

CURRENT STATUS OF THE DENTAL PRACTICE IN BULGARIA. META-ANALYSIS

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ABSTRACT

The purpose of this study was to show the leading trends in dental practice and dental profession development after two decades of transition.

Materials and methods: A systematic review of data was performed including analysis of secondary statistical data and benchmarking data from relevant publications.

Results: The meta-analysis found that: The dentists/patients ratio decreased steadily; The dental surgeries' development, in terms of new equipment, is observed; The use of support staff increased from 1996 to 2001, and decreased as on 2011; The utilization of dental services, compared to EU level is going down; The disproportion between new technologies implementation and lack of trained support staff utilization was evidenced; Long-term trend toward general versus specialize care was demonstrated

Conclusions: The extensive growth and irregular distribution of dental practices, along with the decrease of the dental services' utilization shape the portrait of the dental profession and dental practice in Bulgaria by the end of the first decade of 21 century.

Key words: dental practice, dental practitioner, dental service utilization, dental staff, professional status

INTRODUCTION

The development of dentistry in Bulgaria in recent decades has led to major changes, such as: promotion of private ownership of health facilities, participation of the dental profession in the tripartite model¹ of social and health assurance, technological innovation of dental surgeries, marketization of the professional activities [3]. Dentists identify themselves as a regulated profession [4].

These changes are the result of processes occurring in society and in the professional community. On the other hand, they are the basis and the precursor of future development of the health care entities, the dental practices, in particular.

¹ "Tripartite": Tripartite, with the participation of the State, the employees and the employers.

The review of the literature, as a part of the preparatory stage of a dissertation study entitled "Organization of the dental practice in market conditions", showed that the process of professionalization of dentists and the changes in the health care system were relatively well studied. As regards the development of dental practices, it was found that there is a lack of sufficient and reliable data to explain the complex socio-economic impacts on the professional and technological aspects of the of dental practices today. Therefore, with this study we focused on the search of relevant information to lighten this range of issues and define long-term trends in dental practices' development in Bulgaria by the first decade of the 21 century.

PURPOSE

The aim of this study was to present the current status of dental practices in Bulgaria as a result of 20 years' period of development (1990 - 2010), based on a systematic review of data. To support the hypothesis, the following **tasks** had been formulated:

1. To make a brief description of the demographic situation and demographic trends of Bulgarian population;
2. To present the demographic characteristics of practicing dentists in Bulgaria (distribution by sex and age) and their number and distribution all over the country;
3. To present the structure and the development of dental practices².

MATERIAL AND METHODS:

The metha-analysis³ consists of comparative evaluation of data, issued from published to date studies. The literature review covers two periods: (1990-2000) and (2000-2010). Studies' review comprises: author, year, subject field, study period and sample size (Table 1).

² Change in status, change in type of practice, professional development of physicians, support staff development

³ Meta-analysis is a quantitative method for combining data from independent studies with similar design, combined in a single measurement scale. In a meta-analysis of primary data from surveys again processed and analyzed in biostatistics: stratification, standardization, control errors, etc. In randomized studies, meta-analysis derive empirical results [12, 13].

Comparison of empirical data extracted from publications was presented graphically. A secondary analysis of statistical data was performed. Used are official sources of statistics⁴.

Table 1: Review of literature

Author / Year	Subject field (Key - words)	Period	Sample size
L. Katrova(2009)	Trends in dental demography	1996-2008	842, 98, 235
L. Katrova(2009)	Mobility, continuity	1983-2008	320, 230, 96, 96 (students)
L. Katrova, Hr. Kisov(2009)	Postgraduate education Continuing education' courses	1995-2009	1551, 93, 235, 135
L. Katrova P. Bojinov, I. Mihailova.(2007)	Health reforms, Professional status	1995-2005	842, 192, 98
Katrova L., et al.(2004)	Treatment' needs	2000-2002	130(patients)
L. Katrova, K. Tzokov(2001)	Professional statusAuxiliary staff	1996 1999 2001	842 192 98
L. Katrova, M. Grashkina(1999)	Utilization of dental service	1999	400(patients)
L. Katrova(1997)	Dental health service, Personnel	1986 –1995	1707
L. Katrova,(1995)	Profession's Reproduction Social Aspects	1985 – 1995	230(students)

RESULTS AND DISCUSSION

1. Brief description of the demographic situation and demographic trends in Bulgaria

The latest census in Bulgaria (2010) stated the total number of the population at 7,364,570 people [11]. Compared to previous moment, this figure confirms the trend of continuing decrease in number. In 2009 the total number of the population was 7,563,710 (about 200 000

more) while in the year 2000 the total number was 8,149,468 people (about 800 000 more) [5].

This trend is characteristic for almost all regions of the country, excepted the regions of Varna, Sofia-city, where an increase in the number of the population is observed (Table 2) [5, 7].

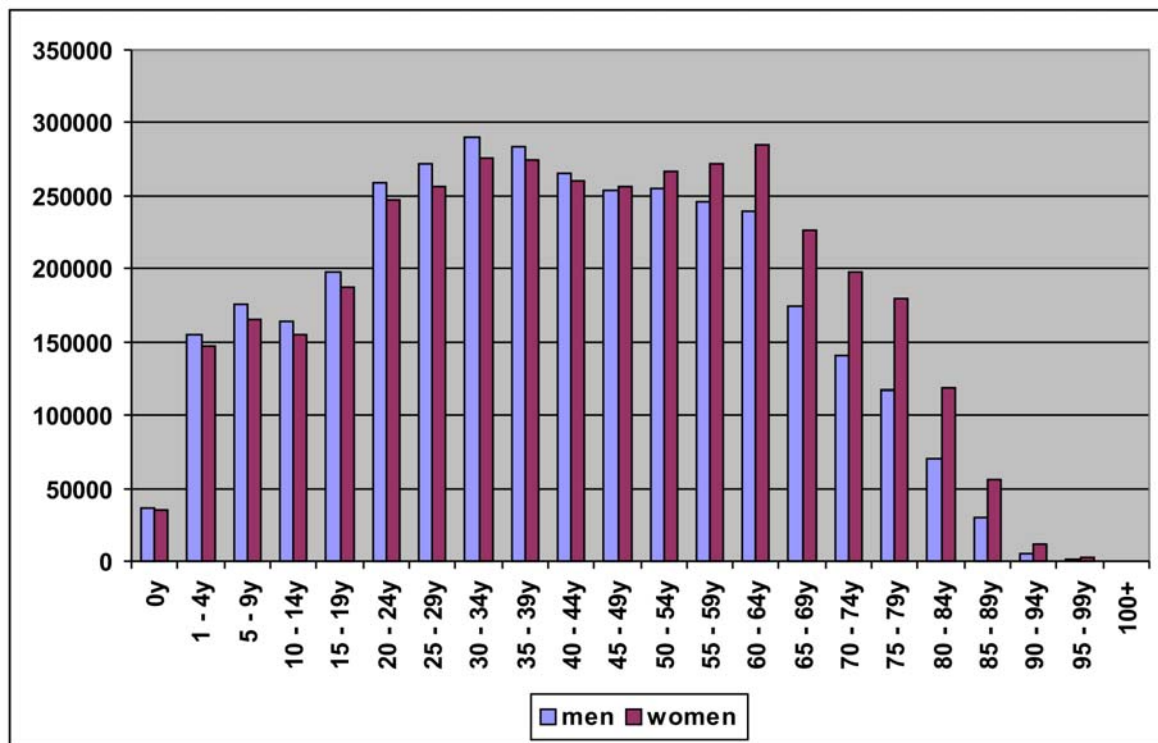
Table 2: Change of number of the population by region

Year region	2002	2007	2008	2009	2011
Bourgas	421049	420095	420840	422319	415817
Varna	460001	459613	463260	465465	475074
Vidin	125158	112604	110310	108067	101018
Kardjali	162332	156652	156008	154719	152808
Plovdiv	712702	705121	704057	701684	683027
Rousse	264232	253008	251236	249144	235252
Sofia-city	1194164	1240788	1247059	1249798	1291591
Targovishte	139600	132771	131233	129675	120818
Shumen	201890	196559	195479	194090	180528

⁴ National Health Information Center (NHIC), National Statistical Institute (NSI) and registers of Bulgarian Dental Association (BgDA).

The distribution by sex and age of the population shows a sustainable tendency to aging. The number of women prevails excepted in younger age groups where a slight increase of male population is observed. Excess of women is generally due to the higher life expectation of women (Fig.1), [11].

Fig 1. Population by age and sex groups.



2. Professional demographics of dentists

The number of dentists in Bulgaria for the studied period increased considerably. Data published by the Bulgarian Dental Association (BgDA) and those published by the National Health Information Center (NHIC) show some differences, so we present them in parallel (Table 3.), [5, 1].

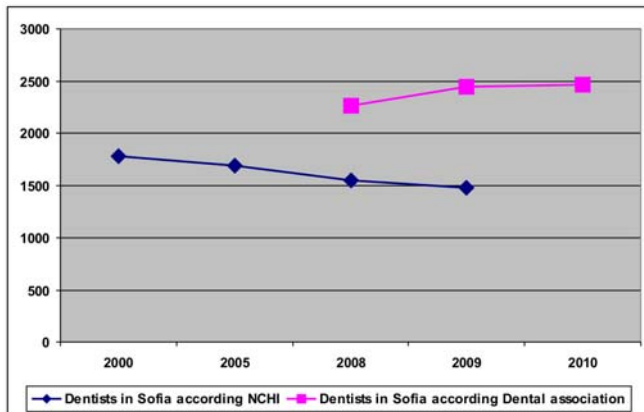
Table 3: Number of dentists by region

Region/ source	NHIC			BgDA		
	2008	2009	2011	2008	2009	2011
Bourgas	258	272	-	340	369	383
Varna	378	426	-	471	486	486
Vidin	96	108	-	125	113	109
Kardjali	104	115	-	128	133	135
Plovdiv	862	936	-	1028	1172	1226
Rousse	162	162	-	186	190	198
Sofia-city	1545	1479	-	2265	2449	2400

Targovishte	59	62	-	72	66	68
Shumen	99	105	-	112	112	116

The case of Sofia is very significant. According to BgDA data the number of dentists in Sofia-city changes from 1545 people in 2000 to 2,449 in 2009. According to NHIC data the number of dentists in the city of Sofia ranged from 1781 (in 2000) to 1479 (in 2009), (Fig 2.).

Fig. 2. Parallel records of the changing number of dentists, the case of Sofia-city



We consider that the discrepancies in the data from two cited sources could be due to the **different methods of registration**. The BgDA keeps the dental practitioners' register. The reduced number issued from this register is reflecting the increasing trend towards working abroad and/or aging of the professional group. On the other hand, the Regional Health Centers register the dental practices. Sometimes one practitioner could be registered more than once, because he/she may practice at more than one place. He or she may be owner of more than one practice and /or employees other dentists to work with him/her or for him/her. Actually in the first case the figures correspond to the number of doctors, while in the second case the figures correspond to the number of dental practices (hospitals).

Age-sex structure of dentists' population is modified as follows:

From a total of about 8000 dentists registered in 2010 (source BgDA) about 66% are women, while in 1990 female dentists represented 75% of the total number of active practitioners. With regard to changes in age composition there two opposing trends are observed: for the country as a whole and for Sofia City, (Fig. 3), [9].

Fig. 3. Differences in men:women dentists ratio and average age of dentists in Sofia and the country

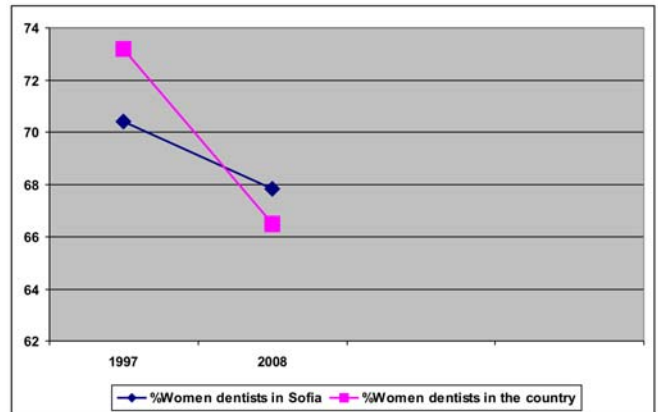


Fig.3a. Men:women dentists ratio

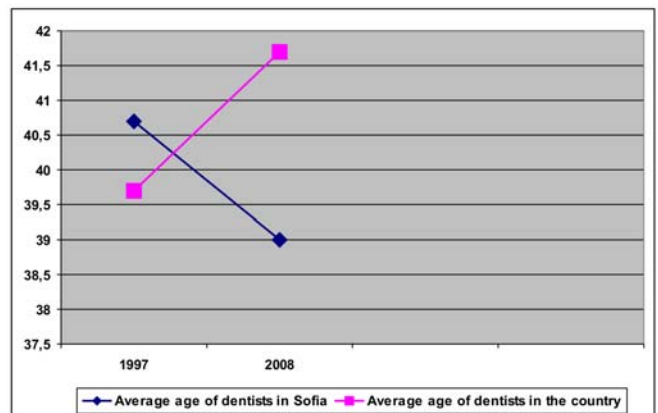


Fig.3b. Average age differences

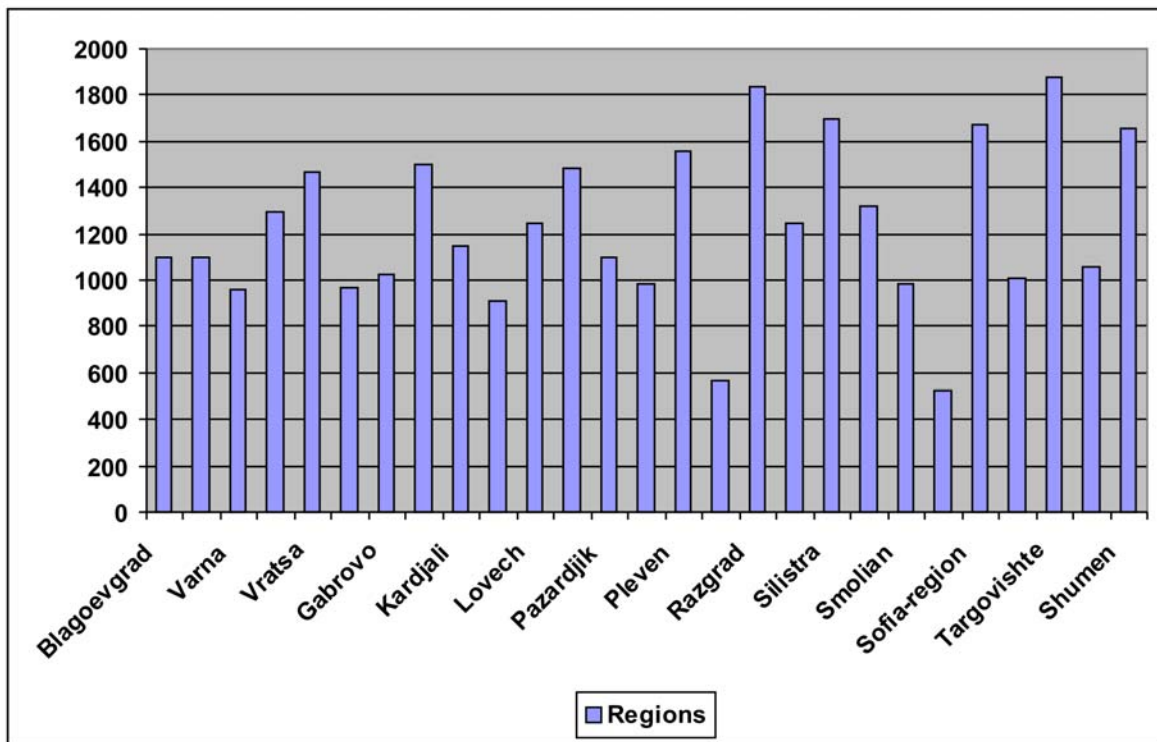
While the **average age** of dentists for the country as a whole is growing - from 39.7 years in 1997 to 41.7 years in 2008, for the Sofia - city it demonstrates an opposite trend: from 40.7 years in 1997 to 39.0 years to 2008. This result is due to the fact that Sofia is a university town and newly graduate dentists widely registered for practice in Sofia.

The **distribution of dentists is uneven over the country**. The number of dentists in urban centers grow: in Varna (from 381 dentists in 2000 to 426 dentists in 2009), in Plovdiv (from 785 dentists in 2000 to 936 dentists in 2009), in Pernik (from 112 dentists in 2000 to 136 dentists in 2009),[3].

In more densely populated regions, characterized by relatively highly developed economy the number of practices is higher and more dentists are registered, while in less

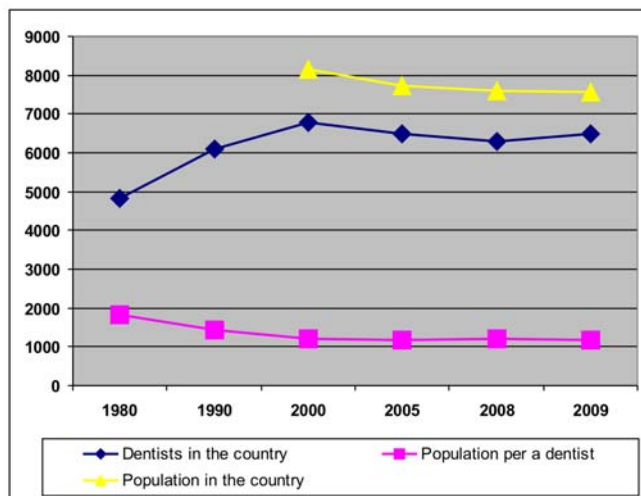
developed regions the number of practices and practitioners is less. On one hand, better infrastructure in places like city of Sofia, Varna, Plovdiv, Pernik, provides easy access to the dental practices, on the other, higher level of employment results in a higher income for the population and consequently bigger purchase power of the population, (Fig. 4).

Fig 4. Dentists : patients ratio per regions



Comparing the demographic trends among the population with the extensive development of infrastructure and the growing number of dental practitioners, it is obvious that the number of patients treated by a doctor is permanently getting reduced (Fig. 5). (3),

Fig. 5. Impact of the demographic changes of the population on patients:dentists ratio for the period (1980 - 2009.)

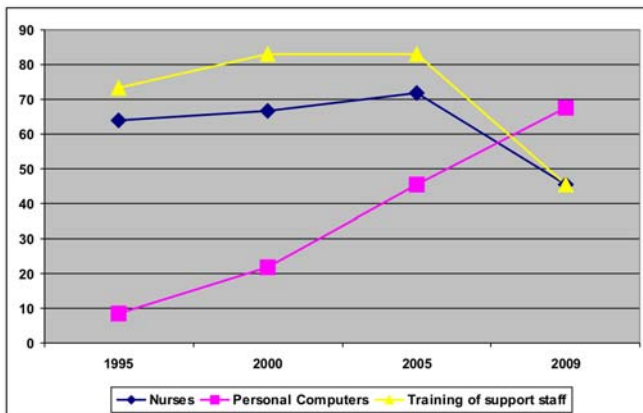


3. Structure and development of dental practices

The parameters studied were: change in status, change in type of practice, professional development, auxiliary staff development, improvement of equipment. According to literature data for the period 1991-2001 the status of dentists was irreversibly transformed by employees in the health care system in **freelance practitioners**. The percentage of **general practitioners** increases at the expense of the number of specialists. The number of specialists and specializing is going down. At the same time, the system for continuous postgraduate education is advancing under the guidance of the BgDA as well as private educational entities.

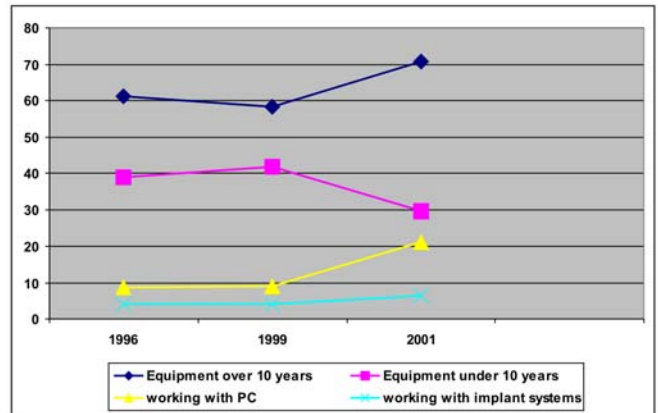
Working with auxiliary staff constitutes a small percentage of practices. The data show that after an increase of the share of dental practices working with auxiliary staff during the period 1996 - 2000, a period of stagnation followed (2000 – 2005) at the level of 40% and a sharp reduction in staff utilization was demonstrated (2005 - 2009). The similar is the trend when studying the process of auxiliary staff training (Fig.6) [8].

Fig.6. Dental auxiliary utilization in dental practices



There is a gradual renewal of dental equipment at the expense of imported equipment (from 16.6% for 1996, to 17.7% for 1999 and 24.0% for 2001). At the same time the tendency for using over 10 years old dental equipment is still present (1996 - 61.2%, 1999 - 58.2%, 2001 - 70.6%). Slowly but steadily percentage of practices working with implant systems is growing (1996 - 4.1%, 1999 - 4.2%, 2001 - 6.4%). Most demonstrative is the increase of number of practices using personal computers (Fig.7), (8).

Fig.7 Technological development of dental practices



Discussion:

Sustainable reduction in the number of the population and its uneven distribution over the country is due to social factors rather than to demographic conditions. The most attractive areas for the population are those with lower unemployment rate and better conditions for living, such as: Sofia city, Varna, Burgas, Plovdiv, as well as destinations abroad. Internal and external migration contribute significant depopulation of other regions like Vidin, Targovishte.

Overall, **the number of dentists is growing**, but we can not expect the demand for dental care to increase due to financial restraints for consumers. As a result, migration of the population is followed by migration of dentists in relatively same direction - from small villages to large agglomerations and / or outside of the country. **Defeminization** of the profession is a lasting trend, as more highly expressed in the country as a whole and less on the territory of Sofia -city. Rejuvenation of the profession is typical for the region of Sofia, but not for the country as a whole, where **an increase in the average age of active practitioners** of dental medicine is observed.

Dental practices are characterized by a clear trend towards technological innovation, while retaining the gap between the technology and team development. Surplus of technological innovation, training and equipment without taking account of available specialists and their implementation, and ignoring the problems of dental team will rise new challenges for dentists to develop their practices.

Mobility of the profession and patients will determine the new parameters of dental practice. Economic situation of the population's health literacy and education will play an increasingly important market impact.

CONCLUSIONS:

1. The dental practice' development should be studied in the context of the processes of European integration and globalization and the existing socio-economic conditions in Bulgaria.

2. The sample should include regions and municipalities that represent the structure of the population and the dental profession nationwide.

3. Methodologies for collecting and publishing data from various sources should be critically studied in the course of the study.

REFERENCES:

1. Статистически данни от регистър на БЗС за 2011 г. (in Bulgarian) http://www.bzs.bg/site/index.php?option=com_content&task=view&id=964&Itemid=663
2. Special eurobarometer oral health 330. http://ec.europa.eu/public_opinion/archives/ebs/ebs_330_en.pdf
- 3 Катрова Л. Стоматологичната професия - състояние и перспективи. Leading technology in dentistry София, 1998, 290 с, ISBN 954-90363-1-6. (in Bulgarian)
4. Катрова Л. Цоков Кр. Катрова Цв. Промяната на социално - професионалния статус на стоматолозите в България в хода на здравната реформа. Годишен сборник ИМАБ. 2002; 8(1):18-21. (in Bulgarian)
5. Национален център по здравна информация, здравна статистика <http://www.nchi.government.bg/> <http://www.nchi.government.bg/Eng/Engli6.html>. (in Bulgarian)
6. Катрова Л, Хр. Кисов. Ученето през целия живот - задължение или привилегия за лекаря по дентална медицина, продължаващото следдипломно образование – задължение или привилегия за факултетите по дентална медицина. *Проблеми на денталната медицина*, XXXVI, 2010, №2, с.28-36, ISSN: 0323-9403. (in Bulgarian)
7. Катрова Л, Папанчев Г. и др. Удовлетворяване на потребностите от лечение на кариеса и неговите усложнения в условията на здравно осигуряване, *Проблеми на стоматологията*, том XXX/2004, с. 63-68, ISSN 0323-9403. (in Bulgarian)
8. Катрова, Л. Професионално-демографски аспекти на структурната реформа в стоматологията. *Стоматол. преглед*, т. 29, 1998, №2, с. 11-28. (in Bulgarian)
9. Катрова Л, М. Грашкина. Използваемост на стоматологичната здравна служба в преходния период. (1999-2000), *Проблеми на стоматологията* т. 27, 2000 с. 115-125, ISSN 0323-9403. (in Bulgarian)
10. Катрова Л. Генерационна мобилност в зъболекарската професия, приемственост и перспективи *Soc. Med. Sofia*, 17, 2009, No 3, с. 29-32, ISSN: 1310-1757. (in Bulgarian)
11. <http://www.nsi.bg/census2011/indexen.php>
12. Ранчов Г. Биостатистика и биоматематика: концепции, методи, приложения. София, 2008 ISBN: 978-954-91084-9-1. (in Bulgarian)
13. Шипковенска Е., Методология на научно-изследователската работа, Здравна политика и мениджмънт, 2011, том 11, №1, ISSN 1313-4981. (in Bulgarian)
14. Katrova L. Leading trends in dental profession demography in Bulgaria for the period 1996-2008 (OP112). 14th Congress of BASS, 9th Scientific Congress of the BgDA. 6-9 May 2009 Varna.
15. Katrova LP, Bojinov I, Mihailova. Oral Health Care reforms in Bulgaria during the period of transition. *Oral health and Dental Management in the Black Sea Countries*, 2007, Vol. VI, No 4, pp 3-8

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