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DENTAL SERVICES FINANCED FROM PUBLIC FUNDS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT: CURRENT STATUS AND CHALLENGES IN POLAND

Dentistry in Poland is based on services financed from consumers' private funds. The catalog of services available under general health insurance is so narrow that a significant number of patients have stopped using the public system and have devoted their funds to commercial dental services. Educational and preventive activities in the field of dentistry are consistent with the idea of sustainable development, especially from the point of view of the social and economic spheres, because prevention or quick treatment is usually more effective and cheaper. The article aims to show possible problems with implementing the idea of sustainable development in the context of health care resulting from the adopted financing policy of the National Health Fund. The work is based on the analysis of macroeconomic data and applicable legal acts in relation to the literature on the subject.

Keywords: dental market, consumer in health care, health services, dentistry, sustainable development.

1. INTRODUCTION

Dentistry in Poland is based on services financed from consumers' private funds (Wicka, 2021; PIU, 2018; J. Kozera, M. Kozera 2022). Dental care within the public health care system is provided to a very limited extent, especially for adults. There is also no protection for members of low-income households (Tambor, Pavlova, 2020). The catalog of services available under general health insurance is so narrow that a significant number of patients stopped using the public system, allocating their funds for commercial dental services, or stopped using them altogether. On the one hand, dental services are among the most expensive, on the other hand, as it may seem, many of them are not strictly necessary. Therefore, the National Health Fund covers only part of dental services, extending the benefit package to particularly sensitive groups, such as children and pregnant women.

It should be noted that not only treatment, but primarily educational and preventive activities in the field of dentistry fit into the idea of sustainable development, especially from the point of view of the social and economic spheres, because prevention or quick treatment is usually more effective and cheaper, and consumers/ patients fit in better in

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society, have greater self-confidence, and are healthier not only in their oral cavity (Jaraszek, Hanke, Marcinkiewicz, 2022).

2. SUSTAINABLE DEVELOPMENT IN THE CONTEXT OF VARIOUS SECTORS OF THE ECONOMY

Sustainable development is a concept that has been appearing at least since the second half of the 20th century. Increased interest in this issue, especially in aspects related to economics, appeared after the first UN Conference in Stockholm in 1972 (Zalega, 2016). This idea was further developed at the second "Earth Summit" in Rio de Janeiro twenty years later, when the "Rio Declaration" constituting a general philosophy of sustainable development and a document called "Agenda 21" were adopted, which presented a road map for the introduction of this philosophy in life (Skowroński, 2006). In United Nations documents and strategies, sustainable development is based on three equal levels: economic, social and ecological. A. Pawłowski (2006; 2009) postulates a broader view of this issue and talks about the following levels: ethical, ecological, social, economic, technical, legal and political. The author assumes that all decisions should have their source in the ethics of an individual, and further postulates equal treatment of ecological, economic and social issues, and technical, legal and political issues should be based on them.

A more people-oriented definition was proposed by the Swiss "Monitoring of Sustainable Development Project" MONET:

Sustainable development means ensuring dignified living conditions with regard to human rights by creating and maintaining the widest possible range of options for freely defining life plans. The principle of fairness among and between present and future generations should be taken into account in the use of environmental, economic and social resources. Putting these needs into practice entails comprehensive protection of bio-diversity in terms of ecosystem, species and genetic diversity, all of which are the vital foundations of life (Keiner, 2005).

Researchers are looking for the sources of the concept of sustainable development in classical economics, whose representatives wondered about the limits of economic growth in connection with the falling productivity of arable land and population development. Already at the turn of the 18th and 19th centuries, Thomas R. Malthus drew attention to the limits of economic growth caused by resource shortages. He postulated that the problems emerging in the socio-economic environment result not so much from bad human institutions, but from the fertility of the human race, i.e. population growth (Mebratu, 1998). The English economist David Ricardo, assuming that natural resources are unlimited, but not uniform, that is, better and worse. Therefore, we can talk about the scarcity of natural resources (Rechul, 2004). In further considerations, representatives of the Club of Rome pointed to the natural limits of growth and, consequently, the need to limit their use and protect them (Jeżowski, 2012).

The idea of sustainable development, although at the beginning of the 21st century some researchers wondered whether it was not treated as a kind of myth (Sztumski, 2006), has gained some dynamics in recent years, both in terms of raising this topic by scientists representing various disciplines and in practical dimension.

Researchers are particularly interested in the impact of the idea of sustainable development in various sectors of the national economy. The issue of sustainable

development of tourism is particularly frequently discussed (e.g. Rasoolimanesh et al., 2023; Streimikiene et al., 2021; Guo, Jiang, Li, 2019), especially due to its dynamic development caused by, among others, an increase in free time and disposable income (Para, 2013). Thus, some tourist reception places are beginning to reach or even exceed their limits (e.g. Birendra, Dhungana, Dangi, 2021) and ideas are emerging to transfer at least part of this traffic to other, previously less popular, although interesting, places (e.g. in Siakwah, Musavengane, Leonard, 2020; López-Sanz, Penelas-Leguía, Gutiérrez-Rodríguez, Cuesta-Valiño; 2021; Paluch, Sarat, 2013), and the last impulse that sparked further interest in this topic was the global epidemic crisis related to with COVID-19 (including Jones, Comfort, 2020; Rahmanov., Aliyeva, Rosokhata, Letunovska, 2020). However, researchers often raise the issue of sustainable consumption - both food (e.g. Maciejewski 2020; Coderoni, Perito, 2020; Vega-Zamora, Torres-Ruiz, Parras-Rosa, 2019) and other goods (e.g. Hernandez, Miranda, Goñi, 2020), especially taking into account the changes brought by the COVID-19 pandemic (Maciejewski, 2023; Chae, 2021).

3. THE PLACE OF HEALTH CARE IN SUSTAINABLE DEVELOPMENT

The health care market, as a branch of the national economy, is relatively poorly researched. For many years, it was ignored in Poland because it was treated as an unproductive sector of the national economy. Also after the political transformation, researchers rarely discussed this issue due to the dominant share of services financed from public funds. Thus, most health care services are distributed without following free market principles.

Researchers who discuss this topic, at least to a limited extent, focus largely on the description of the health care market (Kantyka, 1998), the functioning of the health care system (Nojszewska, 2011), the broadly understood economics of health care (Suchecka, 2011), sources of financing (Golinowska, Tambor, 2014; Markowska, Węglińska, 2019) or reforms of the health care system carried out in recent years (Golinowska, 2013). Topics touched upon by authors in scientific publications, even if they concern social sciences, usually refer indirectly (Kosiński, 2018) or directly (Syrkiewicz-Światała, Światała, 2012) to management and quality sciences.

The dental services market is examined on the one hand as part of the health care market, which should be considered legitimate, but also as a separate market due to significant differences in the form of financing health services. They are, unlike on the health care market in Poland, usually financed commercially, i.e. from consumers' private funds. Therefore, it can be assumed that this consumer is more aware of his needs and is looking for the most effective solutions, as well as requiring an individually prepared package of medical services. To a large extent, these analyzes focus on issues related to the marketing of dental services (Jończyk, Werenda, 2016; Syrkiewicz-Światała, Holecki, Bryła, 2014). The issue of the value of the quality of dental services for the consumer is also raised (Bukowska-Piestrzyńska, 2017; Cieślik, Przybylska, 2018).

Among the 17 UN Sustainable Development Goals there is goal 3: good health and quality of life (e.g. Anju et al., 2023), which is directly influenced by the level, quality and organizational, geographical and financial availability of services in the field of health care. From the point of view of achieving this global goal, the issue of educating society is extremely important - on the one hand, regarding the importance of health protection, as well as regarding lifestyle and impact on the environment, including activities that we could consider as health prevention (Tuszyńska, Pawlak, 2019).

The health of individuals and populations is linked to care for the environment, social development, and the level of economic development of society. Some researchers assume that it is impossible to implement economic growth within the concept of sustainable development without taking into account the special role of health and activities aimed at its protection (Suchanek, 2013).

In principle, the health care system itself, whose primary task is the health safety of citizens. Due to the limited financial and human resources remaining in the system, it must balance the health needs of society, as well as assume the participation of individual people in self-financing their health needs in various categories (Michaluk-Mazurek, 2019). Under the UN Sustainable Development Goal 3, we can also talk about activities aimed at improving the mental health of society. Mental health is defined as "a dynamic state of internal balance that enables individuals to use their abilities in harmony with universal social values. Basic cognitive and social skills; the ability to recognize, express and modulate one's own emotions as well as compassion for others; flexibility and ability to cope with adverse life events and perform functions in social roles; and a harmonious relationship between body and mind are important components of mental health that contribute to varying degrees to a state of internal balance" (Galderisi, Heinz, Kastrup, Beezhold, Sartorius, 2017). The state of mental health and the ability to find one's place in the psycho-socio-economic environment will depend on many factors, but remain in constant connection with the issue of physical health (Niewielska, 2021), including the state of oral health, which affects the level of self-confidence (Romaniuk-Demonchoux, 2020).

4. RESEARCH METHODOLOGY

The work is based on the analysis of data collected by the Polish Central Statistical Office and the Polish National Health Fund regarding the number of health services financed from public funds and the financial outlays for these services, as well as the analysis of applicable legal acts regarding the objective and subjective scope of universal insurance coverage for dental needs. Time range 2016–2022 (for numerous services provided) and 2008–2021 (for financial data). The spatial scope is the area of the Republic of Poland.

5. DENTAL SERVICES FINANCED FROM PUBLIC FUNDS IN POLAND

The provision of dental services financed from public funds in Poland results from the provisions of the Act on health care services financed from public funds (Act, 2004), the Act on medical activities (Act, 2011) and the Regulation of the Minister of Health on guaranteed benefits in the field of dental treatment (Act, 2013). In the latter document, which is modified from time to time, you can find an extensive list of health services, which include:

- general dental services,
- general dental services for children and adolescents up to 18 years of age (including those provided in the dental bus and in the dental office located at school),
- general dental services provided under general anesthesia,
- dental services for beneficiaries at high risk of infectious diseases, including AIDS patients,
- dental surgery and periodontology services,
- orthodontic services for children and adolescents,

- dental prosthetics services,
- providing dental prosthetics for beneficiaries after surgical treatment of facial cancer,
- provision of emergency dental care,
- preventive dental services for children and adolescents up to 19 years of age (including those provided in the dentist's bus and in the dental office located at school).

A simplified list of benefit groups and their limitations are presented in Table 1.

Table 1. Simplified list of restrictions of dental services financed from public funds in Poland

Services group	Quantitative and qualitative limitations	Subject limitations
Oral hygiene examinations and instructions; medical consultations	Limited number of services per time period	Increased frequency in pregnant and postpartum women
X-ray diagnostics	Limited number of services per time period; Limitation regarding of dentist specialization; Limitation of dental equipment	Increased number of services for people up to 18 yo
Conservative dentistry	Material limitations	A wider range of materials for people up to 18 yo
Endodontics	Treatment of incisors and canines; Limitation of dental equipment	Treatment of all teeth in pregnant and postpartum women and for people up to 18 yo
Periodontology	Limited number of services per time period	A wider range of services for pregnant women and the postpartum period, as well as for people up to 18 yo
Dental surgery	-	-
Dental prosthetics	Type (acrylic dentures) and material limitations; Limited number of services per time period	The restrictions do not apply to people after surgical removal of craniofacial tumors
Pediatric dentistry – adaptation visit	Independent visit without other services	Until the age of 6
Preventive services for children	Only specific tooth groups; Place of providing services (school dental office, general dentist's office, dental bus)	Age restrictions
Pediatric dentistry in general	Restrictions on the type of teeth (baby/permanent)	Age restrictions
Orthodontic diagnosis, orthodontic treatment and orthodontic treatment control	Type limitations (one- and two-jaw appliances)	Age restrictions

Source: Own study based on the Regulation of the Minister of Health of November 6, 2013 on guaranteed benefits in the field of dental treatment (Act, 2013).

Despite the extensive list of dental services provided and paid for by the public payer, it has a number of exceptions and limitations, especially regarding the number of services provided of a given type, their frequency, equipment and material limitations, as well as limitations regarding the patients themselves (usually an increased scope of services for children and adolescents and also for pregnant women and the postpartum period).

The greatest limitations, especially from the point of view of conservative dentistry and the aesthetic final effect of treatment, are material limitations. The regulation lists in detail what types of dental materials may be used when providing dental services financed by the National Health Fund to specific groups of patients. This list is presented in Table 2.

Table 2. Materials used in the provision of dental services financed from public funds in Poland

Groups of beneficiaries	Dental materials
All patients	<ul style="list-style-type: none"> • material for temporary fillings, • base cements based on calcium hydroxide, phosphate cement, • glass ionomer cements, • chemically hardened composite material for filling cavities in upper and lower front teeth (from 3+ to +3, from 3- to -3), • non gamma 2 capsule amalgam, • materials for filling root canals, • gutta-percha points, • alginate impression material, • material for functional impressions in edentulism, • surgical sutures, • immobilization splints, ligature wire.
Children and adolescents up to 18 yo	<ul style="list-style-type: none"> • light-cured composite material for filling cavities in incisors and canines in the upper and lower jaws, • fissure sealants, • varnishes, • surgical cement as a dressing for periodontal procedures.
Pregnant and postpartum women	<ul style="list-style-type: none"> • surgical cement as a dressing for periodontal procedures.

Source: Own study based on the Regulation of the Minister of Health of November 6, 2013 on guaranteed benefits in the field of dental treatment (consolidated text: Journal of Laws of 2021, item 2148).

Minors can count on the best dental materials. A particularly large difference is visible in the case of conservative dentistry, i.e. in the types of fillings for cavities.

As can be seen in Table 3, the number of dental consultations within the public system remains at a similar level of 33-34 million consultations per year in 2016-2022 (except for 2020-2021, which can be explained by the COVID-19 pandemic crisis). The number of dental consultations within the public system usually constitutes approximately 11-12% of the number of medical consultations in a given year and this percentage remains at a relatively similar level. However, in financial terms (Table 4), the value of dental services in relation to all services financed by the public payer is constantly decreasing. The planned cost of dental services in 2008 represented 3.83% of the planned expenses for all medical services, and in 2021 it was to be only 1.72%.

Table 3. Number of medical consultations and the number of dental consultations financed from public funds in Poland in 2016–2022 (in millions)

Year	Number of medical consultations	Number of dental consultations	Percentage of dental advice compared to medical advice
2022	297.6	33.2	11.2
2021	285.9	30.7	10.7
2020	256.6	26.5	10.3
2019	291.5	34.3	11.8
2018	288.2	34.4	11.9
2017	285.7	34.5	12.1
2016	282.5	34.5	12.2

Source: Own study based on(GUS 2017, GUS 2018, GUS 2019, GUS 2020, GUS 2021, GUS 2022, GUS 2023).

Table 4. The value of dental services financed from public funds in Poland compared to all medical services financed from public funds according to the National Health Fund's expenditure plans in 2008–2021 (in PLN million)

Year	Total medical services	Dental services	Percentage of expenditure on dental services in relation to total services
2008	49 348	1 889	3.83
2009	53 498	1 964	3.67
2010	56 415	1 716	3.04
2011	58 399	1 753	3.00
2012	61 698	1 801	2.92
2013	62 974	1 774	2.82
2014	63 792	1 773	2.78
2015	67 879	1 763	2.60
2016	70 793	1 781	2.52
2017	74 064	1 822	no data
2018	77 509	1 901	2.45
2019	91 122	1 912	2.10
2020	102 132	1 911	1.87
2021	120 151	2 070	1.72

Source: (NIL, 2019).

6. DISCUSSION

Despite many voices, especially in the media, saying that dental treatment under the National Health Fund is practically impossible (Stec-Fus, 2023), expenditure on this field of health care is nominally increasing. However, taking into account the share of dentistry in the general expenditure of the public payer, this amount is decreasing every year. From the point of view of the significantly increasing costs of medical entities, operating within the public health care system seems to be unprofitable for many of them (Zagórski, 2021).

Undoubtedly, restrictions on the financing of dental services result in longer queues to the dentist. Although there are voivodeships in Poland where the waiting time for an

appointment under the National Health Fund is about a week, in others this time is extended to almost a month (Dentonet, 2023a).

The value of the dental market in Poland in 2024 is estimated by PMR Market Experts at PLN 16 billion (Dentonet, 2023b). The National Health Fund plans to allocate PLN 3.3 billion for dental treatment (Dentonet, 2023a). Therefore, it can be assumed that nearly 80% of dental services in Poland will be paid for commercially (most often from patients' private funds and voluntary insurance). However, it should be remembered that income, education and place of residence influence the use and non-use of dental services and we can talk about health inequalities (Piotrowska, Pędziński, Jankowska, Milewska, 2020).

Dentistry is the branch of medicine that particularly recognizes the need for preventive measures. This is due to, among others, due to the high prevalence of dental diseases and the often ineffectiveness of the treatment undertaken (Jańczuk, 2018). On the one hand, this idea fits into the financial decisions of the National Health Fund in the field of dentistry, because the National Health Fund actually finances preventive activities, and on the other hand, the relatively narrow and shallow scope of the guaranteed benefits package causes some patients to resign from these services, which may even result from ignorance, what they are entitled to under universal health insurance. Of course, the basis for preventive activities should be health education from an early age (Banasiuk, Uracz, Lishchynskyy, Brukwicka, Kopański, 2017; Szeroczyńska, 2023). Its lack may result in negative health effects throughout life, but when properly implemented, it may bring positive effects - not only health-related, but also economic, due to the lower need for medical interventions or their better and longer-lasting effects (Anopa, Macpherson, McMahon, Wright, Conway, McIntosh, 2023). Appropriate actions from the point of view of prevention and education include, on the one hand, a fairly wide range of benefits for people up to 18 years of age, and on the other hand, the correction coefficient introduced in 2019 for services provided in this age group at the level of 1.5, i.e. the entity providing the benefit receives 50% more remuneration for these benefits than if they were provided to adults (Act, 2019).

Living in good health is one of the sustainable development goals. Due to the broad definition of health as physical, mental and social well-being, this topic should be considered in many aspects. Dental problems, diseases of the masticatory system or tooth loss also adversely affect other functions of the human body (DTP, 2011), but they also directly affect the quality of people's lives (Kuryu, Niimi, Gotoh, Shimizu, Kobayashi, 2019). Researchers also calculate that the loss of a tooth or teeth is equivalent to a decrease in the value of the QALY indicator (Wigsten, Kvist, Jonasson, Davidson, 2020), i.e. further quality-adjusted years of life, which is intended to optimize the choices of health interventions (Topór-Mądry, Gilis-Januszewska, Kurkiewicz, Pająk, 2002).

Although the beginnings of the COVID-19 pandemic indicated that its duration may impede the implementation of the Sustainable Development Goals, including Goal 3, related to health (Kaczmarek, 2020), problems with access to health services at that time made many people realize how important it is taking proper care of their health, increasing public health awareness.

7. CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

The inability to cover many dental services under general health insurance means that some consumers will pay for these services from their own funds, but others will forgo them, especially in the case of relatively minor health problems or simply dental

prophylaxis. Preventive and educational activities in the field of oral health and hygiene are most often not only more effective, but also more economically rational. Advanced disease states, however, may lead to far-reaching consequences - specialized treatment or the appearance of missing teeth. This causes problems for the patient - social (related to appearance, lack of self-confidence) and economic (costs). However, it is not only the patient/consumer who bears the economic costs. The public payer finances part of the services in the field of dental prosthetics and dental surgery, which are cost-intensive branches of dentistry. Moreover, worsening dental problems may negatively impact a person's overall well-being and go beyond the scope of interest of a dentist. This may result in the need for additional expenditure on the part of the National Health Fund for the treatment of diseases that may be directly or indirectly caused by negligence in the oral cavity.

Particularly noteworthy are activities in the field of prevention and dental education, which influence not only the maintenance of good health, but also proper health habits, and, consequently, influence a better quality of life, self-confidence and a better place in society. At the same time, these are the activities that the public payer should focus on. However, we cannot forget about other services, the significant limitations of which in terms of implementation or quality may lead to further migration of patients towards private health care, and in the case of some of them, to giving up dental treatment and creating further health inequalities. However, this cannot be done without significant increases in expenditure on public dentistry, which, although nominally increasing year by year, is falling dramatically in relation to the overall expenditure of the National Health Fund on health care.

Due to the fact that this work is largely based on secondary data and applicable legal acts, it lacks a broader perspective from both health care entities and patients themselves. In further considerations, it would be appropriate to conduct direct research among managers of dental entities in Poland and among consumers. It seems that qualitative research would be the most appropriate, and in the case of patients, additionally quantitative research. Another imperfection is the different time frames for quantitative and financial data on benefits financed from public funds, which results from the limited data published by the Polish Central Statistical Office (GUS).

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