

Abstracts

The 11th Annual Conference of The European Association of Dental Public Health, 7-9 September, 2006, Prague, Czech Republic: Scientific Abstracts

**Session 1 – Oral Epidemiology – Congress Hall
Friday 8 September 2006. Chairs: Professor Eino
Honkala and Professor Neda Markovska**

Trends in oral health and treatment need among children and adolescents. Z BROUKAL¹*, R IVANCA-KOVA², E LENCOVA¹, L MRKLAS¹. ¹Institute of Dental Research, 1st Faculty of Medicine, ²Faculty of Medicine, Hradec Kralove, Charles University in Prague, Czech Republic

Surveys of oral health status and treatment need of selected age categories of Czech children and adolescents have been conducted approximately every three years since 1994 with the latest survey in 2004. **Aim** To ascertain the trends in oral health and treatment need by comparing caries experience, dental status and treatment need from four consecutive surveys in the past ten years. **Methods** In each survey, dental practitioners in randomly selected areas have examined approximately 20,000 individuals aged 5, 12, 15 and 18 years. The data were entered into standard WHO dental records. The areas included in the surveys have been the same throughout the ten-year-period. For each survey, the mean values have been calculated for the following parameters of oral health and treatment need: % caries-free (5-year-olds), dmft/DMFT, dt/DT (5, 12, 15 and 18-year-olds), and % in need of restorative care (dt/DT>0) (5, 12, 15 and 18-year-olds). For assessing possible trends, regression lines were plotted for the individual parameter values stemming from the four consecutive surveys. Student's t-tests were used for evaluating the statistical significance of the regression coefficients with the threshold for significance set at $p<0.05$. **Results** 5-year-olds: Percentage of caries-free 23.9, 24.7, 29.8 and 41.6 (ns) for 1994, 1997, 2000 and 2004, respectively. Mean DMFT: 12-year-olds 3.1, 3.2, 3.1 and 3.0 (ns), 15-year olds 5.8, 5.6, 5.4 and 5.2 ($p<0.05$), 18-year-olds 8.4, 7.8, 7.4 and 7.0 ($p<0.05$). Mean dt/DT: 5-year-olds 2.2, 2.2, 1.9 and 1.5 ($p<0.05$), 12-year-olds 0.8, 0.8, 0.9 and 0.8 (ns), 15-year-olds 1.2, 1.1, 1.2 and 1.3 (ns), 18-year-olds 2.1, 1.8, 1.5 and 1.3 ($p<0.05$). Percentage in need of restorative care: 5-year-olds 63.9, 61.1, 53.5 and 46.0 ($p<0.05$); 12-year-olds 43.4, 39.8, 33.9 and 28.5 ($p<0.05$); 15-year-olds 53.2, 52.2, 51.6 and 50.4 (ns); 18-year-olds - 68.5, 63.3, 59.3 and 57.7 ($p<0.05$). **Conclusions** Between 1994 and 2004: caries experience declined in 15- and 18-year-olds but not in 5- and 12-year-olds; mean dt/DT decreased in 5- and 18-year-olds but not in 12- and 15-year-olds; percentage of subjects in need of restorative treatment declined in 5-, 12- and 18-year-olds but not in 15-year-olds. Irrespective of some partial improvement it can be stated

that the current preventive and restorative care are not effective enough to cope with the caries situation among the Czech children and adolescents. **Acknowledgements:** This study was supported by a grant of the Grant Agency of the Ministry of Health No: NR/8331-3.

Oral health among 5-year-old children in Slovak Republic. Z VESELINYOVÁ*, N MARKOVSKÁ I. stomatologická klinika UPJŠ a FNLP, Košice, Slovak Republic
Poor oral health is widely recognized as a problem that cannot be solved by means of dental care only. Family members and school teachers are also important. Slovakia is one of the countries that were not able to fulfil the WHO goals by the year 2000. WHO is collecting dental data from nearly 200 countries, mostly DMFT index values for 12-year-old children but in recent years increasingly also data on caries situation among the 5-year-olds. In Slovakia and Eastern European countries, preventive programmes are not fully established for the latter age group. **Aim** To determine the level of oral health among a group of 5-year-olds living in Slovak Republic. **Methods** In the years 2004-2005, we examined 137 children, 82 boys and 55 girls of whom 76 lived in the town of Košice and 61 in the neighbouring villages. In a clinical oral examination, dental caries and the level of oral hygiene were recorded. The parents of the children also answered a questionnaire that included questions about oral hygiene habits and the use of oral health services. **Results** Only 29% of the children were caries-free. The mean dmft score was 5.5 with untreated dentinal caries being the predominant component of the index score. The most affected teeth were molars. In a similar study in 1987, the mean dmft score had been 3.4. Visible dental plaque was found in 30% of the children. There were no statistically significant differences between boys and girls or between children from the town and villages. The analysis of the questionnaire revealed that 35% of the children had not yet visited a dental office. It was also found that among the parents only 50% had visited the dental office regularly for prevention and only one third reported using dental floss or a mouthwash. **Conclusions** The study confirmed the necessity of revitalizing the systematic dental care for preschool children and establishing functional health promotion programmes in schools in order to advise the children and their parents to adopt appropriate oral health habits.

Caries frequency in 6- and 12-year-old children in central Poland. E JODKOWSKA*, J KEPA, K MALKIEWICZ. Department of Conservative Dentistry, Medical University of Warsaw, Poland

Aim The aim of the study was to assess the oral health status of 6- and 12-year-old children living in the Province of Mazowsze, Poland. **Methods** Under the auspices of a nation-wide epidemiological survey, 132 6-year-old and 147 12-year-old children living in the Province of Mazowsze were randomly selected and examined. The examinations were performed at schools according to WHO guidelines for epidemiological studies. The presence of dental caries was recorded for both deciduous and permanent teeth. **Results** Among the 6-year-olds, the mean dmft score was 6.2. The mean DMFT value was 3.4 for the group of the 12-year-old school children. **Conclusions** The results of the survey reveal that it is necessary to improve dental care and oral health promotion for children in the Mazowsze region.

Dental caries among Portuguese 7-year-olds in 1997 and in 2004. L TEIXEIRA*, J DOMINGUES, A GIÃO, B MONTEIRO, P MELO. *Department of Odontology, Faculty of Health Science, University of Fernando Pessoa, Portugal*

Aim The aim was to compare the prevalence of dental caries and mean DMF scores observed in an epidemiological study that was conducted among 7-year-old school children in 2004 with findings from a similar study performed in 1997 on a sample of 150 schoolchildren of the same age and living in the same area. It was also aimed to evaluate the changes between 1997 and 2004 in the level of behavioural risk factors. **Methods** A random sample of 150 subjects was drawn in 2004 from among all 7-year-olds attending the schools of the county of Vizela, Portugal. The children were examined visually following the WHO criteria for oral examinations and mean DMFT, DMFS, dmft and dmfs scores were calculated for each child. The level of behavioural risk factors (oral hygiene, socioeconomic status and medical oral care) were obtained by means of a questionnaire filled out by the parents. The results of the questionnaire study were compared with the results obtained from a similar questionnaire that had been performed in the same place in 1997. Student's t-tests, One-Way ANOVA and Pearson Chi-Square tests were used for the statistical evaluation of the observed differences with the level of significance set at $p < 0.05$. **Results** From 1997 to 2004 there was a significant increase in the prevalence of caries from 77% to 82% ($p < 0.05$). The average DMFT value dropped from 1.9 ± 1.5 in 1997 to 1.0 ± 1.3 in 2004 with the mean DMFS score decreasing from 2.6 ± 2.7 to 1.4 ± 2.2 respectively. The mean dmft value decreased from 5.0 ± 3.1 to 3.5 ± 2.8 and mean dmfs value from 13.4 ± 10.8 to 10.0 ± 10.1 between 1997 and 2004, respectively. In both years, the decayed component (D) comprised the most predominant part of the DMF scores. From 1997 to 2004 a significant decrease was observed in the mean number of decayed permanent teeth (1.8 ± 1.4 vs. 0.7 ± 1.1 $p < 0.001$) with a simultaneous increase in the mean number of filled permanent teeth (0.1 ± 0.5 vs. 0.3 ± 0.8 , $p = 0.036$). A significant improvement was observed between 1997 and 2004 in oral hygiene habits (frequency and time of the day), in the socioeconomic status and in the attendance to dental care. **Conclusions** Between 1997 and 2004 there was an increase in the

prevalence of caries but the mean numbers of affected teeth and surfaces decreased, which may at least partly be explained by better oral hygiene habits associated with an increase in socioeconomic status that allows an easier access to oral health care. However, this population still has a high level of dental caries and associated need for preventive and therapeutic care.

Trends in caries frequency between 1978 and 2005 in Tromsø, Norway. P MARSTRANDER*, E HONKALA. *Institute of Clinical Dentistry, University of Tromsø, Norway*

Based on the national statistics of the Public Dental Services in Norway, Haugejorden & Birkeland (2002) reported a decline of dental caries among the Norwegian children. Among the 5-year-olds, however a decline was observed only from 1985 to 1997; there was an increase after that. **Aim** This study sought to analyse the annual dental statistics of Tromsø district for revealing the trends in the occurrence of caries among the 5-, 12-, 16- and 18-year-olds. All these age groups had annual clinical examinations including x-rays during the whole period. The trends in caries prevalence (%), caries experience (dmft/DMFT), and percentages of children with a high caries experience (dmft/DMFT > 9) were analysed between 1978 and 2005. **Methods** The data were collected from the annual statistics of the Tromsø dental health district. Some missing data were collected from the archives of the health district administration. Data were not available for some years and the statistics for the 18-year-olds were only collected from 1985 onwards. There were 8 dental clinics in 1978 and 6 in 2005, but the geographical area served by these clinics stayed the same. The number of children in each age group varied annually between 449 and 908 and the coverage of the examinations between 69 and 100%. **Results** Among the 5-year-olds, caries prevalence increased from 54% in 1979 to 59% in 1981, then declined to 43% in 1985, staying quite stable (>40%) up to 1995, declined again to 32% in 1997, again increased up to 46% in 2001, and finally declined again to 26% in 2005. The mean dmft followed the same pattern: 2.8 (1979); 3.2 (1982); 1.8 (1985); 1.1 (1997); 1.8 (2001) and 0.9 (2005). The percentage of children with high caries levels declined quite consistently from 9.1% (1980) to 1.2% (2005). Among the 12-year-olds the caries prevalence declined quite consistently from 96.9% (1979) to 56% (1996) and then increased up to 69% (2004). The mean DMFT followed the same pattern declining from 6.1 (1978) to 1.6 (1998), increasing then slightly to 2.2 (2004). The percentage of children with high caries levels decreased from 15% (1978) to 0.5% (2005). The declining trend of caries prevalence was similar among the 16- and 18-year-olds, from 99-100% (1978-1985) to 87-88% (2005). The trend of DMFT among the 16-year-olds was from 12.4 (1978) to 4.4 (2005) and among the 18-year-olds from 10.0 (1985) to 5.4 (2005). The percentages of the high caries children declined rather consistently from 70% (1978) to 10% (2005) among 16-year-olds and from 32% (1985) to 15% (2005) in 18-year-olds. **Conclusions** The caries indicators of the 5-year-olds seem to reflect the changes in caries situation more sensitively than the same indicators of the older age groups. There was

practically no improvement in the caries situation among the 5-year-olds between 1985 and 1994 and between 1997 and 2001. These results coincide with the national statistics. These two latent periods were only very weakly seen among the 12-year-olds, but not at all among the 16- and 18-year-olds. The change of the recommendations of fluoride use in 1997 might explain the sharp caries increase between 1997 and 2002. More effective preventive programmes are needed for controlling caries among children and adolescents.

Cohort analysis of trends in caries between 1980 and 2005 in Tromsø. E HONKALA*, P MARSTRANDER. *Institute of Clinical Dentistry, University of Tromsø, Norway*

The Norwegian National Public Dental Statistics have been used to monitor and to analyse trends in the occurrence of caries, especially among the national index age-groups of 5-, 12-, 16- and 18-years. **Aim** In this study we wanted to find out, whether there were any changes among the consecutive age cohorts born in 1970-1987 in caries prevalence (% of children with DMFT>0), caries experience (dmft/DMFT), and in the number of functional teeth (FS-T) over the period between 1980 and 2005. **Methods** The data were collected from the annual statistics of the Tromsø dental health district. Some missing data were collected from the archives of the health district administration. All data were not available for every year. There were 8 dental clinics in 1980 and 6 in 2005 in this district. The data were available for the age cohorts born between 1970 and 1987. The number of children in each cohort varied annually between 449 and 908 and the coverage of the examinations between 69% and 100%. **Results** The values of the selected indicators of caries occurrence were higher among the children born between 1970 and 1978 than among the younger ones, but among children born in 1979 or later the trend of improvement was very weak. There was no decreasing trend in caries prevalence at the age of 18 years (86-90%) in the cohorts born in 1977 or later, and at the age of 16 in the cohorts born in 1975 or later (80-87%). At the age of 12 years, caries prevalence among the cohorts born in 1975-1977 stayed between 70-75%, among the cohorts 1978-1983 between 62-65%, and among the cohorts 1984-1987 between 56-60%. At the age of 5, caries prevalence was over 50% (51-59%) in cohorts 1975-1978 and less than 50% (41-46%) in the cohorts 1980-1987. All the cohorts 1978-1987 had dmft<2.4 (at the age of 5), DMFT<2.2 (12 years), DMFT<5.1 (16 years), and DMFT<6.2 (18 years). There was a weak decreasing trend in the 5- and 12-year-olds but no decrease was found among the 16- and 18-year-olds. The range of the cohort specific increases in caries prevalence between 12 and 18 years of age was 16-33% (mean=23.9%), and the corresponding range of DMFT increments was 3.1-4.2 (3.8), both without any trend. This was further confirmed by the fact that there was practically no trend in FS-T from 12 years of age (22.1), to 16 (25.6), and to 18 years of age (25.4) over the whole period. The caries decline between 1980 and 2005 (cohorts 1975-1987) concerned only 5- and 12-year-olds and there were no differences among the age cohorts in DMFT increment between the ages of 12 and 18 years. There was no improving trend in the number

of functional teeth in the permanent dentition in any age cohort during this 25-year-period. **Conclusions** These regional results confirm the fluctuating caries trend, which has also been reported at the national level. The caries prevention activities should be urgently re-evaluated and improved for getting the evidence of their effectiveness on every age cohort.

Changes in caries experience among 35-year-old Oslo citizens, 1973-2003. R SKUDUTYTE-RYSSTAD¹*, HM ERIKSEN². ¹Faculty of Dentistry, University of Oslo, Norway, ²Faculty of Medicine, University of Tromsø, Norway

Aim To describe caries experience among 35-year-olds in Oslo in 2003 and to assess changes in caries experience during the past 30 years using data from previous cross-sectional studies performed in 1973, 1984 and 1993. **Methods** The dental status of 149 randomly selected 35-year-olds living in Oslo was determined in 2003 (response rate 64%) and the data were compared with corresponding data available from the earlier studies. Dental caries was examined clinically and radiographically at the surface level using the same criteria as used in previous studies and recorded as DMFS. **Results** There was a gradual decrease in the mean DMFS scores by 62% from 68.2 in 1973 to 26.1 in 2003. There was an 83% decrease in the mean number of DS, 73% decrease in the mean number of MS and 56% decrease in the mean number of FS during this 30-year period. The percentage of individuals with DS=0 gradually increased from 5% in 1973 to 54% in 2003. There was a significant decrease in the prevalence of recurrent caries from 2.8% in 1984 to 1.2% in 2003. While a statistically significant reduction in the mean number of decayed, missing and filled surfaces was observed during the period 1984-1993, only the decrease in the number of filled surfaces was statistically significant during the last decade. **Conclusions** The results indicate that dental health among 35-year-olds in Oslo, measured as reduction in caries experience, has improved substantially between 1973 to 2003.

Prevalence of fluorosis among a teenage population in Castelo de Paiva, Portugal. J. FRIAS-BULHOSA^{1,2}*, P. BARBOSA¹, T. OLIVEIRA¹, A. ALVES¹. ¹Centro de Saúde de Castelo de Paiva, ²Department of Community Dental Health, Faculty of Health Science, University of Fernando Pessoa, Portugal

Health services in Castelo de Paiva have promoted the use of systemic fluoride supplements for years. Some studies suggest that the prevalence of dental fluorosis is increasing in developed countries. Possible changes in the occurrence of fluorosis have not been adequately monitored in Portugal after fluoride products began being prescribed to children and adolescents, and the associated impacts remain unknown. **Aim** To determine the prevalence of fluorosis in a population of teenage school children in Castelo de Paiva, Portugal. **Methods** During the school-year 2005/06, 285 school children aged 12, 15 and 17 years, 56.1% of whom were female, were examined, and a questionnaire was completed to determine their socio-demographic background and health profile. Dean's index was used to classify dental fluorosis. At the same time the subjects' satisfaction with teeth was

recorded. **Results** Of the subjects, 91.2% reported having used fluoride supplements, and 47.7% were affected by dental fluorosis, most of them in mild category: 88.2% had mild fluorosis, 7.4% had moderate fluorosis, and 4.4% had severe fluorosis. Reported satisfaction with teeth was lower when the severity of dental fluorosis was higher. **Conclusions** Recommendations on the use of fluoride supplements should be reconsidered bearing in mind the evidence base presented on this subject. In our opinion, further monitoring of this phenomenon is important.

Dental health status and subjective oral symptoms in asthmatic children. A ADAMO-WICZ-WIESZCZECZYŃSKA^{1*}, K GERRETH¹, A BRĘBOROWICZ², M BORYSEWICZ-LEWICKA¹. ¹Department of Paediatric Dentistry, Poznan University of Medical Sciences, Poland, ²Department of Pneumology, Allergology and Clinical Immunology, Poznan University of Medical Sciences, Poland

Aim To assess the dental health status and the frequency of subjective oral symptoms in asthmatic children and to compare their situation to that of comparable healthy children. **Methods** The study group consisted of 59 asthma patients and the same number of randomly selected healthy control children living in the province of Wielkopolska, Poland. In both groups, there were 29 girls and 30 boys, aged 7-16 years. The asthma patients and the controls were matched for age, gender and place of residence. All asthmatic children were using inhalants and they were regularly monitored at the out-patient clinic of the Poznan University of Medical Sciences. Oral examinations were carried out in artificial light using a probe and a mirror. Subjective undesirable oral symptoms (xerostomia, hypersensitivity of teeth and halitosis) were determined by using medical documentation and by interviewing the children and their parents. The interviews were carried out by two dental surgeons. **Results** Xerostomia was found among 51.7% and 56.7% of the asthmatic girls and boys, respectively. In the control group, the corresponding figures were 27.3% and 12.5%. In the asthmatic group, 41.4% of girls and 63.3% of boys had halitosis whereas in healthy children the symptom was observed in none of the boys and 9.1% of the girls. Among the asthmatic children, 49.2% were hypersensitive to heat and 8.5% to chemical agents. In the control group, the corresponding percentages were 27.7% and 4.6%, respectively. The mean DMFT score was 5.8 in asthmatic children and 4.7 among the healthy controls. In both groups, teeth with untreated cavitated caries comprised the most predominant and the filled teeth the second biggest component of the DMFT score. **Conclusions** The asthmatic children had more caries experience and greater treatment needs related to caries than the healthy control children had. The higher frequency of xerostomia, hypersensitivity of teeth and halitosis among the asthmatic than among the healthy children may result from the disease per se or from the potential side effects of the medications that are used for treating asthma.

Prevalence of gingival recession among 18-year-old students in Gdańsk, Poland. M ŁASKA*, J SADLAK-NOWICKA, P STAROŃ, E PIECZYŃSKA, Department

of Periodontology and Oral Mucosal Diseases, Medical University of Gdańsk, Poland

Aim To assess the prevalence and the extent of gingival recession in a population of 18-year-old high school-students in the city of Gdańsk, Poland. **Methods** A total of 1,516 high school students were examined for periodontal disease according to WHO guidelines. The prevalence and extent of gingival recession determined according to the classification suggested by Miller (1985). [Miller PD Jr. Int J Periodontics Restorative Dent 1985;5:8-13.] The examination also included an evaluation of the tooth brushing technique of each subject. **Results** A traumatic tooth brushing technique was discovered in a high percentage of students. Gingival recession was found in 497 out of the 1,516 students (32.8%), more often in women (38.8%) than in men (27.5%). The affected subjects included both individuals having a single and those having multiple recessions sites. Among the teeth with a recession, class I according to Miller's classification was observed most often, in 748 teeth (71.9%), while class III or IV was found in 55 teeth (5.3%). A considerable percentage of the students needed surgical treatment of recession. **Conclusions** Gingival recession were a common problem among 18-year-old high school students in the city of Gdańsk. It is essential to develop educative and prophylactic measures for controlling gingival recession among the studied population.

Prevalence of burning mouth syndrome and associated factors. M BERGDAHL*, J BERGDAHL. *Institute of Clinical Dentistry, University of Tromsø, Norway*

Burning mouth syndrome (BMS) is a burning sensation in the oral cavity although the oral mucosa is clinically normal. BMS mostly affects middle-aged and elderly women. Local, systemic and psychological factors have been found to be associated with BMS, but its aetiology is not fully understood. **Aim** To estimate the prevalence of BMS and evaluate associated factors. **Methods** Oral complaints were surveyed in 669 men and 758 women who were randomly selected from annually updated public dental health registers with 48,500 eligible patients. Ten groups of 100 men and women were selected in each 5-year age group within 20 to 69 years. Attendance rate was 71%. After clinical examination, fifty-three individuals (3.7%), 11 men (1.6%) and 42 women (5.5%) were classified as having BMS. Presence of systemic diseases (ICD-10), medication (ACT), salivary flow rate, depression, anxiety, stress, and the intensity and location of pain were determined. **Results** In men, BMS was not present until the age group 40 to 49 years; and with a prevalence of 0.7%. The prevalence of BMS was highest (3.6%) in the oldest age group (60 to 69 years). In women, BMS was not found in the youngest age group, but in the age group 30 to 39 years the prevalence was estimated to be 0.6% and it was highest (12.2%) in the oldest age group. Of the individuals having BMS, 66% reported subjective oral dryness, 64% intake of medication, and 57% illness. Subjective oral dryness, age, medication, taste-disturbances, intake of thyroid hormones, illness, stimulated salivary flow rate, depression and anxiety were factors associated with BMS. The most prevalent site with burning sensations was the tongue (67.9%). The burning sensation was described as intermittent often in 50.9% of

the individuals. The intensity was estimated to 4.6 (range 2 to 9) on a visual analogue scale graded from 0 to 10. There were no elevated levels of depression, anxiety or stress among the individuals with more pain compared to those with less pain. **Conclusions** BMS is a marker of illness and/or distress. The complex aetiology of BMS calls for interdisciplinary collaboration.

Screening for oral cancers and their risk factors in the Roma population. P CSÉPE¹, C DOMBI², L DÖBRŐSSY³, J FORRAI², Z OLAH^{1*}.¹Department of Public Health, Semmelweis University, ²Faculty of Dentistry, Semmelweis University, ³National Public Health Officer's Service, Budapest, Hungary

Oral cancer has been identified as a significant public health threat. It is reported that more than 2,800 new cases of oral cancer are diagnosed in Hungary each year with approximately 1,700 associated deaths. Oral cancer is the 6th most common cancer in men. Most oral cancers are preventable, 75% of cases are related to tobacco use, alcohol use, or both. While there is insufficient evidence to support or refute the use of visual examination as a method of screening for oral cancer in the general population, screening programs targeted on high-risk populations are highly recommended. It was presumed that high-risk behaviour including tobacco and alcohol use is one of the characteristic of Roma people. **Aim** The main aim of the study was to elaborate a screening model program for the Roma population to determine risk factors of oral cancer and establish early diagnosis to improve response to treatment and reduce mortality. In the program we planned to survey the risk factors in the target population, establish the diagnosis of oral cancer and/or pre-cancer and refer the patients to health care facilities. **Methods** First we determined the target population in four Hungarian towns with the help of Roma social workers and local public health officers. We prepared a questionnaire on risk factors. Training for Roma social workers and screening personnel was also undertaken. Screening for oral pre-cancer and cancer and the survey of the risk factors were performed at the same time. Patients deemed to be positive were referred to specialists. **Results** Altogether 1,146 persons, 656 male and 490 female (age 20-77 years, mean 40 years,) participated in the screening and 84% of them reported some kind of complaints. More than fifty percent of participants did not brush tooth regularly, 75% were smokers, and 45% were drinking alcohol regularly. Among the screened participants, 1.6% had oral lesions that did not require referral to a specialist; 2.6% had referable oral mucosal lesions including leukoplakia. An overwhelming majority (93%) of the participants screened to be positive did not see dentist regularly. **Conclusions** Three quarters of the group screened were smokers, almost a half consumed alcohol regularly. 2.6% of the subjects screened were deemed to be positive, the majority of whom did not see a dentist regularly.

**Session 2 – Oral Health Services Research -
Lounge 1 Friday 8 September 2006. Chairs: Dr.
Ivor Chestnutt and Professor Martina Kukletova**

The outlook for private dental practices in Finland - drivers, barriers and scenarios. A VESIVALO*, H MIKKOLA, S JAUHAINEN, E WIDSTRÖM, National Research and Development Centre for Welfare and Health, Stakes, Helsinki, Finland

In 2001-2002, the dental care system in Finland was reformed. Age restrictions on adults' access to the Public Dental Service (PDS) were abolished and all adults became entitled to publicly subsidised private dental care. This changed the operational environment for private dental practises. **Aim** To perform an industry analysis of the private dental practises. Specifically, the aim was to survey and analyse performance and to specify the determinants of the competitive advantages of the private dental practices. **Methods** Twelve managers from the largest dental practices were interviewed using frameworks suggested by Porter (1980, 1990). [Porter, M.E. (1980). Competitive strategy: techniques for analyzing industries and competitors. Free Press, New York. Porter, M.E. (1990) The competitive advantage of nations. Free Press, New York.] Financial data for the years 2000-2004 were collected for the hundred largest practices, including turnover and key financial ratios. Complementary aggregate industry data were collected including the number of dentists, industry turnover and turnover of subsidised care. **Results** The dental practices we studied performed strongly throughout the period of 2000-2004 with the median return on invested capital (ROIC) ranging from 23-29 %. The price adjusted industry volume increased 13.6% despite the 11.6% decrease in the number of private dentists. According to the interviews the demand environment was favourable partly due to the reform. A two-fold business concept was dominant among the practices: 1) care production for patients and 2) facilities supply for the dentists. Effect of competition was described as weak. Instead, professional ambitions were said to drive the development. Ageing of workforce and labour shortage were the major obstacles to growth. **Conclusions** It was obvious that the industry had performed well with its traditional ways. Despite the growth in demand, the reform had no major impact on private dental practises. Even though the performance was strong, coping with future challenges may require new business concepts and ideas. **Acknowledgements:** The study was supported by the Finnish Academy, Health Services Research Grant Terttu.

Demand for dental studies and employability of dental graduates in Catalonia, Spain.

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The concept of employability, which derives from the Bologna Declaration, stresses that degree courses in higher education should enable graduates to become employed in the European labour market. **Aim** To analyse the trend in the demand for dental studies, as well as the satisfaction of recent graduates with their employability in a context characterized by a low utilization of dental services and a large increase in the dental workforce in the private fee-for-service system. **Methods** Population based data on the patterns of attending a dentist were obtained from Catalan health surveys (1994 and 2002). Data on the demand for dental studies were obtained

from the University of Barcelona. Employability characteristics were obtained from a survey designed by the Catalan Agency for University Quality and administered to students graduating from public universities in 2001 and 2005. **Results** Over the last five years, applications to the public dental school (University of Barcelona) have been three times higher than the maximum intake. At the same time, the number of dentists has increased from 2,537 to 3,444. According to the Catalan health survey (2002) only 37.7% of women and 30.6% of men attended a dentist during the previous twelve months. The percentage of dental graduates who were employed was 100.0 in 2001 and 96.4 in 2005, while the corresponding figure for all graduates was 90.2% for both years. Among dental graduates, 93.3% and 90.2% were satisfied with their studies in 2001 and 2005, respectively, while the average percentage for all graduates was 69.5% (2001) and 70.6% (2005). While 20.5% and 29.4% of all graduates were working in public sector jobs in 2001 and 2005, respectively, the corresponding figures for dental graduates were only 3.0% and 7.4%, respectively. In 2001, 8.0% of all university graduates earned more than €30,000/year, whereas the figure for dental graduates was 16.4%. The corresponding percentages for 2005 were 9.9% for all graduates and 20.4% for the dental ones. **Conclusions** Demand for dental studies has been nearly three times higher than what is on offer and has shown no sign of change over the last five years. Socially, dentistry is regarded as an attractive career and graduates report a high level of satisfaction with their training. The results imply that the dental curriculum fulfils the requirement of employability set for the European Higher Education Space.

Gender differences in professional burnout among Indian and Sri Lankan dentists. GN CHANDU^{1*}, MD SHAFIULLA¹, VVS REDDY². *Departments of Community Dentistry¹ and Pedodontics², College of Dental Sciences, Rajiv Gandhi University of Health Sciences, Karnataka, India*

Differences between men and women in the manifestation of burnout have been reported for different occupational groups. Most of the reported studies indicate that women differ from men on the aspects they find stressful as well as in the way they cope with the stressors. **Aim** To analyse differences between genders in burnout among Indian and Sri Lankan dentists and to identify possible concomitant factors. **Methods** Male (n=459) and female (n=225) Indian and Sri Lankan dentists filled out the English version of a 20-item Burnout Inventory questionnaire including several health- and work-related questions that were to be answered on a seven-point Likert scale, ranging from 0 (never) to 6 (every day). The questionnaire included three subscales: feeling of Emotional Exhaustion (EE, 8 items), Depersonalization (D, 5 items) and reduced Personal Accomplishment (PA, 7 items). The data were subjected to statistical analyses by using multivariate analysis of variance and Students t-tests. **Results** Male dentists reported a higher score on the depersonalization dimension of the Burnout Inventory than did female dentists. No gender differences were found on the other dimensions (i.e. Emotional Exhaustion and Personal Accomplishment). No gender-related differences were

found in reported work-stress or health-related aspects. It was found that male dentists put in more working hours and saw more patients per week than female dentists did. Most of the female dentists were working on a part-time basis (resulting in less treatment hours and treated patients) or had altogether stopped working as a dentist (resulting in a lower mean age). **Conclusions** Among dentists, differences between genders do exist in burnout. Both Indian and Sri Lankan dentists do have relatively favourable mean levels of burnout, but those who report exhaustion can be extremely exhausted. Male dentists appear to be more vulnerable to burnout than female dentists are.

Values about good work for Swedish oral surgeons and general practice dentists. G PILGÅRD^{1,2,3}, K HJALMERS^{2*}, B SÖDERFELDT², J ROSENQUIST¹, *Departments of Oral Surgery¹ and Oral Public Health², Faculty of Odontology, Malmö University, Sweden, ³Department of Oral and Maxillofacial Surgery, Borås Hospital, Sweden*

Aim Dentists in the Public Dental Health Service (PDHS) in Sweden seem to have a larger discrepancy between ideal and reality with regard to good work than do other academic groups in Sweden. [Aronsson G, Bejerot E, Härenstam A. *Public Personnel Management* 1999;28:197-215., Hjalmers K, Söderfeldt B, Axtelius B. *Acta Odontol Scand* 2004;62:107-10.] This study investigates how oral surgeons and female general practice dentists (GPDs), two groups in the PDHS, perceived good work, both in an ideal world and in reality, as well as to compare if there was a discrepancy between the two. **Methods** A questionnaire containing twelve items about good work (Aronsson 1999) was sent to the oral surgeons and to the female GPDs. There were 106 oral surgeons from 22 oral and maxillofacial surgery (OMFS) clinics in Sweden. Of them, 90% responded to the questionnaire. The GPDs were 183 female dentists without any managerial position, working in one region in Sweden. Of them, 94% responded to the questionnaire. **Results** The oral surgeons and the GPDs rated highest the following two criteria: The job should be intellectually stimulating (91% of both the oral surgeons and the GPDs considered this as very important) and the job should provide opportunities to have an influence on important decisions (82% and 85% of the oral surgeons and the GPDs, respectively, considered this as very important). Opportunity for career advancement was more important for the oral surgeons and this was the only criterion, where the gap between ideal and reality was wider for the oral surgeons than it was for the GPDs. **Conclusions** The main result was that the criteria for an ideal work situation among the oral surgeons corresponded to those among the female GPDs. For all aspects but one, however, the discrepancy between ideal and reality with regard to good work was wider for the female GPDs. **Acknowledgements:** Supported by FoU-centre in Southern Älvsborg County, Sweden.

Dental hygienists as primary oral health providers and their degree of professionalism. S ORDELL^{1,2*}, B SÖDERFELDT¹. *¹Department of Oral Public Health, Malmö University, Malmö, Sweden, ²Dental Commissioning Unit, Östergötland County Council, Linköping, Sweden*

The number of active dentists in Sweden will fall sharply in the next decade and will partially be countered by an increased number of dental hygienists. The acceptance of this transition to primary oral health care by hygienists will be dependent on many factors; among them will be the perceived service quality offered by the dental hygienists, which may depend on how their professional status is perceived. **Aim** To find out whether the professional status of Swedish dental hygienists is such that it is possible to meet the demands from the population. **Methods** The professional status of Swedish dentists and dental hygienists was analysed by the variables suggested by Greenwood (1957). [Greenwood E. *Social Work*. 1957 2: 45-55.] **Results** The variables used point to shortcomings in the professional status of Swedish dental hygienists. Dentists in Sweden constitute a strong profession, while dental hygienists are emerging as a profession. They lack a coherent and systematic theory in their academic education. Their fields of expertise are not exclusive to their group and that further weakens their professional status. They will probably not meet the service quality that is presently expected by the population. Many factors will have to be combined to make possible the necessary transition from dentists to dental hygienists as primary providers of oral health care. One of them is that the expected level of service must be adjusted to the available personnel. **Conclusions** The professional status of the dental hygienists needs to be consolidated and strengthened by a more homogenous curriculum. **Acknowledgements:** This study was supported by the dental commissioning unit in Östergötland County Council.

Uptake of caries prevention implementation strategies and dental hygienist employment. J CLARKSON¹, D BONETTI¹, G MACLENNAN², C TILLEY¹, S TURNER^{1*}. ¹DHSRU, Dundee University, UK, ²HSRU, Aberdeen University, UK

Aim To investigate the relationship between dental hygienist employment and the implementation of an evidence-based caries preventive treatment for children in a Cluster RCT. Preventive fissure sealants (PFS) to treat children at high caries risk remain under-utilised, despite strong evidence of efficacy. This treatment is within the clinical remit of a qualified hygienist. Improved prevention could reduce oral health inequalities, due to the strong and persistent caries-deprivation link. **Methods** Factorial cluster randomised trial based on a sample of General Dental Practitioners (GDPs) working in more deprived areas in Scotland. GDPs were randomised to: a “fee” group, offered a fee for each PFS placed; an “education” group, invited to a workshop on evidence-based practice; a “both” group, offered fee plus workshop; or to a “control” group. Main outcome measure: proportion of 12-14 year olds receiving PFS on second permanent molars (7s), based on a sample of 25 children seen by each GDP. **Results** Fifty-three per cent (149/284) of eligible GDPs were recruited, 89% (133) of whom returned data on 2,833 children. 55/73 (73%) attended workshops, and 48/76 (63%) claimed for PFS. Taking account of baseline differences, 10% more children seen by GDPs offered a fee had PFS on 7s by study-end compared with those seen by GDPs not offered a fee. The education intervention had no statistically significant impact on this outcome.

Children in practices employing a hygienist were more likely to be treated with PFS (36% cf. 27%). There was no significant interaction effect between fee intervention and hygienist employment on PFS placement. **Conclusions** Adjusting the fee structure to promote preventive care is likely to change clinical behaviour significantly, resulting in improved child dental health. However, payment of a fee in itself may not be sufficient to influence which dental care professional undertakes the treatment. **Acknowledgements:** The ERUPT Study was funded by the Chief Scientist’s Office, Scottish Executive and The Scottish Higher Education Funding Council.

An audit of health promotion activities within dental practices in Leeds and Bradford. J CSIKAR*, S WILLIAMS, S ANWAR, J GODSON, Leeds Dental Institute, UK

Aim To establish baseline information regarding the prevalence and range of health promotion activities (HPA) undertaken by dental practices in Leeds & Bradford. **Methods** A piloted questionnaire was mailed three times to all primary care dentists between March & November 2005. **Results** 87% (n=105) of Bradford practices and 76% (n=120) from Leeds responded. Proportionally more dental teams reported taking part in HPA with patients in Bradford (67%) than in Leeds (57%). Activities included advice on diet and nutrition (DN), smoking cessation (SC), trauma prevention (T), programmes targeting special needs groups (SN) and creating partnerships (CP). In Bradford, 70 (51%) respondents were involved in HPA with 65 (42%) offering DN advice followed by 39 (25%) for SC. In Leeds, the corresponding values were 68 (49%) respondents taking part in HPA, 68 (43%) DN and 40 (25%) for SC. Partnership creation was reported by 23 Bradford and 11 Leeds dentists, with a wider range and proportion of partnerships in Bradford being reported. A significantly higher proportion of Leeds respondents (n=83; 70%) felt confident to talk about SC than in Bradford (n=54; 52%) ($p<0.05$). Conversely, significantly more Bradford dentists (n=38; 67%) referred to SC services compared with those in Leeds (n=19; 33%) ($p<0.05$). A similar proportion of dental teams in Leeds and Bradford offered some form of HP for their patients, with DN most frequently provided in both areas. **Conclusions** Health promotion activities were reportedly carried out by 67% of Bradford practices and 57% in Leeds. Regarding SC, the lower utilisation of referral services in Leeds may reflect more in-practice activity, or a generally lower key engagement with SC. The results for smoking cessation suggest a need for further research into practice profiles alongside training and support for the dental team from SC services.

The potential for delegation of clinical care in U.K. general dental practice. CE EVANS, IG CHESTNUTT*, BL CHADWICK, Dental Public Health Unit, Cardiff University, Wales, UK

The adoption of a multi-skilled team approach in primary medical care has done much to alleviate workforce pressures in that setting. In the U.K., the concept of team based dentistry is accepted. However, the lack of a good evidence base on what proportion of care could be delegated to dental hygienists and therapists, means

that the full potential of truly shared-care in the general dental practice setting has not been established. **Aim** To examine the proportion and volume of work undertaken by primary care dental practitioners that could be delegated to hygienists and therapists. **Methods** Data on treatment provision both NHS and private, over one course of treatment, for 850 consecutively attending patients at 17 dental practices, selected to be representative of a range of socioeconomic, urban and rural environments, were extracted from case records. Treatment provided was recorded as: number of visits; care provided, (categorised as; diagnostic examination, simple, intermediate or complex restorative intervention, and other complex interventions); and time taken per procedure. **Results** The 850 patients attended on 2,433 occasions. Diagnostic examination accounted for 833 (34.2%) visits, while simple, intermediate and complex restorative interventions and other complex interventions accounted for 500 (20.5%), 361 (14.8%), 365 (15%) and 374 (15.4%) visits respectively. The total time required to provide the care was 42,800 minutes, of which 6,550 (15.3%) were devoted to diagnostic examinations, while 10,485 (24.5%), 7,935 (18.5%) and 11,790 (27.5%) were taken up with simple, intermediate and complex restorative care. Other complex interventions accounted for 6,040 (14.1%) minutes. Assuming that dental therapists are permitted to undertake, simple and intermediate restorative interventions, they could provide 35.3% of care when number of visits is utilised as the outcome measure, but 43.0% of the clinical time taken to provide care. Delegation of diagnostic and treatment planning powers to dental therapists, as has been recently proposed by the U.K. General Dental Council, could potentially result in 69.5% of visits and 58.3% of clinical time being provided by therapists. **Conclusions** These data infer that a considerable proportion of work in U.K. general dental practice could be delegated, and suggest that at present only 57% of dentists' time is devoted to activities beyond the scope of dental therapists. **Acknowledgements:** The support of the British Dental Association Research Foundation is acknowledged gratefully.

The division of labour between dentists and dental hygienists in Norway. B ABELSEN*, JA OLSEN, E WIDSTRÖM, *Institute of Community Medicine, University of Tromsø, Norway*

Aim The aim of the study was to investigate the division of labour between dentists and dental hygienists in the public and private sectors in Norway and the perceived need to delegate more tasks to dental hygienists. **Methods** A questionnaire was mailed to a random sample of 1,111 dentists and 268 dental hygienists in 2005. The response rates were 45% and 42%, respectively. No systematic response bias was detected. The respondents were asked about their work profiles, and their preferences for different tasks had a free choice been possible. They were also asked if there were treatments currently conducted by a dentist, which could be transferred to a dental hygienist. Some attitude statements concerning dental hygienists' position and work were also presented. Logistic regression analyses were performed to determine how the answers differed by respondent characteristics. **Results** In both sectors, dentists used about 40% of their

total working hours doing examinations, screening and basic treatments. There were no differences in the mean number of different tasks done by dentists between clinics with and without dental hygienists, indicating that dental hygienists supplemented rather than substituted for dentists. Dentists desired few changes in tasks, while the dental hygienists, particularly in the public sector, wanted to undertake a greater selection of basic treatments and fewer examinations and screening. Most dentists (61%) agreed that more of their work could be done by a dental hygienist but older dentists, dentists in areas where there were many dentists and public sector dentists were less likely to agree. Of the dentists, 32% disagreed with the statement that the technical quality of some dental work was about the same, whether done by a dental hygienist or a dentist. Agreement was more likely if the dentist was currently working with a dental hygienist. Most (79%) dental hygienists agreed that dental hygienists should be the entry point for oral health services. Only 21% of the dentists shared this opinion. **Conclusions** Within the constraints of the low response rate, the results may indicate that there will not be major changes in the division of labour between dentists and dental hygienists as long as dentists are in charge of the development. Norwegian legislation stipulates that dentists are responsible for care provision when dental hygienists and dentists are working together in teams. The public authorities or dental customers may alter the situation by choosing the dental hygienist as the point of entry to oral health services. By establishing their own dental businesses dental hygienists could contribute to this change. **Acknowledgements:** The study was supported by the Directorate of Health and Social Affairs, Oslo.

Children's use of dental services in four Nordic countries. JI VIRTANEN^{1,2*}, LT BERTSSON^{2,3}, E LAHELMA¹, L KÖHLER², H MURTOMAA¹. ¹University of Helsinki, Finland, ²Nordic School of Public Health, Gothenburg, Sweden, ³University of Gothenburg, Sweden.

An increase in the use of services offered for children by general practitioners has taken place since the 1980s in the Nordic countries. **Aim** To compare differences in children's use of dental services in four Nordic countries between the 1980s and the 1990s and to analyse trends during the period. **Methods** The participants were 12,000 children aged 2-17 years in Finland, Iceland, Norway and Sweden. Cross-sectional population surveys using random samples of 3,000 children were conducted in 1984 and 1996. Time trends in the use of dental services were studied in each country by age, gender, parents' highest level of education, and living area. The main outcome was dental services utilization that was based on the responses to a questionnaire item asking whether the parents had consulted a dentist / a dental nurse with regard to their children's oral health during the previous three months. **Results** The percentage of children who had used dental services varied from 50% in 1984 in Norway to 38% in 1996 in Sweden. A clear time trend towards a decreasing utilization of dental services ($p < 0.05$) was found in all countries except in Finland where the utilization of dental services increased significantly ($p < 0.05$) between 1984 and 1996. Odds ratios for time trends (1984=1.00) varied from 0.66 (95% CI 0.58-0.75) in Sweden to 0.71 (0.62-

0.81) in Iceland. The corresponding figures in Finland were 1.32 (1.16-1.48). In Finland and Norway, children in families with a lower education used more dental services than those in families with a higher education. **Conclusions** Between the 1980s and the 1990s, children's use of dental services has decreased significantly in three of the four Nordic countries. Increased use of individual recall intervals in oral health care might partly explain this finding.

The use of preventive and diagnostic dental services among adults in Denmark. LB CHRISTENSEN*, PE PETERSEN, University of Copenhagen, School of Dentistry, Denmark

Aim To describe the use of diagnostic/preventive dental services in the adult Danish population 1994-2003. Use of dental services was analysed in relation to gender, age-group, counties, ethnicity, level of education, marital status and level of income. **Methods** A 10% sample of the total population aged 18 or more was randomly drawn from a population-based register. Due to migration and death the annual sample size varied between 402,179 in the year 1994 and 411,105 in 2003. Bivariate analyses were applied to describe the use of dental services by socio-demographic factors. A cohort of persons who were registered as residents in Denmark all the years 1999-2003 was drawn from the samples (n=393,277). Logistic regression analyses were applied to determine the effect of various factors on the use of diagnostic/preventive dental services. **Results** An increase was found in the use of diagnostic/preventive services. During each year women, married persons, people with a high educational level and high income received more diagnostic/preventive dental services than other groups did. Geographical and ethnic variations were also found. Logistic regression analyses revealed relative low odds ratios for having received diagnostic/preventive dental services during the latest five years for younger adults, men, persons with a low income and a low level of education, widows or widowers, and immigrants ($p < 0.001$). **Conclusions** For part of the adult population in Denmark, there seem to be some barriers to the use of diagnostic/preventive services. The major barriers relate to socio-economic and cultural background factors. Adjustments of the dental care system are recommended to better match the needs for prevention of oral diseases among the disadvantaged adults. **Acknowledgements:** The study was supported by The National Health Insurance and The Danish Dental Association.

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Friday 8 September 2006 Chairs: Professor Annerose Borutta and Dr. Konrad Malkiewicz**

Evaluation of preventive programmes for pre-school children in Thuringia, Germany. A BORUTTA*, S KNEIST, M UHLIG, B KOZLIK, Zentrum für Zahn-, Mund- und Kieferheilkunde, Klinikum der Friedrich-Schiller-Universität Jena, Poliklinik für Präventive Zahnheilkunde, Jena, Germany

In Germany, group prevention programmes are based on a social law. In Thuringia the total population of about

two million inhabitants includes than 180,000 children between 2 and 6 years of age. There are 1,395 kindergartens in which basic group prevention programmes (daily tooth brushing with F-toothpaste, oral health education at least 4 times a year, yearly oral examinations) are performed for more than 10 years. **Aim** To evaluate the changes in oral health between 2001 and 2004 in relation to prevention received by pre-school children of Thuringia, who participate in basic group prevention programmes. **Methods** Yearly oral examinations were carried out in the kindergartens by trained and calibrated dentists. Dental caries (dmft) was registered according to the WHO criteria (1997). **Results** In 2001, the mean dmft values were between 0.46 (2-3-year-olds) and 2.04 (6-year-olds) with the percentages of caries-free being 85% and 49%, respectively. One year later the mean dmft score amounted to 0.59 for the 2-3-year-olds and to 2.11 dmft among the 6-year-olds. The percentages of caries-free children were 84% (2-3-year-olds) and 49% (6-year-olds). In 2003, the mean dmft values had again increased in all age groups. The 6-year-olds showed a mean dmft value of 2.23. Only 45% of them were caries-free. Caries frequency was highest in 2004. The mean dmft values were between 0.69 (2-3-year-olds) and 2.33 (6-year-olds). **Conclusions** Despite the basic prevention programmes, caries frequency increased among the pre-school children. Preventive care in kindergartens must be intensified. More fluoride applications are needed for children and more education concerning diet recommendations for mothers.

Caries incidence and increment after cessation of two different fluoride administration methods

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Aim To determine caries incidence and increment among a group of children after five years of cessation of two fluoride administration programmes. **Methods** A total of 61 14- and 15-year-olds were studied in 2004. The children comprised a subgroup of a representative sample of 146 children living in the county of Vizela, Portugal who had taken part in a longitudinal study performed between 1997 and 1999. Seven years earlier, group A (n=23) had received a 1 mg fluoride tablet per day for two years (1997-1999). For the same period, children in group B (n=38) had used a biweekly 0.2% sodium fluoride rinse. The determination of DMFT and DMFS was based on WHO criteria. Records from the examinations performed in 1999 were compared with those of 2004. The increment of dental caries was assessed and compared between the two fluoride administration groups. Student's t-tests were used for statistical evaluation of the differences in mean values. **Results** The overall incidence of caries during the five years was 6.6% for all teeth and 4.9% for permanent incisors and molars. No statistically significant difference was found in DMFS increment between the two groups ($p=0.153$). However, when considering only the permanent incisors and molars that had been present in the oral cavity during time of fluoride administration, DMFS increment was higher in group A (2.48 ± 2.84) than in group B (1.11 ± 2.91) the difference being statistically significant ($p=0.025$). **Conclusions** Mouth rinses seem

to offer a better protection against dental caries than fluoride tablets in those teeth that are in direct contact with fluoride. It can also be concluded that the systemic fluoride did not have a significant influence on unerupted teeth, which confirms the importance of the availability of fluoride in the oral cavity. A two-year fluoride mouth rinsing program alone was not sufficient to control dental caries among the studied cohort.

Assessment of dental status and overweight of children in two French areas. M FOLLIGUET^{1*}, A VEILLE-FINET¹, MC BERTIERE², P HOWELL¹, C ROY³. ¹Odontology Department, Louis Mourier University Hospital, AP-HP, France, ²CERIN, Paris, France, ³Epidemiology Department, Bichat Hospital, Paris, France

Both obesity and tooth decay affect children from socio-economically disadvantaged families. Development of related complications may be avoided by means of screening and early preventive actions. **Aim** To search for a relationship between dental caries and obesity among 7-year-old children. **Methods** An exhaustive cross-sectional survey was carried out from April to September 2005 among first-grade schoolchildren of two socio-economically disadvantaged areas: a suburban city (Colombes) and Tahiti (French Polynesia). For each child, dft, DMFT, dft/DMFT scores as well as gender and body mass index (BMI) were recorded. After a descriptive analysis of dental status and BMI, a multivariate analysis using a Poisson regression model for count-data was performed to study the relationship between obesity and DMF, with an adjustment for sex and the area of residence. The threshold for statistical significance was set at $p < 0.05$. **Results** The screening concerned 1,140 children (51% boys). When both permanent and temporary teeth were considered, 44% of the children had at least one decayed tooth ($n=390$), with a total of 1,588 carious or filled teeth. The mean dft/DMFT was 1.8. Among the children, 48 were obese (4%) and 87 (8%) were overweight. The mean BMI value was 16. Multivariate analysis showed a statistically significant relationship ($p < 0.0001$) between obesity and caries in temporary teeth when gender was adjusted for, this relationship being much stronger (regression coefficient 1.3) in Tahiti than in Colombes (0.69). There was also a relationship between caries in permanent teeth and both gender ($p=0.03$) and obesity ($p=0.01$). **Conclusions** Obesity and caries may both be social markers. Complementary studies are needed to fully understand the reasons of the observed difference between the two populations.

Knowledge and attitudes concerning diet and oral health in a group of Turkish students. Ö ERZENGIN^{1*}, B KARGÜL², M AYLAN², SN ÖKTEM², N BEKIROĞLU¹. ¹Medical School, ²Dental School, Marmara University, İstanbul, Turkey

A balanced diet leads to sound nutrition. It is important for good health throughout life. **Aim** To describe the knowledge and attitudes of Turkish University students, studying in İstanbul and aged from 16 to 25 years, to their diet in general and, in particular, the level of their knowledge relating to the potential effects of diet on oral health. **Methods** The students' smoking and drinking habits, their consumption of coffee, cola drinks and

chocolate and their tooth brushing habits were studied through a questionnaire. The study was carried out between February and March 2006 in three districts of İstanbul. The questionnaires, which included 18 questions, were distributed to 230 students. **Results** There were 133 respondents with a mean age of 19.8 years (SD 2.51). This represented a response rate of 53.2%. Among the respondents, 90% (96/133) had some knowledge of the relationship between diet and oral health. The media (newspaper articles, books and television) were the main source of dietary and dental information for 37% of the respondents. Sixty-eight percent had some knowledge of dietary items that prevent tooth decay and 74% knowledge of dietary items that are harmful for oral health. Six percent reported that they were always aware of the ingredients in packaged foods. However, 44% reported that they did not care about the ingredients. Forty-two percent thought that the Turkish people in general were not aware of the relationship between diet and oral health, whilst in contrast only 2% thought that the Turkish people were aware of this relationship. Only 23% of the students had attended a dentist regularly every 6 months. **Conclusions** If the results of this small and localised study are representative of the national situation, the Turkish people need to be better informed about the potential influence of diet on oral health.

Dental knowledge and behaviour among mothers of 6-14-year-old school children in İstanbul. B KARGÜL^{1*}, B ALTINOK, Department of Paediatric Dentistry, Dental School, Marmara University, İstanbul, Turkey

Aim To determine via different perspectives the level of dental knowledge and attitudes towards child dental care among parents, with special reference to knowledge concerning the first permanent molar. **Methods** The mothers of 94 children aged 6 to 14 years were asked to fill in a structured questionnaire about the eruption time, position and caries prevention of the first permanent molar and from where they had received that information. The age of mothers ranged from 25 to 41 years with the mean being 36.0 ± 6.9 years. **Results** The time of first permanent molar's eruption was known by 31.9% of the mothers, and the question on its position in the arch was correctly answered by 22.3%. The mothers' education level did not affect the answers on the age of the eruption of the first permanent molar ($p=0.232$) nor the answers about its position ($p=0.602$). The mothers' occupation did not affect level of knowledge either. Of the preventive methods for the first permanent molar, daily tooth brushing was reported most often (26.6%), while pit and fissure sealing was only mentioned by 8.5%. Most of the mothers mentioned that they had received the information from a dentist (44.7%), and only 2.1% of them answered that they had received oral health related information when leaving hospital after birth. **Conclusions** Because of the inadequacy of the mothers' knowledge about the first permanent molar, oral health programmes should be implemented for parents to promote the application of preventive measures. Education of parents by dentists and physicians, especially paediatricians, could possibly increase the awareness of the importance of early dental visits for children.

Caries experience, taste preferences and dietary habits among 12-year-olds in Poznan, Poland. J CHLAPOWSKA^{1*}, G DUDA², M MARUSZEWSKA². ¹Department of Paediatric Dentistry, Poznan University of Medical Science, Poland, ²Department of Bromatology, Poznan University of Medical Science, Poland

Aim To determine caries experience, taste preferences and the frequency of eating sugar containing food items among a group of 12-year-olds. **Methods** The subjects were 111 children (46 girls and 65 boys) from an elementary school in Poznan. All children underwent a clinical oral examination, and DMFT and DMFS scores were calculated for each child. By means of a questionnaire, the children were asked about their taste preferences, the number of main meals, eating patterns between the meals, amount of sugar in tea and the amount of sweets eaten daily. **Results** The mean DMFT and DMFS scores were 3.6 and 4.3, respectively. The values were higher in girls than among boys; 4.1, 3.2 and 5.2, 3.6, respectively. The results of the questionnaire revealed that among the studied tastes, the sweet taste was preferred most (79.3%), followed by sour (34.2%) and salty (26.1%). The majority of the respondents ate 3 to 4 meals daily (86.9% of girls and 78.5% of boys). Among the girls and boys, 60.9% and 41.5%, respectively, admitted eating 2 or 3 times between the main meals. The majority of children, about 60%, reported using two spoonfuls of sugar with tea. Everyday use of chocolate was reported by 17.7% of girls and 24.6% of boys, and daily use of candies by 13.0% of girls and 24.6% of boys. Statistical analysis revealed a positive correlation between the mean DMFT and DMFS scores and the frequency of eating between meals. Among boys, a correlation was also found between caries experience and the frequency of eating chocolate. **Conclusions** Among the studied group of 12-year-olds, unhealthy eating habits were correlated with caries experience. Measures should be taken to increase the awareness of the children about the importance of a healthy diet.

Severe caries experience in 5-year-olds: what are the determinants? D DECLERCK¹, R LEROY^{1*}, MJ GARCIA-ZTERA². Dental School¹ and Biostatistical Centre², Catholic University Leuven, Belgium

Aim To investigate the determinants of the severity of caries experience in the primary dentition in Flemish 5-year-olds. **Methods** The study was performed using baseline data from the 'Tandje de Voorste - Smile for Life' project, a prospective oral health study in Flanders (Belgium). Before implementation of an oral health promotion initiative, the dental health status of pre-school children residing in 4 selected geographical areas was assessed. Caries experience was determined by visual-tactile clinical examination using the BASCD criteria [Pine CM, Pitts NB, Nugent ZJ. Community Dent Health 1997; 14 Suppl 1:18-29] and was expressed by means of the d_3mft -score; oral hygiene was determined using the index described by Alaluusua et al. (1994). [Alaluusua S, Malmivirta R. Community Dent Oral Epidemiol 1994; 22: 273-276] Children were examined by one of eight trained dentist-examiners, after calibration in the examination methodology. Parents completed a pre-tested and validated questionnaire consisting of structured and

open-ended questions covering oral hygiene and dietary habits, oral health behaviours and socio-demographic variables. Data obtained from 1,283 5-year-old children were analysed using univariable and multivariable logistic regression models. **Results** Signs of caries experience were recorded for 30.8% of the children examined. A d_3mft -score between 1 and 4 was seen in 23.6%; a score of 5 or higher was recorded in 7.2%. Caries experience ($d_3mft > 0$ vs. 0) was significantly associated with age, gender, presence of dental plaque and consumption of sugar-containing drinks between meals. When only the children with caries experience were considered multivariable analyses revealed a significant impact of gender (girls were likely to have higher disease levels; OR=4.67; 95% CI: 1.65-13.21) and presence of visible plaque accumulation (OR=3.91; 95% CI: 1.23-12.42) on the severity of disease (1 to 4 lesions versus 5 or more). **Conclusions** This study illustrates the impact of visible plaque accumulation on both the presence and on the severity of caries in the primary dentition. If caries experience was present, girls were likely to have higher disease levels than boys were. **Acknowledgements:** This study was supported by Gaba International and Gaba Benelux.

The impact of parents' education on children's oral hygiene habits. E BENDORAITIENE¹, J NARBUTAITE^{1*}, S MILCIUVIENE¹, V VAITKEVICIENE¹, A ZABORSKIS². ¹Clinic of Preventive and Paediatric Dentistry, ²Institute for Biomedical Research, Kaunas University of Medicine, Lithuania

Aim To investigate the relationship between oral hygiene habits among 11-, 13-, and 15-year-old Lithuanian schoolchildren and their parents' educational level. **Methods** This study is part of the WHO coordinated survey program Health Behaviour in School-Aged Children (HBSC). The data were based on questionnaires, which were administered in school classes to the nationally representative samples of 11-, 13-, and 15-year-old Lithuanian schoolchildren. The response rate was over 95%. The questions covered information on parents' education level, frequency of tooth brushing and the use of dental floss. A total of 2,931 (52%) schoolchildren from all 5,636 respondents reported the education level of their parents. Logistic regression analysis was applied. Chi-square tests were used for comparisons between the groups. **Results** Parents' education level seemed to have an impact on children's oral hygiene habits. Forty five percent of the schoolchildren whose parents (both) had a university level of education brushed their teeth more than once a day, while 44% and 37% did that if only father or only mother, respectively, had a university level of education. Only 34% of the respondents whose parents (both) had less than university level of education brushed teeth more than once a day ($p < 0.001$). Forty six percent of schoolchildren whose parents (both) had a university level of education used dental floss. If only father or only mother had a university level, flossing was reported by 39% and 37% of respondents, respectively. Only 31% of respondents whose both parents had less than university level of education were using dental floss ($p < 0.001$). **Conclusions** The study revealed that there is a positive association between the oral hygiene habits of

Lithuanian schoolchildren and their parents' education level. Schoolchildren whose parents (both) had university level of education were brushing their teeth and using dental floss more often than children whose parents had a lower educational level.

Factors related to life course and traumatic dental injuries among Indian adolescents. *GM PRASHANTH¹**, *GN CHANDU¹*, *MD SHAFIULLA¹*, *VVS REDDY²*. *Departments of Community Dentistry¹ and Pedodontics², College of Dental Sciences, Rajiv Gandhi University of Health Sciences, Karnataka, India*

Studies on the causes of traumatic dental injuries have focused on current risk factors and excluded the influences of experiences along the life course. Few models have been proposed to explain the aetiology of traumatic dental injuries. The contribution of risk factors for dental injuries at different stages of life needs to be investigated. **Aim** To investigate the relationship between life course experiences and the occurrence of traumatic dental injuries among Indian adolescents. **Methods** A survey was performed to collect retrospective data concerning histories of traumatic dental injuries and life course events. Out of the total number of 1,539 eligible 13-year-olds enrolled in private and government schools located in urban areas of India, 1,385 (90%) agreed to participate in the study. They were interviewed and examined for traumatic dental injuries by four trained dental epidemiologists using validated criteria. The interviews covered information on socioeconomic status, family related factors, school grade and anthropometric measures (height and weight). **Results** The percentage of subjects who had experienced traumatic dental injuries was 23.4%. Boys, those from non-nuclear families, those reporting high levels of paternal punishment and those who were at a low school grade for their age were more likely to have experienced dental injuries than were girls, subjects from nuclear families, those reporting low levels of paternal punishment and those who were at a high school grade for their age. Overweight subjects had experienced more dental injuries than had their non-overweight counterparts. The associations between both the family structure and the relationships within the family and the history of dental injuries remained statistically highly significant even after adjusting for the other variables included in this study. **Conclusions** The adolescents who had experienced adverse psychological environments along the life course had had more traumatic dental injuries than their counterparts who had lived in more favourable environments.

Dental behaviour of mothers living in Preveza's Region, NW Greece. *SS RESTIKIAN¹**, *VS MICHAS²*, *D TSOUTSIS²*, *I KOSMAS¹*. *¹Private General Dentists, Preveza, Greece, ²Regional Community Health Center, Preveza, Greece*

Aim To investigate the dental behaviour of Greek mothers with children aged 1-12 years, in relation to certain demographic and socio-economic factors as well as to their knowledge and attitudes concerning issues related to oral health. **Methods** Five hundred Greek mothers, living in the region of Preveza, N.W. Greece, selected at random, were personally interviewed at nurseries, kindergartens

and schools. Responses to questionnaire items relating to knowledge, attitudes and behaviours were examined by place of residence, socioeconomic status, mother's age and the children's age. **Results** 92% of the mothers had visited a dentist, the main reason for their visit being the monitoring of their oral health. The percentage of children that had visited a dentist was 96%. Seventy three percent of the mothers reported brushing their teeth at least once a day, while the corresponding percentage for children was 60%. Only 16% of mothers reported using dental floss. The percentage of children using fluoride mouth rinses was 34% and for 45% fluoride had been applied topically at the dental office. Forty five percent of mothers were consuming sugary foods daily, while the corresponding percentage for children was 46%. Sixty three percent of mothers reported having encouraged their children to brush their teeth at the age of 4 and over. Mothers belonging to the third socioeconomic class presented generally worse dental behaviour in comparison to those belonging to the two higher classes. Dental behaviour seemed to be significantly influenced by children's age with the children aged 7-12 having better oral health habits than the younger children. **Conclusions** The results revealed reasonably favourable oral health habits among the studied group of Greek mothers except for those belonging to the lowest socio-economic class for whom special efforts are needed to achieve improvement.

Oral hygiene and dietary habits among students with high DMFT scores. *MARJO TIPURI**, *Student Health Service, Tampere, Finland*

Aim To investigate differences in oral hygiene and dietary habits and eating frequency between university students having a low and a high DMFT score. **Methods** A questionnaire was completed by the first and the second year students who had their first dental check-up at our clinic. The questionnaire items included questions concerning oral home care and dietary habits. We also registered DMFT scores. Third molars and extractions due to orthodontic reasons were not included in the DMF. **Results** 437 completed questionnaires were received between between October 2004 and March 2005 (response rate 62%). For 111 students (group A), DMFT score was 7 or more. Group B comprised 326 students with DMFT scores lower than 7. The students in group A reported brushing their teeth as frequently as those in the group B. However, there were differences in dietary habits and eating frequency. Among the students belonging to group A, 39.6% reported eating 6 or more times per day; while the corresponding percentage was 23.9% in group B. In the latter group, 14.4% reported drinking juice or soft drinks at least two times per day. Students in group A also required extensive restorative treatment. For 32.4% of them the DT score was higher than four. **Conclusions** Oral hygiene habits did not seem to be associated directly with the level of caries experience. However, a positive association was observed between caries experience and the eating and drinking frequencies. **Acknowledgements:** Supported by the Finnish Dental Society Apollonia.

**Session 4 – Oral Health Promotion - Lounge 1
Friday 8 September 2006. Chairs: Professor Kenneth Eaton and Dr. Vlasta Merglova**

Teachers' opinions on school-based oral health education and caries prevention. E DYBIZBANSKA¹, F SZATKO², E PIERZYNOWSKA¹, M GANOWICZ¹, M WIERZBICKA^{1*}. ¹Medical University of Warsaw, Department of Conservative Dentistry, Poland, ²Medical University of Lodz, Poland

Aim To investigate school teachers' opinions concerning the functioning of school-based oral health education and caries preventive programmes and factors determining effectiveness of these programmes. **Methods** One hundred twenty one primary schools in 2003 and 128 in 2005 were selected for the study by stratified random sampling from the urban and rural areas of Poland. In each school, one of the teachers of the 12-year-olds completed a self-administered questionnaire investigating their opinion concerning the functioning of oral health education and caries preventive programmes at their schools. **Results** Children had participated in dental examinations at over 47% of schools in 2003 and over 25% of schools in 2005, although only 17.4% and 13.1% of children had had access to the necessary dental treatment at school, in 2003 and 2005, respectively. Over 50% of the teachers in 2003 and nearly 75% two years later reported that their pupils were taking part in school-based fluoride prophylaxis programmes (brushing, rinsing). Almost 50% children in 2003 and nearly 25% in 2005 had received fissure sealants. In 2005, over 80% of children at grades I–III had received instruction in oral health care, while over 63% had participated in oral health education programmes (80% in 2003). In 2005, only 16% of the teachers were satisfied with the cooperation among the persons/institutions involved in children's health care, while 70% reported that there was no such cooperation, or that it was insufficient (in 2003 18% and more than 80%, respectively). **Conclusions** Despite a positive trend in the provision of fluoride prophylaxis in schools, a decrease was noted in the percentage of schools providing oral health education. Furthermore, a high percentage of teachers reported a lack of adequate cooperation with persons/institutions involved in child health care, and an increasing percentage of teachers were dissatisfied with such cooperation. Nearly 75% reported an insufficient motivation for the implementation of oral health education in schools. These results should be considered when future oral health education and caries preventive programmes are being developed for schools.

Oral health promotion program at schools. İNCİ OKTAY*, GÜLÇİN BERMEK, FERDA DOĞAN, KADRİYE PEKER, Department of Dental Public Health, Faculty of Dentistry, İstanbul University, İstanbul-Çapa, Turkey

This study is part of a research programme designed to develop a model for oral health promotion for the primary schools in Turkey. **Aim** To determine DMF increment using data on a group of initially 8-year-old children which were followed up for 5 years until the age of 12 years. **Methods** The data were collected from two experimental towns (415 students) and one control town (68 students)

chosen by cluster sampling. The children were examined at baseline (1996) and in the middle and at the end of the 5-year follow-up (2001) by three calibrated dentists under blue-white colour light by using a plane mouth mirror and probe after the children had brushed their teeth and the teeth had been dried with cotton rolls. Visual-tactile measures were used for the examinations with the following grading of the observations: 0 sound, 1 potentially carious, 2 inactive noncavitated lesion, 3 active cavitated, 4 inactive cavitated diameter <0.5 mm, 5 active cavitated diameter <0.5 mm, 6 inactive cavitated diameter >0.5 mm, 7 active cavitated diameter >0.5 mm, 8 filled (sound), 9 filled with active caries, 10 filled with inactive caries. In all groups, the children were divided into those with a low to medium and those with a high to very high caries risk depending on their baseline caries experience, the distribution of which did not differ statistically significantly among the test and the control groups. Children in the test groups used 0.2% NaF rinse weekly and brushed their teeth at school with fluoridated toothpaste once daily under the teachers' observation. In the test groups, children with a high to very high caries risk also brushed under observation three times a year with a 1.1% NaF gel. Student's t tests were used for the statistical evaluation of the observed differences. **Results** DMFS increment was estimated to be 2.09 among the low to medium risk children of test groups, while it was 4.73 among the low to medium risk children in the control group. For the children with a high to very high caries risk, DMFS increment was 4.44 in the test groups and 6.52 in the control group. Among the low to medium caries risk children, DMFT score was 0.94 in the test groups and 1.18 in the control group at the end of 5-year period when the children were 12 years old. The corresponding figures for the high to very high caries risk children were 1.97 and 2.11. **Conclusions** School based oral health promotion programmes are useful when efforts are made to reach the national goals for the year 2020 in Turkey.

The effectiveness of the National Caries Preventive Program in Romanian schoolchildren. I DANILA*, T TIMIS, Preventive Dentistry Department, University of Medicine and Pharmacy "Gr. T. Popa", Iasi, Romania
In 1999 a National Caries Preventive Programme (NCP) comprising supervised weekly mouth rinsing with 0.2% NaF was introduced in all primary schools of 4 focal points of Romania. In Iasi, a non-fluoridated area, the programme includes 12,400 children from 48 schools. In 2004, the NCP was improved by adding secondary prevention procedures that were to be performed at school dental offices. **Aim** To evaluate the effectiveness of the NCP among Romanian schoolchildren after five years of implementation. **Methods** This study began in 2003 and comprised 3,638 schoolchildren (grades I–VII). All children were examined clinically twice a year by trained and calibrated dentists according to WHO criteria. The examinations took place at the beginning and towards the end of the school year. No radiographs were taken. The effectiveness of the programme was evaluated in terms of the onset and progress of caries lesions (stationary, cavitation, new incipient lesions), reduction of socio-economic inequalities in the oral health status of

the schoolchildren and compliance with the school-based oral health programme. **Results** The rate of cavitation decreased (from 49.7% after one year to 29.7% after 3 years of programme implementation) and the rate of stationary incipient carious lesions increased significantly as the period of programme implementation increased (from 39.3% after one year to 56.1% after 3 years). The value of the Gini coefficient decreased from 0.85 in 2003 to 0.61 in 2005. The compliance with the programme also improved significantly. **Conclusions** The NCPP has proven to be an efficient measure for improving the oral health status among schoolchildren and for diminishing socio-economic inequalities by providing for all children an equal access to the preventive programme. An endowment of the school dental office network gives the opportunity to maintain, improve and extend the programme. **Acknowledgements:** This study was supported by the Ministry of Health, Romania.

Fluoride-based caries prevention among infants in Dresden. G BUSKE*, A DWORATZECK, G HETZER. Department of Paediatric Dentistry, University of Technology Dresden, Germany

Preventive aspects of oral health for infants have been the purview of the paediatricians rather than the dentists. **Aim** To compare recommendations regarding caries prevention among infants given by paediatricians on the one hand and the implementation of these recommendations by the parents on the other hand. **Methods** In autumn 2004 a total of 229 children aged 7-30 months from mother-child-groups in 7 districts of Dresden were examined. The examinations included the number of erupted teeth, dmft values and the presence of visible plaque on upper incisors. Data on oral hygiene habits, fluoride use and feeding practices of children were collected by a standardised interview with their mothers. Paediatricians of the 7 districts were asked about their actual fluoride recommendations. **Results** The mean number of erupted teeth was 11.3 ± 5.4 . Caries was found among 17.5% of the children with the mean dmft score being 0.22. The average Significant Caries Index (SiCindex) value was 3.26. Predictors of caries like bottle feeding at night, breast-feeding on demand or frequent consumption of sweetened beverages were confirmed. All paediatricians reported on regular counselling during the preventive paediatric examinations of all mothers about caries prevention with fluoride: administration of (Vitamin D-) fluoride tablets up to the second birthday and tooth brushing without fluoride after the eruption of the first tooth. Fluoridated salt was not recommended. Against that, 53.8% of all mothers reported that they had never obtained such counselling by their paediatrician. Nevertheless 53.7% of the parents claimed that they had started brushing the teeth of their children after the eruption of the teeth. Of the children, 10.7% were reported to brush their teeth without help; 14.2% had not yet started to brush, especially children with caries. Of the children brushing their teeth, 64.2% used fluoridated toothpaste (500 ppm). At the time of the examination, 55.6% of the children received fluoride tablets, 21.7% had received fluoride tablets regularly until a few months previously and 22.7% had received them irregularly or had never received them. Fluoridated domestic salt was used by

59.6% of the mothers. **Conclusions** At present, parents in Dresden are not adequately informed about the oral health care of their children. The lack of a uniform recommendation by dental and paediatric organisations up to the year 2005 may have hampered the appropriate oral health care of small children.

Parental factors among schoolchildren with active initial caries. R POUTANEN^{1,2*}, S LAHTI^{1,3}, L SEPPÄ¹, M TOLVANEN¹, H HAUSEN¹. ¹Institute of Dentistry, University of Oulu, Finland, ²Oral Health Services, Health Center of Seinäjoki, Finland, ³Oral and Maxillo-facial Department, Oulu University Hospital, Finland

Aim To determine if the presence of active initial caries lesions among 11-12-year-olds is related to parental factors. **Methods** All 5th and 6th grade schoolchildren (n=1,691) and their parents in Pori, Finland were invited to the study. Of the children 1,575 (93%) were screened for active initial caries. Of the parents 1,523 (90%) completed questionnaires including items on SES and 24 items on oral health-related knowledge, attitudes, belief and behaviours. Parents were grouped according to three oral health habits. Those in the "good behaviour group" (GB) had all four favourable behaviours, those in the "moderate behaviour group" (MB) had 2-3 and those in the "poor behaviour group" (PB) had 0-1 favourable behaviours.

Results The children whose father's occupation level was low had more often caries (47%) than children whose father's occupation level was high (37%; $p < 0.001$). Of the children whose parents belonged to the GB group, 40% had caries while the corresponding percentages for the MB and PB groups were 43 and 56 ($p = 0.003$). If parents snacked daily children had more often caries (53%) than if parents snacked less frequently (43%; $p = 0.013$). Of the items concerning knowledge, belief and attitudes (24) only two were related to children's caries. Children whose parents did not consider tooth brushing important for avoiding caries had more often initial lesions (52%) than those whose parents considered it important (43%; $p = 0.046$). Children of parents who did not believe that they could keep their own teeth for the whole life had more often caries (50%) than those whose parents believed they could (41%; $p = 0.002$). **Conclusions** Parental factors seem to be related to children's active initial caries. **Acknowledgements:** Supported by Juho Vainio Foundation and the Finnish Dental Society Apollonia

Salivary mutans streptococci among children having received topical fluorides for 2 years

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Aim To determine the level of salivary mutans streptococci (MS) among preschool and primary school children after two years of topical fluoride applications. **Methods** Approximately 50 children, in good general health, who were patients of the Department of Dentistry, Charles University, were included in the study and divided in two groups: group A (deciduous dentition, mean age 3.8 years) and group B (1st phase mixed dentition, mean age 7.2 years). The dmft and DMFT scores were registered and applications of topical fluoride (AFP gel 1.23% and

fluoride varnish 0.1%) were supplied each six months for two years. Oral hygiene instruction was given to the children and their parents at each of the visits. Level of salivary MS (Dentocult SM dip-slide test), presence of dental plaque and the intake of carbohydrates were determined at baseline and at each of the subsequent visits. Baseline data were compared to those after two years. Paired Student's t-tests were used for the statistical evaluation of the observed differences. The threshold for significance was set at $p < 0.05$. **Results** Among the children in Group A, the mean Dentocult SM value was 3.0 at baseline and 2.2 at the end of the follow-up. The corresponding mean dmft scores were 1.3 and 3.4, respectively ($p < 0.05$). For the older children in Group B, the mean Dentocult SM score was 2.9 at baseline and 1.9 at the end of the follow-up. The corresponding DMFT scores were 0.9 and 1.6, respectively ($p < 0.05$). **Conclusions** After two years of topical fluoride applications and oral hygiene instructions, we found that although salivary mutans streptococci levels decreased from those at baseline, the mean dmft and DMFT scores increased significantly. Rather than monitoring the level of a specific species of bacteria and its relation to dental caries it is recommended that dental plaque be regarded as a biofilm. The use of topical fluorides (gel and varnish) is indicated as part of a comprehensive preventive intervention. **Acknowledgements:** This study was supported by a grant of the Ministry of Health, Czech Republic No. 8331-3.

Selected risk factors for early caries and dmft among three-year-old children. M DUBIELECKA*, E RUSYAN, S MAŁGORZATA SŁOTWIŃSKA, Department of Conservative Dentistry, Medical University of Warsaw, Poland

Aim To evaluate the influence of oral hygiene and dietary habits of three-year-old children on the prevalence of early childhood caries. **Methods** This study is a part of a greater research project conducted by the same 2 dentists in the years 2000-2005. The participants were 157 mothers with different levels of education (high school or university education) and their 36-48-month-old children (study group: $n=97$, control group: $n=60$). All women attended antenatal classes, lived in Warsaw district and were recruited in the 3rd trimester of pregnancy. They all had good health and agreed to participate in the study for the next four years. They were examined for the presence of caries lesions and salivary level of mutans streptococci. The study group was formed of those women who agreed to fully participate in further research, which included a check-up every 6 months. The control group was formed of those, who due to personal reasons could not participate so actively and only agreed to attend the final examination, when their children were 3 years old. During pregnancy, mothers in both groups received detailed instructions on child's diet and oral hygiene, which were repeated every 6 months in the study group. In the study group, 1% CHX varnish was applied every six months to the teeth of the women who had a high salivary mutans streptococci level until their children were 36 months old. In the years 2004-2005, when the children were three years old, their dmft score was registered according to WHO criteria. At the

same time all mothers filled out a questionnaire on diet and hygiene, which included questions about risk factors for early childhood caries. **Results** In the study group, the mean dmft was significantly lower (0.4) than in the control group (4.9; $p < 0.001$). Statistical analysis revealed correlations ($p < 0.001$) between the level of caries experience and dietary habits (sweets as snacks, sweet drinks at night) as well as oral hygiene habits (age at which parents had started to brush the teeth, tooth brushing frequency and tooth brushing after the last meal before going to bed). **Conclusions** In order to lower the level of caries experience in primary teeth, an increase in maternal oral health education is necessary.

Comparison of two manual toothbrushes and an electric toothbrush for controlling plaque. J HAMISSI*, Department of Periodontics, Qazvin Dentistry College, Qazvin, Iran

Aim To compare two manual toothbrushes, Laleh® and Oral-B Contura® and an electric toothbrush, Braun Oral-B 3D® for their efficacy in plaque removal. **Methods** The study was a cross-over single-blind randomized clinical trial. A total of 21 healthy dental students (12 female and 9 male) aged 20-30 years volunteered to participate in the study. The students did not use any mouth cleaning solutions, toothpastes or other agents for 24 hours before the first appointment where the presence of plaque was assessed with the aid of a disclosing tablet at six sites per tooth according to the plaque index by Silness and Loe (1964) and where the teeth were cleaned professionally.[Silness J, Loe H. Acta Odont Scand 1964; 22: 121-135.] The students were told to brush their teeth for four minutes twice a day using Laleh, Oral B Contura and electric Braun Oral B 3D during the first, second and third week, respectively. The presence of plaque was determined at the end of each week. **Results** Braun Oral-B 3D electric toothbrush was found to have significantly more plaque removing power in both the proximal and posterior areas. The toothbrushes were less effective in removing plaque from lingual surfaces compared with the buccal areas. Overall, the plaque removal efficacy was weaker for the two manual toothbrushes (Laleh® < Oral-B Contura®) than it was for the electric toothbrush. **Conclusions** Within the constraints of the small number participants and the short duration of the study, the results indicated that the new Braun Oral-B 3D® electric toothbrush may offer some advantages over the two manual toothbrushes in terms of controlling dental plaque.

Prevention of tooth injuries and their complications in children. V. TZIGKOUNAKIS*, V MERGLOVÁ, Dentistry Department of Medical Faculty in Pilsen, Charles University in Prague, Czech Republic

Aim 1. To investigate the aetiology of tooth injuries in children and to assess the period elapsing between trauma and subsequent dental care. 2. To evaluate the knowledge of primary school teachers about providing first aid in cases of tooth avulsion. 3. To inform teachers, parents and children about the prevention of dental injuries and about providing first aid in case of dental avulsion. **Methods** We analysed the documentations of 178 children, who were treated for dental trauma at the Dentistry Department of the Medical Faculty in Pilsen

between 1995 and 2002. Subsequently, we prepared and distributed to randomly chosen primary schools in Pilsen a questionnaire for teachers about the correct way to provide first aid in cases of avulsion of permanent teeth. **Results** Of the injuries, 35.8% were the result of sport activities, 33.4% of playing and 12.8% of school accidents. The period between the accident and subsequent treatment was more than 24 hours for 23.2% of periodontal tissue injuries and for 35.3% of clinical crown injuries. Among the teachers, 68% answered that they had never received any information about dental injuries and 33% of them had never heard the term avulsion of tooth. **Conclusions** Prevention of tooth injuries comprises the early treatment of predisposing factors, safe schools, sport fields, toys and the use of mouth-guards during sport activities. The results from the analysis of the documentation of the patients and questionnaires indicated that we should focus on informing the professionals who are in daily contact with children about the prevention of dental injuries and the importance of providing proper and immediate first aid in cases of dental trauma. We prepared a poster, containing important information on the correct response and behaviour of primary school teachers when a dental avulsion incident occurs in their school.

A pilot of innovative approaches to groups at risk of oral disease in Hungary. *M GYENES^{1*}, C DÓZSA², KA EATON³*, ¹Department of Public Health, Semmelweis University, Budapest, Hungary, ²Ministry of Health Care, Hungary, ³Eastman Dental Institute, University College London, UK

Epidemiological evidence suggests that there has been no overall improvement in the oral health of Hungarians over the last 15 years and that the prevalence of oral cancer has increased, particularly in at risk groups. **Aim** The aim of this pilot project was to develop new methods of reaching groups at risk of contracting oral cancer. **Methods** The project focused on encouraging children under 18 years of age, in general, and those with special needs, in particular, expectant and nursing mothers, and adults who smoked and were heavy drinkers, to attend dentists for free examinations and advice. All dentists providing oral health care within the Hungarian National Health Insurance Fund (NHIF) were invited to bid for additional funds to take part in the pilot project. All patients who took part received a standardised examination for caries, periodontal diseases and screening for oral cancer. **Results** A total of 238 dentists applied to take part in the project, 205 were accepted, and 188 were given contracts for a 4-month pilot-period. The dentists explained the problems of dental caries in children and oral cancer in adults to local and national media and were able to obtain very wide publicity for the project (free of charge). This publicity included 165 local newspaper interviews and articles, 26 local radio interviews, 76 local television interviews, 8 articles in national papers, 4 national radio interviews, 3 national television interviews, 80 minutes of advertising on national television and over 300 minutes advertising on local television. Posters showing oral cancer and offering free screening were displayed in bars in two major cities. A dedicated project website with open access to patients was established. Patients who requested appoint-

ments were contacted in a number of innovative ways, including via SMS, through community leaders and via puppet shows in schools. It appears that 70,000 (30,000 under 18 years of age) potentially at risk patients were examined, 15 cases of early oral cancer (no lymph node involvement) were diagnosed clinically, with subsequent histological confirmation, and were treated and 94 patients with pre-malignant lesions were found. The Hungarian Ministry of Health Care has agreed to fund the project for a further 12 months. The dentists who took part are establishing a Hungarian Association for Community Dentistry. **Conclusions** By using a range of innovative approaches 70,000 at risk Hungarians were reached, a number of whom had potentially fatal lesions treated. The pilot has also brought together Hungarian dentists with an interest in community dentistry and enabled them to share knowledge. **Acknowledgements:** This project was funded by the Hungarian Ministry of Health Care.

The effect of different interventions on dental hygiene among long-term hospitalized elderly. *P PELTOLA^{1*}, MM VEHKALAHTP²*, ¹Espoo City Social and Health Services, ²Institute of Dentistry, University of Helsinki, Finland

Aim To evaluate the effects of an intervention on the dental hygiene of long-term hospitalised elderly patients in Laakso hospital, Helsinki, Finland. **Methods** These long-term patients were receiving necessary dental treatment on an emergency basis only. No dental hygiene measures were provided by dental professionals, but might have been provided by nurses at the departments upon request. For the intervention we grouped the ten patient departments with a total of 260 subjects (mean age 83.3 years) into three groups (A, B, C) each having a different oral hygiene program. Group A (three departments): A dental hygienist or a group of dental hygienist students with their teacher visited the departments at three week intervals and provided oral hygiene measures for the patients. Group B (three departments): Dental hygienist trained the nursing staff at the departments to take care of patients' daily dental hygiene. Group C (four departments) served as a control with no intervention nor any scheduled visits by a dental hygienist. In total, 164 subjects (63%) completed the intervention; 36% died and two patients moved away before the end of the follow-up. One of the authors (PP) performed the clinical oral examinations, including assessments of dental hygiene at the baseline and after the 11-month intervention. Dental hygiene was assessed on the buccal surface of the crown and visible part of the root for each tooth present in the upper incisor and lower premolar region. The right side of the upper jaw and the left side of the lower jaw were examined for those subjects born on even days and the left upper and the right lower for those subjects born on odd days. For each region, the level of dental hygiene was recorded as good, moderate or poor; good: clean or almost clean; moderate: dental plaque, calculus or food remnants covering no more than 1/3 of any buccal surface; poor: dental plaque, calculus and food remnants covering more than 1/3 of at least one buccal surface. Chi-square tests were used for the statistical evaluation of the observed differences. **Results** Of the 164 subjects, 56% were dentate, with an aver-

age number of 12.6 functioning teeth. At the baseline examination, dental hygiene of the upper incisors was good for none and moderate for 51%, the corresponding figures for lower premolars were 0% and 55%, with no significant differences between the groups ($p>0.05$). After the intervention, improvement in dental hygiene of the upper incisors was seen for 34%, by group: A 28%, B 48%, C 28%, and deterioration for 10%, by group: A 19%, B 0%, C 16% ($p=0.16$). For lower premolars, improvement was seen for 39%, by group: A 24%, B 65%, C 37%, and deterioration for 14%, by group: A 12%, B 0%, C 27% ($p=0.02$). **Conclusions** The fact that the best outcome was achieved in group B shows that the nursing staffs, when trained in oral hygiene measures, are able to take care of the daily hygiene of their long-term hospitalised patients. **Acknowledgments:** The study was supported by the Finnish Dental Society Apollonia and the City of Helsinki.

**Session 5 – Oral Epidemiology – Congress Hall
Saturday 9 September 2006. Chairs Dr. Roberto
Ferro and Dr. Erika Lencova**

Visual and laser fluorescence examination for early detection caries on first molars. H SENKEL^{1*}, R HEINRICH-WELTZIEN², I GODDON¹, J KÜHNISCH³, L STÖSSER². ¹Health Department Enepe-Ruhr-District, Germany, ²Department of Preventive Dentistry, Friedrich-Schiller-University, Jena, Germany, ³Ludwig-Maximilians-University, München, Germany

Aim To compare a visually ranked caries scoring system with a laser fluorescence system for detection of non-cavitated lesions on first molars in 8- and 12-year-old schoolchildren. **Methods** After professional cleaning, 408 first molars of 8-year-olds ($n=143$) and 250 first molars of 12-year-olds ($n=114$) were examined visually by using the criteria suggested by Ekstrand et al. (1998). [Ekstrand KR, Ricketts DN, Kidd EA, Qvist V, Schou S. Caries Res 1998;32:247-54.] Laser fluorescence (LF) measurements were performed with the DIAGNodent device (KaVo, Biberach, Germany) on dried pits and fissures on occlusal, buccal and palatal surfaces of the first molars. LF readings were categorized by using the following cut-offs: 0-15 sound, 16-17 enamel lesion, 18-31 dentin lesion, and >32 deep dentin lesion [Lussi A, Longbottom C, Gyax M, Braig F. Caries Res. 2005;39:284-6.] **Results** In both age groups, most of the surfaces (>70%) were sound (0) or had brown opacities distinctly visible without air drying (2a) according to the visual criteria with the remaining findings being distributed among the other categories of the visual caries scoring system. In the 8-year-olds, an agreement was found between visual score 0 and LF value 0-15 for 94% and 98% of the occlusal and palatal/buccal surfaces, respectively. In contrast, visual score 2a was associated with a LF value of 0-15 in 21% and 42%, 16-17 in 5% and 7%, 18-31 in 39% and 25%, and >32 in 35% and 25% of the occlusal and palatal/buccal surfaces, respectively. Among the 12-year-olds, visual score 0 corresponded to LF values 0-15 for 94% and 99% of occlusal and palatal/buccal surfaces, respectively. Visual score 2a was associated with LF values 0-15 in 20% and 38%, 16-17 in 8% and

10%, 18-31 in 44% and 32% and >32 in 28% and 21% for the occlusal and palatal/buccal surfaces, respectively. **Conclusions** Further investigations are needed to elucidate the reasons for the large variation of LF readings on the tooth surfaces with a visual score of 2a.

Possibilities of *in vivo* monitoring of enamel surface micro defects with optical microscope. J HANDZEL^{1*}, M MARYŠKA². ¹Stomatologic Clinic, 1st Faculty of Medicine Charles University, Prague, Czech Republic, ²Department of Glass and Ceramics, Institute of Chemical Technology Prague, Czech Republic

Aim To develop an *in vivo* monitoring technique for enamel surface micro defects accompanying the development of initial carious lesions and to study changes in enamel surface after preventive or minimally invasive procedures. **Methods** The authors have developed a special *in vivo* replication technique capable of showing changes on the enamel surface with the lateral resolution being better than 1 μ m. This technique enables the observation of the same spot of tooth surface at different points of time. The method consists of two steps: 1) the preparation of an acetyl cellulose foil replica of the enamel surface and 2) the analysis of this foil by an optical microscope using computer image processing. **Results** The main results consist of the comparison of changes in carious enamel micro defects after different treatment procedures as seen in microscopic pictures. The following regimens were compared: application of fluoroapatite nanoparticles in different tooth pastes, in artificial saliva and in a sodium carbonate solution. The comparisons illustrate the ability of the new replication technique to show the reparation process of an initial carious lesion. **Conclusions** The main advantage of this new imaging technique is that it makes it possible to monitor *in vivo* changes in the enamel surface of the visible part of tooth crown and to assess the short- and long-term effects of different caries preventive procedures. The method is a useful and prompt supplement to epidemiologic caries studies, which require lengthy follow-up periods.

Impact of SES on oral health of adolescents and adults.

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A substantial body of evidence exists in the literature that the socio-economic status (SES) of individuals has a significant impact on their oral health. **Aim** To verify the impact of SES on oral health among of adolescents and adults in the Czech Republic. **Methods** A nation-wide survey of oral health and treatment need of selected age categories of Czech adults was conducted in 2004. In total 5,769 18-year-olds and 38,998 35-44-year-olds were examined in randomly selected areas of the country. SES was recorded as: 18-year-olds: student, worker, 35-44-year-olds: 1. Legislators, senior officials and managers, 2. Professionals, 3. Technicians and associate professionals, 4. Clerks, 5. Service workers and shop & market sales workers, 6. Skilled agricultural and forest workers, 7. Craft and related trades workers, 8. Plant and machine operators and assemblers, 9. Elementary occupations, 10. Not employed (International Standard Classification of Occupations, ISCO-88). Differences in oral health and

treatment need among the SES groups were evaluated statistically using: Student's t tests, Snedecor's Chi-square tests and Fisher's tests with the level of statistical significance set at $p < 0.05$. **Results** 18-year-olds – workers vs. students: DMFT 8.3 vs. 6.8 ($p < 0.05$), DT 2.2 vs. 1.5 ($p < 0.05$), MT 0.2 vs. 0.1 ($p < 0.05$), Restorative Index (%) 73 vs. 78 (ns), percentage in need of immediate dental care 19 vs. 13 ($p < 0.05$), CPI=0 (%) 36 vs. 53 ($p < 0.05$), CPI=3 (%) 3 vs. 1 ($p < 0.05$). 35-44-year-olds: mean DMFT 17.9 – ISCO-88 groups: The group specific means of DMFT in groups 1-3 (16.8, 16.3 and 17.3, respectively) were lower than the overall mean while in groups 4, 5, 6, 9, and 10, the group specific mean DMFT scores were higher than the overall mean value (18.2, 18.1, 19.0, 20.2, and 18.6, respectively) ($p < 0.05$). The mean RI amounted to 88%. Group specific mean RI values in groups 2-4 (88.4, 89.7 and 89.5, respectively) were higher than the overall mean, while in groups 7-10 they were lower (86.7, 85.8, 83.0 and 85.3, respectively) ($p < 0.05$). Mean CPI=3 amounted to 16%. In groups 1-4, the percentages of CPI=3 (15, 13, 13 and 15, respectively) were lower ($p < 0.05$), and in groups 6-9 they were higher than the overall mean (19, 18, 18 and 22, respectively) ($p < 0.05$). Mean CPI=4 amounted to 3.3%. The percentages of those with CPI=4 in groups 2-4 (1.8, 2.3, 2.3, respectively) were lower than the mean ($p < 0.05$) while in groups 6-9 they were higher (5.0, 4.2, 5.2 and 5.3, respectively) ($p < 0.05$). **Conclusions** The stratification of the population of adolescents and adults according to ISCO-88 showed the significant impact of SES on caries experience, dental & periodontal status and treatment need. Oral health promotion activities in the public health service ought to be focused especially on the less privileged groups of the population. **Acknowledgements:** This study was supported by a grant of the Grant Agency of the Ministry of Health No. NR/8331-3.

Oral health in 11-14-year-old children with immigrant background living in SW Germany. A BIS-SAR^{1*}, G MUHJAZI², C OIKONOMOU¹, MJ KOCH¹, AG SCHULTE¹. ¹Department of Conservative Dentistry, University of Heidelberg, Germany, ²Department of Tropical Hygiene and Public Health, University of Heidelberg, Germany

Many previous studies in industrialised countries have reported that immigrant children generally present higher levels of dental caries than the native children. **Aim** To assess the oral health of immigrant children living in a South-West German city, and to compare the results with those of their native German classmates. **Methods** In 2004, a cross-sectional study was performed among 11- to 14-year-old children attending five schools in underprivileged areas of the city of Heidelberg which had a high proportion of immigrant children. The WHO methods and criteria for caries diagnosis were followed for collecting and recording the data. All examinations were performed in the schools by the same dentist. A total of 570 schoolchildren took part in the study; 50% of them had an immigrant background. **Results** In all age categories, the immigrant children demonstrated a poorer oral health and a higher need of dental treatment compared to the children of German origin. Among 12-year-olds, the mean DMFT score was higher for the immigrants

(1.3) than it was for the native children (0.9); a similar difference was found in the mean Significant Caries Index values (3.7 and 2.5, respectively). Only 50% of the immigrant children had no DMFT while the corresponding figure was 62% among the children of German origin. The immigrant children had on average fewer permanent teeth with fissure sealants than their native German classmates: 1.8 and 2.9 respectively. Orthodontic treatment had been started for 23% and 45% among the immigrant and native German children, respectively. **Conclusions** It seems that the conventional measures used until now for caries prevention had not provided the desired benefits for all children living in this region. Immigrant children must be categorised as a risk group. Appropriate oral health programmes targeting parents and children of this group should be urgently developed in order to improve the oral health of this subgroup of the population. Prospective studies have also to be planned to monitor changes in caries incidence among the immigrant children.

Inequalities in preschool children's caries experience in north-east of Italy. R FERRO^{1*}, A BESOSTRI¹, A OLIVIERI¹, L BENACCHIO¹, S TABACCANT². Local Health Care Unit no. 15¹, Local Health Care Unit No. 7², Veneto Region, Italy

Aim To determine dental caries experience among preschool children aged 36-71 months living in 2 Health Districts in North-East of Italy and to compare caries experience among subgroups formed on the basis of immigrant status and age. **Methods** The study was a descriptive cross-sectional survey on a sample 4,198 3-5-year-old children drawn from a total population of 9,829. Presence of ECC/S-ECC was determined according to the criteria of Ismail and Sohn (1999) [Ismail AI, Sohn W. J Public Health Dent;59:171-91], but considering the presence of cavitated lesions only, by 2 calibrated examiners using artificial light, mouth mirrors and dental probes. The examinations were performed at school between October 2004 and June 2005. The participants were divided into 2 subgroups according to the country of origin of their mothers: mothers of non-western origin (from Eastern Europe, Asia, Africa, Turkey, South and Central America) and of western origin (Nordic countries, Western Europe, North America, New Zealand and Australia). **Results** A total of 3,401 pre-school children (81% of the original sample) took part in the examinations. The prevalence of ECC (S-ECC) was: 15% (9%) in 3-year-olds, 24% (13%) in 4-year-olds and 31% (12%) in 5-year-olds. At the same ages, the children of immigrant mothers of non-western origin showed a significantly higher prevalence of caries than did their counterparts of western origin both in terms of ECC (31% vs. 14%; 48% vs. 22%; 64% vs. 28%) and of S-ECC (20% vs. 7%; 32% vs. 10%; 38% vs. 8%). As compared to the 3-year-olds, the older children had more caries (4-year-olds: OR 1.7, CI 95% 1.4-2.1; 5-year-olds: OR 2.5 CI 95% 2.1-3.1, respectively). A non-western origin had a negative effect on caries experience (OR 3.6, CI 95% 2.8-4.6). **Conclusions** Inequalities associated with the immigrant background of mothers were observed in the distribution of caries experience among the 3-5-year-olds studied. These children represent the first generation settling and growing up in Italy and their dental status-

related data are comparable to those detected at the same ages in the first generation of the non-western children living in industrialised countries.

Oral hygiene and gingival inflammation in mentally disabled children. A PILINOVÁ, E LENCOVÁ*, Institute of Dental Research, 1st Faculty of Medicine, Charles University in Prague, Czech Republic

Inadequate attention has been paid to the maintenance of oral hygiene among the mentally disabled children with combined impairments. This is due to the fact that the general health status masks the oral health impairment. Insufficient knowledge about how to perform oral hygiene measures in these patients further complicates the situation. The biggest difficulties are related to the gingival bleeding. This usually results in the discontinuation of oral hygiene measures, which worsens the gingival inflammation. The medication used by these patients may also have an unfavourable effect on their oral health status. **Aim** To determine the level of oral hygiene and gingival inflammation in mentally ill children with combined impairments. **Methods** A total of 95 children were examined. They had combination impairments, such as mental retardation, epilepsy and quadriplegia etc. Of them, 25 (mean age of 3.4 years) had temporary dentition, and 70 (mean age of 14.4 years) had either mixed dentition or complete permanent dentition. The levels of oral hygiene and gingival inflammation were determined using DI-OHI (Debris Index) and PMA (Papilla-Marginal Attached Gingiva) indices. Observations were made on each tooth that was present in the oral cavity. **Results** In the temporary dentition, the mean DI-OHI score was 0.36, which means that the teeth were not thoroughly brushed with remnants of plaque around tooth neck. The observed PMA index values showed that marginal gingivitis may develop as early as in the preschool age; it was found in 12% of the children. In children with mixed or permanent dentition, more than 33.3% of the teeth were covered with dental plaque (mean DI-OHI score for the tooth was 1.27). In this age group, 63% of the examined patients had gingivitis, 13% had inflammation of the attached gingiva. After the examination, the carers and parents of the patients were motivated and instructed to conduct proper oral hygiene measures for them. **Conclusions** Minor or improper attention had been paid to the maintenance of oral hygiene among the studied patients. Oral hygiene and gingivitis can be improved even in mentally disabled children with combined impairments, if proper oral hygiene measures are conducted. **Acknowledgements:** This study was supported by grant No. NR/8331-3 of the Grant Agency of the Ministry of Health of the Czech Republic.

Down syndrome patients' management in a public oral health service. C GALLO*, M BEGHETTO, A MAGLIARDITI, E ZECCHI, L BORELLA, Community Dental Service, Azienda Local Health Care Unit no. 14, Veneto Region, Italy

Down syndrome (DS) is characterized by growing disturbances, mental retardation, and systemic and oral anomalies. **Aim** The aim of our study was to investigate dental pathologies and other oral health related problems among patients with DS. In addition, we wanted to find

out which kind of dental treatment had been given to a group of these patients and how the patients had complied with the treatment. **Methods** Data on forty-five subjects with Down syndrome (mean age 24.7 years) were analyzed. The level of dental caries, periodontal status, dental anomalies and bruxism as well as the type of dental treatment that had been given to the patients were recorded, and the patients' compliance with the treatment determined. **Results** Among the subjects, 49% had dental caries, 44% were affected by gingivitis, and 11% had developed a serious periodontal disease. Eruption of teeth was generally delayed in timing and sequence, in both dentitions. Tooth agenesis and dental anomalies were found in 17% and bruxism in 9% of the subjects. Of the patients, 57% had been treated under local anaesthesia; 17% had been treated under general anaesthesia only for surgical operations, while 27% of the subjects had been treated under general anaesthesia for all kinds of dental care, because of a total lack of compliance with treatment. **Conclusions** Down syndrome patients show a higher frequency of oral anomalies and diseases compared with the general population. These patients show a good rate of compliance with brief and atraumatic treatments. General anaesthesia is preferable when oral surgery is needed. After dental treatment, the patients need to be periodically subjected to dental check-up, scaling and oral hygiene education in order to control periodontal disease and dental caries.

Incidence of palatal clefts in selected provinces of Poland – a pilot study. K MALKIEWICZ*, E MALKIEWICZ, Department of Conservative Dentistry, Medical University of Warsaw, Poland

Aim To determine the incidence of clefts of the primary and/or secondary palate among newborns in selected provinces of Poland (Dolnoslaskie, Kujawsko-Pomorskie, Lubuskie, Lodzkie, Opolskie, Pomorskie, Warminko-Mazurskie, Wielkopolskie and Zachodniopomorskie). **Methods** The data of all (644) newborns in the pilot area with clefts of the primary and/or the secondary palate were collected by neonatologists in cooperating hospitals in 1998 and 1999 and then registered by the Polish Register of Congenital Malformations. At the time of the study, 53% of the Polish territory and 48% of the newborn children were covered by the Register. The incidence rate was based on the number of clefts of the primary and/or secondary palate occurring in syndromes or as isolated malformations among the total number of live and still births. **Results** In the pilot area, the mean incidence rate of clefts of the primary and/or secondary palate was 1.70/1000 live and still births with the lowest rate in the province of Lodzkie (1.28/1000) and the highest in the province of Zachodniopomorskie (2.21/1000 live and still births). **Conclusions** The incidence rate of the palatal clefts in the pilot area was similar to that reported in the European Register of Congenital Deformities (EUROCAT) for the Western European Countries.

Psychosocial consequences of dental fear and anxiety among Indians. J NAGENDRA¹*, GN CHANDU¹, MD SHAFIULLA¹, VVS REDDY². Departments of Community Dentistry¹ and Pedodontics², College of Dental Sciences, Rajiv Gandhi University of Health Sciences,

Karnataka, India

Aim The objective of this study was to examine the negative psychosocial impacts of dental anxiety in a sample of dentally fearful and anxious individuals recruited from the general population. The associations between psychosocial impacts, dental anxiety scale (DAS) scores and other severe fears were explored. **Methods** 1,224 subjects who were anxious or fearful about dental treatment were divided into low and high general fear groups based on the number of other fears they reported. Negative psychosocial impacts were assessed using a modified form of the scale developed by Kent et al. (1996) [Kent G, Rubin G, Getz T, Humphris G. *Community Dent Oral Epidemiol* 1996;24:394-7.] This consisted of three dimensions: psychological reactions, social relationships and avoidance/inhibition. Other measures included self-ratings of oral, general and emotional health and scales to assess self-esteem and morale. Later the data was subjected to statistical analysis and differences in means and proportions were evaluated using Student's t-tests and Chi-square tests with the threshold for statistical significance set at $p < 0.05$. **Results** Overall, 93% of the subjects reported one or more impacts; 81% had experienced psychological problems, 63% reported problems with respect to social relationships and 27% reported avoidance/social inhibition. Those in the high-fear group had higher psychosocial impact scores than those in the low-fear group. Differences were most marked with respect to psychological consequences and avoidance/inhibition. The high-fear group had scores indicative of lower self-esteem and lower morale. Forward step-wise linear and logistic regression analysis indicated that both dental anxiety and general fearfulness contributed to these negative outcomes. **Conclusions** The study indicated that dental fear and anxiety have pervasive psychosocial consequences and that these are more marked among subjects with high levels of general fearfulness.

Treatment need in children treated under general anaesthesia. L PANTUČEK^{1*}, M KUKLETOVÁ¹, Z BROUKAL², Z HALAČKOVÁ¹, J KUKLOVÁ¹. ¹Faculty of Medicine, Masaryk University of Brno, Czech Republic, ²1st Faculty of Medicine, Charles University, Prague, Czech Republic

In the Czech Republic, children in need of specialized dental care are referred to the dental clinics of the medical faculties. Often a pilot examination and treatment plan assignment are only conducted, due to a lack of cooperation from the patients. **Aim** The aim of the study was to compare the treatment plan based on a child patient's preliminary examination and the treatment need assessed during respective therapy under the general anaesthesia. **Methods** Dental records of 98 children (mean age 10.6 years, SD 3.0) were used, and the data were gathered and evaluated on the basis of the treatment need and the type of the treatment performed. Fourteen of the children treated under general anaesthesia were diagnosed with physical and/or mental illness. **Results** In the dental records that were assessed, no treatment was indicated on the examination for 2,356 teeth, filling was indicated for 429 teeth and extraction for 415 teeth. Interval between examination and treatment ranged from 0-411 days; the average being 42 days. Under general anaesthesia 375

teeth were filled, 373 teeth were extracted and 2,452 teeth were not treated. **Conclusions** The treatment need determined during the treatment under the general anaesthesia was lower than that assessed in the prior examination. The differences in treatment need between the actual treatment situation and the preceding examination may be explained by the poor cooperation of the child at the time of the examination or by the fact that different dentists from the paediatric department participated in the preliminary examinations. In spite of difficulties encountered during examination due to lack of child patient co-operation, the recordings were conducted with great care. The need for treatment was deemed to be higher than that actually carried out. **Acknowledgements:** The study was supported by grant No: NR 8215-3 from the Czech Ministry of Health and by the Project 1 M0528 from the Ministry of Education.

Teeth and successful aging: association with cognitive function and genetic factors. J BERGDAHL^{1*}, M BERGDAHL¹, R HABIB², L NYBERG², L-G NILSSON³. ¹Institute of Clinical Dentistry, University of Tromsø, Norway; ²Department of Radiation Sciences and Integrative Medical Biology Section, Umeå University, Sweden; ³Department of Psychology, Stockholm University, Sweden

Successful aging can be characterized in terms of health, cognition, and socio-economic factors. Elderly have been classified as successful when they exhibit higher cognitive functioning, higher levels of education, better living conditions, and better subjective health. In animal studies a relation between dental status and cognitive performance has been found. It is unclear whether such a relation exists for humans. **Aim** To study the relationship between the presence of natural teeth, cognition, and genetic factors in adulthood and aging. **Methods** This study is a part of a large-scale longitudinal population-based study (the Betula study) in which the chief objective is to examine the development of health and memory in adulthood and old age and to determine risk factors for dementia. Individuals between the ages 35 and 90 years were studied. 1,366 subjects with natural teeth (55% women, 45% men; mean age 56.3 years) and 510 edentulous subjects (61% women, 39% men; mean age 73.4 years) were compared with regard to age, gender, socio-economic status (SES), mini-mental state (MMSE), stress level, various diseases and performance on twelve cognitive tests. In a subsequent analysis, cognitive performance was examined with matching the natural teeth group (n=221; 53% women, 47% men; mean age 69.3 years) and the edentulous group (n=209; 53% women, 47% men; mean age 68.5 years) were with regard to age, gender, SES, MMSE, stress level and various diseases. In a further analysis of the natural teeth group and edentulous group the variants of a gene that has a large impact on longevity and successful aging, were studied. **Results** In the first analysis, the natural teeth group had a lower mean age, higher SES, reported less back pain, and performed significantly higher on several cognitive tests. After the subsequent matching, the natural teeth group still performed significantly higher on multiple cognitive tests. The edentulous group had a significantly higher frequency of the gene variant that is associated with an increased risk for heart disease, stroke and

Alzheimer's disease. **Conclusions** The results suggest that functional natural teeth may be essential in successful aging and that the interactions between environmental and genetic factors are important. Our findings suggest that functional natural teeth help to maintain cognitive functioning, which underlines the necessity of adequate dental care for the elderly.

Dental care consumption by people age 65 and older in a French district. E BERT¹*, M FOLLIGUET², L SALOMON³, JL LEROUX¹, B TRUTT¹ et al. ¹French National Insurance, Paris, France, ²Odontology Department², Public Health Department³, Louis Mourier University Hospital, AP-HP, France

Among older people, the resources available for oral health care tend to diminish with an increasing age even though the related needs may increase. **Aim** To describe the use of dental care among a French urban elderly population. **Methods** A descriptive analysis of the consumption of dental care was performed using the 2004 French Insurance Health Coverage data concerning the reimbursements to people aged 65 years or older, living outside institutions in a department of Ile de France. Data were collected on age, gender, co-morbidities identified from the medications taken, and consumption of ambulatory dental care (visits, radiographs, restorative treatments, extractions and dentures). **Results** In total 180,831 persons were studied of whom 59% women. Half of the subjects were less than 75 years old, 21% 75-79 years, 23% 80-89 years, and 5% over 90 years. Co-morbidities included cardio-vascular diseases (56%), diabetes (10%), dementia (7%) and Parkinson's disease (1.7%). Psychotropic treatment was given to 35% of the subjects. Of the studied population, 72,340 persons (40%) had used dental care. Among the users, 61% were women. The distribution by age was similar to that among the whole population. The same was true for the frequency of co-morbidities; 41% were under psychotropic medications. Reimbursement for all the treatments given during the studied year corresponded to an average of 0.41 consultations, 1.44 conservative treatments, and 0.29 surgical, 0.57 diagnostic and 0.65 denture-related measures per patient. The average total reimbursement for each patient was 115 euros. **Conclusions** The findings confirm that in the study area, older people had little resources for oral health care.

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Dental attendance patterns among middle-aged Lithuanian university employees. Z SAKALAUSKIENE¹*, V MACHIULSKIENE¹, MM VEHKALAHTI², H MURTO². ¹Faculty of Odontology, Kaunas University of Medicine, Lithuania, ²Institute of Dentistry, University of Helsinki, Finland

Aim To describe dental attendance patterns among Lithuanian university employees aged 34-45 years. **Methods** A questionnaire survey was conducted anonymously among 34-45-year-old employees (n=862) of four Lithuanian Universities in March-June 2005. The questions covered

the reasons for dental visits, type of practice, and change in dental attendance frequency during last five years as well as the reasons for the change. Respondents' age, gender, marital status, education and income were used as background information. Chi-square tests were used for statistical evaluation of the data. **Results** A total of 553 (64%) questionnaires were returned. The respondents' mean age was 40.1 years (SD=3.2). Among the respondents, 79% were women, 72% were married/cohabiting, 82% had a university degree, and 39% reported a medium level household income, 38% being below and 23% above that. Half of the respondents reported visiting a dentist only in case of emergency; 51% visited for preventive check-ups: more women than men ($p=0.01$), and more individuals with higher income ($p<0.01$). Visiting private practice was reported by 63% of the respondents, more often by those with higher income ($p<0.01$) and university degree ($p<0.01$). During the previous five years, dental visiting frequency remained stable for 55%, increased for 30% and decreased for 15% of the respondents. As a main reason for the increased dental visiting, the respondents indicated dental problems (49%). Absence of dental problems (49%) and high cost of dental treatment (28%) were the main reasons for visiting a dentist less often than previously. **Conclusions** These middle-aged well-educated Lithuanians visit a dentist mainly in case of a dental problem. Such behaviour calls for more emphasis on a preventive approach in provision of dental services for adults. **Acknowledgments:** We appreciate Vilnius Pedagogical, Vytautas Magnus, Klaipeda and Siauliai Universities for cooperation, and Procter&Gamble company for their support.

Patient satisfaction in oral health care. V KORAC^{*}, M VASIC, M KRSTIC, Institute of Public Health, Belgrade, Serbia

Patient satisfaction is a measure which expresses the degree to which the system of health care satisfies the expectations of the consumers. **Aim** To establish the level of satisfaction with dental health care and identify factors that have an impact on satisfaction. **Methods** A Patient Satisfaction Survey was performed in dental departments within 157 primary health care institutions in Serbia in November 2005. A structured questionnaire, containing 16 questions, was completed by patients, after receiving health care services. The sample was a one-day population, aged 19 years and over (8,802 respondents, response rate 81.5%). Overall patient satisfaction was measured using a five point ordinal scale, ranging from very satisfied, satisfied, neither satisfied nor dissatisfied, and dissatisfied to very dissatisfied. **Results** The overall patient satisfaction with dental health care was very high, 82% of respondents were satisfied (44%) or very satisfied (38%). Neither satisfied nor unsatisfied were 8% of respondents, while 8% of respondents were unsatisfied or very unsatisfied. Factors that showed to be highly significant ($p<0.001$) key determinants of satisfaction relevant to the overall patient satisfaction with dental health care were education, income, continuity of care, availability, willingness to inform, waiting times, doctor's competence and communication skills. Education and age showed to be statistically significant ($p<0.005$), while gender was the only variable among these data that was not significantly

related to patient satisfaction. The greatest percentages of satisfied respondents were observed for those belonging to the age group 55-64 (86.8%), with primary school education (88.7%), those who were married and had good economic status (97.1%), and those who had regularly visited the same dentist. Those respondents who ranked highly the doctor's skills, capability as well as personal features irrespective of his expertise, were significantly more satisfied consumers of dental care than the rest of the respondents were. Young and better educated respondents as well as those with a low economic status were more likely than others to be dissatisfied with dental health services. **Conclusions** Complacency with high scores achieved on patient satisfaction surveys is a common pitfall. A systematic approach requires careful measurements. The results need to be interpreted in conjunction with other data. Ongoing monitoring is necessary to ensure the maintenance of high performance and to make appropriate changes in areas of concern.

High and low users of Public Dental Service in a Finnish adult population. *A NIHTILÄ**, *E WIDSTRÖM*, *National Research and Development Centre for Welfare and Health, Stakes, Helsinki, Finland*

In 2001-2002, age restrictions limiting adults' access to the Public Dental Service (PDS) were abolished in Finland. The increased demand for care by adults generated pressure to overlook normal treatment routines, especially in big cities where the PDS had previously offered little treatment for the adult. **Aim** To study differences between heavy and low dental care users among the adult patients in the PDS of one of the biggest cities in Finland. **Methods** All adults having had 6 or more dental visits (n=3,241) in 2004 and a comparison group of those having had 3 or less dental visits (n=21,700) were selected from the patient register of the PDS in the city of Espoo (232,000 inhabitants). A sample of 300 patients was randomly selected from both groups. Information on age, gender, number and types of visits, treatments provided and patient fees were collected from their treatment records. **Results** Nine percent of the adults, who had visited the PDS in 2004, were heavy users according to the definition used. Their dental treatment made up 30% of all dental visits by adults. High-users were more often men; their average age was about 6 years higher than that among the low users, they had a higher number of emergency visits and paid on the average EUR4 more per visit than the low users did. Endodontic and prosthetic needs as well as multiple problems characterized the high-user group, while the low users most often had received fillings and periodontal treatment only. The high-users had more caries lesions and periodontal disease than the low users had. **Conclusions** Our study indicates that complicated treatment needs and possibly the uncertainties of the caregivers in dealing with patients having multiple problems could result in elevated numbers of dental visits for an individual patient. **Acknowledgements:** The study was supported by the Finnish Academy, Health Services Research Grant Terttu.

Follow-up of drop-out rates after a supplementary compensation to dentists. *K BJERREHORN**, *G SUN-DQVIST*, *The Dental Authority of Stockholm County*

Council, Stockholm, Sweden

Aim To follow up drop-out rates among children in the Stockholm County, Sweden, after the introduction in 2003 of a supplementary compensation to dentists for treating children with increased treatment needs. The aim of the reform was to reduce the differences between various parts of the county with respect to dental health and drop-out rates (children not coming to regular check-ups and treatment when called by dentists). **Methods** Dental care is given free of charge for children up to 19 years, and all children are called regularly by a dentist of their choice, whether in public or private service. Some 400,000 3-19-year-old children live in the county. Generally, the County Council compensates dentists on a capitation basis, i.e. offers the same amount of money for a child regardless of treatment given. As from 2003, a supplementary payment is given for treating children from areas known to have increased treatment needs compared to other areas. The county was divided up into 266 areas based on socio-economic factors. Each of the areas was assigned into one of four "treatment need areas". The areas at the lowest socio-economic level were assigned to group 4, and the supplementary compensation was the highest for treating children from these areas. At the other end, i.e. for children from the areas belonging to group 1, no supplementary compensation was given. Follow-ups were done yearly since 2001 through 2005. **Results** Drop-out rates went down in all age groups, also among those two (3 and 19 year olds) who had the highest rates. In the county as a whole, the rates went down from 10% in 2001 to 7% in 2005. The fall was greatest in areas where the drop-out rates had been the highest in 2001. In group 4 areas, the rate went down from 18% to 13% but still remained higher than in other areas. A decrease was observed even for the highest drop-out rates (among 19-years-old boys in group 4 areas). **Conclusions** It can be concluded that the supplementary compensation has had positive effects.

Drop out of dental treatment before wisdom tooth extraction among Finnish students. *M MARINESCU-GAVA**, *A VUORINEN*, *Student Health Service, Tampere, Finland*

Aim To identify causes of drop out from dental treatment among Finnish university students, to raise awareness of the importance of dental care and to facilitate efforts to optimize the use of resources. **Methods** Of the 3,408 students examined in our clinic between 1 September 2001 and 31 December 2002, 16.9% had dropped out of dental treatment (as checked in February 2004). For 45% of the drop-outs, the withdrawal took place before a planned extraction of a wisdom tooth. We sent a questionnaire to this group of drop-outs (n=165) asking for reasons for the withdrawal and offering an opportunity to re-enter the dental treatment. **Results** Among the respondents (n=71), 76.6% reported being aware that the treatment should have continued and 46.6% remembered correctly what therapeutic step was missing. For the drop-outs from a planned extraction, the average DT/DMFT was lower than that for the other drop-outs and than the average DT/DMFT for students in general. The DT score was lower than 3 for 90% of those who had withdrawn from an extraction. Causes of drop out varied widely with the

most frequent reason being lack of symptoms (consistent with the low DT/DMFT), followed by considering the interval between appointments as unreasonable. Fear was reported to be the third commonest cause for dropping out before an extraction. In a follow up to the original study, we found that 38% of those who had dropped out before an extraction had the planned tooth removed within one year and 65% within two years, in most cases as emergency-treatment, which confirms that the indication for extraction had been correct. **Conclusions** Among students with little perceived dental problems, it is important to emphasize the importance of complying with the planned treatment, regardless the presence of symptoms. **Acknowledgements:** The study was supported by the Finnish Dental Society Apollonia.

Four-year changes in dental treatment received by 30-59-year-olds in Laukaa, Finland . MJ RUOHO^{1*} and MM VEHKALAHTI² . ¹Public Dental Service, Laukaa, Finland, ²Institute of Dentistry, University of Helsinki, Finland

In 2005, following a legislative change in Finland, patients with acute dental problems became entitled to an appointment within three days. This might have affected the pattern of dental treatment offered at the Public Dental Service (PDS). **Aim** To evaluate changes over four years in treatment received by 30-59-year-olds attending PDS in Laukaa, a Finnish municipality with a population of 17,000. **Methods** Data from patient records and official statistics of PDS were used. In total seven dentists, three oral hygienists and nine dental assistants work at the local PDS. Services are highly subsidized by the community and the government. The data cover all 30-59-year-olds treated in 2001 (n=1,108) and in 2005 (n=487), separately for three age groups: 30 to 39, 40 to 49, and 50 to 59 years of age. The number of decayed teeth (DT) was recorded for each patient. The number of visits to a dentist, a dental hygienist, and a dental nurse were recorded separately. The numbers of different treatment items, such as fillings, endodontic and, periodontal treatments, extractions, and preventive care were also recorded. Chi-square and t-tests were used for statistical evaluation. **Results** Mean DT was 1.4 (SD=1.9) both in 2001 and in 2005; by age group, mean DT was 1.3–1.6 in 2001 and 1.2–1.6 in 2005. Among all patients, those receiving comprehensive care comprised 41%–48% in 2001 and around 20% in 2005 ($p<0.001$). In the three age groups, the mean numbers of visits per patient were 2.9–3.3 in 2001 and 2.5–2.6 in 2005. In both years, visits to dentists accounted for 68%–74% of all dental visits. The pattern of dental treatment changed notably during the study period: the share of tooth extractions increased slightly (from 4% to 9%), whereas the share of filling treatment items decreased from 56% to 44% and the share of preventive treatments almost doubled, from 12% to 20% ($p<0.001$). The majority of the periodontal treatment items had been carried out by dental hygienists, 71% in 2001 and 89% in 2005. **Conclusions** The focus of PDS in Laukaa seems to have moved from comprehensive to acute care, but at the same time the preventive approach has strengthened.

Use of local anaesthesia for primary restorations in Helsinki public dental service. U PALOTIE^{1, 2}, MM VEHKALAHTI^{2*}. ¹Dental Care Department, City of Helsinki Health Centre, Finland, ²Institute of Dentistry, University of Helsinki, Finland

Aim To evaluate the use of local anaesthetics for primary restorations in public dental service in Helsinki, Finland.

Methods Public dental clinics serve all inhabitants of the municipality, some age groups, however, having a priority for care. Patients up to the age of 19 years receive all treatment free of charge and others at highly subsidized rates. The data for the current study were collected during a two-week period from all public dental clinics in Helsinki. A one-page questionnaire was sent to all clinical dentists (n=140); 137 of them responded. The data requested included the dentist's identification and his/her name and numerical code, the patient's gender and year of birth, and details on each restoration: which tooth and which surfaces were filled, was the filling a primary restoration or a replacement, and whether or not local anaesthetics were used. Only primary restorations were considered in the present study. On the basis of the dentists' numerical codes, Helsinki City Health Department provided their background information, such as gender and year of birth to be appended to the present data. Age for both patients and dentists was rounded to the nearest full year. The mean age for female dentists exceeded that for the males (42.2 vs. 37.7; $p=0.04$). For the patients, the mean age was 21.0 years (SD=12.5; range 3-87; median 17.6) with no gender-difference. Chi-square tests and ANOVA were used for the statistical evaluation of the data. **Results** A total of 1,798 primary restorations were reported by 135 dentists (15% male). The average number of primary restorations per dentist was 13.3 (SD=5.2), with no difference by dentist's gender. Of the restorations, 21% were in primary teeth and 79% in permanent teeth: 14% in incisors, 14% in premolars, and 51% in molars; for female patients more molar restorations were reported (53% vs. 49%; $p=0.02$). Primary restoration under local anaesthetics was reported for 52%, more for female patients (54% vs. 50%; $p=0.05$), but with no difference by dentist's gender. Patients receiving restorations under local anaesthetics were older (22.1 vs. 19.7 years; $p<0.001$) and dentists preparing such restorations younger (40.7 vs. 42.0 years; $p=0.002$) than the rest were. By type of tooth, local anaesthetics were used for primary restoration in 32% of primary teeth, and in 57% of permanent teeth: in 48% of incisors, in 67% of premolars, and in 57% of molars, with no differences according to dentist's and patient's gender, but with similar age-differences as for all restorations. **Conclusions** Half of primary restorations were placed without local anaesthetics, calling for more emphasis on painless dental care, in particular regarding restorations for primary teeth. **Acknowledgments:** Grants to UP by the Finnish Dental Society Apollonia and by Helsinki City Health Department are gratefully acknowledged

Indications for orthodontic treatment and appliances used in Finnish municipal Health centres. T PIETILÄ^{1*}, I PIETILÄ¹, A-L SVEDSTRÖM-ORISTO², J VARRELA², P ALANEN² . ¹Health Centre of Pori, ²Institute of Dentistry, University of Turku, Finland

Aim The study compares indications of orthodontic treatment and use of orthodontic appliances in eight municipal health centres in Finland. **Methods** A random sample from two whole age groups, 16- and 18-year-olds (n=1,109) in eight municipalities were clinically examined by three specialist orthodontists. The history of orthodontic treatment was obtained by a questionnaire. The data concerning treatment were collected from the dental files of all the subjects reporting previous or ongoing orthodontic treatment (n=608). **Results** The most frequently given diagnosis both in the whole study group and separately in all eight health centres were crowding (46.8%, range 31.4%–63.3%) and Angle II malocclusion (41.9%, range 26.5%–63.0%), followed by deep bite, lateral and anterior cross bite (frequencies 20.2%, 17.0% and 11.3%, respectively). A half of the study group (47.2%) had been treated by head gear (range 6.4%–77.2%). Head gear was used more frequently in the health centres starting treatment early, before the age of 9 yrs. The second and third most frequently mentioned appliance was one-arch-fixed appliance in upper (38.1%, range 15.2%–75.6%) or lower jaw (19.8%, range 3.7%–43.6%). Two-arch-fixed appliances were most frequently used in the health centres with a higher starting age for orthodontic treatment, 11 years or later. **Conclusions** Even though orthodontic treatment had often been started based on similar indications, the frequencies in the use of appliances varied considerably. The choice of appliances was connected with the timing of treatment.

Variation of residual orthodontic treatment need in Finnish municipal health centres. I PIETILÄ^{1*}, T PIETILÄ¹, A-L SVEDSTRÖM-ORISTO², J VARRELA², P ALANEN². ¹Health Centre of Pori, ²Institute of Dentistry, University of Turku, Finland

Aim The study compares residual treatment need in eight Finnish health centres applying different treatment modalities. **Methods** A random sample of 16- and 18-year-olds (n=1,109) in eight municipalities were examined by three specialist orthodontists. The subjects were assessed by the Occlusal Morphology and Function Index (OMFI) for the acceptance of the occlusion and the Dental Health Component (DHC) and Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN) for the residual treatment need. The history of orthodontic treatment was enquired by a questionnaire. The data concerning orthodontic treatment were collected from the patient records of all subjects reporting previous or ongoing orthodontic treatment (n=608). The subjects with ongoing treatment (n=37), and with discontinued treatment (n=77) were excluded. **Results** The percentage of discontinuity varied from 3.5 to 43.1 between the health centres. All criteria of acceptance according to the OMFI were fulfilled by 32.7% of treated subjects (n=494) and 35.5% of subjects without treatment history (n=501), with the ranges among the health centres being 14.1–55.6% and 22.9–60.0% for the treated and untreated subjects, respectively. According to the DHC, the percentage of residual treatment need among treated and untreated subjects was 17.6 vs. 17.4 (variation between the health centres 7.8–26.8 vs. 13.1–30.0), and according to the AC 13.1 vs. 10.2 (variation 3.7–30.5 vs. 0.0–18.4). **Conclusions** In the whole study population, there were only

minor differences in residual treatment need between treated and untreated subjects. However, the wide variation between the health centres calls for studies on reasons for the differences in treatment modalities.

Parental perceptions of their child's pathway to severe dental decay: qualitative study. PA SMITH^{*}, Dental Health Services Research Unit, University of Dundee, Scotland, UK

Child dental health remains a serious issue in Scotland with 49% of 5 year olds having had experience of caries (d₃). As parents are responsible for their children's dental health it is important that their views and experiences are explored. **Aim** This study aims to gain insight into parents' perceptions of their child's pathway to severe dental decay. **Methods** Semi-structured in-depth interviews were performed with a purposive sample of 20 parents of differing ages and social background whose children were referred to Dundee Dental Hospital for assessment for dental extractions. The interviews focused on the parent's and child's current and past dental experiences and knowledge and perceptions of factors supporting or inhibiting the maintenance of their child's dental health. The interviews were audio taped, transcribed and analysed using the "framework" method. **Results** Initial findings from the 20 parents interviewed to date indicate that although parents appeared aware of the cariogenic role of sugar in the diet they found difficulty in implementing this knowledge in an environment where sweet treats are a persistent part of childhood culture. Although home tooth-brushing regimes were usually followed, a common precursor to the child's dental problems was lapsed supervision when the child started school and parents were shocked at the subsequent speedy development of caries. Family difficulties often reduced the priority of 'baby teeth' and could lead to missed dental appointments and difficulty with continuing care regulations. Children subsequently were de-registered by the family dentist. **Conclusions** The parents interviewed were aware of the major causes of dental caries but had difficulty applying this knowledge. Complex social or health problems within the family meant that 'baby teeth' were given low priority. Current continuing care regulations in Scotland and shrinkage in the availability of NHS dentistry can result in children missing out on care particularly when family difficulties impede attendance. **Acknowledgements:** The study was supported by the Scottish Executive.

Patients' health in contract and fee-for-service care – a descriptive analysis. V JOHANSSON^{1*}, B AXTELIUS¹, B SÖDERFELDT¹, F SAMPOGNA¹, J PAULANDER². ¹Department of Oral Public Health, Malmö University, Sweden, ²The Public Dental Health Service in Värmland, Sweden

Aim Fee-for-service, paying afterwards for services provided, is the traditional patient financial system in dentistry in Sweden. The public dental health service (PDHS) in Värmland has since 1999 also an alternative system: contract care, where a fixed sum of money is paid annually for dental care, which is then received without additional cost. This study describes demographic as well as general and oral health-related characteristics among patients in a service study comparing the two patient

financial systems, fee-for-service and contract care, in the PDHS in Värmland. **Methods** A questionnaire was answered by 1,324 patients (response rate 57%). Of the respondents, 52% were in contract care and 48% in fee-for-service. A non-response analysis and a special study of the non-respondents were undertaken. General health was studied with SF-36, measuring health in eight dimensions: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. Oral health was studied with OHIP-14, measuring oral health in seven dimensions (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap) and as an index. The demographic factors included gender, age, birth country, marital status, education, and social affinity with neighbourhood and housing area. The data were analysed with contingency tables, Chi-square tests, t-tests, Mann-Whitney non-parametric tests and logistic regression analyses. **Results** The non-response analysis revealed that the likelihood for answering the questionnaire was higher for women (OR=1.27), for respondents in contract care (OR=1.43) and for each year of life (OR=1.02). A short telephone interview with 40 non-respondents in each financial system indicated that the non-respondents had better oral health than the respondents. The non-respondents had experienced less pain in the mouth, less difficulties doing their usual jobs and had found life more satisfying than the respondents. There were no significant differences in gender or age. In the study population, differences in health were observed between the financial systems. Respondents in contract care had better oral health than those in fee-for-service ($p=0.019$). They had also better general health in half of the dimensions of SF-36 (physical functioning: $p<0.001$; role-physical: $p=0.002$; general health: $p<0.001$; social functioning: $p=0.045$), were younger ($p<0.001$), better educated ($p<0.001$), were born in Sweden more often ($p<0.001$) and were more often married/living with somebody ($p=0.011$) than were the fee-for-service respondents. The fee-for-service respondents experienced higher social affinity with their housing area ($p=0.049$). **Conclusions** There was bias in nonresponse. Contract care patients had better general and oral health than patients in fee-for-service. **Acknowledgements:** The study was financed by the Swedish Research Council.

Patient visits to the emergency dental care service in Montpellier, France. P TRAMINI*, B AL-QADI NAS-SAR, P GIBERT. Faculty of Odontology, University of Montpellier, France

Aim To investigate the socio-demographic and oral health related characteristics of patients attending the emergency dental care service of Montpellier (France). **Methods** After having observed an unusually high number of visits to the emergency dental service of Montpellier, it was decided to conduct an investigation of the use of these services. Between October 2004 and October 2005, the following socio-demographic and oral health status factors were recorded for all the patients attending this service ($n=500$): age, gender, profession, distance from home, reason for consulting, concerned tooth, oral hygiene index (HI) value and DMFT score. Mann-Whitney tests were used for continuous variables and Chi-square tests

for categorical variables. **Results** Among the patients, 55% were men and 45% women, with the men being significantly older than the women (on the average 1.5 years). The mean values of DT, MT and DMFT were higher for men, but only the difference in mean DMFT score was statistically significant. The mean FT score was slightly higher among the women. The mean HI value was significantly higher for men. Reasons for consultation included pulpitis (33%), urgent problems with prostheses (25%), and oral infections (21%). The lower molars were concerned more often than the other teeth were (28%). There was no justification for emergency consulting in 4 cases (0.8%) that were motivated rather by aesthetic concerns or convenience. **Conclusions** Most emergency consultation visits could be avoided, if the patients would be aware of the necessity of control visits to their dentist. The patients consulting the emergency dental service tend to have inadequate oral hygiene and a lot of treatment needs. They are often socially deprived, and not always cooperative.

Session 7 – Oral Health Related Quality of Life and Tobacco and Oral health – Lounge 1 Saturday 9 September 2006 Chairs: Professor Hannu Hausen and Dr. Monika Gyenes

Children's oral health-related quality of life – a screening tool?

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Aim To explore whether elementary school children's oral health-related quality of life (OHRQoL) responses can be used by community health workers to screen these children for oral health problems. More specifically, the aim was to investigate which aspects of children's OHRQoL would be correlated with objective oral health indicators such as the numbers of primary and permanent decayed, missing and filled teeth and surfaces, and the number of abscesses. **Methods** Oral examinations were conducted on 3,550 elementary school children (51.7% female / 48.3% male; 50.1% African American / 43.8% white / 3.2% Hispanic; Mean age 98.8 months; SD 22.1) in 35 elementary schools of Genesee County, MI. Oral health-related quality of life data were collected from 3,871 children. OHRQoL was assessed with the 14-item-long Michigan Oral Health-related Quality of Life Scale - Child Version (MOHRQoL-C). **Results** The children's overall OHRQoL score based on the answers to all 14 items was significantly correlated with the number of decayed, missing and filled primary teeth and surfaces, and the number of abscesses on primary teeth. The item that was most strongly correlated with the level of caries was the item concerned with pain due to eating something sweet. **Conclusions** Children's responses to the items on the MOHRQoL were significantly correlated with their objectively determined oral health status. It seems justified to educate community health workers about the potential benefits of using certain questions from this scale as for identifying children in need for dental

care. **Acknowledgements:** This research was supported by grant #R01DE14887-01A2 from NIDCR.

Oral health-related quality of life among 12-year-olds in Constanta. C NUCA*, C AMARIEI, S FILDAN, Department of Preventive Dentistry, Faculty of Dental Medicine and Pharmacy, "Ovidius" University of Constanta, Constanta, Romania

Aim To assess the prevalence and severity of the impacts of the oral health conditions on the daily performances of the 12-year-old children from Constanta, Romania.

Methods 100 children were studied. The children were examined clinically using the WHO criteria (DMFT score and OHI-S Index value). OHRQoL was assessed using questionnaire and an assisted interview that were based on the original Child-OIDP Index Questionnaire. The first step was to fill in an assisted questionnaire with 17 questions, in order get the subjects accustomed to the oral conditions that they may perceive as reasons for impacts. The next step was an assisted interview, assessing the oral health condition impacts on eight daily performances: nutrition, speaking, oral hygiene, sleeping and resting, smiling, being able of show teeth without embarrassment, emotional status, learning and social relationships. The reference period was three months. The frequency and severity of the oral health condition impacts on every day activities was assessed by scoring the answers and calculating frequency and severity scores.

Results The mean DMFT was 2.1; 16% of subjects were caries-free, and the average value of the OHI-S Index was 2.4. The oral health problems (out of the first set of questions) that were perceived most frequently having a negative impact on children's every day's activities were dental pain (48%), bleeding of gums (36%), dental caries (24%), dental malpositions (26%), gum inflammation (22%), exfoliation of temporary teeth (22%), sensitivity of teeth (16%) and discolouration of teeth (14%). Of the subjects, 88% suffered from at least some negative impacts included in the questionnaire. The number of affected activities (Performances with Impacts, PWI) was between 1 (in 4.5% of cases) and 8 (9.1% of cases). The actions that were affected most by the oral health conditions were nutrition and oral hygiene, followed by smiling and speaking. The less affected activities were learning, sleeping and socializing. Nutrition was most frequently affected by dental pain (60%), sensitivity of teeth (17%), exfoliation of temporary teeth (22%), and gum ulceration (2%). Oral hygiene was affected by gum bleeding (81%), gum inflammation (9%), gum ulceration (5%) and exfoliation of temporary teeth (3%). A small number of subjects suffered from very severe (8%) or severe impacts (14%). **Conclusions** Even though the oral health status of the children was satisfactory, oral health problems moderately affected most of the subjects. The most affected actions were nutrition and oral hygiene. Dental pain, sensitivity of teeth, gum bleeding and gum ulcerations had most important impacts on daily performances.

Using quality of life measures to screen for dental treatment need. C MCGRATH¹*, HP WHELTON²
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Aim To assess the ability of the United Kingdom oral health related quality of life measure (OHQoL-UK) to screen for dental treatment need (as assessed clinically) in a national oral health survey. **Methods** In a population wide study of oral health in the Republic of Ireland, 2,795 adults were interviewed about the impact of their oral health status on their life quality employing the OHQoL-UK measure. In addition, the subjects underwent a clinical oral examination to determine their restorative, prosthodontic, endodontic, surgical and periodontal treatment need. Weighted and unweighted OHQoL-UK scores were derived and their association with clinically assessed treatment need explored. The sensitivity and specificity of the OHQoL-UK measure in identifying those with a treatment need were examined using the following cut off scores for the measure: a) below median population level, b) at median population level and c) 1 above median population level. **Results** OHQoL-UK scores (weighted and unweighted) were associated with clinically assessed treatment need ($p < 0.01$). Maximum sensitivity was achieved by using the cut-off point of '1 above the median population level' for both the weighted and unweighted versions of OHQoL-UK. Sensitivity for periodontal treatment was 68%, 68% for prosthetic treatment, 71% for restorative treatment, 83% for endodontic treatment and 84% for oral surgery treatment employing the weighted version of OHQoL-UK. Sensitivity for periodontal treatment was 69%, 70% for prosthetic treatment, 71% for restorative treatment, 84% for oral surgery treatment and 86% for endodontic treatment employing the unweighted version of OHQoL-UK. However, at this cut off point ('1 above median population level') specificity values were low for both the weighted version of OHQoL-UK (31-34%) and for the unweighted version of OHQoL-UK (30%-33%). Weighting had little effect on the performance of the OHQoL-UK measure's sensitivity or specificity. **Conclusions** Clinically assessed dental treatment need was associated with OHQoL-UK scores. At certain cut off scores OHQoL-UK had moderate-good sensitivity as a test to detect those who had a clinically assessed dental treatment need. The findings have implication in the use of OHQoL-UK measure in screening for dental treatment need.

Oral index of the quality of life . LG BORISENKO*, LA BORISENKO, Belorussian State Medical University, Minsk, Belarus

With increased life expectancies, as seen in industrialized countries, geriatric dentistry has become increasingly important. Improvement in medical care will allow older patients to maintain an active and pleasant life at more advanced ages. Complete and partial tooth loss are associated with reductions in physical, psychological, and social functions and ability to chew, increased disability and handicap, and potential harm to general health. Clinical criteria for oral conditions and diseases are well documented in WHO oral health publications and widely used in public oral health programs. **Aim** To develop a clinical method (index) for the assessment of the impact of oral health on the quality of life. **Methods** Oral index of the quality of life (OIQL) comprises subjective (patients') and objective (dentists') assessments of problems related to nine criteria that might affect physical (chewing,

speaking and kissing), psychological (smiling, halitosis, appearance) and social (social activities, conversation, choice of profession) aspects of life. Each dimension consists of three questions, which are given scores from 0 (not at all) to 3 (a great deal), the sum of which is the OIQL score. The maximum score of 54 (27 points for both subjective and objective assessments) implies that oral health problems do not affect adversely the quality of life. **Results** Assessment of the OIQL among 320 dental patients aged 60-80 years resulted in an average OIQL score of 30.8 (57.0% of the maximum score). The mean score of subjective assessments was significantly ($p < 0.05$) higher (18.3, SE 0.43) than that of objective assessments (12.5, SE 0.21), which means that patients considered oral impacts less severe than dentists did. **Conclusions** These results indicated significant negative effects of oral health problems and diseases on the quality of life of the older adults. OIQL can be used in clinical practice and epidemiological studies to monitor the impact of the oral health on the quality of life.

Smoking habits among the students of a Romanian dental faculty. M SZÉKELY^{1*}, Z FAZAKAS²

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The most common form of risk behaviour among young adults is smoking. **Aim** The aim of this cross-sectional study was to investigate the smoking habits of the 1st-6th-year students of the Dental Faculty, University of Medicine and Pharmacy, Targu-Mures. **Methods** A self-administered questionnaire regarding the use of tobacco was completed anonymously by 275 dental students, 108 males and 167 females. **Results** The percentage of smokers was higher (33.3%) among the male students than it was among the females (28.7%), but the difference was not statistically significant ($p = 0.15$). Of the smokers, 47.6% reported smoking regularly and 52.4% occasionally. A majority of the smokers (63.1%) had tried to quit smoking for health reasons. **Conclusions** Our study indicates that years at university are a crucial period with regard to the adoption or avoidance of smoking behaviour. The high prevalence of smoking among these dental students calls for pertinent educational measures for tobacco control. The Dental Faculty needs to incorporate into the curriculum not just didactic instruction about the impact of tobacco use on oral health, but also practical training in counselling patients about smoking prevention and cessation.

Smoking habits among the first year students at four Czech university faculties. K KOSORÍNOVÁ*, R SLEZÁK, Department of Dentistry, Faculty of Medicine in Hradec Králové, Charles University in Prague, Czech Republic

Aim To determine smoking habits of first year undergraduate students at four university faculties located in Hradec Králové, Czech Republic. **Methods** A total of 418 students (131 males and 287 females, mean age 20.1 years) took part in an anonymous questionnaire study on smoking habits and related attitudes. The respondents were attendants of lectures or practicals, during which

the questionnaires were filled out. **Results** Among the respondents, 20.4% reported smoking but 45.9% of the smokers smoked less than 1 cigarette per day. Of the smokers, 47.9% had started smoking regularly before the age of 17 years; 50.6% had tried to quit smoking at least once during the past twelve months and 47% wished to quit in the future. The students had good knowledge about the harmful effects of tobacco abuse and principles of nicotine-replacement therapy. Only minimal differences according to gender and type of school were observed in smoking habits and knowledge related to the harmful effects of smoking. In addition to tobacco smoking, 44% of the students had own experiences with cannabis products. **Conclusions** Almost 80% of the students were non-smokers. No systematic differences in smoking habits could be observed according to the background factors that had been considered. Nearly one half of the smokers wished to quit smoking. **Acknowledgements:** The study was supported in part by Research project IGA MZO NR/8781-3

Cigarette-smoking, chewing-tobacco, and alcohol-drinking: coexisting risks for oral health in Indian males. P SHAMBULINGAPPA^{1*}, GN CHANDU², MC SHASHIKANTH¹, MD SHAFIULLA², VVS REDDY³ Departments of Oral Medicine¹, Community Dentistry² and Pedodontics³, College of Dental Sciences, Rajiv Gandhi University of Health Sciences, Karnataka, India

The use of chewing tobacco (Gutka) is widespread among Indian men, but little is known about the use of it among the adolescents. **Aim** To describe patterns of exposure to three major hazards for the oral mucosa, i.e. cigarette smoking, chewing tobacco and alcohol drinking among young Indian males. **Methods** Out of a total number of 6,309 eligible 18-21-year-old Indian males, 5,112 (81%) agreed to participate in the study. The study instrument consisted of an anonymous questionnaire that was self-administered in the class room. Questions regarding cigarette-smoking, chewing-tobacco and alcohol-drinking were included in the questionnaire. ANOVA was used for the statistical analysis of the data. **Results** Of the respondents, 63% were not using tobacco, 18% were smoking cigarettes, 9% were using chewing tobacco only, and remaining 10% were using both cigarettes and chewing tobacco. In total 20% of the study population reported consumption of alcoholic beverages on at least one occasion during the 10 weeks prior to the survey. No association was seen between smoking and alcohol consumption when alcohol consumption was treated as a continuous variable. Out of the 1,022 (20%) alcohol users, 20% were not taking any form of tobacco, 68% were cigarette smokers, 6% were using chewing tobacco and the remaining 6% were using both cigarettes and chewing tobacco. **Conclusions** Both tobacco use and alcohol drinking have been independently associated with a variety of pathological oral conditions in adults. These behaviours coexist in early adolescence. Their effect on oral health needs to be investigated in prospective studies and should be of concern to the dental professionals.

Smoking and oral health - a pilot study. SMEJKALOVA J, E CERMAKOVA², J VIMAL^{1*}, R SLEZAK³, SN VEL-LAPPALLY¹. ¹Department of Hygiene and Preventive

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Aim To study the influence of smoking on oral health, especially periodontitis and dental caries. **Methods** A sample of 216 respondents in the aged 30-69 years, who were patients of two cooperating private dental practitioners, answered a questionnaire and took part in an oral examination. The questionnaire contained items on background information (age, gender, education, and income), personal and family history, smoking, eating and drinking habits, oral hygiene practices and participation in dental check-ups. The clinical examination included the determination of DMFT and CPITN. The NCSS 2004 software was used for analyzing the data. Chi-square tests were used for statistical evaluation of the observed differences. **Results** Of the subjects, 97 were smokers (48 males and 49 females; mean age 44.8 years SD=9.3) and 119 non-smokers (53 males and 66 females; mean age 42.4 years SD 9.0). The non-smokers had better oral hygiene habits and were participating in dental prevention more frequently than the smokers were. Generally, they also had better education and higher income than the smokers had. We did not find any statistically significant differences in the mean DMF-T index value between the two groups. Chi-square test revealed a significant difference in CPI between the smokers and the non-smokers ($p<0.05$). Among the smokers, there was a higher frequency of sextants with score 3 or 4 (moderate or severe pocketing) than among the non-smokers who had a higher frequency of sextants with healthy periodontal tissue (CPI 0). **Conclusions** The negative influence of smoking on periodontal health was confirmed even among the small number of subjects participating in our pilot study. **Acknowledgements:** Supported by a grant no. NR/8781-3 of the Ministry of Health Grant Agency

Smokers but not snuffers are at risk for periodontal bone loss. J BERGSTRÖM*, Institute of Odontology, Karolinska Institutet, Stockholm, Sweden

Use of moist snuff has become increasingly common in Sweden. Little is known about the possible harmful effects of snuff use on periodontal health. **Aim** To study periodontal bone loss in regular smokers and regular snuff users. **Methods** The study subjects included 25 smokers, 25 former smokers, 25 current snuffers, 21 former snuffers and 82 controls (non-smokers and non-users) in the age range 20-60. Bone loss was determined from bitewing radiographs measuring the distance from the cement-enamel junction (CEJ) to the periodontal bone crest (PBC) at premolars and molars. **Results** The mean (95% CI) CEJ-PBC distance (mm) was 1.72 (1.53-1.91) in current smokers, 1.62 (1.42-1.81) in former smokers, 1.08 (0.88-1.27) in current snuffers, 1.02 (0.81-1.23) in former snuffers, and 1.16 (1.05-1.27) in controls. When age was controlled for, the differences between current or former smokers and controls were statistically significant ($p<0.001$), but the differences between current or former snuffers and controls were not ($p>0.05$). The differences between the smoker and snuffer groups were statistically significant ($p<0.001$). The relative risk for periodontal bone loss in excess of 1.45 mm (25th percentile) was elevated 6.7-fold and 2.7-fold in current and former

smokers, respectively ($p=0.001$ and $p=0.067$, respectively). Snuff use was not associated with an increased risk for periodontal bone loss ($p>0.05$). The subjects' oral hygiene was of a high standard and plaque index did not differ between groups ($p>0.05$). **Conclusions** The present observations suggest that use of moist snuff in contrast to smoking is not associated with elevated risk for periodontal bone loss.

Smoking cessation in general dental practice - a pilot study. K JONES*, C ALLEN, N WILLIS

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Aim To determine if smoking cessation interventions could be provided in a general dental practice setting in southeast England. **Methods** Two different approaches to smoking cessation were piloted. The first approach involved a mailshot campaign to patients of dental practices and the second approach involved the provision of one-to-one smoking cessation advice within the dental practice. The pilot ran for a period of six months following recruitment of the dental practices and training of the dental staff. The number of four-week smoking quitters resulting from each approach was calculated together with the associated costs. Simple descriptive tests were used to analyse the data using SPSS version 13.0. **Results** One practice participated in the mailshot approach. Three hundred letters inviting people to attend local NHS Stop Smoking Services were sent out with the dental recall letter in November 2005. Based on the assumption that 29% of these people smoked (Health Development Agency, 2004), we can assume that the letter reached 87 smokers. Of these, 20 people (23%) contacted the NHS Stop Smoking Services and attended for group therapy. Based on a 60% quit rate, the number of 4-week quits resulting was 12. The cost of the mailshot worked out at £25 per quitter, excluding the costs of the group sessions and any pharmacological support. Four practices were recruited to the one-to-one approach, however, one practice dropped out of the study. Forty people were referred to the trained smoking cessation advisors in the dental practices. Of these, 32 people set a quit date. This resulted in 19 (48%) successful four-week smoking quits. The cost per four-week quitter was £43. This did not include the cost to the primary care trusts of providing any pharmacological adjuncts to smoking cessation. **Conclusions** One-to-one advice from a member of the dental team was found to be an effective means of delivering smoking cessation interventions in the general dental practice setting. Interestingly, the success rate for four-week quitters was similar to that of general medical practitioners and pharmacists providing smoking cessation advice in the same geographical area. Although the success rates were lower than those achieved by the NHS Stop Smoking Services (60%) through their group therapy, but their costs per four-week quitter are much higher at £182.43. Providing one-to-one smoking cessation advice through general dental practice would appear to be more cost-effective than using mailshots to recruit people to NHS Stop Smoking Services.

Dental students' attitude towards anti-smoking programs: an analytical study in Flanders, Belgium. *J VANOBBERGEN**, *P NUYTENS*, *M VAN HERK*, *Ghent University, Ghent, Belgium*

The dental team can play an important role in tobacco control programs, both community and individual patient based. **Aim** To assess the dental students' attitude toward tobacco cessation promotion in the dental setting as well as the influence of knowledge, belief in effectiveness, smoking status, gender and dental education on students' attitude toward smoking cessation interventions. **Methods** The study group for the present study comprised the dental students from the 2002-2003 classes (5 consecutive years) at the Ghent University (n=96). A validated questionnaire, tested for reliability, was administered to all students. This questionnaire was designed with four different sections: demographic characteristics, attitude related to tobacco cessation programs in the dental setting, belief in effectiveness of tobacco cessation programs in the dental setting and knowledge concerning health effects of tobacco. Non parametric Kruskal-Wallis and Mann-Whitney tests and logistic regression analyses were performed to evaluate differences in attitude, belief in effectiveness of tobacco cessation programs in the dental setting, and knowledge. **Results** Response rate was 81% (78/96). A narrow majority (54%) had an explicit positive attitude towards tobacco cessation programs,

receiving an average rating of at least 7.5 out of 10 (a score of 10 is the best possible attitude) on the responses related to this item. All respondents agreed to show their individual patients the oral health hazards of tobacco use and 96% of respondents were willing to use anti-tobacco programs in their practice to advise patients to quit using tobacco. However, only 40% of respondents agreed that it is the responsibility and the duty of every dentist to co-operate in anti-tobacco programs and only 51% were willing to co-operate actively in anti-tobacco counselling programs at community level. Slightly more than half of the respondents agreed that tobacco counselling offered in the dental office can be adequate and have an impact on patients' quitting. Multiple analyses indicated that knowledge increased with year of graduation, but not necessarily with age. The odds ratio for increasing knowledge per year was 2.03 (95% CI 1.20-3.44). The variance of attitude towards tobacco cessation programs was significantly affected by knowledge and the belief in effectiveness of tobacco cessation programs in the dental setting. **Conclusions** Besides the knowledge, the attitude of newly graduated dentists could be improved by stressing the effectiveness of smoking cessation activities during training modules in the undergraduate education. Both aspects have to be emphasised: the community based programs and the individual communication skills.