwa Zdrowia i Narodowego Funduszu Zdrowia, *Programy profilaktyczne [Disease prevention programmes]* https://pacjent.gov.pl/programy-profilaktyczne (access: 25.10.2023).

Termedia,*Ochrona zdrowia oparta na wartości – na przykładzie modelu opieki dla chorych na POChP. [Value-based health care – an example based on a model of COPD patient care*.], 2021, https://www.termedia.pl/mz/Ochrona-zdrowia-oparta-na-wartosci-na-przykladzie-modelu-opieki-dla-chorych-na-POChP,43163.html (access: 20.10.2023).

Wielicka K.*, Zarys funkcjonowania systemów opieki zdrowotnej w wybranych krajach Unii Europejskiej [Outline of the functioning of healthcare systems in selected European Union countries],* „Zeszyty naukowe Politechniki Śląskiej" Seria: Organizacja i Zarządzanie, nr 70, Gliwice 2014, https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-6b2ddcba-fc31-458e-86de-6527cfdb11a1/c/Wielicka_OiZ_70_2014.pdf (access: 25.10.2023).