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Caries prevalence of 5, 12 and 15-year-old Greek children: A national pathfinder survey

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Aim: To study the caries prevalence and caries experience of 5, 12 and 15-year-old children in Greece and evaluate how the disease pattern is related to their sociodemographic parameters. ***Methods:*** A stratified cluster sample of 1209, 1224 and 1257 of five, twelve and fifteen-year-old Greek children were randomly selected according to WHO guidelines for national pathfinder surveys and examined for dental caries, according to the BASCD criteria and standards. $d_3$mft, D_3MFT and their components, as well as $d_3$mfs, D_3MFS, Care Index (CI) and SiC were recorded and related to the demographic data collected concerning age, gender, counties, urban/rural areas and parents' educational status. ***Results****:* Dental caries varied considerably between the different districts, with a mean dmft/DMFT value for each age group being 1.77, 2.05 and 3.19 respectively, while 64%, 37% and 29% of them, were with no obvious dentinal caries. Children living in rural areas demonstrated significantly higher dmft/DMFT values and less dental restorative care (CI), whereas children with fathers of a higher educational level showed significantly lower dmft/DMFT values. The significant caries (SiC) index value for the three age groups was 5.01, 4.83 and 7.07 respectively. Posterior occlusal surfaces of the permanent teeth presented most of the caries in the 12 (68%) and 15-year-old group (78%). ***Conclusions:*** Despite the decrease in the prevalence of caries in Greek children disparities remain. Children in rural areas and children with less educated parents had more caries and more untreated caries. All the above call for immediate intervention with comprehensive preventive programs and better geographic targeting of the dental services at a national level including targeted prevention of pit and fissure sealants on posterior permanent molars.

Key words: caries prevalence, caries experience, national survey, adolescents

Introduction

During the past 20 years, many epidemiologic studies have revealed a declining trend in the prevalence and severity of oral diseases in Western children (Marthaler, 2004; Whelton, 2004). In Greece, a number of epidemiologic surveys have been carried out through the years in order to assess dental health in different areas of the country (Mamai-Homata, *et al*., 1987, Oulis and Tsinidou, 1995), with only Moller and Marthaler (1988) performing a nationwide study on a representative sample of the population. However, the use of non-calibrated examiners and the absence of standardized diagnostic criteria in most of the studies cited above make epidemiologic data non-comparable and question the interpretation of the results. On the other hand, there are surveys conducted in the UK (Pitts *et al*., 2007), Sweden (Carina and Sting, 2002) and Denmark (Ekstrand *et al*., 2007) using the same criteria and to which our results can be compared.

The present study was part of a national pathfinder survey assessing the oral health status of the Greek population for 5, 12, 15, 35-44 and 65-74 year-olds. This part of the study aimed to assess the caries prevalence and the caries experience, of 5, 12 and 15-year-old Greek children within the different counties of the country and evaluate how their disease pattern is related to variables, such as gender, parental educational and rural-urban areas of the population.

Material and Methods

A stratified cluster sample was selected according to WHO guidelines for national pathfinder surveys, which ensures the participation of a satisfactory number of people that may present different disease prevalence in the conditions being examined (World Health Organization, 1987). To obtain comparable data, samples were collected in the same manner and from the same areas as in the 1985 survey (Moller and Marthaler, 1988) with four new areas added to expand the survey. The survey covered two cities (Athens and Thessaloniki), six counties (Achaia, Chania, Evros, Ioannina, Kastoria, Larissa) and three islands (Lesbos, Naxos and Kefallinia). Three communities of different socio-economic backgrounds were selected randomly within each of the cities, while one urban and one rural community were selected randomly within each county or island. Therefore, the survey was conducted in 22 sites (14 urban, 8 rural) and around 50 subjects were examined at each site. Stratified random sampling was used to select 3 schools from each city. The sample totalled 3690 children of Greek nationality.

Before examinations started we ensured all examiners were calibrated for caries at surface level and for each age group with a reference examiner was taken as the "gold standard". Initially this calibration covered the theory of diagnostic criteria and common diagnostic problems,

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using images of all different clinical conditions of teeth with and without caries. The second session started with every examiner examining 10 children twice with the same children also examined once by the reference examiner. Results were then analysed and disagreements discussed. Each examiner was evaluated for intra and inter-examiner reliability with an accepted level of specificity and sensitivity level above 85% (Pine *et al*., 1997). Then, after the reference examiner explained the possible reasons for the disagreements, non-standard examiners examined 10 new children and were again compared with the standard until they reached agreement.

All clinical examinations were carried out by the calibrated examiners, assisted by an assistant as a recorder. The examinations were held in the schools' classrooms, using reclining chairs and portable lights under standardised conditions recommended by the World Health Organization. Cotton rolls and gauze were available for moisture control and removal of plaque as necessary.

All dental surfaces were examined and caries was diagnosed at the cavitation level (D3) threshold according to the BASCD criteria and trainers' pack standards (Pitts *et al*., 1997), using a visual method without x-rays, fibre-optic transillumination or compressed air. Data were recorded on individual charts and the following indices calculated: percentage of subjects with no evidence of dental caries (DMFT/dmft=0), dmft/DMFT and dmfs/DMFS indexes and the mean number of decayed (DT/dt), missing (MT/mt) and filled (FT/ft) teeth for the permanent and primary teeth respectively. Additionally, the Care Index (CI) (ft/dmft% or FT/DMFT%) and the significant caries index (SiC) representing the mean DMFT or dmft of the one third of each age group with the highest caries score were also calculated (Brathall, 2000).

Caries indices were analysed in relation to age, gender, county, urban/rural areas and parental education. Parental education was assessed in years of paternal and maternal education and categorized into four levels: <6 years (primary), 9 years (secondary/high school), 12 years (secondary/lyceum), >12 years (higher).

The chi-square test was used for the comparison of proportions and the Student's t-test and ANOVA for the assessment of means. To explore how each sociodemographic variable affects caries prevalence in the presence of other variables, a multivariate linear regression analysis was performed. Data were processed and analysed with SPSS (PC version 10.0) with the level of statistical significance level set at <0.05.

Permission from the Ministry of Education, ethical approval of the committee of Research and Deontology in Dentistry, of the University of Athens and parental consent were obtained before the clinical examinations.

Results

The sample of the surveyed children was 1209, 1224, and 1257 in the 5-, 12- and 15-year-old groups respectively. The number of children, the dmft and DMFT values for the three age groups and their components in relation to the different districts, residential location, gender and parental education level, are shown in Annexes 1, 2 and 3 (available only online at cdhjournal.org).

The percentage of children without obvious caries declined with age from 57% for 5-year-olds to 37% and 29% for 12 and 15 year olds respectively. The highest dmft/DMFT=0 value, 68%, was found for Athens 5 year olds and the lowest 19% for Ioannina 15 year olds.

The dmft and DMFT mean values varied greatly between districts. The crude unweighted mean dmft scores for 5-year-old Greek children was 1.77, 2.05 for 12-year-olds and 3.19 for 15-year-olds. Thessaloniki 5 and 12 year olds had the lowest scores closely followed by Athens 15-year-olds. The highest mean dmft and DMFT scores were for Ioannina children, 3.12, 2.87 and 3.76 for the 5, 12 and 15-year-olds respectively. Rural areas showed significantly higher means than urban areas only for the 5 and 15 year olds, namely: 2.56 cf 1.65 (p=0.001) and 3.72 cf 3.05 (p=0.005). Girls presented higher DMFT/DMFS means than boys among both 12-year-olds, 2.28 cf 1.79 (p=0.005), and 15-year-olds, 2.90 cf 3.41 (p=0.031).. Also, children of all ages with a higher-educated parent had lower dmft/DMFT values: e.g. for 5-year-olds the mean dmft was 2.50 for mothers and 2.80 for fathers with least education decreasing to 1.37 and 1.21 for those with higher educational (p=001). The same trends were found for the 12 and 15-year-olds DMFT scores: 2.52/2.54 cf 1.42/1.44 and 3.65/3.73 cf 2.50/2.56, p=0.001. The care index was very low for 5-year-olds: lowest in Kefallinia, 5%, to highest in Athens at 19%. The 12-year-olds' indexes were somewhat better, ranging between 29% (Naxos) and 57% (Thessaloniki) and better still for 15-year-olds, 36% (Achaia) to 83% (Athens) (Annexes 1,2,3).

Caries experience in the posterior teeth were 83% in 12- and 87% in 15-year-olds. Pit and fissure caries (occlusal of posterior teeth, buccal of the lower molars and lingual of the upper ones) contributed 56% and 58% of the total caries experience of these children. The SiC indexes of the unweighted population for 5-, 12- and 15-year olds were 5.01, 4.83 and 7.07 respectively.

Multivariate analysis (Table 1) revealed that the dmf-s/DMF-S index of the children with higher-educated fathers with had significantly lower dmft-s/DMFT-s in each age group (p=0.012, 0.002, 0.016 respectively). For 5-year-olds, urban children and those of higher-educated mothers had lower dmft (p=0.001 and 0.010 respectively). Finally, among 12-year-olds, boys (p<0.006) and children of higher-educated mothers (0.025) scored significantly lower DMFT-S values.

Discussion

The objective of this first national survey was to determine the prevalence of dental caries in the Greek children and adolescents and based on the findings to help the health authorities to plan better dental services and improve the dental health of the Greek population. The data presented in this study is part of a National Oral Health Survey of the Hellenic population. It is the first time that a Greek National Survey with calibrated examiners has captured dental data at the same time and for all the age groups.

Declining trends in caries prevalence of children and adolescents have been reported for the last two decades in many European countries (Whelton, 2004). The same trend was found when we compared the findings, of the present study to the available Greek epidemiologic studies using WHO recording criteria (Mamai-Homata *et al*.,

Table 1. Multiple linear regression analysis for dmfs/DMFS by gender, location and parents' educational level of 5, 12 and 15-year-old Greek children

		5 year old			
Dependent variable	*Independent variables*	*b**	*se(b) ***	*t-test*	*p*
dmfs	Gender	0.125	0.372	0.335	0.738
	Location	-1.818	0.560	-3.244	0.001*
	Father's educational level	-0.596	0.237	-2.516	0.012*
	Mother's educational level	-0.645	0.249	-2.594	0.010*
		12 year old			
Dependent variable	*Independent variables*	*b*	*se(b)*	*t-test*	*p*
DMFS	Gender	0.898	0.329	2.733	0.006
	Location	-0.206	0.408	-0.505	0.614
	Father's educational level	-0.551	0.181	-3.039	0.002
	Mother's educational level	-0.435	0.193	-2.252	0.025
		15 year old			
Dependent variable	*Independent variables*	*b*	*se(b)*	*t-test*	*p*
DMFS	Gender	0.660	0.399	1.652	0.099
	Location	-0.907	0.499	-1.818	0.069
	Father's educational level	-0.531	0.220	-2.414	0.016
	Mother's educational level	-0.246	0.233	-1.053	0.292

b*: Constant, se(b)**: Standard error of the constant b

Table 2. DMFT of Greek 12-year-olds in 1983-1989 compared to 2005

Districts	*DMFT Years 1983-1989*	*DMFT Year 2005*	*Decrease (% decrease)*
Athens	7.00	2.35	4.65 (66.4)
Achaia	5.80	4.32	1.48 (25.5)
Ioannina	8.61	3.76	4.85 (56.3)
Larissa	8.50	3.54	4.96 (58.4)
Chania	8.00	2.93	5.05 (63.1)
Mean	7.58	3.38	4.20 (55.4)

1987). However, while WHO recording criteria were used, the examiners were not calibrated so caution must be exercised when making comparisons. Nevertheless, within the different districts of Greece, the mean DMFT values of 12-year-olds, showed a noticeable improvement over the 20-25 years, ranging from 26% to 66%, with a mean of 55% (Oulis and Tsinidou, 1995, see Table 2).

No geographical variations of caries prevalence either north/south or east/west were observed, though large cities predictably scored lower caries prevalence and higher care index than smaller conurbations. Striking disparities in dental disease prevalence among people based on sociodemographic characteristics, such as income, location, and parental educational level are commonplace (Carina and Sting, 2002) and those poorer children suffer twice as much compared to their non-poor peers and their disease is more probably untreated. Such disparities were found in our study and children or adolescents living in small cities or in rural areas or with less-educated parents, presented higher prevalence of caries, more untreated caries (dt/DT) and less dental care (lower Care Index). These findings agree with other studies that attributed these findings to rural areas generally having fewer dentists per population and more poverty, and therefore, children with less access to and use of dental care (Vargas *et al*., 2003).

The low prevalence of sealants in the population (8%, Oulis *et al*., 2011) may explain most of the caries being found on the occlusal surfaces of posterior permanent teeth..

Although there is some caries reduction over the years ago in Greece, the DMFT values of the older groups continue to be higher (almost double for 12 and 15 year-olds) compared to the DMFT values found in many industrialized European countries. The mean dmft for Greek 5 year-olds are close to those found recently in England (1.47) (Pitts *et al*., 2002), higher than in Denmark (0.8) (Ekstrand *et al*., 2007), but lower than in Scotland (2.16) (Pitts *et al*., 2006), the Netherlands (2.5) (Elfrink *et al*., 2006) and Wales (2.38) (Pitts *et al*., 2002). As for Greek 12 year-olds, DMFT values were close to Scotland's (1.8), but higher than England's (1.25), Italy's (1.1) France's (1.2), Sweden's (1.0) and Germany's (0.8) (WHO, 2007). Similar differences exist for the 15 year-olds, where the mean DMFT of 3.19 is higher than in England, Wales (1.48) (Pitts *et al*., 2006) and Spain (1.84) (Almerich-Silla 2006), while Denmark's mean DMFS value of 2.97, (Ekstrand *et al*., 2007) is also much higher than we found in Greece. In 15 year-olds, 29% had no obvious decay: much lower than the findings in Great Britain (61%) (Pitts *et al*., 2007), Spain (44%) (Almerich-Silla and Montiel-Company, 2006), Denmark (42%) (Ekstrand *et al*., 2007) and Finland (74%) (Marja-Leena *et al*., 2008).

This study employing calibrated examiners, documents for the first time a caries reduction trend and an improvement in dental health of the Greek children compared to the earlier years. However, caries still affects the children and adolescents of our country to a greater extent and larger degree than other industrialised European countries. One explanation for this may be better and more organised national oral health systems in these other countries, providing better and free dental services to children. In Greece, dental services are primarily private and expensive so children of lower socioeconomic status cannot afford them. The National Health system established in Greece in 1886 to cover all the rural and deprived areas and offer preventive and operative (fillings) services free to all children under 18, doesn't seem to meet demand adequately.

Another possible explanation is that most of the caries was located on the occlusal surfaces of posterior teeth due to the fact, that the low use of sealants in Greek adolescent (Oulis *et al*., 2011) compared to Denmark and Finland where sealants are applied to almost 70% of children through national preventive programs. Application of sealant to the occlusal surfaces of posterior teeth have resulted in a 60% decrease in tooth decay up to 5 years after application (Gooch *et al*., 2009). The introduction of such a program combined with other preventive measures in our population might reduce the DMFT index to a considerable degree and reduce caries prevalence to the level of other European countries.

In conclusion, although child and adolescent dental caries prevalence and extent in Greece has fallen, it is still much higher than in most European countries.

The great variation of caries prevalence found across the different locations with the worst DMFT figures and higher percentage of untreated caries found within the poorer and less educated families necessitates early intervention with comprehensive national preventive program targeted on these groups' children.

Paternal educational level is a significant predictor of the extent of dental caries. It was negatively related to DMF values and to untreated dental caries.

Since the majority of dental caries in the Greek adolescents was found on the occlusal surfaces of the posterior permanent teeth, a preventive program with sealants on more tooth surfaces could eliminate caries to a large extent.

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Annexe 1. Number of children (n), no obvious caries (%), mean dmft and dmfs at 95% confidence interval and components and Care Index(CI) for 5-year-old children according to district area, urban-rural, gender and parent's educational level.

Examination area	*n*	*No obvious Caries (%)*	*dt*	*mt*	*ft*	*dmft (SD) (95% CI)*	*dfms (SD) (95% CI)*	*Care Index CI (%)*
Achaia	101	59.4	1.41	0.01	0.23	1.64 (2.82) (1.09-2.20)	2.82 (5.27) (1.78-3.86)	14.0
Athens	151	67.5	1.02	0.07	0.22	1.23 (2.42) (0.84-1.61)	2.42 (5.54) (1.53-3.31)	18.0
Chania	102	63.7	1.05	0.00	0.14	1.16 (2.24) (0.72-1.60)	2.18 (4.93) (1.21-3.15)	12.1
Evros	100	59.0	1.19	0.00	0.09	1.25 (2.32) (0.79-1.71)	2.50 (5.81) (1.35-3.65)	7.2
Ioannina	101	50.5	2.77	0.03	0.36	3.12 (4.35) (2.26-3.98)	6.13 (10.77) (4.00-8.26)	11.5
Kastoria	102	50.0	2.37	0.00	0.34	2.70 (3.63) (1.98-3.41)	4.84 (7.67) (3.34-6.35)	12.6
Kefallinia	100	64.0	1.43	0.00	0.08	1.51 (2.46) (1.02-2.00)	2.37 (4.21) (1.53-3.21)	5.3
Larissa	100	45.0	1.64	0.02	0.28	1.94 (2.63) (1.42-2.46)	3.36 (6.03) (2.16-4.56)	14.4
Lesbos	100	53.0	1.53	0.00	0.54	2.02 (3.12) (1.40-2.64)	4.36 (7.84) (2.80-5.92)	26.7
Naxos	100	45.0	2.25	0.00	0.19	2.43 (3.24) (1.7- 3.07)	4.67 (7.49) (3.18-6.16)	7.8
Thessaloniki	152	63.8	0.89	0.00	0.20	1.08 (2.15) (0.7-1.42)	1.84 (4.10) (1.18-2.49)	18.5
ANOVA F = 4.994 , p = 0,001								
Location								
Rural	156	42.9	2.24	0.00	0.35	2.56 (3.19) (2.05-3.06)	5.26 (7.68) (4.04-6.47)	13.7
Urban	1053	59.4	1.44	0.00	0.22	1.65 (2.88) (1.48-1.83)	3.01 (6.36) (2.63-3.40)	13.3
* *t-test = 3.999 , p = 0,001*								
Gender								
Boys	606	57.9	1.50	0.00	0.24	1.72 (2.92) (1.49-1.96)	3.19 (6.48) (2.67-3.71)	13.9
Girls	603	56.6	1.58	0.00	0.24	1.81 (2.96) (1.58-2.05)	3.41 (6.69) (2.88-3.95)	13.2
* *t-test = 0.580 , p = 0,562*								
Father's education								
6 years or less	204	49.0	2.65	0.00		2.80 (3.96) (2.25-3.35)	5.89 (10.16) (4.49-7.29)	6.1
9 years	212	50.9	1.61	0.00		1.97 (2.89) (1.58-2.36)	3.45 (5.75) (2.67-4.23)	17.2
12 years	433	60.0	1.33	0.00		1.53 (2.67) (1.27-1.78)	2.84 (5.81) (2.29-3.39)	13.7
More than 12 years	358	62.0	1.13	0.00		1.37 (2.42) (1.11-1.62)	2.32 (4.74) (1.82-2.81)	18.2
ANOVA F = 14.358 p = 0,001								
Mother's education								
6 years or less	160	51.3	2.31	0.00		2.50 (3.81) (1.90-3.10)	5.10 (9.90) (3.55-6.65)	9.2
9 years	192	50.0	2.22	0.02		2.51 (3.54) (2.01, 3.01)	4.85 (7.73) (3.75-5.95)	11.1
12 years	483	54.9	1.43	0.00		1.67 (2.62) (1.43-1.90)	3.02 (5.60) (2.52-3.52)	15.0
More than 12 years	371	66.3	1.02	0.00		1.21 (2.94) (0.97-1.46)	2.12 (4.85) (1.62-2.61)	17.3
ANOVA F = 12.150 , p = 0,001								
Total	1209	57.2	1.54	0.06		1.77 (2.94) (1.60-1.93)	3.30 (6.58) (2.93-3.67)	13.5

Annexe 2. Number of children (N), no obvious caries (%), mean DMFS and DMFT at 95% confidence interval and components and Care Index(CI) for 12-year-old children according to district area, urban-rural, gender and parent's educational level.

Examination area	*N*	*No obvious Caries %)*	*DT*	*MT*	*FT*	*DMFT (S.D) (95% C.I)*	*DMFS (S.D) (95% C.I)*	*Care index CI (%)*
Athens	160	50.0	0.66	0.01	0.87	1.50 (2.43) (1.12-1.88)	2.69 (5.69) (1.81-3.58)	58.0
Achaia	100	38.0	1.94	0.03	0.86	2.67 (3.19) (2.04-3.30)	4.62 (7.01) (3.23-6.01)	32.2
Chania	104	38.5	0.98	0.09	1.00	1.97 (2.05) (1.57-2.37)	3.97 (5.07) (2.98-4.96)	50.8
Evros	100	30.0	1.19	0.01	1.20	2.24 (2.64) (1.72-2.76)	3.61 (4.80) (2.66-4.56)	53.6
Ioannina	101	22.8	1.78	0.03	1.21	2.87 (2.97) (2.28-3.46)	5.08 (8.76) (3.35-6.81)	42.2
Kastoria	101	25.7	1.29	0.01	1.18	2.34 (2.25) (1.89-2.78)	4.40 (5.15) (3.38-5.41)	50.4
Kefallinia	101	40.6	0.94	0.00	0.83	1.58 (2.16) (1.16-2.01)	2.60 (4.16) (1.78-3.43)	52.5
Larissa	101	36.6	1.35	0.01	1.14	2.38 (2.70) (1.84-2.91)	3.67 (4.82) (2.72-4.62)	47.9
Lesbos	100	29.0	1.00	0.04	1.18	2.20 (2.04) (1.80-2.60)	3.73 (4.34) (2.87-4.59)	54.1
Naxos	102	33.3	1.62	0.06	0.66	2.26 (2.75) (1.72-2.80)	3.89 (6.30) (2.65-5.13)	29.2
Thessaloniki	154	49.4	0.56	0.01	0.73	1.28 (1.78) (1.57-2.37)	2.33 (4.31) (1.65-3.02)	57.0
ANOVA F = 2,85 p=0,002								
Location								
Rural	248	33.9	1.38	0.05	0.89	2.23 (2.71) (1.89-2.56)	4.01 (6.23) (3.23-4.79)	39.9
Urban	976	37.9	1.10	0.02	0.99	2.01 (2.44) (1.85-2.16)	3.47 (5.48) (3.13-3.82)	49.2
* *t-test = 1,34 p = 0,181*								
Gender								
Boys	580	39.0	1.10	0.03	0.77	1.79 (2.12) (1.62-1.97)	3.11 (4.48) (2.74-3.47)	43.0
Girls	644	35.4	1.20	0.02	1.15	2.28 (2.77) (2.07-2.50)	4.01 (6.49) (3.51-4.51)	50.4
* t-test = -2,81 , p =0,005								
Father's education								
6- years or less	287	32.4	1.76	0.04	0.92	2.54 (3.01) (2.19-2.89)	4.68 (7.10) (3.85-5.50)	36.2
9 years	257	33.5	1.36	0.05	0.95	2.26 (2.54) (1.95-2.57)	4.27 (6.82) (3.43-5.11)	42.0
12 years	366	35.2	0.99	0.01	1.11	2.04 (2.36) (1.80-2.28)	3.40 (4.73) (2.92-3.89)	54.4
More than 12 years	310	46.8	0.61	0.003	0.87	1.44 (1.91) (1.23-1.65)	2.24 (3.30) (1.87-2.61)	60.4
ANOVA F = 11,1 p=0,001								
Mother's education								
6 years or less	247	18.1	1.67	0.04	0.96	2.52 (2.86) (2.16-2.88)	4.70 (6.68) (3.86-5.54)	38.1
9 years	241	17.4	1.59	0.03	1.05	2.53 (2.99) (2.16-2.91)	4.53 (7.61) (3.56-5.49)	41.5
12 years	449	34.7	0.94	0.02	1.03	1.93 (2.25) (1.72-2.14)	3.29 (4.68) (2.85-3.72)	53.4
More than 12 years	283	29.8	0.67	0.01	0.82	1.42 (1.84) (1.20-1.64)	2.30 (3.36) (1.91-2.70)	57.7
ANOVA F = 10,9 p =0 ,001								
Total	1224	37.1	1.15	0.02	0.97	2.05 (2.50)	3.58 (5.64)	47.3

Annexe 3. Number of children (N), no obvious caries (%), mean DMFS and DMFT at 95% confidence interval and components and Care Index(CI) for 15-year-old children according to district area, urban-rural, gender and parent's educational level.

Examination area	*N*	*No obvious Caries (%)*	*DT*	*MT*	*FT*	*DMFT (S.D) (95% C.I)*	*DMFS (S.D) (95% C.I)*	*Care Index CI (%)*
Achaia	100	23.0	2.96	0.04	1.54	4.32 (4.13) (3.50-5.14)	7.12 (8.50) (5.43-8.81)	35.6
Athens	150	40.7	0.42	0.02	1.97	2.35 (3.09) (1.85-2.85)	3.69 (5.76) (2.76-4.62)	83.8
Chania	111	36.0	1.46	0.04	1.57	2.93 (3.43) (2.28-3.57)	6.13 (9.20) (4.40-7.86)	53.5
Evros	114	20.2	1.46	0.04	1.97	3.35 (3.37) (2.73-3.98)	5.25 (6.08) (4.12-6.37)	58.8
Ioannina	105	19.0	1.77	0.06	2.04	3.76 (3.05) (3.17-4.35)	6.11 (6.10) (4.93-7.30)	54.2
Kastoria	104	26.9	1.40	0.08	1.86	3.26 (3.72) (2.54-3.98)	6.34 (8.72) (4.64-8.03)	57.0
Kefallinia	101	28.7	1.67	0.01	1.20	2.68 (2.92) (2.11-3.26)	4.31 (5.40) (3.24-5.37)	44.7
Larissa	105	23.8	2.01	0.09	1.65	3.54 (3.75) (2.82-4.27)	5.53 (6.74) (4.23-6.84)	46.6
Lesbos	108	25.0	0.93	0.06	2.14	3.08 (2.77) (2.55-3.61)	4.87 (4.79) (3.96-5.78)	69.5
Naxos	104	27.9	1.84	0.12	1.87	3.75 (4.16) (2.94-4.56)	6.35 (7.96) (4.80-7.89)	49.8
Thessaloniki	155	37.4	0.72	0.03	1.95	2.66 (3.20) (2.16-3.17)	4.45 (6.08) (3.49-5.42)	73.3
ANOVA,F =2.76 p = 0.002								
Location								
Rural	252	24.2	2.06	0.06	1.73	3.72 (3.71) (3.26-4.18)	6.47 (8.14) (5.46-7.48)	46.5
Urban	1005	30.0	1.28	0.05	1.84	3.05 (3.37) (2.84-3.26)	5.08 (6.61) (4.67-5.49)	60.3
**t-test = 2.83 p = 0.005*								
Gender								
Boys	549	32.1	1.37	0.04	1.60	2.90 (3.32) (2.62, 3.18)	4.87 (6.81) (4.31-5.45)	55.1
Girls	708	26.4	1.49	0.06	1.98	3.41 (3.54) (3.15-3.67)	5.73 (7.06) (5.21-6.25)	58.0
**t-test =-2,16,p = 0.031*								
Father's education								
6 years or less	271	20.3	1.98	0.10	1.80	3.73 (3.56) (3.31-4.16)	6.42 (7.63) (5.51-7.34)	48.2
9 years	220	21.4	1.99	0.08	2.03	3.91 (3.77) (3.41-4.41)	6.94 (8.33) (5.83-8.04)	51.9
12 years	350	32.0	1.28	0.03	1.86	3.07 (3.41) (2.71-3.42)	5.16 (6.73) (4.45-5.86)	60.5
More than 12 years	407	35.9	0.91	0.01	1.69	2.56 (3.13) (2.25-2.86)	4.04 (5.54) (3.50-4.58)	66.0
ANOVA F =11.0 p = 0.001								
Mother's education								
6 years or less	248	21.0	1.92	0.08	1.75	3.65 (3.27) (3.24-4.06)	5.97 (6.22) (5.19-6.75)	47.9
9 years	199	19.6	2.12	0.10	2.16	4.19 (4.03) (3.63-4.75)	7.56(9.14) (6.28-8.84)	51.5
12 years	480	32.1	1.27	0.04	1.82	3.02 (3.48) (2.71-3.33)	5.12 (6.99) (4.50-5.75)	60.2
More than 12 years	323	35.3	0.90	0.01	1.66	2.50 (2.98) (2.17-.2.82)	3.97 (5.45) (3.37-4.56)	66.6
ANOVA F =11.9 p = 0.001								
Total	1257	28.9	1.43	0.05	1.81	3.19 (3.45)	5.36 (6.96)	57.0