

Private dental health expenditure in Greece by region and income: comparison between the years 1987 and 1998.

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Objective The purpose of this study was to describe the evolution of private dental health expenditure in Greece, between the years 1987 and 1998, and to investigate whether there is evidence of variation by region and income. **Basic research design** The primary data were derived from the Household Budget Survey of the National Statistical Service of Greece from which private dental expenditure was estimated using the Consumer Price Index (CPI). **Results** 1. In both years the greatest annual dental health expenditure per capita was observed in urban areas and in 1998 it had increased by 9.4% while in semi-urban and rural areas it decreased (by 33.33% and 11.25% respectively). 2. The annual expenditure per capita was distributed according to the monthly income of the population, but in 1998 the differences were more pronounced and higher income groups showed an increase of 67.2%. 3. Statistical analysis showed no significant differences in the distribution of expenditure between geographic areas over the decade ($p > 0.05$). **Conclusions** Private dental health expenditure in Greece is differentiated by income level and geographic region and these variations became more pronounced over the decade. Similar percentages in the distribution of dental expenditure between the geographic areas suggest that during the decade no changes have been made towards increasing the amount of dental care for members of populations in semi-urban and rural areas.

Key words: Expenditure; Greece; private dental health expenditure; region/income

Introduction

Health expenditure has dramatically increased during the last thirty years and dental care represents a significant percentage of all non-hospital health care expenditure. Dental care is an important component of health care and although the dental and medical professions show many similarities, the contribution and financing of dental care differs considerably with serious implications in dental utilization (Manski *et al.*, 1999). Data show that out-of-pocket expenditure is greater for dental care than for medical care. It has been reported that in the USA, approximately 50% of dental expenditure is paid directly by patients, and in the UK there is a considerable amount of co-payment (80%) of the cost of dental treatment within the NHS (Manski *et al.*, 1999; Health Care Systems in Transition, UK, 1999; Crystal *et al.*, 2000).

The need for dental care is determined by demographic and epidemiological factors. In addition, economic variables, which affect the operation of dental care markets, are dental insurance, the income level of the population and the supply of dentists. Dental insurance seems to be the dominant factor. (Douglass and Furino, 1990; Cordes and Doherty, 1991).

In Greece, almost 90% of the registered dentists practice privately which is reflected by the fact that more than one third of the total private health expenditure from family budgets is devoted to oral health. On the other hand, in the public sector dental expenditure seems to be extremely low (Souliotis, 2000). Moreover, there are geographic inequities in the distribution of dentists

and equalities in public dental insurance coverage of the population. These observations in combination with the high costs of dental treatment, and the lack of private dental health insurance (Sekhri and Savedoff, 2005), have implications for the use of dental services in Greece.

The purpose of this study was to present the evolution of private dental health expenditure in Greece, between the years 1987 and 1998, and to investigate whether there is any evidence of regional and income variations.

Method

The primary data for the study were derived from the Household Budget Survey of the National Statistical Service of Greece (NSSG), an epidemiological study that provides monthly data on consumption trends of individuals and families, as well as on expenditure on goods and services, according to various socioeconomic standards such as the number of family members, family income, geographic region and occupational status of the household leader. The Household Budget Survey is carried out every four years on a random and representative sample of households, where all types of households are included, regardless of their demographic, social, or economic characteristics.

For the year 1987-88 a multistage stratified random sampling method was followed and the sample size was the 2/1000 of the total number of households for the whole year. For the year 1998-99 a two-stage stratified random sampling method was followed and the sample size was the 1.89/1000 of the total number of households

for the whole year (NSSG, 1987/88, 1998/99). Data on private dental health expenditure was first taken in 1987 and this year provides a baseline reference point.

The annual private dental expenditure for the survey household sample and per capita, by region and family income category, were estimated using the monthly private dental expenditure, the number of households and the relevant population, as well as the mean number of household members. According to the NSSG, regions are divided into urban, semi-urban and rural areas according to population density; towns and municipalities over 10,000 residents for urban areas, municipalities and communities from 1,000 up to 9,999 residents for semi-urban areas and municipalities and communities up to 999 residents for rural areas (NSSG, 1987/88, 1998/99).

According to the NSSG, family income level is graded into eight categories, ranging from less than 117€ in the lowest income category, to more than 880€ in the highest category in current prices for the year 1987. The corresponding values for the year 1998 are <293€ and >2935€ respectively. The intermediate categories are positioned between those two figures (NSSG, 1987/88, 1998/99). Household data were derived from the Household Budget Survey and the Census Data of NSSG for the referred years.

Dental expenditure was adjusted for inflation (Consumer Expenditure) using the Consumer Price Index (CPI) of dental services of the year 1999 (NSSG 2003). Thus, expenditure is dental expenditure adjusted for inflation and expresses the real expenditure in constant prices (1999) that can be used for comparisons between the years. Differences in dental health expenditure by region between the two years were tested using Mann - Whitney test. The level of statistical significance was set at $p < 0.05$.

Results

Figure 1 shows the annual private dental health expenditure per capita by geographic area for the years 1987 and 1998 in Euro (€). The largest amount of the total dental health expenditure per capita, in both years, was observed in urban areas (131€ and 160€ respectively) and the smallest in rural areas (80€ and 71€ respectively). There was an increase of 22.14% in dental expenditure per capita in urban areas between 1987 and 1998, while in the country on average a modest increase of 9.4% was observed. On the contrary, in semi-urban areas and rural areas a considerable decrease was found (33.33% and 11.25% respectively).

Annual private dental health expenditure per capita by income level is presented in Figure 2. There was an increase in expenditure parallel to the increase of family income.

In the first and second income categories expenditure was almost zero in both years. During the decade, a decrease was demonstrated in private dental expenditure in income categories III to VII. In middle-income levels (III to V) the consumption was less than the country average (117€ and 128€) and this became more prominent in 1998. It is worth noting the dramatic increase of 67.2% that was observed in the highest income group (VIII) in 1998 (from 433€ to 724€).

Finally, Table 1 presents the annual private dental health expenditure in Euro and as a percentage of surveyed households by geographic area (1987 and 1998). Despite the fact that there are some differences in the percentages sampled in the different areas, it is obvious that the increased expenditure is attributed to urban areas and mostly to the capital. The total expenditure in rural areas is larger than in the semi-urban ones because of the larger number of households in rural areas. The statistical analysis showed no statistical significance in the distribution of expenditure between different geographic areas during the decade ($p < 0.05$).

Discussion

Private health expenditure in Greece seems to be remarkably high, in comparison with other European countries and represents a continually increasing trend (OECD, 2004). According to the data, the private health sector absorbs an important and continuously increasing percentage of the total health expenditure (36.46% in 1987, 43.18% in 1998 and 44% in 2001). (Souliotis, 2000; Sekhri and Savedoff, 2005).

Relevant studies have proved that expenditure for dental services in Greece constitutes a significant percentage of the expenditure for medical services (15.4% in 1998) and private dental expenditure shares 34% of the total private health expenditure of households (Souliotis, 2002). In 1989, total dental expenditures amounted 0.36% of GNP where 70% was private dental expenditures. In 2001, 1.1% of GNP was spent on oral health care and 95.7% of this expenditure was private (Widstrom and Eaton, 2004). This may be attributed to the inefficiency of the public dental health sector in Greece.

The present study suggests that there are geographic and income variations in private dental expenditure in Greece, and this pattern of dental expenditure did not change over the decade. Difficulties in the access of private dental services especially in mountainous and island regions form a significant reason for geographic variations in the consumption of dental services in Greece. As the majority of dentists practice mainly in urban areas and towns, there are problems accessing dental care services mostly in rural and less in semi-urban areas.

Another explanation for the low levels of private dental expenditure may be the limited demand for dental care in these areas. This may be due to the fact that people who live in semi-urban and rural areas are less aware the importance of oral care and prevention. A few studies in Greece showed that geographic area and education level play an important role in dental awareness and attitude. (Zavras *et al.*, 2002). The existence of geographic variations in dental consumption in Greece is confirmed by the high levels of oral diseases, edentulousness and high treatment need among rural and semi-urban populations, as well as in low socio-economic level groups (Homata, 2003).

The analysis of income related expenditure per capita shows remarkable results. Families with low-income demonstrate very low consumption for dental care, which decreased further during the decade. The exclusive provision of dental care by the private sector, in combination with the fact that dental services are costly, indicates that

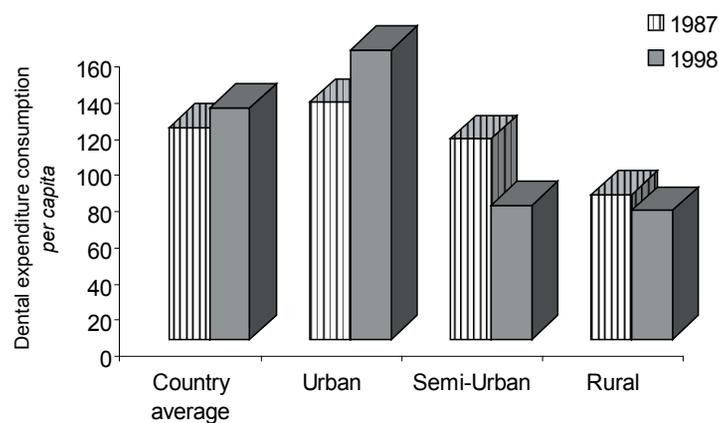


Figure 1. Annual private dental health consumption expenditure per capita (€) by geographic area, the years 1987 and 1998

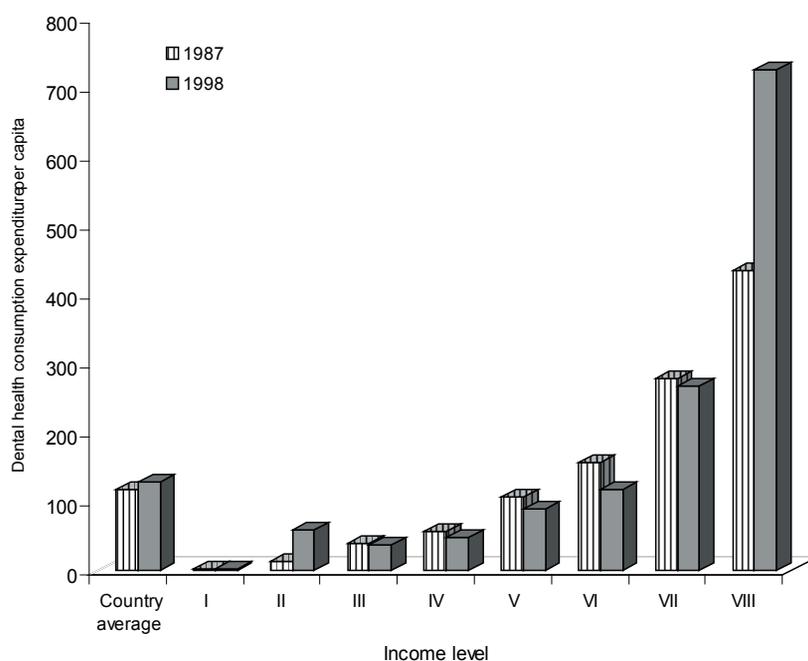


Figure 2. Annual private dental health consumption expenditure per capita (€) by family income level the years 1987 and 1998

Table 1. Annual private dental health consumption expenditure in € and as percentage % of surveyed households by geographic area (1987 - 1998)

Geographical area	1987			1998		
	Survey household sample (n)	Consumption expenditure in €*	Consumption expenditure %**	Survey household sample	Consumption expenditure in €*	Consumption expenditure %**
Urban areas	4195	1717593	72,42	4202	2020105	80,76
Semi-urban areas	653	227182	9,58	721	162739	6,5
Rural areas	1641	452870	19	1335	318735	12,74
Country	6489	2371634	100	6258	2501118	100
Capital (Athens)	2312	1201668	50,67	2560	1487780	59,48

*In constant prices 1999

**Mann-Whitney: 8 $P_v = 1$ ($p_v > p=0.05$): no significant differences were found

the provision of high quality dental services is a privilege of the minority. The excessive increase of 67.2% in per capita consumption observed in the highest income group reinforces the aspect that there are social inequalities in oral health in Greece.

The association between oral health and social inequalities is very well documented. It is believed that although oral health has dramatically improved during the last 20 years, oral health inequalities have dramatically increased (Watt and Sheiham, 1999). Studies in England (Watt and Sheiham, 1999) and Denmark (Petersen, 1990) suggest that widening inequalities in oral health exist between social class, geographic regions and ethnic groups. People from the lower social classes have poorer dental health in comparison with those who belong to high middle class. Moreover, Hobdell *et al.*, (2003) agreed that there is a discernable association between oral diseases (dental caries, periodontal disease and oral cancer) and various socioeconomic variables. According to Locker and Ford (1994), and Locker and Clarke (1999), the place of residence seems to influence health and health related behaviour, which is independent of personal circumstances, and there are considerable geographic variations in the volume and value of dental services. Utilization of dental services among people living in rural areas is reported to be lower than that observed in their urban counterparts (Bagevitz *et al.*, 2002).

There is scientific evidence that family income is a strong determinant of deprivation and health inequalities and is directly related to expenditure for dental care and utilization of dental services (Douglass and Furino, 1990; O’Keeffe and Hochstein, 1994; Manski *et al.*, 1999; Kronstrom *et al.*, 2002). Recent studies have proved that utilisation of dental services seems to depend primarily upon income and people with higher incomes tend to utilise dental services and higher income is associated with more dental visits (Zavras *et al.*, 2004). In the USA, low-income families had lower dental use rates than middle and high-income families and the gap in use rates between them has widened during the last 20-year period. (Manski *et al.*, 2001).

Conclusions

The results of this study suggest that in Greece, private dental health expenditure is differentiated by income level and geographic region. Furthermore, during the decade 1987 - 1998, these variations became more pronounced, showing signs of social inequalities in oral health. Taking into account that there was not statistical significance in the percentage distribution of dental consumption between, geographic areas during the decade, it is considered that the pattern of consumption expenditure remains stable in all areas. This means that no progress has been made towards increasing the amount of dental care for the members of populations in semi-urban and rural areas.

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