

Dental services market in Poland and its impact on the health decisions of patients and doctors



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Abstract

Aim The aim of the paper is to verify the impact of the current dental services market in Poland on the society decisions regarding dental treatment as well as to assess the differences in the valuation of commercial and public dental services.

Materials and methods Study Design: In the first step 1,444 subjects including children, adults and elderly were subjected to a questionnaire survey to characterise them in terms of sex, age, place of residence and level of education, type of dental treatment used including services privately funded and reimbursed by the National Health Fund and the reasons of his/her decisions. In the second step we compared the results of the survey to the average price of commercial and reimbursed procedures to verified a possible correlations between them. The research tool was a questionnaire survey by the author. The questionnaires were distributed among randomly selected kindergartens, schools, workplaces, senior clubs, social care homes and random passers-by in the streets. Average prices of dental procedures were based on price lists of 12 commercial offices and National Health Fund's contract conditions for the reimbursed services.

Results Dental treatment solely financed privately has been chosen by 35% of people aged under 18. The main reason for the choice of privately funded dental treatment was a long waiting time for a visit reimbursed from public funds. The largest difference in prices for the commercial and public services exists for the endodontic treatment (125 EUR). Statistics: Pearson's chi-square test and the HR were used to verify the relationship between nominal and order variables. The study of the causes and the relationship between the method of financing the treatment and other variables was carried out in the first step based on one-way logistic regression analysis. The p value of <0.05 was considered statistically significant.

Conclusions Regardless of the age, Poles are far more likely to use private dental care. The level of education affects the form of financing of the dental treatment of children. There is a large disproportion between the revenues of private and public dental offices providing the same dental services.

KEYWORDS Dental services; Poland; Dental treatment.

Introduction

According to the Organization for Economic Co-operation and Development (OECD) report published in March 2018, the Polish economy has been constantly developing for several years, making Poland a country with a high economic potential [OECD, 2018]. It is forecast that Poland will soon be a key partner in the European market. With the lowest unemployment index for 20 years (4.2%), an increase in the level of wages, and a

strong pro-social government policy, the standard of living of society as a whole has been raised. In consonance with recent Eurostat data, a record high level of the Polish GDP is not without relevance, which in the first quarter of 2018 increased by the largest amount in the whole of the European Union by quarter-over-quarter count [Eurostat, 2018]. To maintain a positive trend, the OECD points to a strong need for investment in the health sector. However, there is concern that despite the increase in investment in the Polish health sector, the advancement of the dental care situation will, as usual, be marginalised. In most European countries, a larger proportion of the population indicates some unmet needs for dental care than for medical care. This is mainly because dental care in many countries is only partially included (or not included at all) in public schemes and so must either be paid out-of-pocket or covered through purchasing of private health insurance. The WHO, through the third Sustainable Development Goal (SDG), points to the importance of guaranteeing universal health coverage to all people and communities, ensuring healthy lives, and promoting wellbeing for all ages [DSDG, 2016]. Whereas the healthcare system represents a key point for policymaking, oral healthcare issues rarely represent a priority for health policy agendas, as they are not life-threatening [Patel, 2012; Bellaa et al., 2017]. The estimated percentage of GDP spent on oral health in 2013 or 2016 in most European countries presented in Figure 1 proves that the financial resources allocated to dentistry are too small in relation to the existing needs of treatment. Poland's public spending in this sector is one of the lowest in Europe [OECD, 2018]. Dental benefits are treated particularly marginally. Only 2.4% (0.44 billion EUR) of the entire budget of the National Health Fund (NHF) constitutes public funds for dental services in 2018 [NHF, 2018]. The rigorous public budget enforces a limited amount and type of reimbursable dental services, which in turn implicates a tendency of patients to privately fund dental treatment. [Tomaszewski, Matthews-Kozanecka, 2018]. This translates directly into the shape of the current market of dental services in Poland. Recent findings of research and consulting companies, describing the Polish market of dental services, define it as a sector prone to growth. According to the forecasts for 2015-2020, the market of dental services will continue to develop intensively. The projected average annual growth of services at the level of about 7%, will generate its value at the end of 2020 in the amount of EUR 2.93 billion. The valuable share of private expenditure on dental care in Poland will increase from 79% in 2014 to 86% in 2020 [Tomaszewski, Matthews-Brzozowska, 2018]. An affirmation to that can be a report from the Central Statistical Office, which on one hand informs that the number of ambulatory healthcare facilities, including dental clinics, has

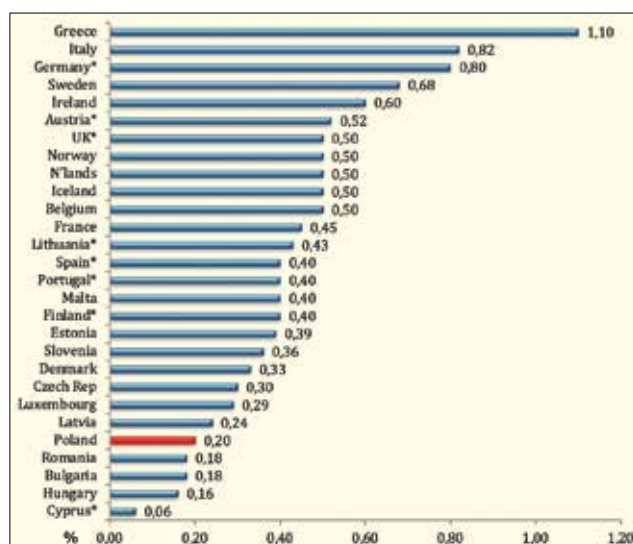


FIG. 1 Estimated percentage of GDP spent on oral healthcare in 2013 (*2016) in Europe.

been growing for several years and, on the other hand, the number of dental practices providing services from public funds has been decreasing from 5300 dental offices in 2010 to 4300 dental offices in 2016 [Główny Urząd Statystyczny - Central Statistical Office, 2017]. It can be assumed that the reason for this state of affairs are, on one hand, low rates offered by the NHF to dentists for implementing reimbursable dental procedures and, on the other hand, increased demands and expectations of patients. A growing awareness of their own health on the part of Poles, their desire to improve oral health, access to the latest technologies in the field of dental treatment (non-refundable) and societal affluence are the main determinants of the growing interest in commercial dental services. While people can give a number of reasons for not receiving care, the data presented in this paper concentrate on reasons related to health care systems, including financial reasons (too expensive), reimbursing and not reimbursing treatment, long waiting times, quality of the material used in private clinics. Differences in the reporting of unmet care needs across countries may be partly due to differences in social norms and expectations. However, these factors are likely to play a lesser role in explaining any differences among population groups within each country. Self-reported unmet care needs must be interpreted in conjunction with other indicators of potential barriers to access, such as the extent of health insurance coverage and the amount of out-of-pocket payments, as well as the actual use of health services [OECD, 2018].

The aim of this paper is to verify the influence of the current shape of the dental services market in Poland on the decisions of society in regards to dental treatment in terms of the factors determining the method of choice in financing dental treatment and an estimation of the differences in pricing of commercial services and services reimbursed by the NHF.

Materials and methods

The research tool was a questionnaire survey devised by the author, relating to the provision of dental services for Greater Poland residents. In 2016 a total of 2,000 questionnaires were distributed and 1,492 of them were returned. 48 questionnaires were incorrectly filled out and, therefore, they were rejected. Statistical analysis comprised of 1,444 surveys. Surveys were

aimed at people inside three age groups: children (individuals under 18 years of age, filled out by both parents - mother and father) – 570 respondents, adults (individuals between the ages of 19 and 64 years) – 706 respondents, and the elderly (individuals over 65 years of age) – 168 respondents. The number of respondents in each group was selected in such a way as to best reflect the age structure of the regional citizens. The study was conducted in rural areas, small and large cities, so that the survey results corresponded to the population of Greater Poland Voivodeship in the best way. The questionnaires were distributed among randomly selected by authors kindergartens, schools, workplaces, senior clubs, social care homes and random passers-by in the streets of the region. The characteristics of the study group were presented in the Table 1. Participation in the study was voluntary and anonymous. The study involved inhabitants of villages, towns, and large cities. Each respondent was asked to complete a questionnaire in which they answered 3 blocks of questions. The first metric served to classify the respondent according to sex, age, place of residence and level of education. In the second block of questions, respondents indicated the type of dental treatment they used in 2015, including services privately funded and reimbursed by the National Health Fund. The questionnaires provided (in the second block of questions) a list of 40 most common dental procedures. In the third block, respondents gave reasons for their choice of private or public dental care and reason for non-use of dental treatment (if respondents did not use any during the whole year). All of the questions in the third block were closed questions and respondents chose one answer from the list of reasons most frequently mentioned in different international and national reports. In the conducted studies, the influence of factors such as age, education or place of residence on decisions regarding dental treatment was verified.

The average price of commercial procedures for the selection of dental services in 2015 was adopted on the basis of price lists of randomly selected by authors 12 dentist offices (without any distinction between general and specialist practices). As for services reimbursed by the NHF the value was defined by the NHF's contracts for the years 2014–2017. For each commercial dental service the lowest and the highest prices were removed, the average cost of dental care was then calculated. Pearson's chi-square test and the HR (the highest reliability) were used to check the relationship between nominal and order variables. The p value of <0.05 was considered statistically significant.

The study of the causes and the relationship between the method of financing the treatment and other variables was carried out in the first step based on one-way logistic regression analysis. Its results made it possible to perform a multivariate analysis in which only independent variables were used, which turned out to be statistically significant in the univariate analysis.

The research was carried out with the written consent (Resolution No. 394/16 of 06.04.2016) of the Bioethics Committee at the Karol Marcinkowski Medical University in Poznan. The research was self-financed and thus the authors did not receive any subsidies from any funding agency in public or commercial sectors.

Results

The analysis of studies using Pearson's chi-square test showed a significant relationship between the age of the respondents and the form of financing of the dental treatment ($p < 0.001$). The results of this dependence are presented in Figure 2. Among

Age	Gender		Place of residence			Education					
	Male	Female	Village	Town	Large City	Basic		Secondary		High	
up to 18	248	322	258	282	30	Mother	Father	Mother	Father	Mother	Father
						19	24	149	185	117	76
19-64	234	472	210	220	276	27		331		348	
over 65	58	110	69	62	37	52		95		21	

TABLE 1 Demographics of sample population

the respondents who used private dental services, the highest percentage is people in the age group of 19 to 64 years (56.4%), and the lowest is in the group of people aged over 65 years (8.8%). Dental treatments provided by the NHF were the most popular among children and adolescents under 18 years of age (49.3%). Among people who have used dental treatments both privately and as part of the NHF, the highest percentage was of children up to 18 years old (55.5%). Among those surveyed who did not use dental services at all, the highest were people over the age of 65 (27.5%) and the lowest were children under the age of 18 (19%).

The main reason for parents to treat a child in a private dentist's office was the long waiting time for a visit reimbursed by the NHF (63.4% of parents), better materials and equipment (52.9% of parents). Most frequently, children did not undergo dental treatment because of their fear of it (28 subjects). The results are presented collectively in Figure 3.

For all age groups, a statistically significant relationship was found between education and the form of financing for dental services. Among children who used only private dental services, the highest percentage are children whose parents have higher education (49.6%). Among children who received dental services only under the NHF, the highest percentage are children whose parents have basic education (44.4%). Among children who did not use dental treatment at all, the highest percentage are children whose parents have primary education (22.2%), and the lowest are children whose parents have higher education (3.9%). The results of the multivariate logistic regression analysis both in the group up to 18 years of age and among people aged 19-64 years old, the logistic regression model turned out to be significant ($p < 0.0001$) for the variables "place of residence" and "education". It turned out that a child living in the city has 1.79 times greater chance (is more willing) of using private benefits than a child living in the country (with the remaining independent variables remaining at the same level) ($p = 0.0350$). The mother's education also played a role, as a child whose mother had higher education has a 3.34 times greater chance of using private benefits than a child whose mother did not have higher education (with the remaining independent variables remaining at the same level) ($p < 0.0001$). Variables such as age, school location and father's education turned out to be statistically insignificant.

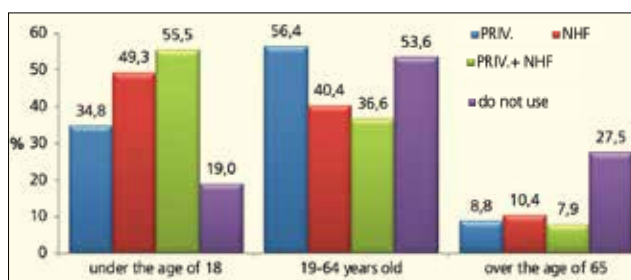


FIG. 2 Financing form of the dental services chosen by the 1444 respondents in 2015 – division by the age of the respondent.

The shape of the current market of dental services is dictated, in a sense, by the divergence of commercial prices and prices which are reimbursed by the NHF for services rendered.

Table 2 summarises the average income gained by the offices from sample dental services divided into private clinics and clinics remunerated by the NHF. The highest price differentiation occurs in the case of endodontic treatment of a three-canal tooth (EUR 125), and the lowest in the scope of radiological diagnostics services for both dental arches (EUR 0.21). Some services are not covered by the possibility of a reimbursement, hence only financing from household funds is possible in their case. The most expensive of these include treatments in the field of prosthetics, implantology and orthodontics.

Discussion

The share of household consumption allocated to medical spending varied considerably across EU countries in 2014 but on average was 2.3%. [OECD, 2016]. Payments for dental treatment also represent a significant part in household medical spending, accounting for nearly one-fifth of all out-of-pocket expenditure across the European Union. In Spain, Denmark and Estonia, this figure reaches 30% and more. This can at least partly be explained by the lack of public coverage for dental treatment and prosthesis in these countries compared with a more comprehensive coverage for other categories of care [OECD, 2017]. The relatively high tendency of the inhabitants of Greater Poland Voivodeship, demonstrated in the conducted studies, to self finance dental treatment finds its backing in the research results of other independent sources. According to a Central Statistical Office report, approximately 40% of Polish households use solely private dental treatment [Główny Urząd Statystyczny, 2013]. The Organization for Economic Co-operation

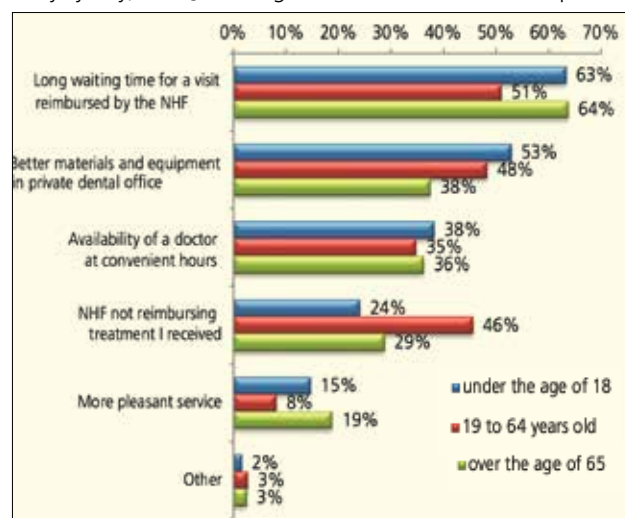


FIG. 3 Factors determining the choice of dental treatment financed from private funds.

Dental services	Private	Nhf	Difference
Root canal treatment of a three-canal permanent tooth	164	39	-125
Root canal treatment of a two-canal permanent tooth	143	40	-103
Canal root treatment of a single-canal permanent tooth	125	27	-98
Partial acrylic denture	195	106	-89
Removable orthodontic appliance	156	112	-44
Diagnosis of lesions on the oral mucosa	47	3	-44
Complete prosthesis	181	139	-42
Plastic surgery of the frenulum	44	11	-33
Removal of tartar deposits	41	11	-31
Permanent tooth extraction	35	7	-28
Composite filling of a permanent tooth	36	13	-23
Incision of abscess (+ possible drainage)	24	5	-19
Temporary deciduous or permanent tooth filling (dressing)	16	3	-13
Deciduous tooth filling	20	8	-12
Orthodontic control visit with removable appliance	17	6	-11
Implant + crown	933	Non refundable	
Fixed orthodontic appliance, without control visits	516	Non refundable	
Partial skeletal denture	328	Non refundable	
Crown or 1 point in blocked crowns, "bridge"	163	Non refundable	
Root-crown post	59	Non refundable	
Orthodontic visit with a fixed appliance	29	Non refundable	

TABLE 2 Average prices in Euros of selected dental services in private and reimbursed by the NHF clinics, and completely nonrefundable services in Greater Poland voivodeship in 2015.

and Development (OECD) reported that the Poles cover as much as 63.9% of their expenditure on dental treatment from the household budget [Lella, 2013]. In this way, citing estimates of The National Institute of Public Health from 2015, Polish households spend about (EUR) 1.8 billion annually on private dental treatment. The main reasons indicated by the residents of Greater Poland for the choice of commercially-financed treatment were a long wait time for a visit reimbursed by the NHF and better equipment and materials in private offices. It can be assumed that long queues, a limited list of reimbursed services and a specific type of dental materials used in their implementation are a source of a strictly defined budget of public funds for dental treatment. The growing demand for quality of services is also not insignificant. The growing number of dental institutions forces a change in the form of competition from price into quality. The presented research results prove that not all services are reimbursed by the state budget. Part of the unfortunately expensive dental services are self-financed to maintain better health and aesthetic aspects of oral health. Unfortunately the lack of data prevent to compare causes of increasing tendency of using privately financed dental care by Poles with reasons that guide other Europeans. Some international reports underline that in many countries, dental care is only partially included (or not included at all) in basic health care coverage, and so must either be paid out-of-pocket or covered through purchasing private health insurance [OECD, 2017]. From the point of view of the rationality of decisions made by the dentists who are also owners of dental practices, the profitability of running a business under the NHF contract seems to be meager with the current rates offered by the NHF budget. Hence, the previously mentioned diminishing number of such offices. On the other hand, the offer of dental treatment in an office providing both commercial and reimbursable services may attract a greater number of patients who use services financed from the state budget ensuring a stable income of revenue needed to cover a part of fixed costs. Furthermore some patients opting for additional commercial services will

generate additional revenue for the office.

The studies performed by some authors showed that among the main reasons, for which respondents decided to resign from dental treatment was a fear of treatment (all age groups). Worth noticing is the fact that the aspect of location unawareness of the available dental offices should be excluded, because about 94% of the surveyed population declared that they knew where, in the immediate vicinity of their place of residence, there is a dental surgery, both private and with a contract for reimbursed services. The results obtained closely correspond to the results of other authors' research. The scientific community provides some of the most important reasons for the lack of regularity in dental visits. These include factors such as fear of pain and lack of time. The Eurobarometer survey of 2009 focused on a group of 27 EU member countries and the three countries applying for membership, and shows that for 33% of the respondents, the reason for avoiding the dentist was disregard of the problems of the oral cavity, for 16% it was absence of teeth or dentures, 15% indicated expensive treatment, and 10% suffered from fear called dentophobia [Lella, 2010].

The study conducted by the Central Statistical Office (CSO) "Healthcare in households in 2013" shows that for nearly half (48.8%) of Poles surveyed, the financial aspect was the most important. Other causes were "long waiting time for an appointment" and fear of treatment; 16.1% and 12.5% respectively. CSO's research result is therefore different from the data obtained in the study carried out by the authors in terms of the most significant reason. At the same time, it is worth mentioning that the CSO research refers to research done in 2013, which is 2 years earlier than the authors' research [Piotrowska et al., 2018; CSO, 2015].

Gmyrek-Marciniak [2004] unequivocally states that a difficult economic situation is among the main reasons for not taking dental treatment. The problem of the cost of dental treatment so often raised was also examined by the Department of Marketing Services and the Faculty of Management and Economics of Services at the University of Szczecin. It turns out that the amount

of income per person in the household has a large impact on the undertaking of dental treatment. This is particular of people with income of 70–120 EUR per 1 person in a family. As many as 81% of respondents declare that income affects the frequency of visits. Although, as revenue increases, the impact loses its importance, in the opinion of respondents it remains relatively high (around 60%), with the exception of the group with an income above 280 EUR per 1 person in the family, among which for 40% of this group, income affects the regularity of visits to the dentist's office [Gracz, Świdarska, 2011].

Research [www.dlazdrowia.pl, 2016] shows that for the average European, high costs of treatment are an important reason for avoiding dental offices (40%). A visit to the dentist due to its cost is most often postponed by the Irish (51%), Spaniards (50%) and Poles (49%) while the least likely to do so are the French (24%) and the Germans (25%). Among the reasons for the lack of regularity, the aforementioned fear of a dentist called dentophobia is indicated. According to the research, every third European person admits that it is fear that decides about avoidance and postponement of subsequent visits. In this regard, the Poles are in the lead, fearing dental treatment the most of all the people of Europe (39%). To a lesser extent, this applies to residents of Great Britain (25%) and France (26%) [www.dlazdrowia.pl, 2016].

The present research shows a correlation between the level of education and the type of financing of dental care. Along with the increase in the level of education of the respondents, the tendency to choose treatment financed from their own funds increases. This may be caused by greater awareness of oral health among Poles and the need for dental services that are not reimbursed by the NHF. EUROSTAT data show that the reasons for not using dental services differ depending on the level of education, although the published statistics do not indicate whether these differences are statistically significant. According to this source [Eurostat, 2018], in Poland in 2016 among people with higher education, 1.3% did not use benefits due to financial reasons, 1.8% due to lack of time, and 0.7% due to fear of treatment. In the case of people with primary (basic) education it was correspondingly 3.6%, 0.4% and 1.2% of respondents. In other EU countries, similar relationships are observed, and the differences are only visible in the proportion of statements. In this context, observations showing that as the level of education increases, the level of income increases [Wołoszczyn, Głowica-Wołoszczyn, 2015; Wałęga, 2010] and thus the number of people not using dental care decreases [Tchicaya, 2014].

Conclusions

1. The level of education affects the form of financing of the dental treatment. In all three age groups, there is a positive correlation between the level of education and the form of financing. Across all age groups, household funds was the most common means of financing the treatment for people with higher education. This is the most evident among people of working age, where nearly 60% of respondents declared purely commercial treatment.

2. Regardless of age, Poles are far more likely to use private dental care rather than dental services reimbursed by the NHF.

3. The main factors determining the choice of privately funded dental treatment are: a long waiting time for a visit reimbursable from public funds, as well as better equipment and materials in private doctors' offices.

4. There is a large disproportion between the revenues of private and public offices for performing the same dental services.

5. Due to profitability reasons, doctors are more and more willing to give up contracts with NHF for reimbursed treatment and to offer only privately financed services what can influence on the children treatment. I can positively impact on quality of treatment but negatively on willingness to treat because of need of selffinancing the service..

Author contributions

Conceptualization: M.T. and T.M-B; Methodology: M.T.; Validation: M.T. and T.M-B.; Formal analysis: M.T. and T.M-B.; Investigation: M.T.; Resources: M.T.; Data curation: M.T.; Writing: (draft) M.T.; Writing (final version) M.T. and T.M-B.; Visualization: M.T.; Supervision: T.M-B.; Project administration: M.T.; All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

References

- › Bellaa E, Leporattib L, Montefioria M, Krejci I, Arduca S. Popular initiatives in 2014–2016 call for the introduction of mandatory dental care insurance in Switzerland: The contrasting positions at stake. *Health Policy* 2017, 121, 575–580.
- › Committee on Oral Health Access to Services. Improving access to oral health care for vulnerable and underserved populations. National Academies Press 2011.
- › Eurostat, GDP and main aggregates estimate for the second quarter of 2018; 2018, 139/2018 - 7, 1.
- › Eurostat. Self-reported unmet needs for dental examination by sex, age, main reason declared and educational attainment level. www.appso. eurostat.ec.europa.eu, access 7.05.2018.
- › Główny Urząd Statystyczny. Healthcare in households in 2003. 2014, 51
- › Główny Urząd Statystyczny. Zdrowie i ochrona zdrowia w 2016 roku. 2017, 119-120.
- › Gmyrek-Marciniak A. Wpływ warunków ekonomicznych na zdrowie jamy ustnej. *Magazyn Stomatologiczny* 2004, 14, 2, 70-72.
- › Gracz L, Świdarska J. Społeczne i ekonomiczne uwarunkowania podejmowania przez pacjentów leczenia stomatologicznego. *Hygeia Public Health* 2011, 46 (1), 77-82
- › Lella A. Światowy dzień zdrowia jamy ustnej. *Gazeta Lekarska* 2013, 03/2013, 11-13
- › Lella A, Korkosz T. Obcęgi i wiertło czy szczotka. *Menedżer Zdrowia* 2010, 6, 74-79
- › Manning W, Newhouse J. The demand for dental care: evidence from a randomized trial in health insurance. *J Am Dent Assoc*, 1985; 110, 6, 895-902.
- › National Health Fund. Financial Plans of the NHF 2012 – 2018. 2018.
- › OECD. Health at a Glance: Europe 2016 State of health in the EU cycle. 2018
- › OECD. Health Care Coverage in OECD Countries in 2012. *OECD Health Working Papers* 2016, 88
- › OECD. Health Care Coverage in OECD Countries in 2013. *OECD Health Working Papers* 2017, 89
- › OECD. OECD Economic Surveys: Poland. 2018, 10.
- › OECD Health Statistics. Eurostat Database. WHO. Global Health Expenditure Database. 2016
- › OECD Stat. Health expenditure and financing 2018. 2018, 1.
- › Patel R. The state of oral health in Europe. Report commissioned by the platform for better oral health in Europe 2012, 68.
- › Piotrowska D, Pedziński B, Jankowska D, Milewski R, Szpak A. Reasons why Poles do not use dental care. *Medycyna Ogólna i Nauki o Zdrowiu* 2018, 24, 3, 191–194
- › Tchicaya A, Lorentz N. Socioeconomic inequalities in the non-use of dental care in Europe. *Int J Equity Health* 2014, 13(1), 7–10
- › Tomaszewski M, Matthews-Brzozowska T. The possibility of modification and improvement of dental services in Poland for children and adolescents with special emphasis on orthodontic service. *European Journal of Paediatric Dentistry* 2018, 19/1-2018, 49-55.
- › Tomaszewski M, Matthews Kozanecka M. Skłonność do leczenia stomatologicznego — doniesienie wstępne. *Dental Forum* 2018, XLVI(1), 35–41
- › United Nations, Global sustainable development report; 2016, www.sustainabledevelopment.un.org, access 01.02.2017
- › Wałęga A. Wykształcenie jako determinanta poziomu i struktury wydatków gospodarstw domowych. *Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie* 2010; 817
- › Wołoszyn A, Głowica-Wołoszyn R., Dochód i wykształcenie jako determinanty stopy oszczędności gospodarstw domowych w Polsce. *Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 855 Finanse, Rynki Finansowe, Ubezpieczenia* 2015, 1, 74
- › www.cecdo.org/oral-healthcare/cecdo-database/, access 03.10.2020.
- › www.dlazdrowia.pl. Bardziej niż świeżego oddechu boimy się wiertła dentystycznego; access 27.06.2016.