

VILNIUS UNIVERSITY

VILIJĄ BERLIN

**PLANNING PROJECTIONS OF DENTIST AND DENTAL SPECIALIST  
SUPPLY AND DEMAND IN LITHUANIA UNTIL 2024**

Summary of doctoral dissertation

Biomedical sciences, Medicine (06 B)

Vilnius, 2016

The dissertation was prepared at Vilnius University in 2011–2015.

**Academic supervisor** – Prof. Dr. Alina Pūrienė (Vilnius University, Biomedical Sciences, Medicine – 06 B)

**Academic advisor** – Habil. Dr. Jadvyga Petrauskienė (Lithuanian University of Health Sciences, Biomedical Sciences, Public health – 09 B. From 2011, till 2014)

The dissertation will be defended at the Research Board for Medicine of the Vilnius University:

**Chairman** – Prof. Dr. Jolanta Dadonienė (Vilnius University, Biomedical Sciences, Medicine – 06 B)

**Members:**

Prof. Dr. Vytautas Kasiulevičius (Vilnius University, Biomedical Sciences, Medicine – 06 B)

Prof. Dr. Eugenijus Lesinskas (Vilnius University, Biomedical Sciences, Medicine – 06 B)

Assoc. Prof. Dr. Tomas Linkevičius (Vilnius University, Biomedical Sciences, Odontology – 07 B)

Prof. Dr. Mare Saag (Tartu University (Estonia), Biomedical Sciences, Odontology – 07 B)

The public defence of the dissertation will be held at the sitting of the Research Board for Medicine on 11th of February 2016, at 2.00 p.m., in the Great auditorium of Vilnius University Hospital Žalgiris Clinic.

Address: Žalgirio 115, LT-08217 Vilnius, Lithuania.

The summary of the dissertation has been sent out on the 11th of January, 2016.

The doctoral dissertation is available at the library of the Vilnius University.

The doctoral dissertation is available at Vilnius University Library and VU internet website: [www.vu.lt/lt/naujienos/ivykiu-kalendorius](http://www.vu.lt/lt/naujienos/ivykiu-kalendorius)

VILNIAUS UNIVERSITETAS

VILIJA BERLIN

**GYDYTOJŲ ODONTOLOGŲ IR GYDYTOJŲ ODONTOLOGŲ  
SPECIALISTŲ PASIŪLOS IR POREIKIO PROGNOZĖS LIETUVOJE IKI  
2024 METŲ**

Daktaro disertacija

Biomedicinos mokslai, medicina (06 B)

Vilnius, 2016

Disertacija rengta 2011–2015 metais Vilniaus universitete

**Mokslinė vadovė** – prof. dr. Alina Pūrienė (Vilniaus universitetas, biomedicinos mokslai, medicina – 06 B)

**Mokslinė konsultantė** – habil. dr. Jadvyga Petrauskienė (Lietuvos sveikatos mokslų universitetas, biomedicinos mokslai, visuomenės sveikata – 09 B. Nuo 2011 m. iki 2014 m.)

Disertacija ginama Vilniaus universiteto medicinos mokslo krypties taryboje:

**Pirmininkė** – prof. dr. Jolanta Dadonienė (Vilniaus universitetas, biomedicinos mokslai, medicina – 06 B)

**Nariai:**

Prof. dr. Vytautas Kasiulevičius (Vilniaus universitetas, biomedicinos mokslai, medicina – 06 B)

Prof. dr. Eugenijus Lesinskas (Vilniaus universitetas, biomedicinos mokslai, medicina – 06 B)

Doc. dr. Tomas Linkevičius (Vilniaus universitetas, biomedicinos mokslai, odontologija – 07 B)

Prof. dr. Mare Saag (Tartu universitetas (Estija), biomedicinos mokslai, odontologija – 07 B)

Disertacija bus ginama viešame Medicinos mokslo krypties tarybos posėdyje 2016 m. vasario 11 d. 14 val. Vilniaus universiteto ligoninės Žalgirio klinikos Didžiojoje auditorijoje.

Adresas: Žalgirio g. 115, LT-08217 Vilnius, Lietuva.

Disertacijos santrauka išsiuntinėta 2016 m. sausio mėn. 11 d.

Disertaciją galima peržiūrėti Vilniaus universiteto bibliotekoje ir VU interneto svetainėje adresu: [www.vu.lt/lt/naujienos/ivykiu-kalendorius](http://www.vu.lt/lt/naujienos/ivykiu-kalendorius)

## INTRODUCTION

The structure of professional dental care in Lithuania has gone through substantial changes since the country regained independence in 1991. During this time, dental care gradually and increasingly transitioned from a public and free-of-charge dental care system to a two-tier dental care delivery model including both private and public dentistry. In the dental care system, firstly in the private sector, and later in the public sector, too, innovative, qualitative dental materials, and complex equipment started to be used, new advanced treatment methods were mastered, therefore, the quality of dental treatment significantly improved. Dental care rapidly evolved, no obligation to receive dental treatment according to the living place existed and Lithuanian residents started to monitor the qualifications of dental care providers, their expectations and requirements about dental care increased.

Since the country's independence, the number of dentists and dental specialists in Lithuania has constantly increased. There were an average of 5.5 dentists to 10,000 inhabitants in 1992, 6.5 dentists in 2002, 10.9 dentists in 2012, and 12.1 dentists in 2013 (LR OR, 2012, 2014c; WHO, 2015). As a comparison, the average for the European Union amounted to 6.7 dentists per 10,000 residents in 2011 (WHO, 2015). In 2014, 17% of dentists were dental specialists (LR OR, 2014c). In other European countries dental specialists make up from 2% to 32% of all dentists (CECDO, 2015). Though dental caries and periodontal diseases are more prevalent among Lithuanian residents, compared to many countries in Europe (Koning, Holtfreter and Kocher, 2010; Patel, 2012), the signs of increased competition among dentists and dental specialists are empirically observed in the country. Studies show that during the economic crisis in 2010, 26.9% dentistry graduates intended to emigrate abroad (Janulyte et al., 2011).

The number of dentists and dental specialists is important for patients as well as for dentists and the dental care system as a whole. If a shortage of dentists or dental specialists is encountered, the accessibility of dental care will be limited, no competition will occur, dentists will attempt to perform part of the work that requires the qualification of dental specialist. Therefore, dental practice will be ineffective; the quality of treatments can diminish. On the other hand, a surplus of dentists or dental specialists is also a problem. If an oversupply of dentists or dental specialists is encountered, their economic wellbeing will be disturbed, professionals will work less and earn less, they will be less appreciated, they may change professions or emigrate, and a tendency to provide unnecessary treatment may occur as a result of that (McCallum, 1978; Hartshorne and Hasegawa, 2003; Wendling, 2010). All this means an ineffective use of public educational and health care system monetary resources.

The main objective of professional dental workforce planning is to ensure that in the future the country will have adequate number of dentists, satisfying the need for dental care, ensuring the availability and quality of services provided in order to guarantee optimum working conditions for dentists, lower the rate of emigration and effectively allocate public educational and health care system monetary resources. The number of dentists and dental specialists is constantly increasing in the country, therefore the planning of their supply and demand is acute for dental care system in Lithuania; in the unrestricted migration of professionals in the EU – it is acute internationally. One of the ways to evaluate the situation of dentists and dental specialists in today's dental health care services market, and their demand in Lithuania is to assess the perception of this professional group about their immediate experience and insights regarding the topic. The results of the questionnaire study will show the specificity of dentists' and dental specialists' professional practice (working hours, employment status, practice type, location, number of institutions they worked at, perceived shortage of patients, required additional workload, provision of different treatment procedures, referral patterns to dental specialists, the reasons why this is not done), future career intentions (intentions to emigrate, change profession, when they plan to retire) and their perception regarding the demand of dentists and dental specialists in Lithuania.

**The aim** of the present study was to assess the self-perceptions of dentists and dental specialists about their demand in Lithuania and to prepare the planning projections of the supply and demand of dentist and dental specialist human resources in Lithuania until 2024.

### **Objectives of the study:**

1. To assess the specificity of dentists' and dental specialists' professional practice and future career intentions.
2. To evaluate the self-perceptions of dentists and dental specialists about their supply in Lithuania.
3. To project the change of the supply and demand of dentists and dental specialists until 2024.
4. To assess if dentists' and dental specialists' projected supply will match the projected demand.

## **The novelty and significance of the study**

In 1994, J. Petrauskienė and co-authors were the first to publish planning projections of Lithuanian dentists until 2009 (Petrauskiene, Bierontas and Guogiene, 1994). In 2006, they were updated by Ž. Zakaitė. She was the first to accomplish a study of dentist requirement in Lithuania. On the basis of the study, she prepared the planning projections of Lithuanian dentist supply and requirement until 2015. This study was the last one to investigate the dentist requirement in Lithuania and project dentist supply and requirement in the country.

The results of our study summarise the specificity of dentists and dental specialists' professional practice and future career intentions. The data of the questionnaire study depict dentists and dental specialists' perception of their demand in Lithuania and refer to their immediate experience and insights in today's dental health care services market. In the past, this has not been investigated. This study is the first to analyse dental health care services market in greater detail.

In this study, the planning projections for dentist and dental specialist supply until 2024 is structured and presented. The latest data available from the Lithuanian and foreign authorities, trends in the recent years, and the results of the study were used for this purpose. As the point of reference, the present number of dentists and dental specialists in Lithuania and the number of Lithuanian residents and their demographic characteristics were used to structure the planning projections for dentist and dental specialist demand for the next decade. Last time planning projections of dentist supply and requirement were composed in 2006. Our study is the first to analyse dentist workforce from the demand point of view. The topic of planning projections of dental specialist supply and requirement or demand in Lithuania has never been analysed before.

The results of the study are useful for the authorities responsible for the planning and effective use of dentist and dental specialist human resources in Lithuania. The study data is a recommendation for the Ministry of Health of the Republic of Lithuania and universities how to adjust the admission of students for dental studies and dental residency programs and how to distribute state-funded study places for residency specialties. The planning of dentist and dental specialist human resources is important in order to ensure the availability and quality of services provided, to guarantee the optimum working conditions for dentists, lower the rate of emigration and effectively allocate public educational and health care system monetary resources. Published data are useful for high school graduates who consider studying dentistry and dental students for choosing a residency program.

The results of the study and the planning of dentist and dental specialist workforce in Lithuania are also important internationally – EU qualified dentists and other dental workers, who are EU citizens, are legally permitted to work in their chosen profession anywhere within the EU, over or under production of dentists or other dental workers in one EU member state can have consequences for all other member states.

## SUMMARY OF THE DISSERTATION

**The structure and volume of the thesis.** The dissertation is written in Lithuanian. The thesis includes the following chapters: Introduction, Review of the Literature (divided into three subchapters), Material and Methods, Results, Discussion (divided into four subchapters), Conclusions, Practical recommendations, References, Published articles and conference reports list, Acknowledgements and Annex. The thesis consists of 145 pages of text, 52 tables, 11 figures, 124 references and 7 pages of Annex.

## MATERIAL AND METHODS

### **Questionnaire study**

The questionnaire of the study was composed according to similar foreign studies and studies previously performed in Lithuania. The questionnaire included questions about dentist and dental specialists' demographics (gender, age, marital status, place of living), professional (specialisation, the way it was obtained, job experience), practice characteristics (practice location, type, employment status, number of work places, working hours, perception of insufficient number of patients, required additional workload, specific treatment procedures performed, referrals to different dental specialists), future career intentions (emigration, profession change, retirement time); self-perceptions regarding the supply of dental professionals in Lithuania and the need for governmental regulation strategies with regard to training and distribution of the dental workforce. Questionnaire's reliability was tested with a pilot study. 10 randomly chosen dentists in Vilnius University Hospital Žalgiris Clinic were asked to complete the questionnaire twice with a two months' gap in between these recordings in order to avoid memory bias. The questionnaire items were structured on nominal, ordinal and interval scales. The reliability of questions structured on nominal or ordinal scales was tested employing Cohen's kappa and the interval scale responses were checked using intra-class correlation. Overall, the reliability was high for questionnaire items falling within a range of 0.7–1.0.



The study was approved by the National Data Protection Inspection (2012 09 14, No. 2R-3247 (2.6.1) and 2013 12 11, No. 2R-2149(2.6-1.)). An ethics approval was not required due to the nature of the study. Data and contact information (name, surname, specialisation, age, e-mail, address, telephone number) of all licensed dentists in Lithuania was acquired from the License Registry of the Lithuanian Dental Chamber in October 2012. The retired (103), emigrated (66), the dentists, whose contact information was not correct (348), and maxillofacial surgeons (17) were excluded from the sample. The overall study sample consisted of all licensed dentists and dental specialists in Lithuania, whose contact information was available in the License Registry of the Lithuanian Dental Chamber (N=2971).

All dentists were contacted up to three times. Firstly, depending on the available contact information (e-mail or address), questionnaires were sent either electronically or by post. Non-responders received copies of the same questionnaire again after six weeks. Those who did not respond after the second time were contacted again by phone six weeks later and the questionnaire was re-sent via their preferred mode. In total, 2008 questionnaires were returned and the final response rate was 67.6%. The data were collected from December 2012 till June 2013.

Statistical analysis of the data was performed using the standard statistical programs SPSS and EXCEL for Windows. Descriptive statistics for questionnaire data were computed. The comparative analysis in groups was performed using independent sample t-test, nonparametric Mann-Whitney U test,  $\chi^2$  test/Fisher test (for categorical variables) and odds ratio. The multivariate logistic regression model with Enter method was used to assess the joint effect of determinants related to perceived low numbers of patients. Exploratory Factor Analysis (EFA) with Varimax Rotation was performed in a cohort of general dentists to examine common trends or patterns in the provision of different treatment procedures. Due to some missing answers for individual questions of the questionnaire, the statistics for each question are based on a varying number of study subjects.

### **The planning projections of dentist and dental specialist supply and demand**

The planning projections of dentist and dental specialist supply and demand in Lithuania were composed in accordance with the Dewdney workforce planning model (Dewdney, 2001). It is a stepped mathematical Excel program model chosen for its simplicity, versatility to adapt to available data, and coverage of various data areas. This model was adapted to available statistical indexes and the data used for planning projections. The latest available statistical indexes (2013-2014) and the questionnaire study data were used. Projections were composed for the next ten years, i.e., until 2024.

**Supply.** Planning projections of dentist and dental specialist supply were composed using these factors: the number of dentists and dental specialists in 2014, the predicted number of graduates, immigrating dentists and dental specialists, the predicted rate of dentists and dental specialists' retirement, death, emigration and profession change. The number of dentists and dental specialists each year was derived according to the previous year, detracting dentists and dental specialists who are predicted to leave the professional workforce and adding those, who supplement it. The number of dentists who are predicted to leave and supplement professional workforce were counted using adopted assumptions. With regard to the factors that influence the supply of dentists and dental specialists, three supply projections were composed:

- The maximum number
- The medium number (the most likely)
- The minimum number

These projections differ in predicted dentists and dental specialists' retirement age, emigration, immigration and profession change rate. Other factors, which influence the dentist and dental specialist supply in the country, are the same. The number of graduates in different projections is also the same – it is assumed that universities in Lithuania will not change the number of dentistry students and residents in the future. The data from the License Registry of the Lithuanian Dental Chamber, Vilnius University Medical Faculty Institute of Odontology, Lithuanian University of Health Sciences Faculty of Odontology, Ministry of Health of the Republic of Lithuania, Institute of Hygiene Health information Centre and the questionnaire study data were used.

**Demand.** Planning projections of dentist and dental specialist demand were composed using these factors: the present demand (according to the agreement) – number of dentists and dental specialists in 2014 and the predicted demographic changes (growth or decline of the population and the composition according to age groups) in Lithuania. The data from the License Registry of the Lithuanian Dental Chamber and the Eurostat statistical data (European Commission, 2014) were used.

Planning projections of dentist and dental specialist demand in Lithuania, which were based on the present demand (according to the agreement) – a number of dentists and dental specialists in 2014, were combined with the questionnaire study data depicting that present demand. Then, the final conclusions and practical recommendations were drawn.

## MAIN RESULTS AND DISCUSSION

### Questionnaire study

The analysis showed no significant differences between responders and non-responders regarding the number of different dental specialists (oral surgeons, periodontists, endodontists, prosthodontists, orthodontists, and pediatric dentists;  $P = 0.252$ ). However, there were significantly fewer young dentists ( $P = 0.001$ ), males ( $P < 0.001$ ), and dentists from big cities ( $P < 0.001$ ) among the responders compared to the non-responders.

### The specificity of dentists and dental specialists' professional practice

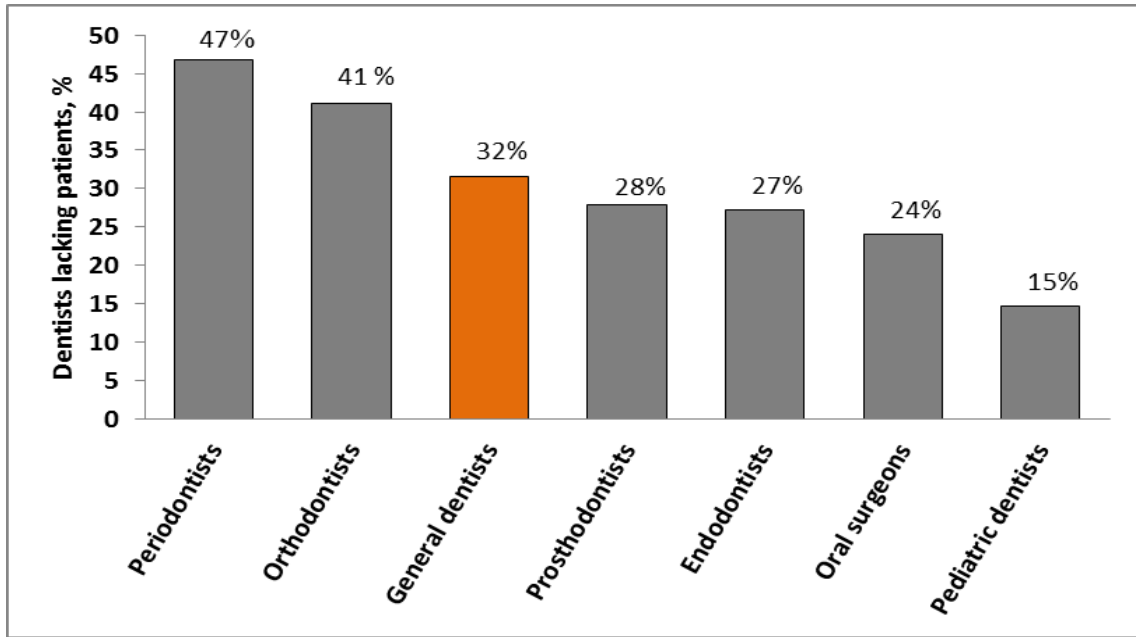
The main data from the questionnaire study about socio-demographic, employment-related characteristics and future career intentions of Lithuanian dentists and dental specialists are presented in Table 1. The majority of dentists and dental specialists work in big cities and in private practice. Almost every third dentist and dental specialist works overtime (more than 40 hours per week), two thirds of both groups of dentists had plans to work after retirement. Dental specialists practiced in significantly more employment sites compared to general dentists ( $2.0 \pm 1.2$  and  $1.4 \pm 0.6$ , respectively;  $P < 0.001$ ).

**Table 1.** Socio-demographic, employment-related characteristics and future career intentions – comparison between general dentists and dental specialists

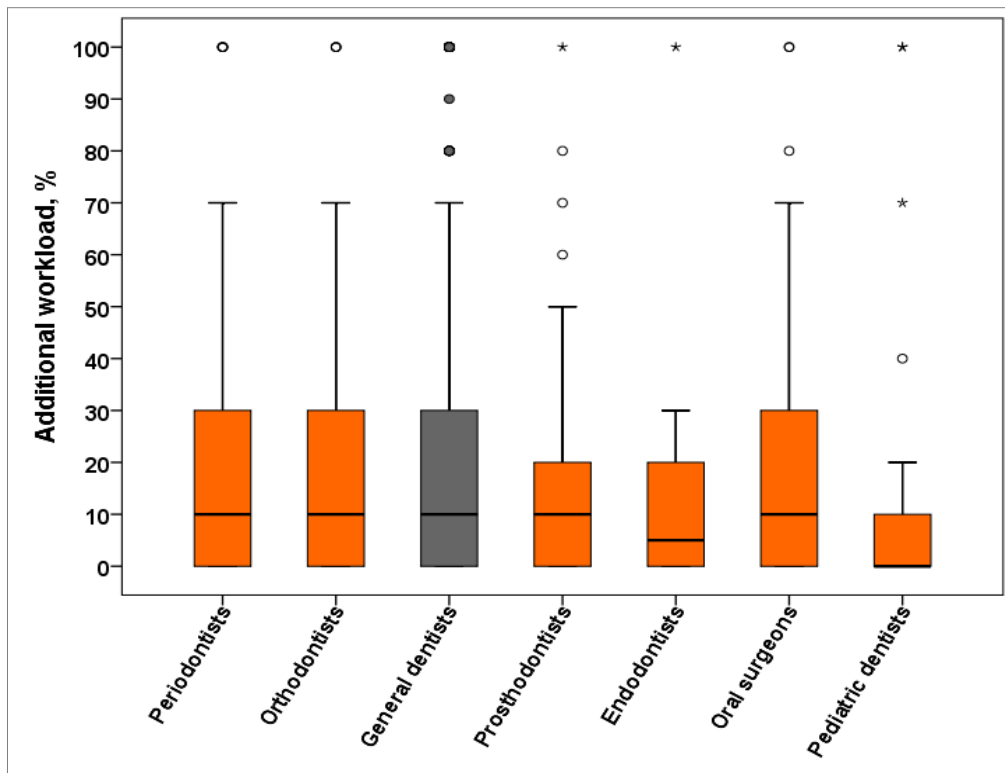
Demographic, employment-related characteristics, future carrier intentions	General dentists		Dental specialists		Total		P value
	N	%	N	%	N	%	
Age group							
35 years or less	589	35,7	109	31,6	698	35,0	0,183
36–55 years	592	35,9	141	40,9	733	36,7	
56 or more years	470	28,5	95	27,5	565	38,3	
Total	1651	100	345	100	1996	100	
Practice location							
Big cities	907	57,1	243	70,4	1150	59,5	<0,001
Suburban or rural	681	42,9	102	29,6	783	40,5	
Total	1588	100	345	100	1933	100	

Practice type							
Public	373	22,8	54	15,8	427	21,6	<0,001
Public and private	326	19,9	122	35,7	448	22,6	
Private	939	57,3	166	48,5	1105	55,8	
Total	1638	100	342	100	1980	100	
Working hours (per week)							
Part time ( $\leq 30$ hours)	470	28,9	89	26,3	559	28,4	<0,001
Full-time (30–40 hours)	725	44,6	117	34,5	842	42,8	
Overtime ( $>40$ hours)	432	26,6	133	39,2	565	28,8	
Total	1627	100	339	100	1966	100	
Intention to emigrate							
Yes	175	10,8	28	8,3	203	10,3	0,202
No	1450	89,2	310	91,7	1760	89,7	
Total	1625	100	338	100	1963	100	
Intention to change profession							
Yes	42	21,0	6	1,8	48	8,9	0,445
No	158	79,0	334	98,2	492	91,1	
Total	200	100	340	100	540	100	
Intention to retire							
Earlier than retirement age	93	5,8	30	8,9	123	6,3	0,096
At a retirement age	407	25,3	85	25,2	492	25,3	
Continue working at retirement	1109	68,9	222	65,9	1331	70,2	
Total	1609	100	337	100	1946	100	

Figure 1 and Figure 2 show the perceived shortage of patients and the distribution of required additional workload among dentists and different dental specialists. Approximately every third dentist and dental specialist in Lithuania perceived the shortage of patients, the average dentist and dental specialist required at least 10% of the additional workload. However, about half of these professionals required more than that.



**Figure 1.** Dentists and dental specialists lacking patients either sometimes or always



**Figure 2.** The distribution of required additional workload among dentists and different dental specialists

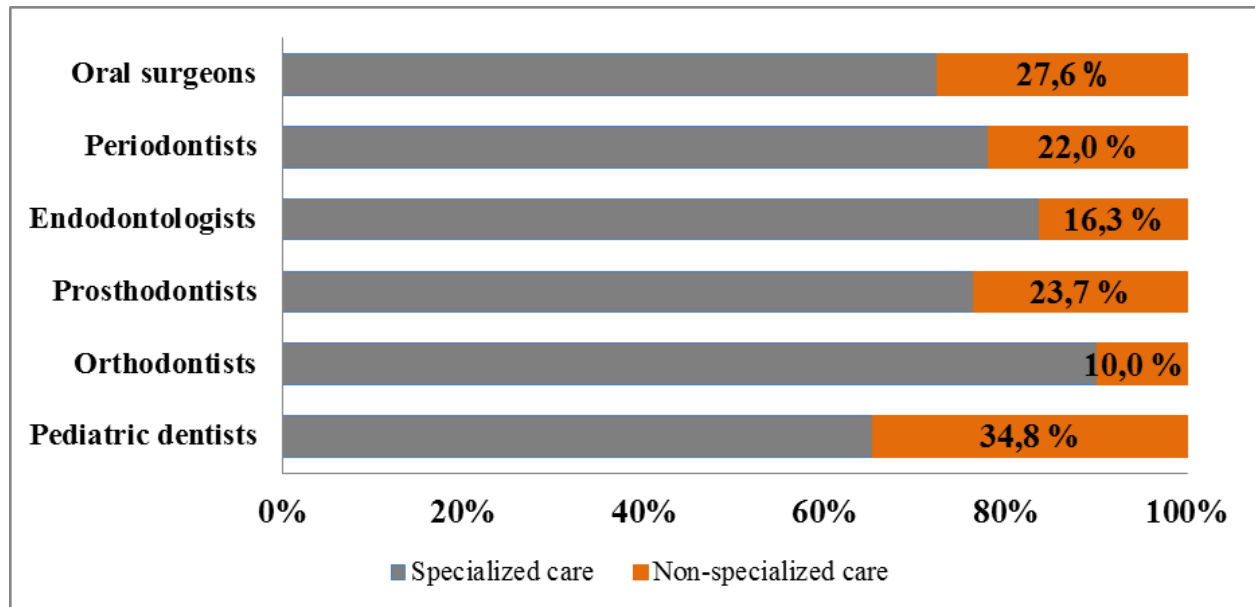
Table 2 presents findings from the logistic regression analysis where the dependent outcome was the perceived shortage of patients and the independent predictors were practice type, age, gender, practice location, type of dentist (general dentists or specialists), and intention to emigrate. The two strongest predictors associated with perceived shortage of patients were working in a private practice or in public and private practices combined (OR = 4.4, P < 0.001) and younger age ( $\leq 35$  years; OR = 2.0, P < 0.001). The likelihood of perceiving the shortage of patients was 1.5 times higher for males (P = 0.007) and 1.5 higher for those who practice in cities compared to those who practice in rural areas (P = 0.001). The perception of the shortage of patients was 1.7 times more frequent for those who intend to emigrate (P = 0.01).

**Table 2.** Multivariate analysis of determinants related to the perceived shortage of patients (logistic regression)

Predictors		B	Significance	Adj. Odds Ratio	95% CI for OR
Practice type	Private or private & public	1.478	<0.001	4.4	3.1; 6.2
	Public	0		1.0	
Age groups	$\leq 35$ years	0.709	<0.001	2.0	1.7; 2.5
	> 35 years	0		1.0	
Gender	Males	0.380	0.007	1.5	1.1; 1.9
	Females	0		1.0	
Practice location	Urban	0.368	0.001	1.5	1.2; 1.8
	Suburban and rural	0		1.0	
Type of dentists	Specialists	0.126	0.646	1.1	0.9; 1.5
	General dentists	0		1.0	
Intention to emigrate	Yes	0.551	0.010	1.7	1.3; 2.4
	No	0		1.0	
Constant		-2.755	<0.001	0.064	

58.2% of all dental specialists provided only specialised care, while the rest 41.8% worked as specialists and also as general dentists. Figure 3 shows what part of everyday care of different dental specialists makes non-specialised dental care. Dental specialists who acquired specialists' license after the attestation or after less than 3 years' residency studies in university and those who graduated from 3 year residency studies in university consistent with international standards did not significantly differ in dental care provided

– they equally worked as dentists and dental specialists ( $p=0.47$ ). Since part of the dental specialists' postgraduate (residency) studies was government funded, the situation leads to an inefficient use of state finance and needs to be addressed by policy makers and health care planners in Lithuania.



**Figure 3.** Dental care provided by dental specialists

The present study findings indicate that a proportion of Lithuanian dentists and dental specialists face a number of challenges. About one third of dentists and dental specialists worked overtime (more than 40 hours per week), perceived the shortage of patients, every second dentist and dental specialist practiced in several work places, the average dentist and dental specialist required about 10% of additional workload. Every second/third dental specialist also worked as a general dentist. A large share of dentists and dental specialists considered a continuation of work beyond the official retirement age, every tenth intended to emigrate. The challenges in the dental profession are also present in other EU countries: Greece has reported an oversupply and unemployment of dentists (Koletsis-Kounari, Papaioannou, Stefaniotis, 2011). Unemployment of dentists is also an issue in Finland, Germany, and Italy (Kravitz and Treasure, 2009).

As there were significantly fewer young dentists, males and dentists from big cities among the responders compared to the non-responders, the results of the study could have been influenced. Young, practicing in big cities and male dentists and dental specialists perceived shortage of patients more often, therefore, the problem of shortage of patients and oversupply of dentists and dental specialists represented by the study results could be even more pronounced in the country.

The study results showed that dentists and dental specialists working in a private practice and in big cities (Vilnius, Kaunas, Klaipeda, Siauliai, Panevezys) perceived the lack of patients more often compared to those working in public sector and in suburban or rural areas. These results indicate that there is an uneven distribution of dentists and dental specialists geographically and between the private and public sector that does not reflect the demand of patients for the respective services and reveal a lack of regulation of the dental workforce and its regional distribution. A few studies have analysed the unequal distribution of dentists across Lithuania and emphasised the need for dental workforce planning (Petrauskiene, Bierontas and Guogiene, 1994; Zakaite, 2006; Starkiene et al., 2007). However, no appreciable measures have yet been taken by policy makers and health care planners in Lithuania to address these shortcomings. In contrast to the dental care system, a similar situation in the general health care system was encountered actively. This comprised increasing student enrolments to medical studies to counterbalance the predicted shortage of physicians, addressing maldistribution of specialised physicians by providing recommendations to universities, partly outweighing geographical maldistribution by facilitating an agreement between medical residents and health care institutions on covering medical residency costs as well as fully or partially subsidising costs (Starkiene et al., 2013). As the shortcomings in the dental care system are acute, similar measures are required.

The specificity of dentists and dental specialists' professional practice and their future career intentions show that in order to optimise dental care in Lithuania, the attention should be directed to the number of dentists and dental specialists, uneven distribution of dentists and dental specialists geographically and between the private and public sector in Lithuania.

### **Self-perceptions of dentists and dental specialists about their demand in Lithuania**

There is a large variety of methods to evaluate and project the requirement and demand of human resources (WHO, 2010a). The requirement of human resources for the population, its estimates, methodology, optimal dentists to population ratio is a frequent object for scientists' disagreement (Australian Dental Association, 2012; Henderson, 1976; WHO, 2013a). Our study revealed the self-perceptions of dentists and dental specialists about their supply in Lithuania and their immediate experience and insights in today's dental health care services market. The results are of a self-reported nature of professional groups. In 2001, such kind of studies reviewed Maupome, Hann and Ray, more human resources studies of a self-reported nature were performed in foreign countries (Tiede and Born, 1975; Goldberg et al., 1976; Watanabe et al., 2013).



The results of the questionnaire study show that an adequate supply or a surplus of general dentists, a shortage of pediatric dentists, an adequate supply or surplus of prosthodontists was perceived by Lithuanian dentists and dental specialists (Table 3). The self-perceived adequate supply or surplus of the colleagues among dental professionals and the unequal distribution of different types of dental specialists was in line with their expressed demand to regulate training and distribution of the dental health care sector (Table 4). The self-perceived adequate supply or surplus of general dentists, a shortage of pediatric dentists, an adequate supply or surplus of prosthodontists matches dentists and dental specialists' required additional workload and the data about the non-specialised care of dental specialists (Figure 2, Figure 3). The observed difference between the general dentists' and dental specialists' perception regarding the supply of oral surgeons, orthodontists, endodontists and periodontists in Lithuania could be the result of competition in the dental care system market: general dentists are happy to readily refer difficult cases, patients with unexpected treatment outcomes and complications to more experienced dental specialists, having a higher number of specialists in the area, charging less for their services would be beneficial for general dentists and, therefore, general dentists do not see dental specialists as competitors (Goldman, 2000; Peciuliene et al., 2010; Ree, Timmerman and Wesselink, 2003; Sharpe, Durham and Preshaw, 2007).

**Table 3.** Dentists and dental specialists' self-perceptions about the supply of different dental professionals

Supply of dental professionals	General dentists		All specialists		P values
	N	%	N	%	
<b>Supply of general dentists</b>					
Shortage	108	6.6	19	5.6	<0.001
Adequate supply	689	42.3	85	25.0	
Surplus	625	38.3	174	51.2	
No opinion	208	12.8	62	18.2	
<b>Supply of dental specialists overall</b>					
Shortage	500	30.3	81	23.5	<0.001
Adequate supply	544	33.0	102	29.6	
Surplus	144	8.7	75	21.7	
No opinion	461	28.0	87	25.2	
<b>Supply of oral surgeons</b>					
Shortage	476	29.3	74	21.9	<0.001
Adequate supply	728	44.9	128	37.9	
Surplus	97	6.0	55	16.3	
No opinion	322	19.8	81	24.0	

Supply of pediatric dentists					
Shortage	1113	68.6	234	69.2	0.431
Adequate supply	233	14.4	40	11.8	
Surplus	28	1.7	9	2.7	
No opinion	249	15.3	55	16.3	
Supply of orthodontists					
Shortage	762	47.0	131	38.8	<0.001
Adequate supply	510	31.4	116	34.3	
Surplus	70	4.3	36	10.7	
No opinion	281	17.3	55	16.3	
Supply of endodontists					
Shortage	861	53.0	173	51.2	<0.001
Adequate supply	471	29.0	81	24.0	
Surplus	72	4.4	36	10.7	
No opinion	219	13.5	48	14.2	
Supply of periodontists					
Shortage	723	44.5	121	35.8	<0.001
Adequate supply	522	32.1	117	34.6	
Surplus	76	4.7	39	11.5	
No opinion	303	18.7	61	18.0	
Supply of prosthodontists					
Shortage	143	8.8	33	9.8	0.066
Adequate supply	805	49.6	145	42.9	
Surplus	296	18.2	80	23.7	
No opinion	380	23.4	80	23.7	

**Table 4.** Self-perceptions of different dental professionals regarding the Ministry of Health regulation of distribution and training of dental workforce

Dental professionals	Ministry of Health should regulate training of dental professionals					
	Regulation		Part regulation		No regulation	
	N	%	N	%	N	%
General dentists	716	44.1	766	47.2	140	8.6
All specialists	174	51.3	139	41.0	26	7.7
Significance	P = 0.054					
Dental professionals	Distribution of dental workforce should be regulated					
	Regulation		Part regulation		No regulation	
	N	%	N	%	N	%
General dentists	858	52.6	610	37.4	162	9.9
All specialists	162	47.8	127	37.5	50	14.7
Significance	P = 0.026					

The high numbers of general dentists and dental specialists in big cities and the shortage in the remote regions of Lithuania is a well-known phenomenon. 57.1% of dentists and 70.4% of dental specialists work in big cities (Lithuanian Dental Chamber, 2013). The study results are in line with existing data: whereas in urban centers the dental workforce seems to be well represented, the limited availability of oral surgeons, orthodontists, endodontists and periodontists in regions distant from the big cities was indicated (Table 5).

**Table 5.** General dentists' self-perception of supply with professional workforce – a comparison between dentists practicing in big cities and towns and villages

Supply of dental professionals	In big cities		Towns and villages		P values
	N	%	N	%	
<b>Supply of general dentists</b>					
Shortage	38	4.2	65	9.7	<0.001
Adequate supply	355	39.5	309	45.9	
Surplus	387	43.1	217	32.2	
No opinion	118	13.1	82	12.2	
<b>Supply of dental specialists overall</b>					
Shortage	244	26.9	242	35.5	<0.001
Adequate supply	332	36.6	191	28.0	
Surplus	89	9.8	51	7.5	
No opinion	242	26.7	197	28.9	
<b>Supply of oral surgeons</b>					
Shortage	204	22.9	256	38.1	<0.001
Adequate supply	440	49.3	264	39.3	
Surplus	65	7.3	29	4.3	
No opinion	183	20.5	123	18.3	
<b>Supply of pediatric dentists</b>					
Shortage	596	66.8	476	70.8	0.281
Adequate supply	137	15.4	91	13.5	
Surplus	18	2.0	8	1.2	
No opinion	141	15.8	97	14.4	
<b>Supply of orthodontists</b>					
Shortage	355	39.8	372	55.4	<0.001
Adequate supply	320	35.9	181	26.9	
Surplus	53	5.9	13	1.9	
No opinion	164	18.4	106	15.8	
<b>Supply of endodontists</b>					
Shortage	462	51.8	370	55.1	

Adequate supply	274	30.7	179	26.6	0.175
Surplus	44	4.9	26	3.9	
No opinion	112	12.6	97	14.4	
Supply of periodontists					
Shortage	370	41.5	326	48.4	<0.001
Adequate supply	315	35.3	189	28.1	
Surplus	54	6.1	21	3.1	
No opinion	153	17.2	137	20.4	
Supply of prosthodontists					
Shortage	71	8.0	66	9.8	0.203
Adequate supply	454	50.9	323	48.0	
Surplus	172	19.3	116	17.2	
No opinion	195	21.9	168	25.0	

The results of the study are of a self-reported nature and should be taken with some caution as far as workforce planning is concerned. General dentists and dental specialists reported self-perceptions regarding the dental workforce supply and expressed their opinion about the need for its regulation in Lithuania. These perceptions reflect their immediate experience and insights in today's dental health care services market. However, the reported self-perceptions might be influenced by competitive motives, the actual situation could be not reflected due to different points of view regarding the same status quo and other reasons. Therefore, the data about current workforce in the dental care system in Lithuania obtained in this way might be biased and might not precisely reflect the reality. This should be taken into account when evaluating the results of the study. In order to evaluate dental workforce more precisely, further research would be needed. It is essential to look at the actual workload of dentists and dental specialists, their distribution in the country, age profile, disease trends, population, projections for the future, etc. A more precise analysis of the current dental care system and respectful workforce planning for the future is needed in order for the country to ensure adequate access to oral care for the population while at the same time allowing for economically sustainable working conditions for dentists.

### **Planning projections of dentist and dental specialist supply and demand in Lithuania until 2024**

Data for the 1<sup>st</sup> of January of each year is presented in the dentists and dental specialists' planning projections (Table 6-12, Figure 4).

**Table 6.** The medium number (the most likely) planning projection of dentist supply and demand for 2014-2024

<b>Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Dentist supply</b> Medium number projection	<b>3176</b>	<b>3192</b>	<b>3208</b>	<b>3223</b>	<b>3237</b>	<b>3253</b>	<b>3268</b>	<b>3286</b>	<b>3305</b>	<b>3325</b>	<b>3345</b>
Supplements the workforce	153,2	153,2	153,2	153,2	153,2	153,2	154,0	154,0	154,0	154,0	154,0
1. Graduates	150,0	150,0	150,0	150,0	150,0	150,0	150,0	150,0	150,0	150,0	150,0
2. Foreign students	1,8	1,8	1,8	1,8	1,8	1,8	2,6	2,6	2,6	2,6	2,6
3. Immigrants	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4
Leaves the workforce	136,8	137,9	137,8	138,6	138,0	137,3	136,5	134,4	134,9	133,9	133,9
1. Retires at 70	63,2	64,0	63,7	64,2	63,4	62,5	61,4	59,0	59,2	57,9	57,6
2. Dies	30,4	30,5	30,7	30,8	31,0	31,1	31,3	31,4	31,6	31,8	32,0
3. Emigrates	22,6	22,6	22,6	22,6	22,6	22,6	22,6	22,6	22,6	22,6	22,6
4. Changes profession	20,6	20,8	20,8	20,9	21,0	21,1	21,2	21,4	21,5	21,6	21,7
<b>Population</b>	2944444	2901 039	2856806	2811831	2766009	2718993	2671108	2622217	2572782	2523372	2474126
1. Population change in % each year		98,5	98,5	98,4	98,4	98,3	98,2	98,2	98,1	98,1	98
<b>Dentist demand</b>	<b>3176</b>	<b>3128</b>	<b>3081</b>	<b>3032</b>	<b>2984</b>	<b>2933</b>	<b>2880</b>	<b>2828</b>	<b>2775</b>	<b>2722</b>	<b>2667</b>

**Table 7.** The medium number (the most likely) planning projection of oral surgeon supply and demand for 2014-2024

<b>Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Oral surgeon supply</b> Medium number projection	<b>100</b>	<b>102</b>	<b>103</b>	<b>105</b>	<b>107</b>	<b>108</b>	<b>110</b>	<b>111</b>	<b>113</b>	<b>115</b>	<b>117</b>
Supplements the workforce	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3
1. Graduates	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3	5,3
2. Immigrants	-	-	-	-	-	-	-	-	-	-	-
Leaves the workforce	3,6	3,6	3,7	3,8	3,9	3,6	3,6	3,5	3,3	3,3	3,5
1. Retires at 70	2,3	2,4	2,4	2,5	2,5	2,3	2,3	2,1	1,9	1,9	2,0
2. Dies	0,7	0,7	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,9
3. Emigrates	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
4. Changes profession	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3	0,3
<b>Population</b>	2944444	2901 039	2856806	2811831	2766009	2718993	2671108	2622217	2572782	2523372	2474126
1. Population change in % each year		98,5	98,5	98,4	98,4	98,3	98,2	98,2	98,1	98,1	98
<b>Oral surgeon demand</b>	<b>100</b>	<b>99</b>	<b>97</b>	<b>95</b>	<b>94</b>	<b>92</b>	<b>91</b>	<b>89</b>	<b>87</b>	<b>86</b>	<b>84</b>

**Table 8.** The medium number (the most likely) planning projection of periodontist supply and demand for 2014-2024

<b>Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Periodontist supply</b> Medium number projection	<b>63</b>	<b>66</b>	<b>69</b>	<b>72</b>	<b>75</b>	<b>78</b>	<b>81</b>	<b>84</b>	<b>87</b>	<b>89</b>	<b>92</b>
Supplements the workforce	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3
1. Graduates	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3	4,3
2. Immigrants	-	-	-	-	-	-	-	-	-	-	-
Leaves the workforce	1,2	1,3	1,4	1,4	1,4	1,3	1,5	1,5	1,5	1,5	1,5
1. Retires at 70	0,4	0,5	0,5	0,5	0,4	0,4	0,5	0,5	0,4	0,4	0,4
2. Dies	0,6	0,6	0,6	0,6	0,7	0,7	0,7	0,7	0,8	0,8	0,8
3. Emigrates	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
4. Changes profession	0,1	0,1	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
<b>Population</b>	2944444	2901 039	2856806	2811831	2766009	2718993	2671108	2622217	2572782	2523372	2474126
1. Population change in % each year		98,5	98,5	98,4	98,4	98,3	98,2	98,2	98,1	98,1	98
2. 65 year and older population group % change each year		102,2	101,6	101,6	102,1	101,5	101,5	102,5	102,4	102,8	103,2
<b>Periodontist demand</b>	<b>63</b>	<b>63</b>	<b>63</b>	<b>64</b>	<b>64</b>	<b>64</b>	<b>64</b>	<b>64</b>	<b>64</b>	<b>65</b>	<b>66</b>

**Table 9.** The medium number (the most likely) planning projection of endodontologist supply and demand for 2014-2024

<b>Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Endodontologist supply</b> Medium number projection	<b>48</b>	<b>51</b>	<b>54</b>	<b>57</b>	<b>60</b>	<b>63</b>	<b>66</b>	<b>69</b>	<b>72</b>	<b>75</b>	<b>78</b>
Supplements the workforce	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0
1. Graduates	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0
2. Immigrants	-	-	-	-	-	-	-	-	-	-	-
Leaves the workforce	0,9	0,9	1,0	1,0	1,0	1,0	1,1	1,2	1,2	1,2	1,3
1. Retires at 70	0,2	0,2	0,2	0,1	0,1	0,1	0,2	0,2	0,2	0,2	0,2
2. Dies	0,5	0,5	0,5	0,6	0,6	0,6	0,6	0,7	0,7	0,7	0,8
3. Emigrates	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
4. Changes profession	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,2	0,2	0,2
<b>Population</b>	2944444	2901 039	2856806	2811831	2766009	2718993	2671108	2622217	2572782	2523372	2474126
1. Population change in % each year		98,5	98,5	98,4	98,4	98,3	98,2	98,2	98,1	98,1	98
<b>Endodontologist demand</b>	<b>48</b>	<b>47</b>	<b>47</b>	<b>46</b>	<b>45</b>	<b>44</b>	<b>44</b>	<b>43</b>	<b>42</b>	<b>41</b>	<b>40</b>



**Table 10.** The medium number (the most likely) planning projection of prosthodontist supply and demand for 2014-2024

<b>Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Prosthodontist supply</b> Medium number projection	<b>273</b>	<b>265</b>	<b>257</b>	<b>249</b>	<b>241</b>	<b>234</b>	<b>227</b>	<b>221</b>	<b>215</b>	<b>210</b>	<b>206</b>
Supplements the workforce	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
1. Graduates	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
2. Immigrants	-	-	-	-	-	-	-	-	-	-	-
Leaves the workforce	13,9	14,3	13,8	13,9	13,3	12,7	12,1	11,6	10,9	10,8	10,0
1. Retires at 70	10,9	10,9	10,5	10,7	10,2	9,7	9,1	8,7	8,1	8,0	7,3
2. Dies	2,1	2,6	2,5	2,4	2,3	2,3	2,2	2,1	2,1	2,0	2,0
3. Emigrates	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
4. Changes profession	0,6	0,6	0,6	0,6	0,5	0,5	0,5	0,5	0,5	0,5	0,5
<b>Population</b>	2944444	2901 039	2856806	2811831	2766009	2718993	2671108	2622217	2572782	2523372	2474126
1. Population change in % each year		98,5	98,5	98,4	98,4	98,3	98,2	98,2	98,1	98,1	98
<b>Prosthodontist demand</b>	<b>273</b>	<b>269</b>	<b>265</b>	<b>261</b>	<b>256</b>	<b>252</b>	<b>248</b>	<b>243</b>	<b>238</b>	<b>234</b>	<b>229</b>

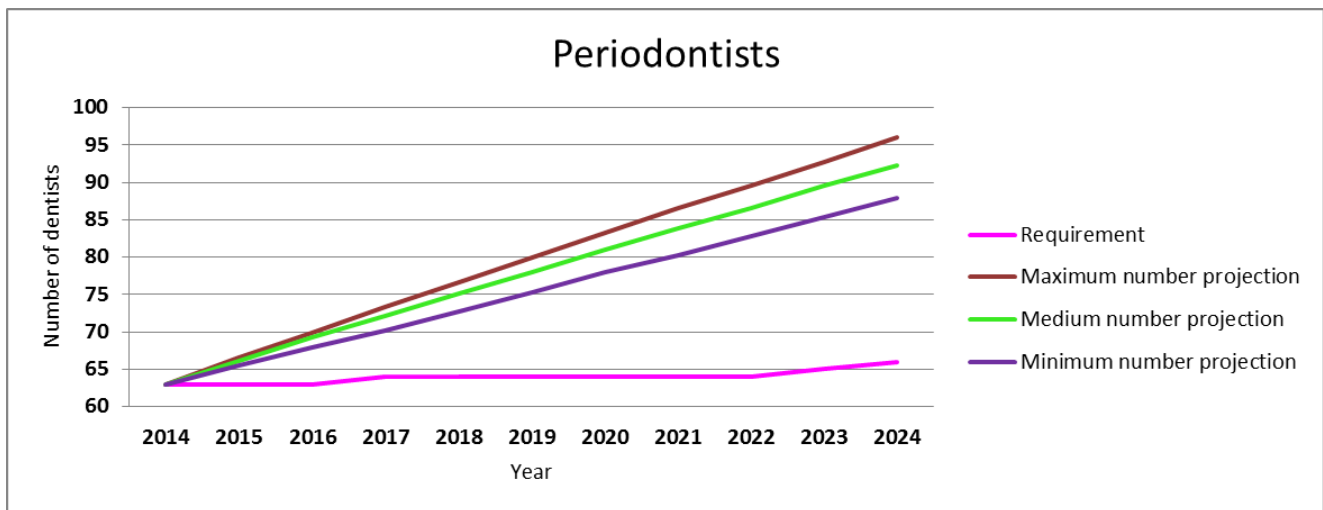
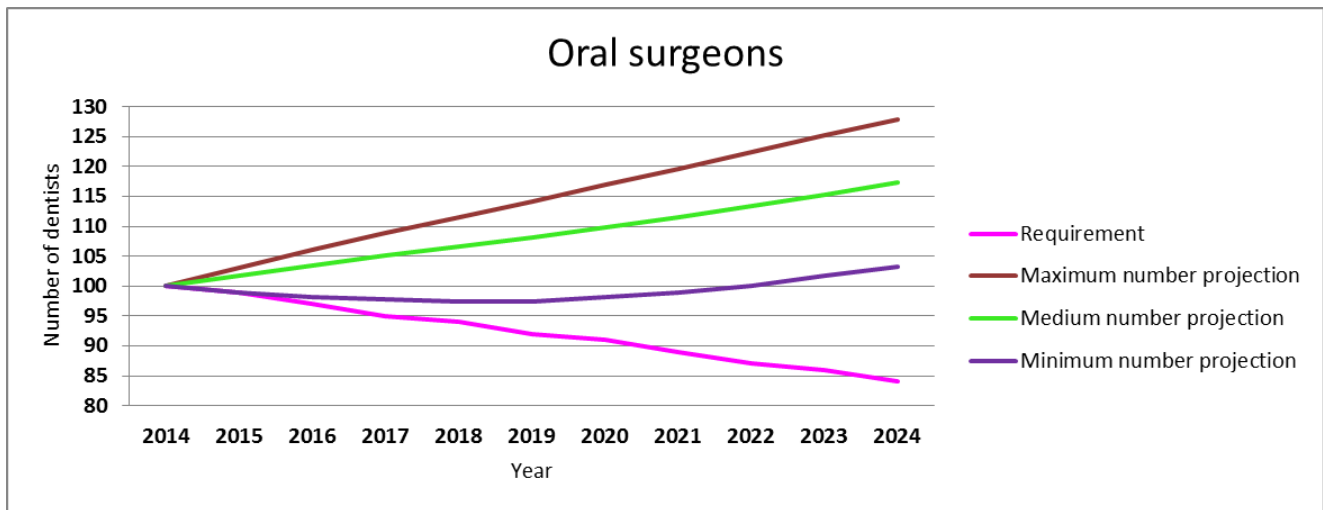
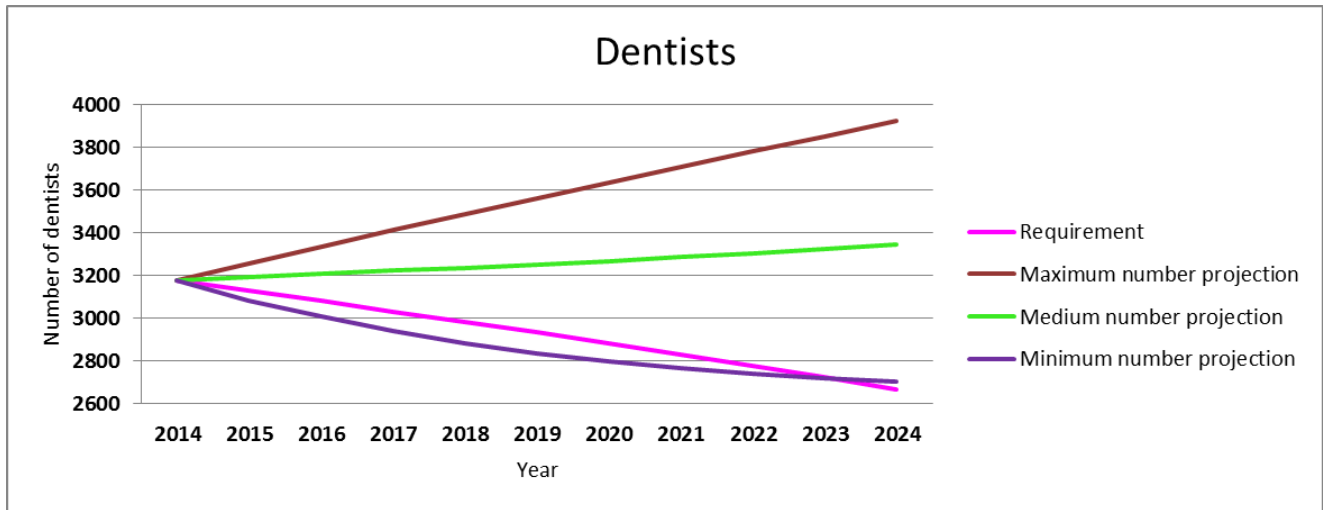
**Table 11.** The medium number (the most likely) planning projection of orthodontist supply and demand for 2014-2024

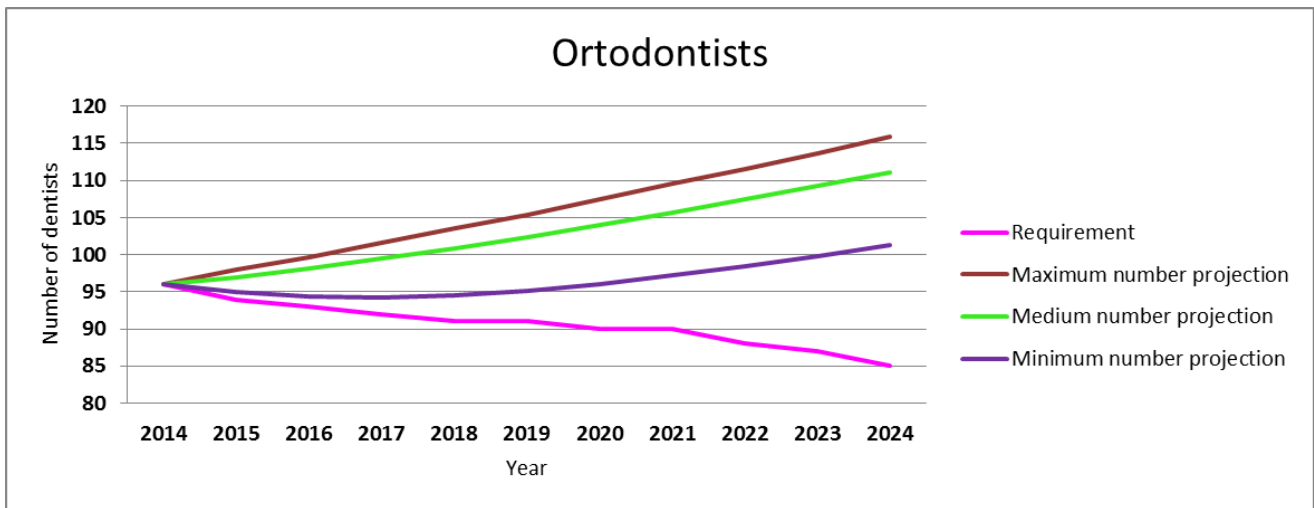
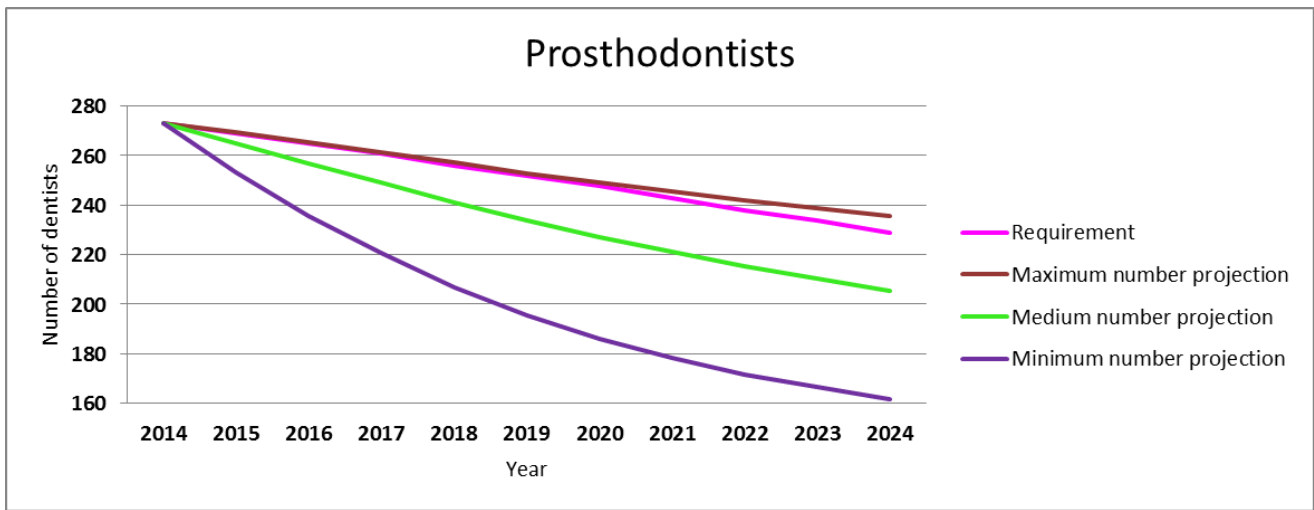
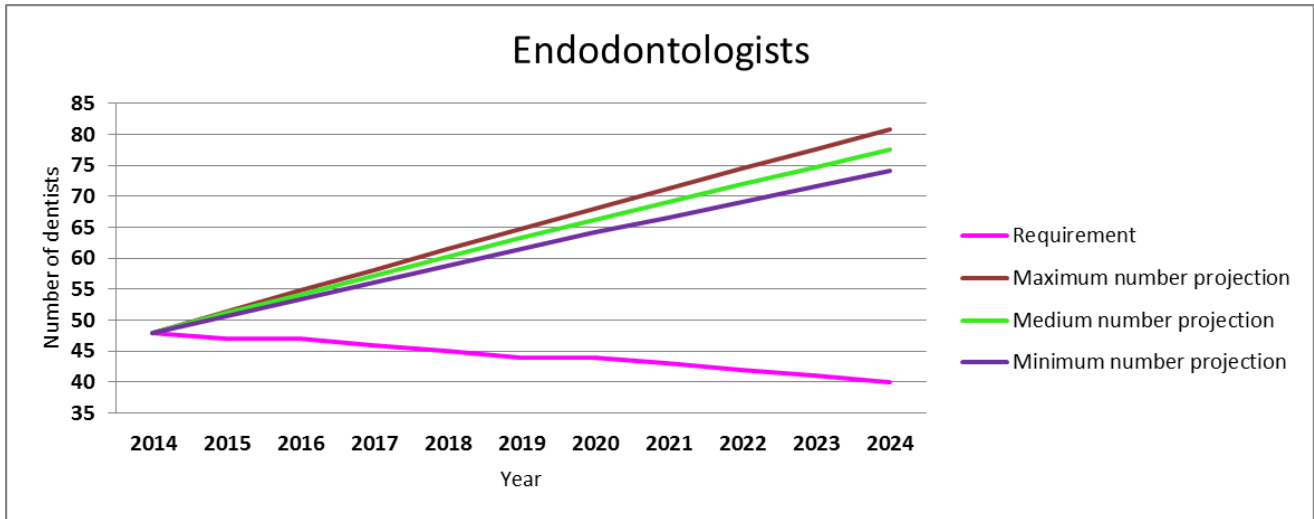
<b>Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Orthodontist supply</b> Medium number projection	<b>96</b>	<b>97</b>	<b>98</b>	<b>99</b>	<b>101</b>	<b>102</b>	<b>104</b>	<b>106</b>	<b>107</b>	<b>109</b>	<b>111</b>
Supplements the workforce	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0
1. Graduates	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0
2. Immigrants	-	-	-	-	-	-	-	-	-	-	-
Leaves the workforce	3,0	2,8	2,7	2,6	2,5	2,4	2,3	2,3	2,2	2,2	2,1
1. Retires at 70	1,6	1,4	1,3	1,2	1,0	0,9	0,9	0,8	0,7	0,6	0,6
2. Dies	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,1	1,1	1,1	1,1
3. Emigrates	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
4. Changes profession	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
<b>Population</b>	2944444	2901 039	2856806	2811831	2766009	2718993	2671108	2622217	2572782	2523372	2474126
1. Population change in % each year		98,5	98,5	98,4	98,4	98,3	98,2	98,2	98,1	98,1	98
2. 0-14 year population group % change each year		99,3	100,7	100,7	100,7	101,3	100,7	101,3	100,6	100,6	100
<b>Orthodontist demand</b>	<b>96</b>	<b>94</b>	<b>93</b>	<b>92</b>	<b>91</b>	<b>91</b>	<b>90</b>	<b>90</b>	<b>88</b>	<b>87</b>	<b>85</b>

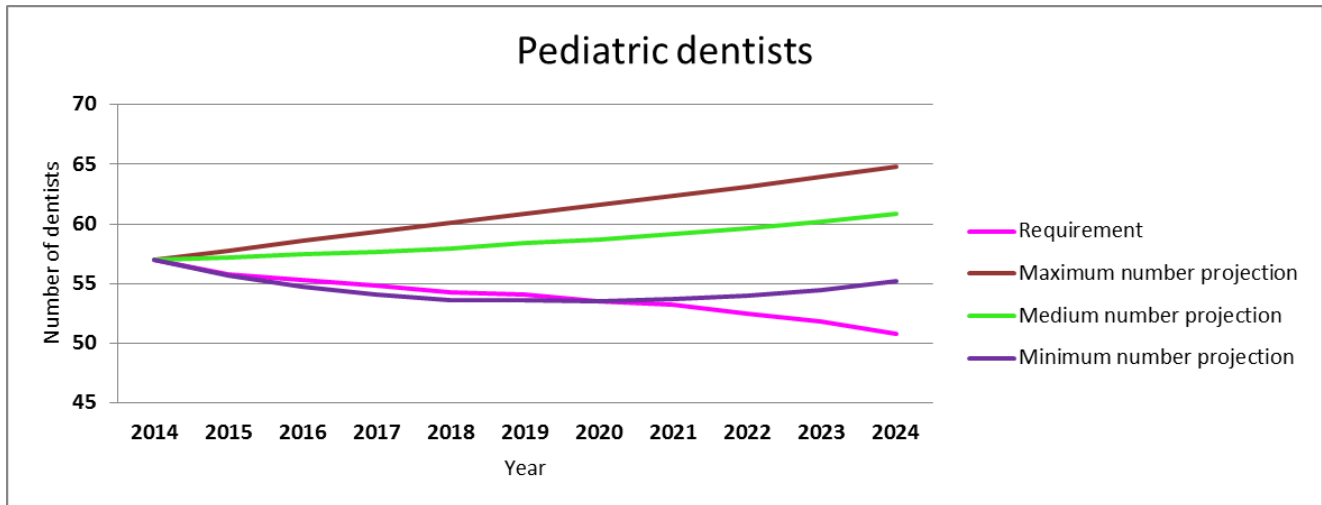
**Table 12.** The medium number (the most likely) planning projection of pediatric dentist supply and demand for 2014-2024

<b>Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Pediatric dentist supply</b> Medium number projection	<b>57</b>	<b>57</b>	<b>57</b>	<b>58</b>	<b>58</b>	<b>58</b>	<b>59</b>	<b>59</b>	<b>60</b>	<b>60</b>	<b>61</b>
Supplements the workforce	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3
1. Graduates	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3	2,3
2. Immigrants	-	-	-	-	-	-	-	-	-	-	-
Leaves the workforce	2,1	2,1	2,1	2,0	1,9	2,0	1,9	1,9	1,8	1,7	1,6
1. Retires at 70	1,4	1,4	1,3	1,3	1,2	1,2	1,1	1,1	1,0	0,9	0,8
2. Dies	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,7
3. Emigrates	-	-	-	-	-	-	-	-	-	-	-
4. Changes profession	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
<b>Population</b>	2944444	2901 039	2856806	2811831	2766009	2718993	2671108	2622217	2572782	2523372	2474126
1. Population change in % each year		98,5	98,5	98,4	98,4	98,3	98,2	98,2	98,1	98,1	98
2. 0-14 year population group % change each year		99,3	100,7	100,7	100,7	101,3	100,7	101,3	100,6	100,6	100
<b>Pediatric dentist demand</b>	<b>57</b>	<b>56</b>	<b>55</b>	<b>55</b>	<b>54</b>	<b>54</b>	<b>53</b>	<b>53</b>	<b>52</b>	<b>52</b>	<b>51</b>

**Figure 4.** The planning projections of dentist supply and demand in Lithuania until 2024.







With regard to the factors that influence the supply of dentists and dental specialists, projections of the maximum, medium and minimum numbers of dentist supply were composed. The number of graduates in different projections is the same – it is assumed that universities in Lithuania will not change the number of dentistry students and residents in the future. If it happens, this will significantly affect the number of dentists and dental specialists in the country, because the number of graduates is a factor that has a big impact on the projections. The most likely and logical one is the medium number supply projection. In the case of absence of any substantive changes in the country and dental health care market, the probability that the number of dentists in the country will not fall between the limits of the minimum and maximum number projections is very low.

During the planning projections study, the problem of data inaccuracy was encountered. Two institutions record the practicing dentists in Lithuania: the Lithuanian Dental Chamber and the Institute of Hygiene Health Information Centre. However, the data about practicing dentists and dental specialists in these registers is not accurate. There is also a lack of data about the retirement age of Lithuanian dentists, the exact numbers of emigrated and practicing abroad dentists and dental specialists and the details about those who change profession. Therefore, it is important to refine, structure and document data used for the planning projections of dentist human resources in the future.

The demand of dentists and dental specialists (except periodontists) in the country is projected to decline in the future. It will happen due to the gradual decline of Lithuanian population and the increase of the 65 years old and older population group. Assessing the medium number supply projections, the demand of dentists and dental specialists (except of periodontists) will be lower than the projected supply.

To sum up the self-perceptions of dentists and dental specialists and planning projections of their supply and demand, the increase in the number of pediatric dentists in the medium number projection will partially compensate for their perceived shortage and the decrease in the number of prosthodontists will partially compensate for their perceived surplus in the country. Due to perceived surplus of dentists in the country, their demand can be even lower than projected; this will highlight the difference between the projected dentist demand and supply in the future even more. According to the number of students accepted, it is predicted that the number of graduates in 2015, 2016 and 2017 will not change significantly and the planning projections for this time period will come true.

The self-perceptions of dentists and dental specialists about the supply of oral surgeons, orthodontists, endodontologists and periodontists differ. However, the study data indicate possible surplus of these dental specialists in the country: they perceived a shortage of patients, required additional workload, and provided non-specialised dental care. If we take into account these data, the rapidly increasing number of oral surgeons, orthodontists, endodontologists and periodontists seems to be worrying. Such an impression is further reinforced by the number of residents already accepted and studying in the residency studies. It means that the planning projections for 2015, 2016 and 2017 will come true.

When analysing the demand and supply of dentists and dental specialists in the country, it is important to take into account the unequal distribution of dentists across Lithuania, the low accessibility to dental and especially specialised dental care in regions distant from the big cities. The majority of dentists and dental specialists in Lithuania practice in Vilnius and Kaunas districts (Table 13). In other districts, the number of dentists is adequate, but the number of dental specialists is extremely low or there are even no different dental specialists in a region. For example, there are no endodontologists in Siauliai and Panevezys, and there is only one in Klaipeda (LR OR, 2014b). Such situation leads to inadequate accessibility to specialised dental care in towns and villages. This problem should be addressed by regulating the distribution of dental specialists in the territory of Lithuania; the number of residency places should not be reduced in the universities at this time. However, as the rapidly increasing number of oral surgeons, orthodontists, endodontologists and periodontists seems to be worrying, the situation must be monitored and the need for the production of these dental specialists in universities after a couple of years should be reviewed.

**Table 13.** The number of members in territorial departments of the Lithuanian Dental Chamber (according to issued licenses) (LR OR, 2014b).

Dental professionals	Vilnius	Kaunas	Klaipeda	Siauliai	Panevezys
Dentist	1087	1151	388	279	271
Oral surgeon	31	38	8	9	14
Periodontist	24	31	4	2	2
Endodontologist	19	28	1	0	0
Prosthodontist	102	99	28	26	18
Ortodontist	41	37	8	8	2
Pediatric dentist	16	28	5	2	6

When analysing the demand and supply of dental specialists in Lithuania, it is also important to take into account the composition of dental specialists' workforce in a country according to the way specialisation was obtained. From 2004, 219 dental specialists graduated from dental residency programs which were consistent with the international standards (LSMU, 2014; VU, 2014). In 2014, there were 637 practicing dental specialists in Lithuania, 65.6% of them acquired their specialisation before 2004.

According to the Soviet model in force until 1997, dental practitioners had a theoretical training for 2–3 months and only during this period they received knowledge from experienced professionals. Later, they practiced on their own in the specialty for 3 years, took an attestation and became dental specialists. The lack of knowledge was compensated by the publicly funded long-term (1-3 months) refresher courses for these dental specialists. From 1991, dental specialists were taught in one-year, later in two-year residency studies in universities. Only from 2004, residency studies in Lithuanian universities, as in all EU countries, last for 3 years. These studies consist of theoretical and practical parts where the resident learns and works with experienced dental specialists. The impression is that the qualification of dental specialists who acquired specialty until 2004 may not fully conform to the current standards and requirements. Our study showed that dental specialists, who acquired specialist license after the attestation or after less than 3-year university residency studies, and those, who graduated from 3-year university residency studies consistent with international standards, did not significantly differ in dental care provided; they equally worked as dentists and dental specialists. However, the way specialisation was obtained may influence the complexity of the specialised care provided: dental specialists who graduated from 3-year university residency studies may provide more complex care when compared to those, who acquired specialisation through attestation or graduated from less than 3-year university studies. This aspect of our study was not analysed; further studies should be carried out for the purpose. If it were found that



dental specialists, who graduated from a 3-year residency at a university, provide more complex care, it would be an additional argument not to reduce the dental specialists' production at universities.

With the free market economy, the market for services adjusts autonomically: if underemployment, unemployment, and a large competition between professionals is faced, less graduates choose to study the specialty. However, this self-regulation of the market is slow and ineffective and in our country it doesn't work in a meantime. In case of a surplus of specialists, public or private funds, human resources are used inefficiently and eventually, a financial burden falls on the shoulders of all the inhabitants of the country. In addition, students suffer when after the studies they cannot work at full load and are unable to repay the loans taken for studies (Alan Montague, 2014).

Planning of dentist human resources is promoted not only at the national level. It is also very important to plan dentist human resources internationally – the EU qualified dentists and other dental workers, who are EU citizens, are legally permitted to work in their chosen profession anywhere within the EU, over or under production of dentists or other dental workers in one EU member state can have consequences for all other member states (CECDO, 2005; Platform for Better Oral Health in Europe, 2013).

The problem of oversupply of dentists and dental specialists in Lithuania has not begun to be solved. Since the Ministry of Health of the Republic of Lithuania is responsible for the public health care and the planning of specialist supply and demand, it should ensure an effective use of public monetary resources when producing dentists and dental specialists and exploiting their human resources in the country. The project for dentist and dental specialist human resources planning should be prepared at the moment. The purpose and duty of the Lithuanian Dental Chamber, which is enacted with a law of the Dental Chamber, is to defend dentists' and dental specialists' interests – their significant role for professional community should also be realised when solving the problem of oversupply of dentists and dental specialists in Lithuania.

Universities in Lithuania are autonomous; they themselves decide how many students will be accepted for different study programmes. In recent years, when the number of dentists in the country increased, on the initiative of the universities, foreigners are accepted for dentistry studies. The number of foreign students in the dentistry programme is gradually increasing in the Lithuanian University of Health Sciences, Vilnius University; one group of dentistry students was also composed from foreigners instead of Lithuanians in 2014. As our study data shows, the majority of foreign students complement foreign labour markets and only few of them increase the number of dental practitioners in Lithuania. Therefore, such efforts of the universities helping to regulate the supply of dentists in the country are welcomed. In order not to increase the number of dentists and dental

professionals in the country, universities should focus on the admission of foreign persons to dentistry and dental residency studies, further reducing the number of Lithuanian students.

State-funded study places currently account for over 70% of the dentistry study and almost 80% of dental residency study places (LSMU, 2014; VU, 2014). According to the study data, state-funded production of dentists and prosthodontists is irrational. Without regulation of oral surgeons, periodontists, endodontologists and orthodontists distribution in the country and employment, the production of these specialists is also controversial. State funds should be allocated for the production of pediatric dentists which the country is lacking. It is necessary to improve the legislations, to direct the oversupply of dentists and dental specialists to fight against the poverty, to reduce inequalities in health of the most vulnerable groups of the population: to take care of people with disabilities, retired persons, low-income individuals.

Strict regulation of the number of dentists and dental specialists in the country can have consequences that are difficult to predict. Therefore, it is very important to monitor the supply and demand of dentists and dental specialists in the country and update the planning projections constantly. Through analysing the planning projections, it is possible to achieve a more effective control over the unforeseen emerging factors and the effect of changing circumstances on the dental care labour market, and in this way, bypass the consequences of poor workforce planning.

## CONCLUSIONS

1. Almost every third dentist and dental specialist in Lithuania works overtime (more than 40 hours per week), perceives the shortage of patients, the average dentist and dental specialist requires at least 10% of additional workload. About two thirds of both groups of dentists have plans to work after retirement.
2. According to the self-perception of Lithuanian dentists and dental specialists, there is an adequate supply or a surplus of general dentists, a shortage of pediatric dentists and an adequate supply or surplus of prosthodontists in Lithuania.
3. If the same number of dentistry students and residents in universities is maintained in the future, in the medium number supply projections until 2024, the supply of dentists and dental specialists (except of prosthodontists) will increase; the demand of dentists and dental specialists (except periodontists) will decrease.

4. If the same number of dentistry students and residents in universities is maintained in the future, until 2024, an adequate supply of prosthodontists and pediatric dentists, a surplus of general dentists, oral surgeons, periodontists, endodontologists and orthodontists is projected. Due to low accessibility to specialised dental care in regions distant from the big cities, the increasing supply of oral surgeons, periodontists, endodontologists and orthodontists can be acceptable for the next few years. The planning projections of these dental specialists should be reviewed later.

## PRACTICAL RECOMMENDATIONS

1. The oversupply of dentists and dental specialists should be directed to improve oral health of the most vulnerable groups of the Lithuanian population: to take care of people with disabilities, retired and institutional persons, and low-income individuals.
2. Universities are recommended to admit foreign persons to dentistry and dental residency studies, while reducing the number of Lithuanian students.
3. It is necessary to implement measures to regulate the distribution of dentists and dental specialists in the territory of Lithuania.
4. It is important to monitor the supply and demand of dentists and dental specialists in the country and to update their planning projections.
5. It is necessary to refine the records about practicing dentists and dental specialists in Lithuania and to structure and document data used for their workforce planning projections.

## LIST OF PUBLICATIONS AND PRESENTATIONS

Publications from dissertation material:

1. Berlin V, Puriene A, Peciuliene V, Aleksejuniene J. Treatment procedures and referral patterns of general dentists in Lithuania. *Medicina (Kaunas)* 2015, 51:296-301.
2. Janulyte V, Puriene A. [The opinion of dentists and dental specialists about their supply in Lithuania]. *Dental and Maxillofacial J Supplement* 2015; 2: 28-32.
3. Janulyte V, Aleksejuniene J, Puriene A, Peciuliene V, Benzian H. Current employment characteristics and career intentions of Lithuanian dentists. *Hum Resour Health* 2014;12:74.
4. Janulyte V, Puriene A. [Health care service of dental specialists in Lithuania]. *Sveikatos mokslai*; 2014, 6:183-186.

Other publications from the topic:

1. Janulyte V, Puriene A, Peciuliene V. [Emigration of Lithuanian dental professional graduates]. *Dental and Maxillofacial J Supplement* 2013; 1: 23-25.
2. Janulyte V, Puriene A., Benzian H., Petrauskiene J., Peciuliene V. International migration of Lithuanian oral health professionals – a survey of graduates. *Int Dent J* 2011; 61: 224-230.
3. Janulyte V, Puriene A, Linkeviciene L, Grigaitė G, Kutkauskienė J. The orthodontic treatment in Lithuania: accessibility survey. *Baltic Dental and Maxillofacial J* 2008; 10(3): 107-112.

Presentations from dissertation material:

1. Janulyte V., Puriene A. Utilization of the specialized dental care in Lithuania: reasons for non-referrals. Poster presentation “20<sup>th</sup> Annual Meeting of the European Association of Dental Public Health”, 17-19<sup>th</sup> of September, 2015, Istanbul.
2. Janulyte V, Puriene A, Peciuliene V. Treatment modalities and referral patterns: a survey of general dentists in Lithuania. Poster presentation “19<sup>th</sup> Annual Meeting of the European Association of Dental Public Health”, 12-14<sup>th</sup> of June, 2014, Gothenburg.
3. Janulyte V, Puriene A. Health care service of dental specialists in Lithuania. The international conference – Evolutionary medicine: perspectives in understanding health and disease. 27-30<sup>th</sup> of May, 2014, Vilnius University.
4. Janulyte V, Puriene A, Aleksejuniene J, Peciuliene V. The supply of dental care specialists in Lithuania: self-perceptions of general dentists and dental specialists. Poster presentation „26th Annual Meeting of European Society of Dental Ergonomics“ 9-10<sup>th</sup> of May, 2014, Vilnius.
5. Juocevicius A, Janulyte V. Work-related musculoskeletal disorders in dental practice. Lithuanian example. „26th Annual Meeting of European Society of Dental Ergonomics“ 9-10<sup>th</sup> of May, 2014, Vilnius.
6. Janulyte V. [Lithuania a donor or recipient country for dental professionals?]. The conference of young scientists “Biofuture: the perspectives of nature and life sciences“ Lithuanian Academy of Sciences, 11<sup>th</sup> of December, 2013, Vilnius.
7. Janulyte V, Puriene A, Aleksejuniene J, Peciuliene V. Lithuania a donor or recipient country for dental professionals? Poster presentation “18<sup>th</sup> Annual Meeting of the European Association of Dental Public Health”, 14-16<sup>th</sup> of November, 2013, Malta.

Other presentations from the topic:

1. Janulyte V, Puriene A, Benzian H. Intentions of Lithuanian oral health graduates to practice abroad. Poster presentation “16<sup>th</sup> Annual Meeting of the European Association of Dental Public Health”, 22-24<sup>th</sup> of September, 2011, Rome.
2. Janulyte V. [The issue of oral health graduates emigration in Lithuania]. International conference of Lithuanian Dental Chamber “Oral health for all”. 27-28<sup>th</sup> of May, 2011, Druskininkai.
3. Janulyte V, Puriene A, Linkeviciene L, Grigaite G, Kutkauskiene J. The orthodontic treatment in Lithuania: accessibility survey. Poster presentation “3<sup>rd</sup> Baltic Scientific Conference in Dentistry”, 6-8<sup>th</sup> of November, 2008, Vilnius.

## ACKNOWLEDGEMENTS

I would like to extend my sincere gratitude to:

Prof. dr. **Alina Pūrienė**, D.D.S., Hab. Dr., Head of the Vilnius University Hospital Žalgiris Clinic, Academic Supervisor of the Doctoral Studies, for developing me as a scientist, providing me the opportunity to carry out the study and for continuous advice, comprehensive help and consistent support throughout those years.

Academic advisor **habil.dr. Jadvyga Petrauskienė** D.D.S., Hab. Dr., rest eternal, for her valuable advice in designing the study and developing study questionnaire.

Dr. **Jolanta Aleksejūnienė**, D.D.S., PhD (The University of British Columbia), for comprehensive lessons and help in statistical analysis of the study data and writing publications.

Prof. Dr. **Vytautė Pečiulienė**, D.D.S., PhD, Head of the Institute of Odontology, Faculty of Medicine, Vilnius University for her valuable scientific discussions and ideas for planning projections and support in carrying out the study.

Dr. **Habib Benzian**, D.D.S., PhD, the founder of the Health Bureau company for advices and help in writing publications.

Lithuanian Dental Chamber, National Data Protection Inspection, Vilnius University, Lithuanian University of Health Sciences, Ministry of Health of the Republic of Lithuania, Institute of Hygiene Health information Centre for providing me the data for the study, consistent and fluent guidance in the process.

## ABOUT VILIJA BERLIN

V. Berlin was born in 1983, in Trakai. In 2002, she entered the Institute of Odontology at the Faculty of Medicine at Vilnius University where she graduated from dentistry with diploma CUM LAUDE (in 2007) and residency in orthodontics (in 2011). From 2007, V. Berlin worked at the Vilnius University Hospital Žalgiris Clinic as a dentist and since 2011, she has been working as an orthodontist, is a doctoral student and assistant professor at the Institute of Odontology at the Faculty of Medicine at Vilnius University. Her field of research concerns the supply and demand of dentists and dental specialists in Lithuania. V. Berlin has participated in one Lithuanian and nine international conferences with posters and oral presentations and published seven studies on the topic. She is a member of the Lithuanian Orthodontic Society, European Orthodontic Society, Lithuanian Association of Dental Ergonomics, and European Society of Dental Public Health.

## SANTRAUKA

**Įvadas.** Nuo Nepriklausomybės atkūrimo gydytojų odontologų, vėliau ir gydytojų odontologų specialistų skaičius Lietuvoje nuolat augo. 1992 m. 10 000 gyventojų teko 5,5 gydytojo odontologo, 2002 m. – 6,5, 2012 m. – 10,9, 2014 m. – 12,1 (LR OR, 2012, 2014c; WHO, 2015). Europos Sąjungos šalių vidurkis 2011 metais buvo 6,7 gydytojo odontologo 10 000 gyventojų (WHO, 2015). 2014 metais 17 % gydytojų odontologų Lietuvoje sudarė gydytojai odontologai specialistai (LR OR, 2014c). Kitose ES šalyse gydytojai odontologai specialistai sudaro nuo 2 % iki 32 % visų gydytojų odontologų (CECDO, 2015). Nors dantų ėduonis ir periodonto ligos yra labiau paplitę tarp Lietuvos gyventojų, palyginti su daugeliu Europos šalių (Koning, Holtfreter ir Kocher, 2010; Patel, 2012), šiuo metu empiriškai matomi padidėjusios konkurencijos tarp gydytojų odontologų ir gydytojų odontologų specialistų šalyje reiškiniai. Tyrimų duomenimis, ekonominio sunkmečio laikotarpiu, 2010 metais, net 26,9 % odontologijos studijų absolventų ketino emigruoti (Janulytė ir kt., 2011).

Pagrindinis gydytojų odontologų ir gydytojų odontologų specialistų žmoniškųjų išteklių planavimo tikslas – užtikrinti, kad ateityje šalyje būtų tinkamas jų skaičius, patenkinantis specializuotų odontologinės sveikatos priežiūros paslaugų poreikį, užtikrinantis teikiamų specializuotų paslaugų prieinamumą ir kokybę, garantuojantis optimalias gydytojų odontologų ir gydytojų odontologų specialistų veiklos sąlygas, mažinantis jų emigraciją bei racionaliai būtų panaudojamos švietimo sistemos ir sveikatos priežiūros lėšos. Šalyje nuolat didėjant gydytojų odontologų ir gydytojų odontologų specialistų skaičiui, jų pasiūlos ir poreikio planavimas aktualus Lietuvos odontologinės sveikatos priežiūros sistemai, o esant nevaržomai specialistų migracijai ES svarbus ir tarptautiniu mastu. Vienas iš būdų, kaip nustatyti gydytojų odontologų ir gydytojų odontologų specialistų padėtį šiandienėje odontologinės sveikatos priežiūros paslaugų rinkoje, jų poreikį Lietuvoje – įvertinti profesinių grupių nuomonę, atspindinčią asmeninę patirtį ir išvalgas dabartinėje odontologinių paslaugų rinkoje. Anketinės apklausos rezultatai parodys gydytojų odontologų ir gydytojų odontologų specialistų profesinės praktikos ypatumus (darbo krūvį, pobūdį, darbovietę, jų skaičių, praktikos vietą, jaučiamą pacientų trūkumą, pageidaujamą papildomą darbo krūvį, teikiamas odontologines paslaugas, pacientų siuntimo gydytojams odontologams specialistams dažnį, priežastis, kodėl tai nedaroma), ateities planus (ketinimus emigruoti, keisti profesiją, kada planuoja išeiti į pensiją) bei jų nuomonę apie gydytojų odontologų ir gydytojų odontologų specialistų poreikį Lietuvoje.

**Tyrimo tikslas** – įvertinti Lietuvos gydytojų odontologų ir gydytojų odontologų specialistų nuomonę dėl gydytojų odontologų ir gydytojų odontologų specialistų poreikio Lietuvoje. Parengti gydytojų odontologų ir gydytojų odontologų specialistų pasiūlos ir poreikio prognozes iki 2024 metų.

## **Darbo uždaviniai:**

1. Įvertinti Lietuvos gydytojų odontologų ir gydytojų odontologų specialistų profesinės praktikos ypatumus, ateities planus.
2. Įvertinti gydytojų odontologų ir gydytojų odontologų specialistų nuomonę apie gydytojų odontologų ir gydytojų odontologų specialistų poreikį Lietuvoje.
3. Prognozuoti gydytojų odontologų ir gydytojų odontologų specialistų pasiūlos ir poreikio šalyje kitimą iki 2024 metų.
4. Įvertinti, ar Lietuvos gydytojų odontologų ir gydytojų odontologų specialistų prognozuojama pasiūla atitiks prognozuojamą poreikį.

## **Darbo naujumas ir aktualumas**

J. Petrauskienė su bendraautoriais 1994 metais paskelbė pirmąsias Lietuvos gydytojų odontologų pasiūlos prognozes iki 2009 metų (Petrauskienė, Bierontas ir Guogienė, 1994). Jas 2006 metais atnaujino Ž. Zakaitė. Ji pirmą kartą atliko gydytojų odontologų poreikio tyrimą, tyrimo pagrindu parengė bendrosios praktikos gydytojų odontologų pasiūlos ir poreikio prognozes Lietuvoje iki 2015 metų. Tai buvo vėliausias bandymas tirti gydytojų odontologų poreikį Lietuvoje bei prognozuoti gydytojų odontologų pasiūlą ir poreikį.

Tyrimo rezultatai apibendrina gydytojų odontologų ir gydytojų odontologų specialistų profesinės praktikos ypatumus Lietuvoje, ateities planus. Anketinės apklausos duomenys atspindi Lietuvos gydytojų odontologų ir gydytojų odontologų specialistų nuomonę, nusako jų asmeninę patirtį ir išvalgas apie gydytojų odontologų ir gydytojų odontologų specialistų žmogiškuosius išteklius šalyje. Anksčiau tai tirta nebuvo. Šis tyrimas pirmasis taip detaliai analizuoja odontologinių paslaugų rinką Lietuvoje.

Naudojant naujausius prieinamus duomenis iš Lietuvos ir užsienio institucijų, remiantis pastarųjų metų tendencijomis, tyrimo duomenimis, sudarytos ir darbe pateiktos gydytojų odontologų ir gydytojų odontologų specialistų skaičiaus Lietuvoje prognozės iki 2024 metų. Poreikio atskaitos tašku laikant esamą gydytojų odontologų ir gydytojų odontologų specialistų skaičių, Lietuvos populiaciją bei jos demografinius rodiklius, sudarytos gydytojų odontologų ir gydytojų odontologų specialistų poreikio per ateinančius dešimt metų prognozės. Tokios prognozės odontologams paskutinį kartą skaičiuotos 2006 metais. Gydytojų odontologų specialistų žmogiškųjų išteklių planavimo problemos Lietuvoje anksčiau analizuotos nebuvo.

Tyrimo rezultatai naudingi politiką formuojančioms institucijoms planuojant gydytojų odontologų ir gydytojų odontologų specialistų žmogiškuosius išteklius Lietuvoje bei efektyviai juos panaudojant. Gauti duomenys yra rekomendacija Lietuvos Respublikos sveikatos apsaugos ministerijai (SAM) bei odontologijos mokymo įstaigoms, kaip jos galėtų



koreguoti studentų priėmimą į odontologijos studijų bei odontologijos rezidentūros programas, pagal specializacijas paskirstyti finansuojamas rezidentūros vietas. Gydytojų odontologų ir gydytojų odontologų specialistų žmogiškųjų išteklių planavimas svarbus siekiant pagerinti odontologinių paslaugų prieinamumą, kokybę, švietimo ir sveikatos sistemos lėšų efektyvesnę paskirstymą, gydytojų odontologų specialistų veiklos sąlygas, mažinti gydytojų odontologų emigraciją. Publikuoti duomenys naudingi abiturientams, ketinantiems studijuoti odontologiją ir odontologijos studentams, besirenkantiems rezidentūros programą.

Tyrimo rezultatai bei gydytojų odontologų ir gydytojų odontologų specialistų planavimas šalyje svarbus ir tarptautiniu mastu – šie gydytojai gali laisvai migruoti ir dirbti visoje ES, todėl jų perteklius ar trūkumas Lietuvoje turės pasekmių kitoms šalims narėms.

### **Ginamieji teiginiai:**

1. Lietuvos gydytojai odontologai ir gydytojai odontologai specialistai jaučia pacientų trūkumą, nori turėti didesnę nei vieno etato darbo krūvį, dirbti sulaukę pensinio amžiaus.
2. Gydytojų odontologų ir gydytojų odontologų specialistų nuomone, gydytojų odontologų ir gydytojų odontologų specialistų pasiūla Lietuvoje neatitinka poreikio.
3. Išsipildžius prognozių prielaidoms, iki 2024 metų gydytojų odontologų ir gydytojų odontologų specialistų pasiūla ir poreikis keisis, pasiūla neatitiks poreikio.

## **TYRIMO MEDŽIAGA IR METODAI**

### **Anketinė apklausa**

Atsižvelgiant į darbo tikslą ir uždavinius, remiantis anksčiau vykdytomis gydytojų odontologų apklausomis Lietuvoje ir panašiais tyrimais užsienio šalyse sudaryta apklausos anketa. Jos patikimumas įvertintas atlikus žvalgomąjį tyrimą Vilniaus universiteto ligoninėje Žalgirio klinikoje.

Anketinės apklausos tyrimui vykdyti gautas Valstybinės duomenų apsaugos inspekcijos leidimas (2012-09-14, Nr. 2R-3247 (2.6.1) ir 2013-12-11, Nr. 2R-2149(2.6-1.)). Jo pagrindu 2012 m. spalio 17 d. iš Lietuvos Respublikos odontologų rūmų licencijų registro duomenų bazės gauti visų Lietuvos gydytojų odontologų ir gydytojų odontologų specialistų, turinčių galiojančią odontologijos specialisto praktikos licenciją, duomenys (vardas, pavardė, profesinė kvalifikacija, amžius, gyvenamosios vietos adresas, elektroninio pašto adresas bei telefono numeris). Iš gautos duomenų bazės pašalinti gydytojai veido ir žandikaulių chirurgai (17), emigravę (66), jau nebedirbantys dėl pensinio amžiaus (103) ir

tie odontologai, kurių kontaktiniai duomenys buvo netikslūs (348). Tiriamąją grupę sudarė visi Lietuvoje praktikuojantys gydytojai odontologai ir gydytojai odontologai specialistai (N = 2971), kurių kontaktai buvo prieinami Odontologų rūmų licencijų registro duomenų bazėje.

Dalyvauti tyrime gydytojai odontologai buvo kviešti tris kartus. Pirmiausiai, priklausomai nuo turimų kontaktinių duomenų (el. pašto ar gyvenamosios vietos adreso), anketa su tyrimo aprašymu ir apmokėtu atgaliniu voku buvo siunčiama paprastu arba elektroniniu paštu. Po 6 savaičių neatsakiusiems anketa siūsta pakartotinai, dar po 6 savaičių skambinta telefonu. Sutikusiems dalyvauti tyrime gydytojams anketa išsiūsta jiems patogiu būdu. Per visą tyrimą gautos 2008 atsakytos anketos, kas sudaro 67,6 % tyrimo atsako dažnį. Gydytojų odontologų ir gydytojų odontologų specialistų anketinės apklausos tyrimas vykdytas 2012 metų gruodžio–2013 metų birželio mėnesiais.

### **Gydytojų odontologų ir gydytojų odontologų specialistų pasiūlos ir poreikio prognozės**

Gydytojų odontologų ir gydytojų odontologų specialistų pasiūlos ir poreikio prognozės sudarytos vadovaujantis australų mokslininko Dewdney parengtu pakopiniu matematiniu *Excel* programos modeliu (Dewdney, 2001). Jis pasirinktas dėl savo paprastumo naudoti, lengvo pritaikomumo, įvairiapusiškumo. Modelis adaptuotas turimiems statistiniams rodikliams ir prognozėms naudojamiems duomenims. Naudoti naujausi prieinami 2013–2014 metų duomenys, prognozės sudarytos ateinantiems dešimčiai metų, t.y. iki 2024 metų imtinai.

**Pasiūlos prognozės.** Prognozuota atsižvelgiant į gydytojų odontologų ir gydytojų odontologų specialistų skaičių 2014 metais, absolventų, imigruojančių gydytojų odontologų skaičių, gydytojų odontologų ir gydytojų odontologų specialistų išėjimą į pensiją, mirtingumą, emigraciją, profesijos pakeitimą. Gydytojų odontologų ir gydytojų odontologų specialistų skaičius kiekvieniems metams prognozuotas pagal ankstesnius metus atimant iš profesijos pasitraukiančius ir pridedant profesinę grupę papildančius gydytojus odontologus, skaičiuojamus pagal priimtas prielaidas. Baigiančiųjų studijas skaičius prognozėse nesiskiria – prognozuojame, kaip keisis gydytojų odontologų ir gydytojų odontologų specialistų pasiūla ateityje, jeigu rengimas universitetuose išliks esamo lygio.

Didžiausio, vidutinio ir mažiausio gydytojų odontologų ir gydytojų odontologų specialistų skaičiaus prognozės tarpusavyje skiriasi amžiaus riba, kurią pasiekę gydytojai odontologai jau nebedirbs, emigracijos, imigracijos ir profesijos pakeitimo masto prognozėmis. Kiti veiksniai, darantys įtakos gydytojų odontologų ir gydytojų odontologų specialistų skaičiui, yra vienodi.

**Poreikio prognozės.** Gydytojų odontologų ar gydytojų odontologų specialistų poreikis per ateinančią dešimtmetį prognozuotas atsižvelgiant į odontologų ir odontologų

specialistų skaičių 2014 metais (pagal susitarimą – esamą poreikį), populiacijos augimą ir jos demografinius pokyčius. Visi kiti poreikiui galintys turėti įtakos veiksniai laikyti nekintančiais.

Remiantis esamu gydytojų odontologų ir gydytojų odontologų specialistų skaičiumi, gautos poreikio prognozės sujungtos su anketinės apklausos duomenimis, apibūdinančiais šį esamą skaičių. Pateiktos galutinės išvados bei praktinės rekomendacijos.

## REZULTATAI

### Anketinė apklausa

Tyrimo metu surinkti gydytojų odontologų ir gydytojų odontologų specialistų apklausos duomenys rodo, kad gydytojais odontologais ir gydytojais odontologais specialistais Lietuvoje susiduria su profesiniais sunkumais. Apytiksliai kas trečias jų dirba daugiau kaip 40 valandų per savaitę, jaučia pacientų trūkumą, kas antras dirba keliose odontologinės sveikatos priežiūros įstaigose, vidutinis odontologas ar odontologas specialistas norėtų bent jau 10 % papildomo darbo krūvio. Kas antras trečias gydytojas odontologas specialistas teikia ne tik specializuotas odontologinės sveikatos priežiūros paslaugas, bet ir dirba kaip gydytojas odontologas. Apie du trečdalius gydytojų odontologų ir gydytojų odontologų specialistų planuoja dirbti ir sulaukę oficialaus pensinio amžiaus, kas dešimtas – ketina emigruoti.

Tyrimo rezultatai atskleidė, kad pacientų trūkumą reikšmingai dažniau jautė gydytojais odontologais ir gydytojais odontologais specialistais, dirbantys didžiuosiuose miestuose (Vilniuje, Kaune, Klaipėdoje, Panevėžyje, Šiauliuose) bei privačiame odontologijos priežiūros paslaugų sektoriuje, kas rodo, kad jų pasiskirstymas šalies teritorijoje bei valstybiniame ir privačiame sektoriuje nevienodas ir neatitinka pacientų poreikio.

Gydytojų odontologų ir gydytojų odontologų specialistų nuomone, Lietuvoje yra gydytojų odontologų perteklius arba dar vis tinkamas skaičius, gydytojų vaikų odontologų trūkumas bei gydytojų odontologų ortopedų perteklius ar vis dar tinkamas skaičius. Gydytojų odontologų ir gydytojų odontologų specialistų nuomonės dėl burnos chirurgų, ortodontų, endodontologų ir periodontologų skaičiaus išsiskyrė: gydytojais odontologais manė, jog gydytojų odontologų specialistų trūksta arba jų yra tinkamas skaičius, o skirtingi gydytojais odontologais specialistais buvo kitos nuomonės – jie nurodė, kad jaučia savo kolegų perteklių. Šis nuomonių skirtumas gali būti dėl konkurencijos profesinės grupės viduje. Didžioji dalis gydytojų odontologų ir gydytojų odontologų specialistų nurodė, kad jų rengimas ir pasiskirstymas šalies teritorijoje turi būti reguliuojamas.

## **Gydytojų odontologų ir gydytojų odontologų specialistų pasiūlos ir poreikio prognozės**

Prognozuojama, kad gydytojų odontologų ir gydytojų odontologų specialistų (išskyrus gydytojus periodontologus) poreikis šalyje mažės. Tai vyks dėl laipsniško Lietuvos gyventojų skaičiaus mažėjimo ir 65 metų ir vyresnių žmonių populiacijos dalies didėjimo. Vertinant vidutinio skaičiaus prognozes, numatomas gydytojų odontologų ir gydytojų odontologų specialistų (išskyrus odontologus ortopedus) poreikis bus mažesnis už prognozuojamą pasiūlą.

Apibendrinant gydytojų odontologų ir gydytojų odontologų specialistų nuomonę bei jų pasiūlos ir poreikio prognozes, matoma, kad, remiantis vidutinio skaičiaus prognozėmis, didėjantis gydytojų vaikų odontologų skaičius iš dalies kompensuos jaučiamą jų trūkumą, o mažėjantis gydytojų odontologų ortopedų skaičius iš dalies kompensuos jaučiamą jų perteklių šalyje.

Vertinant gydytojų odontologų ir gydytojų odontologų specialistų skaičių šalyje, būtina atsižvelgti į jų susitelkimą didžiuosiuose miestuose, blogesnę odontologinių, ypač specializuotų, paslaugų prieinamumą nuo didžiųjų miestų nutolusiuose regionuose. Specialistų pertekliaus problemą reikėtų spręsti reguliuojant gydytojų odontologų specialistų pasiskirstymą Lietuvos teritorijoje, o mažinti odontologų specialistų rengimo universitetuose šiuo metu nereikėtų. Prognozuojamas sparčiai didėjantis gydytojų burnos chirurgų, ortodontų, endodontologų ir periodontologų skaičius kelia rūpestį, todėl situacija turi būti stebima ir šių specialybių gydytojų odontologų specialistų rengimo poreikis po poros metų turėtų būti peržiūrėtas.

Vertinant gydytojų odontologų specialistų skaičių šalyje, būtina atsižvelgti ir į šalies specialistų sudėtį pagal specializacijos įgijimo būdą. Jis gali lemti gydytojų odontologų specialistų atliekamų specializuotų paslaugų sudėtingumą: trejų metų rezidentūros studijas universitete baigę specialistai gali teikti sudėtingesnę specializuotų paslaugų spektrą, palyginti su tais, kurie specializaciją įgijo per atestaciją arba trumpesnes nei trejų metų universitetines studijas. Šis aspektas mūsų tyrime nebuvo analizuotas, tam turi būti atlikti tolimesni tyrimai. Nustačius, kad trejų metų rezidentūros studijas universitete baigę specialistai gali teikti sudėtingesnę specializuotų paslaugų spektrą, tai būtų papildomas argumentas nemažinti jų rengimo.

## IŠVADOS

1. Kas trečias gydytojas odontologas ar gydytojas odontologas specialistas dirba daugiau kaip 40 valandų per savaitę, jaučia pacientų trūkumą, vidutinis gydytojas odontologas ar gydytojas odontologas specialistas norėtų bent jau 10 % papildomo darbo krūvio. Apie du trečdaliai gydytojų odontologų ir gydytojų odontologų specialistų ketina dirbti ir sulaukę oficialaus pensinio amžiaus.
2. Gydytojų odontologų ir gydytojų odontologų specialistų nuomone, Lietuvoje yra gydytojų odontologų perteklius arba dar vis tinkamas skaičius, gydytojų vaikų odontologų trūkumas bei gydytojų odontologų ortopedų perteklius ar vis dar tinkamas skaičius.
3. Išlaikant tokį patį gydytojų odontologų ir gydytojų odontologų specialistų rengimą universitetuose, išsipildžius vidutinio odontologų skaičiaus prognozių prielaidoms, iki 2024 metų gydytojų odontologų ir gydytojų odontologų specialistų (išskyrus gydytojų odontologų ortopedų) skaičius šalyje didės, gydytojų odontologų ir gydytojų odontologų specialistų (išskyrus gydytojus periodontologus) poreikis šalyje mažės.
4. Išlaikant tas pačias gydytojų odontologų ir gydytojų odontologų specialistų rengimo apimtis, iki 2024 metų prognozuojamas tinkamas gydytojų odontologų ortopedų ir vaikų odontologų skaičius bei gydytojų odontologų, burnos chirurgų, periodontologų, endodontologų ir ortodontų perteklius. Dėl mažo specializuotų paslaugų prieinamumo atokiau nuo didžiųjų miestų gydytojų burnos chirurgų, periodontologų, endodontologų ir ortodontų didėjanti pasiūla gali būti priimtina tik ateinančius kelerius metus, vėliau šių specialistų skaičiaus prognozės turi būti peržiūrėtos.

## PRAKTINĖS REKOMENDACIJOS

1. Gydytojų odontologų ir gydytojų odontologų specialistų perteklių šalyje reikėtų panaudoti gerinant pažeidžiamiausių Lietuvos populiacijos grupių – pensininkų, neįgaliųjų, institucinių ir kitų mažesnes pajamas gaunančių asmenų – burnos sveikatą.
2. Universitetams rekomenduojama reguliuoti gydytojų odontologų ir gydytojų odontologų specialistų skaičių šalyje, priimant studijuoti užsienio valstybių asmenis ir mažinant lietuvių studentų skaičių.
3. Būtina įgyvendinti priemones, reguliuojančias odontologų ir odontologų specialistų pasiskirstymą Lietuvos teritorijoje.
4. Svarbu sekti gydytojų odontologų ir gydytojų odontologų specialistų pasiūlą ir poreikį šalyje bei nuolat atnaujinti prognozes.
5. Būtina tikslinti gydytojų odontologų ir gydytojų odontologų specialistų apskaitą, susisteminti bei dokumentuoti odontologų ir odontologų specialistų skaičiaus planavimui svarbią informaciją.