

## Poster abstracts from the EADPH meeting in Heidelberg, september 2008

### 1. 3-year evaluation of an oral health promotion programme in young children (Flanders, Belgium)

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**Aim** To evaluate an oral health intervention in very young children. **Methods** Child & Family (C&F) is a Flemish public agency whose purpose is to monitor the welfare and health of all children from their birth up to the age of 3 years. For parents with small children C&F is an important source of information regarding growth, diet, hygiene. A wide range of parents use this (free!) offer of support. More than 95% of newborn children are contacted by C&F. In order to improve the oral health of very young children, the existing care programme - offered by the nurses from C&F - was extended with oral health related advice that was supported by specifically developed communication tools. This extended care programme was offered to 1,080 children (I group) born after October 1st, 2003; 1,057 children from a geographically distinct area served as controls (C group). These children received the standard care programme. In both areas identical and well-specified inclusion and exclusion criteria were used. At age 3, parents completed a validated questionnaire. Children were examined by trained dentists using mirror and probe. Caries experience (BASCD criteria) was assessed at d1, d2 and d3 level. The project protocol was approved by the ethical committee of the Catholic University Leuven. Comparisons between baseline and follow-up were performed using logistic regression analysis. Differences were tested for statistical significance (5% level) using likelihood ratio tests. **Results** Information was available for 79% of children from the I group and 66% from the

C group. In both groups there was an increase in caries experience free children between 2003 and 2007 (93.5% to 97.2% in I and 90.5% to 95.5% in C, assessed at d3 level). The increase of disease free children at d1 level was significantly higher in children from the intervention group (84.9% to 94.1% versus 75.7% to 79.0%) ( $p < 0.01$ ). A statistically significant improvement in several reported oral health related behaviours was seen in both groups. The reported consumption of sugar-containing between-meals snacks decreased only in the intervention group. The reported (prolonged) use of a nursing bottle and/or pacifier remained unchanged, in both groups. **Conclusion** The oral health of 3-yr olds in Flanders improved between 2003 and 2007. The evaluated oral health intervention programme resulted in a statistically significant improvement in oral health compared to the control group only when caries experience was measured at d1 level (initial lesions). Although several reported oral health habits showed an improvement, the impact on nursing practices (bottle, pacifier) was negligible. *Study supported by GABA International.*

### 2. Caries prevalence and experience in preschoolers in Italy: association with social class

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**Aim** To correlate the occurrence of dental caries with social class in preschoolers in Veneto region of Italy. **Methods** A cross sectional survey was carried out in 20 (out of 88) randomly selected nursery

schools in the area of Health District n.15. 1,820 3-5 year-old children (out of 7,397) were enrolled and 1,410 were visited (subject to their parents written informed consent) in classrooms between September 2005 and May 2006. The response rate was 75%. Drop outs occurred because of absence from the classrooms (372) or due to lack of parental consent (38). WHO (1997) diagnostic criteria for dental caries into dentine threshold were adopted by two calibrated examiners. Information on social level by occupation of the parents was obtained through a questionnaire (n=1205-response rate 85.5%). Children were divided in 4 groups: high class (n=211); clerks (n=395); self employed (n=200); working class (n=399) on the basis of their family social class assessed at the highest occupational level of either parent. Means and standard deviation were calculated for continuous variables; for categorical variables the results were provided as proportions. Comparisons between groups were made using Pearson chi-squared test. The association between caries occurrence and the independent variable family social class was evaluated by means of a logistic regression model. **Results** Caries prevalence and mean dmft among children were: 23% -  $0.8 \pm 2.1$  in the high class; 21% -  $0.7 \pm 2.0$  in the clerks class; 27% -  $1.2 \pm 2.8$  in the self employed class; 36% -  $1.7 \pm 3.2$  in the working class. Tabulating the odds of caries against social class showed a meaningful linear trend across categories of that explanatory variable ( $\chi^2=22.4$ ;  $p=0.0000$ ). The risk for a dmft score  $> 0$  was 1.9 (CI 95% 1.3-2.8) among children of parents in lower social class compared with children of parents in the higher one. **Conclusions** Our data confirm the existing worldwide literature that social class contributes to dental caries risk.

### 3. Association of Early Childhood Caries (ECC) with independent variables

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**Aim** The aim of the present study was to assess caries experience of 3-4-year old children in two counties in Northern Hesse and to correlate this parameter to various independent variables.

**Methods** In 2007, all 3-4-year-old children visiting

Kindergarten in Waldeck-Frankenberg and Marburg-Biedenkopf were invited to take part in the study which was approved by the ethics committee of our medical faculty. Only children whose parents had given their informed consent participated. Some 1532 3-4-year-olds were examined and  $d_{3+4}mft$  values were recorded according to WHO criteria. The participation rate was 81.9 %. Information about feeding practices during early childhood and preventive measures carried out at home, in Kindergarten or by the family dentist were collected for each child via a structured questionnaire. The questionnaires were completed by the parents. A statistical evaluation was performed using the software package SPSS (Version 14.0). To compare the mean caries scores of various subgroups, non parametric tests were performed. Variables associated with caries were included in a binary stepwise backward logistic regression analysis. **Results** The mean  $d_{3+4}mft$  score was 0.66 (f-component = 0.12), the proportion of caries free children was 83%. The restorative index was 0.29. Constantly giving babies their bottle during the night and nightly breast feeding in the parents' bed for longer than seven months as well as frequent intake of sugary drinks at a later time showed a positive correlation to  $d_{3+4}mft$  scores in the bivariate analysis. For example, the mean  $d_{3+4}mft$  of children who were given baby bottles during the night for longer than seven months was 1.62, significantly higher than that of children who were not fed in this way ( $d_{3+4}mft$ : 0.47,  $p < 0.001$ ). Starting tooth brushing early, as well as systemic intake of fluorides, showed a negative correlation to  $d_{3+4}mft$  scores. The binary logistic regression analysis revealed: sugary drinks at night, frequent use of baby bottles during the day and frequent in-between meals were positively correlated with ECC while early start of tooth brushing, intake of fluoride supplements, regular visits to the family dentist and application of topical fluorides showed a negative correlation. **Conclusions** The results of the binary logistic regression analysis suggest that long-term use of baby bottles at night is the most important factor in the development of ECC. **Acknowledgement** Supported by GABA International, Münchenstein Switzerland.

#### 4. ECC – an unsolved public health problem and general hazard arising from *C. albicans*

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**Aims** Early childhood caries is still an unsolved health problem which needs more research to prevent it. Therefore the aim of this study was to analyse the presence of the caries associated microflora in infected dentine of 15 children aged 1 - 5 years. Children with one or more decayed, missing or filled tooth surfaces in primary teeth (ECC) were randomly selected from those who had been referred to the University Dental School at Jena for dental treatment under general anaesthesia.

**Methods** Samples of infected dentine were collected from incisors and molars of 10 children for microbiological examination. These teeth together with 15 further incisors and molars were examined by scanning microscopy. The samples were inoculated onto the surface of *Mitis salivarius* agar with bacitracin (*Mutans streptococci*, MS), onto rogosa agar (*Lactobacilli*, LB) and *Sabouraud* agar medium (yeasts) and incubated at 37°C for 48 h. Counts (CFU) of total numbers of pathogens were calculated. Colony growth was verified and the identification of isolates (n=166 MS, n=152 LB, n=128 yeasts) was performed. Subsequently the percentage of MS, LB and yeasts in the CFU was calculated. The identification was performed macroscopically as well as by assessing physiological and biochemical characteristics. Yeasts were identified by their pseudomycelium and chlamydospores on rice agar. **Results** *Mutans streptococci* and *Lactobacilli* could be detected in 86% and 100% of the dentin samples. However, the prevalence of *C. albicans* was higher in upper incisors (between 67% and 71%) than in first (14%) and second molars (29%). In the samples of teeth from the lower jaw *C. albicans* could not be harvested. These results were confirmed by scanning microscopy. **Conclusion** The occurrence of *C. albicans* in young children with ECC is a health hazard for general mycosis and may have a negative influence on development of the immunological defence system in young children. Therefore the prevention of ECC is very important to prevent serious oral diseases and general mycosis in children.

#### 5. Caries experience of schoolchildren from the Maia district, Portugal

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**Aim** The aim of this study was to assess the prevalence of dental caries in schoolchildren of Maia district, a suburban city in the northwest of Portugal. **Method** A survey was conducted in a mobile dental unit for undergraduate training in community dentistry, that belongs to University Fernando Pessoa. It included a clinical examination by a calibrated observer and a questionnaire on the oral health habits of 289 children aged 6 to 10 years-old, 68.5% of whom were girls, and who were recruited through a sampling procedure that reflected distribution according to age class groups and the gender of the pupils concerned. The study began after the local ethical commission's approval and informed consent had been obtained from parents and caregivers. The dmfs, DMFS score was assessed according to WHO-criteria. All data were analysed statistically by SPSS 15.0. **Results** The results indicated a caries prevalence of 63.7%, increasing with age, the dmfs was 3.9 1.1 (ds=3.0), the DMFS was 1.0 0.7 (at 7 years)(DS=0.8) and 2.8 1.1 (at 10 years)(DS=1.9) respectively. Daily oral hygiene habits was reported 86.5% of the children. Unemployment has a strong impact on this community and its financial consequences limit access to oral health care. This is reflected by the levels of oral disease.

#### 6. Caries experience of pre-school children in Iasi, Romania

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**Aims** of the study were: (1) to assess oral health inequalities in preschool children and any association with parents' socio-economic status (SES) and educational level, (2) to compare the mean dmft scores of 2.5 and 5 year-old pre-school children in Iasi with those of children of the same age living in other Central and Eastern European (CEE) countries, (3) to evaluate the extent to which dental caries in these pre-school children predicted caries

in their permanent dentition. **Methods** In 2004, the authors initiated a three-year longitudinal study which included 382 randomly selected pre-school children aged between 2.5 and 3 years old and 455 randomly selected pre-school children aged between 4.5 and 5 years, all drawn from 12 randomly selected kindergartens in Iasi. Of the 12 kindergartens, 4 were attended by children mainly from high socio-economic groups, 4 from medium and 4 from low. The education level of each child's parents was determined and classified as university, high school or primary school level. Ethical approval for the study was obtained from the relevant regional committee. Oral health was evaluated by 4 calibrated examiners and the mean dmft scores for each group were calculated. Family educational level and SES were evaluated by questionnaire in both 2004 and 2007. Data were analyzed using the *Statistica* program, ANOVA, Pearson, Chi-square. **Results** Statistically significant ( $p < 0.5$ ) differences were seen between the groups. Before the programme commenced in 2004, parents from the lower SES group seldom encouraged their children to brush their teeth. The mean dmft for the 2.5-3 year-old group was found to be lower than that reported for several CEE countries but for the 4.5-5 year-old group the mean dmft was around double that of other CEE countries. **Conclusions** The findings of this study revealed a relationship between the child's dmft, parents' SES, educational level and attitude towards oral health. The dmft results of this study differed from those of other CEE countries. Primary prevention is vital in maintaining oral health in children because deciduous caries experience is the main predictor for caries in the permanent dentition. Prevention must be delivered to all, if the WHO goal that by 2010, 90% of 6 year-old children should be caries free is to be achieved.

### 7. Oral health among Copenhagen children and adolescents with different ethnic backgrounds

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**Aim** to describe oral health among children of 5, 7-, 12- and 15 years of age living in Copenhagen; to analyse the influence of ethnic background and

socio-economic factors on the oral health of these children. **Methods** Almost all children and adolescents in Copenhagen are enrolled with the Public Oral Health Care Service (POHCS). The study included all children with data reported by the POHCS, approximately 80% of the total number of Copenhagen children in the four age groups ( $n = 12,706$ ). Data on children's oral health from the year 2006 was obtained from public oral health registers and were linked with the data on socio-economic and socio-cultural factors from citizen-register of Statistics-Denmark. **Results** In the four age-groups 5-, 7-, 12- and 15-year-olds the mean caries experience (DMFS+dmfs) was 1.9, 4.2, 3.0 and 3.1 respectively. The caries experience of children 5 and 7 years of age with foreign ethnic background was three times higher than among the children with a Danish background. Compared to the Danish children the caries experience in 12- and 15 year-old children with the foreign background was found to be two times higher. Family income and mother's educational level were associated with the level of caries experience in all age groups, and the largest variations were found among 5 and 7 year-olds. In addition, the total number of children in the family was associated with the caries experience of the children. Multiple regression analysis showed that low family income, low education of the mother, high number of children in the family and children's ethnic background were important determinants of caries experience ( $p < 0.001$ ). **Conclusion** Despite the fact that almost all children and adolescents in Copenhagen are covered by the POHCS, which provides care free of charge, at outreach centres and is preventively orientated, considerable variations in caries experience were found in relation to socio-cultural and socio-economic factors. To reduce such inequity in oral health among the children, adjustment of the preventive and health promotion activities are recommended in order to reach a greater part of the target group. **Acknowledgements** The study was supported by the local authorities of Copenhagen, the Employment and Integration Administration.

### 8. Oral health in adults with intellectual disabilities in 2 German states

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Many previous studies in industrialized countries

have reported that persons with disabilities generally present with a higher level of caries prevalence and a lower oral health status than the rest of the population. **Aims** To assess the oral health of adults attending care facilities for individuals with intellectual disabilities in two different regions of Germany and to investigate whether or not regional differences existed. **Methods** A cross sectional study was conducted from July 2007 to February 2008 in the Rhein-Neckar area in south-west Germany and in the Delitzsch area in south-east Germany. In each region the two main institutions which incorporated several care facilities for individuals with intellectual disabilities and which each cared for more than 150 persons were chosen. Subject to consent from their legal custodians, it was planned to examine all patients in these institutions. Caries diagnosis was based on a visual examination, no radiographs were taken. The WHO methods and criteria (1997) were followed for collecting and recording the data (D<sub>3</sub>MFT); a plane mirror, a blunt dental probe and an artificial light were used. The examinations were performed in the institutions by one dentist (F.K.) who was calibrated by a dentist with experience in epidemiology (A.B.). A high inter-examiner reliability was achieved (Kappa=0.925). Consent of the local ethics committee was obtained. **Results** In all, 343 individuals representing 22.5% of the target group were included in the study; 204 from the south-eastern region and 140 from the south-western region. The age of the individuals ranged between 18 and 66 with an average of 36.2 years (SD= 10.9). The gender ratio was balanced (171 men and 172 women). The proportion of caries-free (D<sub>3</sub>MFT=0) individuals was only 2.6%. The mean D<sub>3</sub>MFT was 14.4 (SD= 7.5) for the whole sample; 14.2 (SD= 7.4) in the south-east sample and 14.7 (SD= 7.7) in the south-west sample ( $p= 0.46$ ; Mann-Whitney U test). The unmet restorative treatment need differed significantly between both regions: 40.3% in the south-east sample and 31.7% in the south-west sample. 79% of all those examined were in need of some treatment: 82.3% in the south-east sample and 74.3% in the south-west sample. **Conclusions** Compared to the average oral health data of adults in Germany, these results show that the oral health of individuals with intellectual disabilities is still poor. In addition, these patients do not receive sufficient dental care. The results also show slightly better oral health for these people in south-west Germany than in south-

east Germany. Appropriate oral health programmes targeting these patients, their parents and the staff working in these care facilities should urgently be developed in order to improve the oral health of this population.

### 9. Bioavailability of fluoride from fluoridated milk consumed during or after breakfast

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**Aim** Dental caries remains a major public health problem and the WHO recommends that every effort must be made to extend fluoride prevention. The aim of this study was to compare the bioavailability of fluoride (F) administered in milk during or after breakfast consumption by monitoring salivary and urinary fluoride excretion in adults. **Methods** The 27 subjects were healthy adults (mean age 19.2±0.6 years) of both sexes, residents in an area with low F content in the tap water (<0.1 mg F/l) in Targu-Mures, Romania. The present study had four phases in which the subjects consumed in the morning: 1) standard breakfast; 2) 200 ml fluoridated milk (5mg F/l); 3) standard breakfast and after two hours 200 ml fluoridated milk; 4) standard breakfast with 200 ml fluoridated milk. The testing period lasted four weeks and the sampling took place on the same day each week. Whole saliva was collected at 0, 15, 60 and 120 minutes. Urine was also collected over 24 hours. The fluoride content of both the saliva and urine was analyzed using fluoride selective electrode. **Results** Statistical analysis by ANOVA and Student's t tests revealed significant differences between the salivary fluoride concentrations measured at 0, 15, 60 and 120 minutes after fluoride intake in all phases ( $p<0.0001$ ). Daily urinary fluoride excretion (mean ± SD, µg) showed significant differences between phases: 1) 345±101; 2) 454±148; 3) 757±263 and 4) 663±173 ( $p<0.0001$ ). The highest mean values of salivary and urinary fluoride concentrations were observed when fluoridated milk was consumed two hours after breakfast. **Conclusions** The results suggest that fluoride availability is influenced by the timing of solid food ingestion. The present study shows that fluoridated milk might be used for fluoride supplementation on

a community basis in young adults. Supported by The Borrow Foundation, grant no. 2088/03.03. 2006.

#### 10. How different levels of dental fluorosis affect perceived facial attractiveness

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**Aims** To investigate how perceived facial attractiveness is affected by facial characteristics, including different levels of dental fluorosis. **Methods** Ethical approval was obtained from the University Ethics Committee. Thirty university students or staff were recruited as models. Digital photographs of each model were taken including one with glasses to compare a common minor change in facial appearance to fluorosis. Four images were made: full face with normal teeth (to act as control); full face with glasses; full face with anterior teeth digitally manipulated to simulate mild fluorosis (index TF2); full face with simulated more severe fluorosis (index TF4) on anterior teeth. Fifteen images were duplicated to make up a total of 135 images. Students were recruited as panel members to view images at a fixed conversational distance from computer screen. Facial attractiveness of each image was scored on a scale of 1 to 5 (1 = very unattractive; 5 = very attractive). **Results** Ninety-seven students acted as panel members, comprising 31 male students (mean age = 22.16 years) and 66 female students (mean age = 21.88 years). There was a significant main effect of model on facial attractiveness,  $F(12.69, 1218.10) = 107.85$ ,  $p < 0.001$ ; there was a significant main effect of facial characteristics on facial attractiveness,  $F(2.20, 211.46) = 22.87$ ,  $p < 0.001$ ; there was a significant interaction effect between model and change of facial characteristics,  $F(35.23, 3382.45) = 11.01$ ,  $p < 0.001$ . Also mean facial attractiveness score of models with TF2 teeth (2.766) is similar to that of models wearing glasses (2.769); mean score of having TF4 teeth (2.989) is slightly higher than that of control (2.898). **Conclusions** This experiment shows that perceived facial attractiveness is affected by facial characteristics. While having mild fluorosis teeth could be similar to wearing glasses, there are people who prefer the white patches of more severe fluorosis teeth.

#### 11. Dental erosion severity and risk factors in alcoholic patients undergoing a detoxification programme

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Alcoholic patients are a risk group for dental erosion injuries due to the direct and indirect effects of ethanol on their bodies. In Portugal there is a lack of data on dental erosion lesions. **Aim(s)** To evaluate the severity and to identify some risk factors likely to be directly related to dental erosion lesions in alcoholic patients under detoxification. **Methods** This descriptive and cross-sectional study, previously approved by the Ethical commission of the University Fernando Pessoa, was conducted in one centre (CRAN) for addiction rehabilitation therapy in the north of Portugal. After obtaining signed patient consent, data were collected through personal interviews and clinical examinations of 50 patients, 15 (30%) women and 35 (70%) men, which constitute the total number of patients at the centre between February and May 2006. Past consumption of alcohol was documented. The severity of dental erosion at individual teeth was classified using the Eccles and Jenkins index (Eccles and Jenkins, 1974). Statistical analysis was carried out mainly through non parametric tests, using SPSS v.15.0 (SPSS Inc., IL. Chicago, USA) with a significance level of 0.05. **Results** All the patients had some dental erosion. With 14% at level 1, 58% at level 2 and 28% at level 3. Upper teeth were more commonly effected than lower teeth, and were more severely effected (Wilcoxon test;  $p < 0.001$ ). Significant differences in the severity of dental erosion were found between anterior and posterior teeth, in both the upper and the lower arches (Friedman test,  $p < 0.001$ ). Men had drunk alcohol at an earlier age than women (12-34 years), (Mann-Whitney test,  $p = 0.012$ ). Alcohol abuse problems were identified at on average at 26.8 years 12.2 years for men and at 28.1 years 6.2 years for women (Mann-Whitney test,  $p = 0.165$ ). On average, the daily intake women had drunk alcohol for a shorter time (7.5 years  $\pm$  7.5 years) than men (16.9 years  $\pm$  9.8 years) (Mann-Whitney test,  $p = 0.0025$ ). No

correlation was found between dental erosion severity and the quantity of daily alcohol intake ( $r=-0.006$ ;  $p=0.966$ ), or for alcoholic intake duration ( $r=-0.101$ ;  $p=0.488$ ). A positive association between “before-bed-drinking” and dental erosion on the palatal surfaces of teeth was found (Qui-Square test,  $p=0.029$ ). **Conclusions** Patients undergoing a detoxification programme in the CRAN centre presented high severity levels of dental erosion lesions. The risk factor “before-bed-drinking” significantly increased the severity of palatal surface erosion. **Acknowledgements** To the *Centro Regional de Alcoologia do Norte* (CRAN) Portugal.

## 12. Ten-year Evaluation of an Annual Oral Examination Program for Workers Exposed to Acids

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**Aims** The objectives of this study were 1) to evaluate the outcome of Annual Oral Examination Promotion (AOEP) for workers in Korea focusing on occupational dental erosion between 1993 and 2003 and 2) to suggest some new modifications to the National Oral Health Promotion for workers (NOHP). **Methods** This outcome evaluation was a repeat ecological study. The first national oral health survey for workers exposed to acid was performed as a baseline study in 1993. In this survey, after giving their written consent, 888 workers, the total number exposed to acids in 24 factories, selected by area and size stratified cluster sampling, were examined by a dentist, who had been calibrated and scored a Kappa index of 0.9 using Kim’s dental erosion criteria with five grades (Kim et al. 2003). In 1993, AOEP started as a mandatory program for the early detection and the early treatment of occupational dental erosion (Grade 3-5) among workers exposed to acids under the Occupational Safety and Health Act. It was one of the components of NOHP. A second national oral health survey for workers exposed to acid was performed in 2003. In the second survey, 942 workers from 32 factories using acids, were selected and surveyed by three dentists calibrated with Kappa index of 0.78-0.93, who used same methods as were used in the baseline study. The difference in the prevalence

between 1993 and 2003 was accessed. **Results and Conclusions** In 1993, the prevalence of occupational dental erosion was 8.0% (Kim et al. 1994). The prevalence was 11.2% in 2003. Thus in ten years, the prevalence increased by around 40%. According to the statistics, AOEP was not effective in ameliorating occupational dental erosion. Hence, our suggestions were three-fold: 1) a more critical approach to reduce the ambient acid exposure level in workplaces was needed to reduce the incidence of occupational dental erosion (Kim et al. 2007), 2) the workplace oral health promotion should include more comprehensive programs including regular oral health education, the absolute requirement to wear a mask and the topical fluoride application, and 3) the surveillance system should be operated to maintain the agreed standards.. In 2007, the Korean government lowered the threshold limit value - time weighted amount (TLV-TWA) of acids, and now they are considering other suggestions. **Acknowledgement** The part of this study was supported by the grant of the Ministry of Labour, Korea.

## 13. Associations between Oral Health and Quality of Life

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Diagnostic findings only partially correlate with patients’ health perception. Hence, measuring oral health related quality of life (OHQoL) as an indicator of patient’s well-being and the quality of health care services has become accepted as an explicit criterion of evaluation. One of the most commonly used instruments for measuring OHQoL is the Oral Health Impact Profile (OHIP) questionnaire. It has been successfully used in groups with a considerably impaired oral health status. **Aim** The aim of this study was to evaluate, whether the OHIP can also be applied to an average/standard population sample to detect determinants of impaired OHQoL. **Methods** In 6 companies based in Dresden (Germany) workers were offered a regular dental examination that assessed caries, periodontal, prosthetic, soft tissue, functional and esthetic findings. OHQoL was measured by means of the German version of the OHIP (OHIP-G, 53 items) supplemented by a short questionnaire on sociodemo-

graphic items. The additive score of all item responses (OHIP-ADD score, range 0-212) rises with the level of impairment. Descriptive and univariate procedures were used for statistical analysis. The study was approved by the university ethics committee. Data had been checked for completeness, leaving 861 (95.7%) data-files. **Results** Between 7.5% and 26.0% of the companies' employees took part in the study. The OHIP-ADD score was relatively small (median: 10.0). Univariate odds ratios (ORs) of belonging to a target group with impaired OHQoL (OHIP-ADD>36) were estimated using the SAS/STAT-software-package. The cut-off point was defined heuristically and conformed to the 90% percentile. The risk of belonging to the target group was significantly higher in women than in men (OR=1.61,  $p=0.036$ ), higher in older people (54-65 years vs. <35 years, OR=3.68,  $p=0.002$ ), lower with high educational level (OR=0.34,  $p=0.0063$ ) and higher when occluding pairs were missing (OR=2.38;  $p=0.006$ ). Oral diseases like dental caries showed almost no influence on subjective oral health (> 1 tooth with decay; OR= 2.24,  $p=0.10$ ). **Conclusions** In the present sample, univariate statistical analysis detected relationships between impaired OHRQoL and demographic variables as well as dental aspects. Whether further multivariate analyses will affirm them as indicators remains to be seen. However, it seems worth discussing whether the OHIP-G is an appropriate instrument for measuring OHQoL in a working population. **Acknowledgements** The study was supported by the German Ministry for Education and Science.

#### 14. Patient Satisfaction with Emergency Care in the Public Dental Service in Helsinki

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A recent oral health care reform in Finland opened the public dental services to all adults. Due to great demand for care as a result of the newly available access for all, in Helsinki emergency dental care for adults was centralized to one clinic where eight teams provide services during working days. Appointments for the Emergency Unit are given by the Public Dental Services call centre after a

preliminary evaluation of the need for urgent care made over the telephone. **Aim** The aim of this study was to evaluate the functioning of the Emergency Unit from patients' viewpoints. **Methods** All visits to the Emergency Unit were recorded during a nine-day-period in May 2006. Before treatment the patients were asked to fill in a questionnaire about their problems. Six months later those who filled in the first questionnaire (n=478) were mailed a new questionnaire about the acute treatment episode. Treatments provided were collected from the patient records. Complete data was received from 188 (39%) patients. **Results** Eighty one per cent of the respondents felt that their emergency treatment episode had been good or excellent. Most patients (80%) had more than one visit. Half of the patients (46%) had minor treatments such as opening a tooth with an infected pulp, incision of an abscess or a temporary filling. The other half had endodontics (19%), restorations (18%) and extractions (17%). Those who had had a filling or extraction were most satisfied and those who had endodontics were least satisfied with their care. 58% had their whole acute treatment episode in the PDS and 33% in private sector. Nine per cent of the patients reported that they never made the recommended appointment for further treatment. **Conclusions** Due to a low response rate the results need to be interpreted with some caution. It seems that most of those who had easy emergency problems solved in one or in a few visits were satisfied with the services. Complicated emergency treatments were less successful and the flow of the treatment processes need better planning. It was worrying that a number of patients did not follow instructions for further treatment and some of them are likely to become frequent visitors to the Emergency Unit.

#### 15. Trends in Oral Health of Children and Adolescents in the Czech Republic 1994-2006

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Regular nation-wide oral health surveys among children and adolescents were established in the Czech Republic in 1994. Since then they have been conducted every three years (last survey conducted in 2006) using the same methods for sample col-



lection, dental examination (WHO 1997), epidemiological statistics and interpretation of the data.

**Aim** The aim of this study was to test for significant trends in standard oral health parameters among children and adolescents over the last twelve years. **Methods** Oral health data were gathered from random samples of individuals aged 5, 12, 15 and 18 years who had been examined in 1994, 1997, 2000, 2003 and 2006 in 28 localities, selected by the Czech Institute of Statistics. The samples (approximately 3,000 individuals in each age category and survey) were representative for the whole country. Ethical Committee approval and care-givers' informed consent were obtained at the beginning of each survey. Percentages, means and standard errors of individual parameters of oral health were calculated for each survey. The linear regression model was employed in the study for the expression of trends in the selected parameters of caries experience and dental status (% of caries free, mean dmf/DMF teeth and % of dt/DT from dmf/DMF), in the age categories 5, 12, 15 and 18 years-olds, at a level of significance  $p < 0.05$ . **Results** (Trends - correlation coefficient  $r$  and  $p$ ): 5 year-olds: % caries free –  $r = 0.947$ ,  $p = 0.014$ , dmf – 0.803, 0.040, %dt – 0.994, 0.002; 12 year-olds: % caries free – 0.910, 0.032, DMF – 0.631, 0.108, %DT – 0.974, 0.028; 15 year-olds: % caries free – 0.995, 0.005, DMF – 0.999, 0.0002, %DT – 0.812, 0.086; 18 year-olds: % caries free – 0.969, 0.006, DMF – 0.986, 0.0117, %DT – 0.784, 0.098. **Conclusions** During the period from 1994 to 2006 there were significant trends in the percentage of caries free in all age groups of children and adolescents with final values in 2006 of 42.2%, 29.5%, 13.6% and 6.8% respectively. Significant trends were found in the mean dmf/DMF in 5, 15 and 18 year-olds but not in 12 year-olds (in 2006 the mean dmf/DMFs were 2.69, 2.56, 4.98 and 7.00 respectively). The trend for %dt was for a significant decrease in 5 year-olds. However, %DT in 12 year-olds showed significant increases (final values in 2006 – 55.4, 30.5 respectively). Overall the data showed favourable trends in decreasing caries experience in all age groups but warning signs of ineffective delivery of restorative care for 12 year-olds. **Acknowledgements** This study was supported by the Grant Agency of the Charles University Reg. No. 32208 (2008).

## 16. Caries in primary molars and its impact on the variability of permanent tooth emergence sequences

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**Aims** In an earlier study it was revealed that a history of caries in the primary molars is associated with an early emergence of their permanent successors (Leroy et al., 2003). Hence, caries in the primary molars may have an impact on the order in which the permanent teeth emerge (second phase). In order to obtain information on individual emergence patterns in a population, prospective data from a large sample are needed. The statistical analysis is quite complicated as it involves the estimation of a 7 by 7 correlation matrix of emergence times. Moreover, the censoring of data makes conventional statistical methods inappropriate. The aim of the present study was to fully investigate the variability of permanent tooth emergence in Flemish boys and girls, taking into account the (caries) status of the primary molars. **Methods** For this purpose data available from the Signal Tandmobiel® project were used. In this prospective longitudinal epidemiological survey data were collected from a representative sample of 4,468 children (born in 1989) and examined yearly (between 7 and 12 years of age) by trained dentist-examiners. Caries experience and tooth emergence were recorded by direct inspection. Bayesian statistical analyses taking into account the interval censored character of the data were performed. **Results** 56% of all examined primary molars were sound (i.e. dmft=0). Between 2.5 and 7.2% of the first and second primary molars had been extracted due to caries. When both primary molars were sound, the most prevalent emergence order was '4-3-5-7' (first premolar – canine – second premolar – second molar) in the maxilla and '3-4-5-7' in the mandible, in boys as well as in girls. When both maxillary primary molars had been affected by caries (i.e. either decayed, filled or extracted due to caries), the sequences '4-5-3-7' and '5-4-3-7' were more prevalent whereas sequences '3-4-5-7' and '4-3-5-7' were less prevalent. When both mandibular primary molars were affected by caries, the

prevalence of sequences '4-3-5-7', '4-3-7-5' and '4-5-3-7' was increased whereas the prevalence of sequences '3-4-5-7' and '3-4-7-5' was decreased.

**Conclusions** In conclusion we can state that in the study population a history of caries in the primary molars was associated with an altered order of emergence of canines, premolars and second molars. In many subjects the most desirable emergence sequence was not observed; clinical evaluation and guidance in those cases is very important. *Supported by Unilever Belgium – Research Grant OT/05/60 Catholic University Leuven.*

### 17. Prevalence of occlusal anomalies and tooth spacing among nine-year-old schoolchildren

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**Aim** To provide detailed information concerning clinically relevant traits of occlusion and the prevalence of spacial anomalies in an orthodontically relevant period of dental development. **Methods** In 2002 and 2003, after the approval of the local ethics committee, 494 German schoolchildren (237 males, 257 females) aged 9 were orthodontically examined at their schools by the local community dental service, in the Rhein-Neckar-Area. The only selection criterion for appropriate towns and schools was a low availability of orthodontic treatment. As a result, examinations were carried out in towns with population of between approximately 2,000 and 36,000 inhabitants. In addition to the assessment of spacial abnormalities, overjet and overbite were measured to the nearest 0.5 mm, and sagittal molar relationships were registered clinically to the nearest 1/4 cusp widths. Crossbites, scissors bites and midline displacements were also evaluated. All measurements were made by one investigator (BD) who had been calibrated against an experienced orthodontist (CJL). Interexaminer reliability was determined by performing measurements twice on 30 children. This was done by two examiners (CJL and BD) working independently from each other. **Results** For occlusal anomalies, the children's overjets ranged between -2 and 12 mm with median values around 3 to 3.5 mm. An

increased overjet was more prevalent than a reduced or reverse overjet, and severely increased overjet, beyond 6 mm, was a relatively common finding affecting 5-10 per cent of the children. Similarly, overbite showed considerable variation between -1 and 9 mm (median 3-3.5 mm) and males exhibited a significantly larger overbite than females. Traumatic contact of the gingiva was observed in every fourteenth child. Concerning spacial abnormalities, in the incisor segments, in the maxilla the variance comprised both excess spacing and moderate to severe crowding, which was considerably greater than in the mandible. Severe crowding (>5 mm) was found more often in the maxilla than in the mandible, affecting 2-3% of the maxillary dentitions. In the canine-premolar segments, the arch segments among the males were in general about 0.5 mm larger than among the females, in both the mixed and permanent dentition. In general, the maxilla was more often affected by posterior crowding than the mandible. Anterior crowding seemed to be more prevalent than posterior crowding. **Conclusions** 1. Already at the age of 9 years, a considerable proportion of children were affected by moderate and severe crowding and by a severely increased overjet which may impair further dental and functional development. 2. The wide range of orthodontically relevant occlusal traits encountered in the present study underlines the need for orthodontic screening at 9 years of age (or earlier).

### 18. Knowledge of Flemish paediatricians about children's oral health

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**Aims** To examine the knowledge paediatricians have about oral health in children. **Methods** An anonymous questionnaire on oral health knowledge was mailed in spring 2007 to all members of the Flemish Paediatric Association representing 350 out of 676 Flemish paediatricians. Questions concerned timing of the first dental visit, effects of thumb sucking, fluoride supplements, trauma, fluorosis, *Streptococcus mutans* and dental caries, pre-

vention of dental caries, nursing bottle caries and use of sealants. **Results** 276 questionnaires (79%) were returned. A majority of the responders (72%) was female. The median age of the male responders was 53 years (range 27-79), that of females was 38 years (range 26-63years). 55% of the respondents, mainly younger paediatricians, worked full-time in a hospital. The registry of the association could not give reliable data about age and gender of the members. When compared to the total Belgian population, there was an overrepresentation of younger and female pediatricians (2 test  $p=0.0003$ ). Of the respondents, 71% said they have had some training in dental topics, and most that they relied on information brochures to be informed on dental subjects. Parents frequently questioned paediatricians about tooth eruption. In general, the paediatricians stated that the first dental visit should be scheduled at the age of three. 83% of the paediatricians stated that thumb sucking was harmful to dentition; 7% regularly prescribed fluoride supplements. Their knowledge of fluorosis was moderate. Paediatricians judged tartar removal and polishing, community water fluoridation and tooth brushing after consuming erosive drinks as effective preventive measures. The efficacy of dairy products was underrated. 73% of the paediatricians were aware of nursing bottle caries, whereas only 39% were familiar with fissure sealing. **Conclusion** Initiatives are needed to improve the knowledge about oral health of physicians involved in preventive health care of children.

### 19. Caries in primary dentition and direction of parental locus of health control

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**Aim** The aim of this cross-sectional survey was to assess the relationship between parental locus of health control and level of untreated caries of their preschool children in a representative sample in the Czech Republic, adjusting for relevant socio-demographic characteristics. **Methods** A sample of 285 preschool children and their parents was recruited from 31 urban and rural localities in all regions of the country (previously selected as a sample for a representative nationwide epidemiological survey by the

Czech Institute of Health Information and Statistics). At each locality, 10 children were recruited from a randomly selected local nursery. They were aged more than 3 and less than 5 years on the day of the examination. The children were included in the study after signed informed consent had been obtained from their parents. The study was approved by the Ethical Commission of the General Teaching Hospital in Prague. Data were collected on the children's dental status, recorded in nurseries, and from parental questionnaires with 13 attitudinal items regarding locus of control (LoC) in caries prevention and sociodemographic characteristics, such as age and gender of the child, parental age and marital status and education of mother. The association between parental locus of control and children's level of untreated caries was analysed using logistic regression, adjusted for the effect of key sociodemographic variables. **Results** The response rate to the questionnaires was 84%. Reliability analysis showed an acceptable Cronbach standardised alpha value for the LoC scale: 0.795. Logistic regression showed that there was a statistically highly significant linear trend between increased parental LoC and lower probability of their children having teeth with untreated caries, independent of the effect of the children and parents' socio-demographic variables. After full adjustment, children in the strongest parental LoC quintile were 0.35 (0.15-0.81,  $p<0.05$ ) times less likely to have teeth with untreated caries in comparison to those in the weakest parental LoC quintile. **Conclusions** The findings support the hypothesis that higher internal parental LoC is associated with better control of caries in the preschool children and highlight that a well developed internal LoC within the family is advantageous in the prevention of dental caries. **Acknowledgements** Project No. 44708 was supported by the Grant Agency of the Charles University in Prague.

### 20. Parents' knowledge and behaviour related to their 6-year-old children's oral health

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Oral diseases are clearly related to oral health knowledge and behaviour. **Aims** The aims of this

study were: (1) to determine parents' level of knowledge and behaviour related to their 6-year-old children's oral health; (2) to evaluate parents' oral health knowledge according to their socioeconomic status (SES) and to the oral health status of their children. **Methods** This study, performed in 2007, recruited a representative randomly selected sample of 163 6 year-old children from Constanta and their parents (mother or father). Ethical approval was granted by the relevant authorities. A questionnaire was distributed to the parents, in order to obtain information on their SES, their oral health knowledge, their children's oral health behaviour and the parent's involvement in these activities. Dental examination of all the children took place in school dental offices. All the examiners had previously been calibrated and used W.H.O.(1997) criteria for recording the Decayed, Missing and Filled Teeth Index in permanent (DMFT) and temporary (dmft) teeth. The answers relating to parental knowledge were summated, giving equal weight (1) for each of the correct answers. The mean values were then analysed for possible associations with oral health behaviour, SES, DMFT and dmft. Statistical analyses were performed using SPSS 12. Analysis of variance (ANOVA) was used for testing for group variation; descriptive statistics was used for analysis of SES, DMFT, dmft and the proportions of correct answers. **Results** The response rate was 90.79% (n=148). The mean DMFT was  $0.84 \pm 1.22$ ; the mean dmft was  $5.70 \pm 3.73$ ; the mean SES was  $1.93 \pm 0.72$  (29.7% low; 47.3% middle; 23.0% high). The mean number of correct answers for knowledge was  $6.36 \pm 2.44$ . Parent's knowledge was best for primary caries prevention methods, such as minimizing the consumption of sweets (78.37%) and toothbrushing (88.51%), but not for other preventive measures. Analysis of the questionnaires showed that 48% (n=71) of children reported that they were brushing their teeth twice a day, 58.1% (n=86) of children reported that they were using fluoride toothpastes and 24.3% (n=36) of parents reported that they were helping their children with daily toothbrushing. Higher levels of parent's oral health knowledge were associated with children's daily toothbrushing ( $p < 0.01$ ) and using a fluoride toothpaste ( $p < 0.05$ ) and also with the daily parental help in children's toothbrushing ( $p < 0.01$ ). There were no differences in parent's oral health knowledge according to SES, DMFT and dmft ( $p > 0.05$ ). **Conclusions** These results revealed

that parents had limited knowledge of many aspects of oral health. This was reflected in poor oral health status and behaviour of their children. Given the importance of parent's involvement in children's oral health behaviour, increasing the parent's oral health knowledge should be the first step in community-based oral health promotion programmes.

## 21. Socio-cultural, socio-economic factors and health related behaviour in parents and their children

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**Aim** to describe and to analyze the relationship between social characteristics, health belief, and health behaviour of parents and the health behaviour of their children. **Methods** The study population comprised children born in 1989 and their parents living in eight municipalities in Denmark. The selection of the municipalities was made in order to represent various geographical parts of the country as well as degree of urbanization. A random sampling procedure was made in 2005 by the relevant government agency on the basis of each parent's civil registration number. The parents and their children were mailed a structured questionnaire including questions on socio-economic and socio-cultural background, and also lifestyle-related factors. In addition, self-assessment of the parents' and their children's oral and general health were included. The study population represented 824 pairs of the parents and children; the participation rate was 66%. **Results** The data revealed a strong relationship between the life-style related factors of the parents and their children. Parents with a Body Mass Index (BMI)  $> 25$  more frequently had children with BMI  $> 25$ , ( $p < 0.001$ ). Children of the parents who smoked tobacco more often smoked ( $p < 0.001$ ). The same pattern was observed with respect to consumption of alcohol, eating habits, level of physical exercise and tooth brushing. The parent's schooling, income, ethnicity, and self-assessment of general health seemed to influence the children's life-style. The relationship between the parents' and the children's health behaviour was striking. **Conclusion** The results of the study underline the importance of parents as a target group in any

health promoting activity. **Acknowledgements** The study was supported by the Danish National Association of Public Health Dentistry.

## 22. Oral health knowledge among schoolchildren aged 4 to 14 in Montpellier (France)

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In 2007, a school-based dental health education programme was developed in association with the Dental Faculty of Montpellier (France). **Aim** The aim of this study was to compare, before and after an educational intervention, the knowledge of dental health practices and caries prevention among schoolchildren aged 4 to 14 years old in Montpellier. **Methods** Taking into account the public/private ratio, five schools in Montpellier were randomly selected, which corresponded to a sampling rate of 1/10 of all schools. All the children (600) attending these five schools received a questionnaire adapted to their age group: 4 to 6 years old (G1) / 7 to 10 years old (G2) / 11 to 14 years old (G3). The same children were seen again six months later when they were asked to complete the same questionnaire. Different items evaluated the knowledge of oral hygiene practices and the understanding of these instructions. Moreover, some information about preventive measures was gathered from their parents. Statistical significance was evaluated by chi-square test for categorical variables. Ethics and administrative approval for the study was obtained the relevant ethics committee and from the medical school who in turn gained approval from the heads of the schools concerned before the study commenced. **Results** The response rate of the parents was 26% (16% in public and 50% in private schools): 41% reported giving their children fluoride supplements (tablets) at least once in their life; 24% used fluoridated table salt; 12% did not use any fluoridated toothpaste. The participation level of children was 97%; the proportion of children in each age group was 31% (G1), 31% (G2) and 38% (G3). Concerning the latter group, only 15% had heard about fissure sealings. After attending the educational intervention, knowledge concerning brushing methods was significantly improved ( $p=0.003$ ). In the second age group, the best results were obtained for the item concerning when to brush the teeth (92%); only 35% did know

the meaning of dental plaque. After the educational programme, this percentage (40%) was not significantly different ( $p=0.39$ ), but the awareness of the need for a regular preventive visit to a dentist was significantly improved ( $p=0.001$ ). In the youngest group, only 17% knew the different types of teeth, but this percentage doubled after the educational intervention ( $p=0.0001$ ). The improvement of knowledge was higher in private schools, compared to public schools, globally and for each age group. **Conclusions** The results showed that oral health knowledge of the children at baseline was rather inaccurate, and that some notions of dental hygiene were not well understood, by each age group. The type of school, in relation to socioeconomic background, had a significant influence on these results. **Acknowledgements** All participants in this programme would like to thank the Procter & Gamble Company for supporting this study.

## 23. Oral health-related knowledge and habits of Polish schoolchildren

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**Aims** To investigate children's knowledge and habits related to oral health. **Methods** In 2007, the knowledge and habits of 12-year-old Polish schoolchildren were investigated using the same questionnaire (as used in 1999 and 2003). Oral health-related knowledge was assessed by the children, in response to 9 statements, as true or false. The children were asked about parents' oral health behavior. The questionnaire was distributed among 2,275 12-year-olds, selected by stratified random sampling. Results were compared with data from 1999 and 2003. Ethics approval was sought and given by the relevant authorities. **Results** The response rate in all three years was over 98%. The proportion of the children visiting their dentist every 12 months decreased by nearly 6% between 1999 and 2007. The proportion of children who brushed their teeth at least twice daily increased from 52.5% (1999) to 62.2% (2007), although the proportion occasionally forgetting to brush remained quite high at 8.4% (2007). The percentage of children using dental

floss daily nearly doubled, between 1999 and 2007, from 3.8% to 6.0%. During the same period, the percentage flossing irregularly also doubled from 13.3% to 29.9%. No significant changes were seen in children's consumption of cariogenic products, with nearly 10% of children consuming sweet drinks daily, and only slightly fewer, 7.6%, sweets. The reported frequency of tooth brushing by parents was generally similar to that of children. No significant changes were seen in children's knowledge during the study period. Around a third of children answered "don't know" to each of the statements, suggesting a total lack of relevant knowledge. Over 31% of children declared that a private dentist was their main source of oral health-related knowledge, while 24% reported a public dentist. Only 3% of children considered their schoolteacher to be a source of oral health knowledge. **Conclusion** Although oral hygiene habits have improved over the past eight years, the low level of oral health-related knowledge, associated with a current lack of school oral health education, is of concern. **Acknowledgements** This study was supported by Ministry of Health.

#### 24. Romanian Dental Students' Smoking Behaviour and Their Attitude towards Smoking

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Tobacco represents the single most preventable cause of disease and death in the world today. **Aim** The aims of this study were to assess: smoking prevalence, its effect on dental health attitudes and behaviour among 5<sup>th</sup> year dental students in Iasi, Romania, and their attitudes, when providing smoking cessation programmes for patients. **Methods** A cross-sectional study of all 114 5<sup>th</sup> year dental students at University of Medicine and Pharmacy of Iasi, Romania, Faculty of Dental Medicine was conducted. Ethics approval for the study was sought from the relevant authority and was granted. A self-administered questionnaire based on a modified version of the Hiroshima University Dental Behavior Inventory (HU-DBI) was distributed between November 2007 and March 2008. Multivariate logistic regression analyses were performed to study differences between smokers and non-smokers. **Results** The response

rate was 88.9%, of whom 46% were males and 54% females. The overall prevalence of smoking was 25.2%. Smoking was more prevalent among male students (36%) than female (14.4%). About 43% of the students had started smoking before entering the university. However, most of the students, who currently smoked, had started after entering the university. Multivariate logistic regression analysis showed some differences between smokers and non-smokers. Non-smokers tended to brush their teeth more often than smokers (OR 9.87, 95% CI 2.85-43.27); they spent more time brushing their teeth than smokers (OR 11.84, 95% CI 1.99-65.07); were more concerned about having bad breath (OR 43.34, 95% CI 3.88-62.74) and were more concerned about the colour of their gums (OR 9.04, 95% CI 2.55-42.55). Some 58% of students stated that they wanted to learn how to conduct smoking cessation programmes for patients. Students who smoked showed positive attitudes towards dentists' smoking behaviours and had passive attitudes towards smoking cessation programmes conducted by dentists. **Conclusions** It is necessary to introduce smoking cessation programmes in Romanian Dental Faculties and to provide lectures on tobacco and health issues as well as practical training programmes about giving up smoking in the dental curriculum. **Acknowledgements** This study was supported by Romanian National Centre for Scientific Research.

#### 25. Dental students' smoking and drinking habits in Tanzania

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**Aims** Dentists can play a critical role in smoking cessation. The present study was the first survey in Tanzania aiming to assess smoking and drinking habits, and attitudes towards smoking cessation counseling (SCC) among dental students. **Methods** A 28-item self-administered questionnaire was given to 149 dental students enrolled at the end of academic year 2006-07. It was responded to by 109 students (73%); 64% were 25 years or older and 76% were male. The questionnaire covered socio-demographics, smoking and drinking habits,

knowledge concerning health effects and attitudes towards SCC. Gender, age and study year served as background data. **Results** Smoking was reported by 17% of males and none of females. Alcohol consumption during the previous 30 days was reported by 29% males and 12% females. This was more common during the clinical years (48%) than among the basic science students (13%) ( $p < 0.001$ ). No females reported binge drinking, whereas it was reported significantly more often by the smokers (43%) compared to the non-current smokers (7%) ( $p < 0.001$ ). Smokers reported significantly more often that they had received enough information about methods of SCC (50%) compared to non-current smokers (8%) ( $p < 0.001$ ). Most students (86%) considered that dentists and physicians should participate in SCC. **Conclusion** In this study, Tanzanian dental students reported less smoking and alcohol consumption than dental students internationally. The majority of Tanzanian dental students expressed willingness and the need for SCC training to facilitate the opportunity for further development of these skills. This should be taken into consideration in dental curriculum development worldwide.

## 26. Oral hygiene and periodontal conditions in the rural population of the Gamba

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In the Republic of the Gambia, an ongoing longitudinal primary oral health care training and treatment programme is approved by governmental authorities. Atraumatic Restorative Treatment of caries lesions has been the focus of primary health care in some developing countries such as in the Republic of the Gambia, where it commenced in 1995. The planning of prevention and treatment of oral disease can be informed by an assessment of epidemiological data. **Aim** As a result, the aim of this pilot study was to document oral hygiene and the periodontal treatment needs of a rural population served by Community Oral Health Workers. **Methods** 208 subjects between 13 and 70 years of age were examined for plaque, gingivitis and periodontitis using the following indices: OHI, GI, ESI, CPITN, GPM/T. Parallel to full mouth recording, all subjects were interviewed in order to obtain demographic and oral hygiene data. Statistical analysis was performed using Wilcoxon-

rank-sum-test and Kruskal-Wallis-test. **Results** Gingivitis was not correlated to oral hygiene behaviour using miswak, tooth brush or both. Periodontal disease progression was associated with age. The ESI in young adults was 66% (extend), mean attachment loss for the study population was 3.5mm. The ESI was 93% in 55+ yr old subjects with a mean attachment loss of 4.7mm. The number of teeth with gingivitis (G), periodontitis teeth (P1-3) and missing teeth according to GPM/T index for young adults was G5P112M3/T and for adults 35-54 yrs old G6P1-215M5/T, indicating predominantly shallow pocketing even in older subjects. According to the CPITN only 14.4% needed complex care. **Conclusions** In general, in spite of attachment loss, most of those examined had shallow pockets and Their treatment needs were for basic periodontal treatment which could be executed mainly by trained Community Oral Health Workers.

## 27. Oral health in patients needing haemodialysis in southern lower saxony

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**Aim** This study aimed at evaluating the oral health profile and condition of teeth in patients undergoing ambulant haemodialysis. **Method** 129 patients from 2 dialysis centres in Southern Lower Saxony were asked to enter the evaluation, 54 (42%) of them volunteered to participate. After taking their respective medical history the patients filled in a questionnaire covering their visits to a dentist, interdental hygiene, bleeding, and smoking. The patients were then examined and DMF-T recorded along with other clinical findings according WHO-guidelines. Their degree of gingival inflammation was visually determined (score 0 – 3) with the non-invasive periodontal disease index according to Ramfjord (PDI). The study was reviewed and approved by the Ethics Committee of the University of Goettingen. **Results** A total of 54 patients participated in the evaluation (23 female, and 31 male), aged between 32 and 86 years (Ø 65 years). The majority of patients (n=36) was between 61 and 80 years old, 12 of them were restored with full dentures. For most patients, dialysis treatment had been given for between 1 and 4

years. In 30% of the patients, a glomerulonephritis was the cause of terminal kidney failure, in 22% it was caused by diabetic nephropathy. **Questionnaire:** 29 patients (54%) stated that their last visit to a dentist dated back no longer than 6 months. More than half of the patients had visited the dentist because of pain (n=34/63%). In 46 cases (85%) the dentist was informed of the patient undergoing dialysis, 38 patients (70%) were treated in their dialysis-free intervals. 9 (21%) of the 42 patients with natural dentition answered that they performed interdental hygiene at regular intervals. 8 patients (19%) detected increased bleeding when brushing their teeth. 9 of the patients (17%) were smokers, 45 were non-smokers (16 of which were former smokers). **Oral findings:** 12 dialysis patients (22%) were edentulous; 42 patients (78%) had a natural dentition. The mean DMF-T of the 42 patients with natural dentition was 20.4±5.5 (DT: 1.6; FT: 7.7; MT: 13.0). The differences between MT, DT, and FT were significant ( $p<0.01$ ). The average degree of gingival inflammation was 1, mild to moderate gingivitis. **Conclusion** The dialysis patients utilisation of dental treatment was predominantly pain-related. In most cases, the appointments met the requirements of dialysis therapy. The patients examined in this study showed a high degree of missing teeth and a good degree of restorative rehabilitation. The visual evaluation of the gingiva indicated only minor periodontal problems.

## 28. Oral Healthcare and Support in Care Homes for Older People in Scotland

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**Aim** To describe the reported oral healthcare and support provided in care homes for older people in Scotland. **Methods** A cross-sectional descriptive study was undertaken utilizing postal questionnaires as the method of data collection. A list detailing all care homes registered as providing care to older people in Scotland was obtained from the Scottish Care Commission (n=969). The study population was stratified by Scottish NHS Health Board areas. For the purposes of the study sample, 33% of care homes were selected from each NHS Board area using computer generated randomization. The study sample (n=327) should therefore be representative of care homes throughout Scotland.

In 2007, the questionnaire was sent to the managers of the selected care homes for completion. Ethical approval for the study was granted by the University of Glasgow Medical Faculty Ethics Committee. Three care homes were excluded from the study, one because the questionnaire was returned by Royal Mail and two because the managers contacted the chief investigator to advise that they did not provide care for older people. The response rate to the study was 72% (n=234). The majority of the analysis is descriptive in nature. However, cross tabulations and chi square tests were undertaken as appropriate. **Results** The vast majority of managers (95.7%) reported that their home had a provider of urgent dental care, although many managers raised concerns over the accessibility and responsiveness of the service received. Only half the managers (50.4%) reported that oral assessments of residents were undertaken within one week of a resident's arrival at the care home; of those who reported that such assessments were undertaken (n=118), only 27% of managers reported staff performing such assessments were trained to do so. All care home managers reported that their staff provided oral healthcare assistance to residents if required; however only 42.7% of managers reported that their staff received any training in this area. Care homes which reported employing registered nurses were more likely to report provision of oral health assessments ( $p<0.001$ ) and provision of staff training in oral healthcare ( $p<0.01$ ). Care home managers were also less likely to rate oral health as a high priority, compared to other healthcare areas. **Conclusion** The results of this study show that, in a large proportion of care homes for older people in Scotland, the oral healthcare and support provided falls below that of currently published UK guidance specific to the oral health of older people in care homes.

## 29. Oral lichen planus among adults from Rome (Italy)

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**Aim** Oral lichen planus (OLP) is a T cell-mediated autoimmune disease. Although it is allegedly associated with several conditions, such as hepatitis C, its cause is unknown, as well as its supposedly high malignant transformation rate. This study was aimed at investigating OLP prevalence and the factors associated to this condition. **Methods** A sample



of 200 adults aged 40 years or greater was selected consecutively among subjects undergoing a preliminary medical check up in a spa located in the province of Rome (Fiuggi). With a pre-estimated OLP prevalence of 0.5%, a highest acceptable error of 1%, significance and power levels of 95% and 80%, respectively, the sample size was set at n=162. Typical OLP forms (bilateral and multifocal, reticular and erosive forms, not confirmed histologically) were diagnosed clinically by an intra-observer calibrated examiner (Dice's coincidence index for healthy patients and for OLP patients, 96% and 80%, respectively). Mini Nutritional Assessment (MNA<sup>®</sup>, Nestlè Nutrition Services) and Body Mass Index (BMI) were used to investigate the nutritional status and a questionnaire was administered to patients, who gave their informed consent (participation rate 93%). Ethical approval was provided by the head of the medical district of the spa. OLP point prevalence and 95% confidence interval (95CI) were estimated. Adjusted Odds Ratios (OR) were calculated using various stepwise multiple logistic regression models with backward elimination procedure. **Results** Mean patient age was 67.7±9.3 years, with 58.3% females and 41.7% males. OLP prevalence estimates were 4.3% (95CI, 1.4-7.2% overall), 7.7% (95CI, 0.4-15.0%, aged 40-65 years), 3.0% (95CI, 0.1-5.8%, aged >65 years), 5.1% (95CI, 0.2-10.1%, males), 3.7% (95CI, 0.1-7.2%, females). Variables such as gender, educational and occupational levels, residential area, other systemic and oral conditions, smoking, alcohol drinking, dietary habits (remarkably, vitamin and antioxidant sources) and BMI were excluded from the best fitting regression model (Likelihood Ratio  $\chi^2_{3df}=10.4$ ;  $p=0.01$ ;  $R^2=0.16$ ), which included older age, i.e., over 65 years (OR=0.3; 95CI, 0.1-1.3;  $p=0.09$ ), living with other housemates (OR=0.2; 95CI, 0.1-1.1;  $p=0.06$ ) and, principally, risk for malnutrition (OR=13.6; 95CI, 1.7-107.8;  $p=0.01$ ). **Conclusions** Although presumptively diagnosed, OLP in the present sample was ten times higher than expected, thus stressing the need for further studies on larger samples. Although OLP predisposing factors are mostly unknown, the non univocally reported associations with conditions such as hepatitis C, diabetes mellitus and stress, suggest the hypothetical involvement of states which alter or depress immunity. In this context, malnutrition and, eventually, living alone, also could promote an immunodepressive state. Alternatively, OLP, as well as malnutrition and,

possibly, living alone could be symptoms of a depressive state, thus suggesting that the association between OLP and the present statistically significant risk factors could be spurious.

### 30. Dental health determinants among 35-year-olds in Oslo

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**Aim** The aim of the present study was to identify determinants associated with the number of sound teeth (ST) and the presence of decayed surfaces (DS) among 35-year-old Oslo citizens. **Methods** Randomly selected participants (n=149, response rate 64%) completed a self-administered questionnaire and were examined clinically and radiographically by the calibrated examiners. The number of sound untreated teeth and the presence of two or more dentine carious lesions (D<sub>3</sub>S=2) were selected as the dependent variables. The dental health determinants were assessed by linear (ST) and logistic (D<sub>3</sub>S=2) regression analyses taking into account the hierarchical relationships between the independent variables. **Results** On average 35-year-olds had 17.1 (SD=5.6) ST. Half of the participants had no DS and 26% had D<sub>3</sub>S=2. Non-western country of birth, being single and having a university education were significantly associated with higher numbers of ST as well as low plaque level, high calculus scores and high salivary buffer capacity. Low family income, being a present or former smoker, irregular dental visits together with high plaque scores and lactobacilli counts and low mutans streptococci counts were significantly associated with dentine caries. **Conclusions** The results of the present study indicate the importance of different determinants for health and disease in this adult population.

### 31. Prevalence of Periapical Osteitis in a Roumanian Population

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**Aim** The purpose of this study was to audit the type of treatment received by patients who attended an

Oral Surgery clinic over a 5 years period. Success and failure rates in Endodontic Surgery and their causes were also assessed. **Materials and methods** The records and radiographs of a total of 2 820 patients, who attended an Oral Surgery Clinic over a five year period, were assessed to determine exactly what treatment they had received and the reasons why they had received oral surgical procedures. **Results** It was found that 82% of the patients had been referred for endodontic surgery (apical resection, apical curettage, radicular amputation). Of these patients, 68% who had root resections had not previously undergone any dental treatment before. The other 32% had received coronal restorations and/or endodontic treatment. A large number (25%) of those who had had root resections had faulty root obturations (under-obturated or over-obturated). Six percent of the teeth that were assessed had faulty coronal restorations leading to severe osteitis. Overall, there were no massive post-operational complications that required hospitalization. Three percent of the teeth of patients who had undergone surgical procedures required these teeth extracting in the next five years. Root fracture accounted for 25% of treatment failures, patient neglect leading to gross caries for 58% and periodontal breakdown for 12%. **Conclusions** In this audit, 82% of the patients required surgery after endodontic treatment. Inadequate endodontic treatment led to an increase in the number of patients with lesions that required surgical procedures. These findings suggest that there is a need to improve the availability of oral hygiene advice to patients and better endodontic training for dentists to reduce the morbidity of apical lesions.

### 32. Musculoskeletal job induced pain in dentists in North IRAN

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**Aim** was to determine musculoskeletal work related pain among the dentists in Rasht, North Iran. **Methods** In 2006, all dentists (n=159) who worked in public or private dental offices in Rasht received a questionnaire on the topic of musculoskeletal work related pain. The first part of the questionnaire consisted of self administered questions about their demographics and job satisfaction. The sec-

ond part was the Nordic standard questionnaire for determining the site of pain and the pain symptoms measured by visual analog scale (VAS). The last part dealt specifically with participants' experiences during their work and was the standard Rula questionnaire. All the resulting data were assessed by SPSS V13 and analysed by chi-square test, Fishers Exact test and logistic regression. **Results** The response rate was 58% (n=92), 59% were males and 33% females. Of the responding dentists 74% had musculoskeletal pain. The most common site was neck (43%), and followed by upper and lower back (35-8%), shoulder and wrist (25%) ( $p<0.001$ ). The mean score of severe pain symptoms was 5.75 by visual analog scale. The pain increased according to the increasing age; 1.29 times per year in the logistic regression analysis. The chance of experiencing musculoskeletal pain by the dentists was 0.73 time per year, but there was no significant relationship between the genders. There was a significant relationship between the musculoskeletal pain and the job environment satisfaction, OR=26.65 **Conclusion** Dental professionals commonly experience musculoskeletal pain during their careers and it seemed to increase with their length of service. **Acknowledgement** This study was supported by Guilan Vice-Chancellor for Research.

### 33. Rewarding aspects of the work as a general dental practitioner

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The psychosocial work environment in dentistry is well documented as demanding, but less is known of what makes dentists stay engaged. **Aim** The aim of this study was to explore the rewarding aspects of the work as general dental practitioner. **Methods** A qualitative approach was used to ensure a deeper understanding of the subject, as perceived by dentists working in the field. In 2007-2008, six Danish and Swedish general dental practitioners, were selected step by step to obtain maximal variation of respondents as to country of origin, gender, age and clinical work experience. They were then given semi-structured, in-depth interviews in their mother tongues based on Kvale's principles. The interviews were audio-recorded and later transcribed

verbatim in the original language by the interviewers. Statements covering rewarding aspects of dentistry were used for systematic text condensation, according to the principles of Giorgi's phenomenological analysis, modified by Malterud following 4 steps: (1) reading all the material to obtain an overall impression, and bracketing preconceptions; (2) identifying units of meaning representing different rewarding aspects of good work, and coding for these aspects; (3) condensing and abstracting the meaning within each of the coded groups; and (4) summarizing the contents of each code group to generalize descriptions and concepts reflecting aspects of good work. The study was approved by The Regional Ethical Review Board in Lund, Sweden **Results** The first overall impression of data was that the rewarding aspects of the work as a dentist emerged directly from clinical encounters; from the relation with the patient and the opportunity for performing a high quality odontological handicraft. Next, the dentists described some basic conditions as their relations to workmates, peers and managers as well as how organisational values and conditions influenced the opportunities for achieving the perceived rewarding aspects from clinical encounters. **Conclusion** The results comprising the moral aspects as essential to work as a dentist confirm Hasenfelds' theory of Human Service Organizations. This implies a need for developing work environmental models with internal as well as external rewards when dealing with human service organizations. **Acknowledgements** The authors wish to acknowledge the Swedish Council for working life and social research for financial support.

#### 34. Relationships between clinical indices and self-reported oral health in 12-year-old children

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Oral health status measurement needs both an objective and a subjective evaluation. **Aim** The aim of this study was to assess the relationships

between three commonly used clinical oral health indices and self-reported oral health and the impact on the quality of life of 12 year-old children. **Methods** This cross-sectional study was carried out on representative randomly selected samples of 12 year-old children (n =259) from Constanta District, in 2007 (the sampling error was 0.07). Ethical approval for the study was obtained from the relevant authority. The oral health examination was performed by calibrated examiners in the schools' dental offices, using the instruments and criteria recommended by W.H.O (1997) for registration of the DMFT Index, the Dental Health Component of the Index of Orthodontic Treatment Need (DHC-IOTN) and the Community Periodontal Index (CPI). A questionnaire was designed in order to obtain information on self-reported oral health and its impact on the subject's quality of life. It included seven items categorized in three dimensions. These were: self-reported oral disease symptoms and treatment needs (items A and B), self-perceived oral well-being (items C and D) and social and physical functioning (items E, F, G). The questionnaires were completed at school. Data were analyzed using SPSS version 12.0. Cross-tabulation and the chi-square test were used to assess bi-variate relationships. **Results** The response rate was 100%. The mean DMFT was 3.31 ( $\pm 3.04$ ). One hundred and fifty (57.9%) of the children had a low DMFT (0 - 3), 86 (33.2%) had a medium DMFT (4 - 7) and 23 (8.9%) had a high DMFT (over 8). The DHC-IOTN grades were: no treatment need 154 (59.5%) of the children, borderline need 85 (32.8%) and great need for orthodontic treatment 20 (7.7%). The CPI scores were 0 for 209 (80.7%) of the children and 1 for the remaining 50 (19.3%). The gender differences for the clinical indices were not significant ( $p > 0.05$ ). The analysis of the relationships between the clinical indexes and the subjective variables (questionnaire's items) showed the following: DMFT category was associated with items B ( $p < 0.05$ ) and G ( $p < 0.01$ ), DHC-IOTN was associated with items C and E ( $p < 0.05$ ) and F and G ( $p < 0.01$ ). CPI was associated with items E and F ( $p < 0.05$ ). The gender distribution of the answers was different only for items D and E ( $p < 0.05$ ). **Conclusion** The results of this study showed that, from the three oral conditions objectively assessed, DHC-IOTN was most frequently associated with negative impacts on the sub-

jects' quality of life, the most affected dimensions were social and physical function.

### 35. Caries prevalence in patients attending for dental treatment at the dental school Cluj-Napoca

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**Aim(s)** The aim of this study was to evaluate the DMF-T index in 2007 in a sample of patients in Cluj-Napoca, Romania. The DMFT index changes over the years according to education on oral health care provided for the population, according to each generations susceptibility to oro-dental diseases and on access to professional dental care. The National Health Insurance insures adults only for dental emergencies and children under 18 years old receive 100% coverage. In spite of this, at present, dental examinations for children are not carried at regular intervals. Furthermore, in Cluj-Napoca there have been no attempts to introduce systemic or locally delivered fluoridation for the children. However, topical fluorides have sporadically been given to the children, when they present to the dental offices.

**Methods** The study was performed in the dental office of the dental school of the University of Medicine and Pharmacy in Cluj-Napoca, Romania. There were two examiners who performed the examinations after obtaining consent from the patients. The DMFT index was calculated on 28 teeth, excluding 18, 28, 38 and 48 and separately for 16,26,36,46. For each patient the number of teeth with carious lesions (incipient caries not included) - D, the number of teeth that had been extracted- M and the number of teeth with fillings or crowns -F were recorded. Caries was diagnosed at the cavitation level (WHO 1987). The study included 175 randomly selected patients aged 10 to 77, divided into six age groups with similar gender distribution. The DMFT was calculated (SAS data base) and descriptive and complex statistical analyses were made (Tukeys student range test; *p* value: 5%). **Results** In all age groups the DMFT index was significantly higher than recommended by WHO. DMFT for the 10-19 age group was 5.5, for 40-49 it was 17.1, for

50-59 it was 18.6 and for 60-79 it was 21.2. The DMFT for the 20-29 age group (DMFT = 5.5) and the 30-39 age group (DMFT =12.4) were nearer to the WHO recommendations than was the case for the other age groups. **Conclusions** The DMFT scores that were found in our study were worse than the current WHO recommendations for all age groups for 2007 in a statistically significant manner but less so for the 20 – 29 and 30 – 39 age groups. Suitable preventive programmes are necessary.

### 36. Testing Two School-Based Approaches for Promoting Pre-adolescents' Oral Hygiene

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**Aim** The study compared the effectiveness of two school-based oral health interventions on oral hygiene of pre-adolescents. **Methods** A randomised, examiner-blinded community methodology was used during a three-month trial in a random sample of schools (n=12) in Tehran, Iran, in 2005. A total of 346 (with 8 drop-outs) third-grade schoolchildren were recruited. The schools were randomly assigned to intervention and control groups, each group comprising four schools: intervention via class (IC) at school, intervention via parents (IP) at home, and the controls. Children in IC (n=110) solved a set of puzzles containing oral health messages under the supervision of their health teacher. In IP (n=112), parents received an oral health education leaflet and a brushing diary to supervise their child's tooth-brushing. The control group (n=116) received no intervention. The effect of the intervention was assessed as changes in the dental plaque and in the gingival bleeding. An improvement of gingival health was recorded when all teeth with bleeding at baseline became healthy. Improvement in oral hygiene was recorded when 50% or more of teeth with plaque at baseline were assessed as clean. Ethical approval was obtained. Statistical analysis included t-test, Number Needed to Treat (NNT) and logistic regression. **Results** All children had plaque and bleeding on at least one index tooth at baseline. After the trial, only IP showed any significant difference (*p*<0.001) compared to the control group as to clean teeth. The possibility of having clean teeth was 6.1 times as great (CI: 2.9-12.8) among children in IP, with an

NNT of 3. Children in both IC (NNT=11) and IP (NNT=2) more frequently demonstrated healthy gingiva than did the control group ( $p<0.001$ ). In the logistic regression models, only IP (OR=11.8; CI: 5.7-24.8) showed a significant intervention effect on healthy gingiva. **Conclusion** Only the school-based oral health intervention involving parents showed a significant improvement in the oral hygiene of preadolescents with low-level oral hygiene.

### **37. Childsmile: National Oral Health Demonstration Programme for Scotland – why it is needed!**

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Childsmile, a national oral health demonstration programme in Scotland, has been developed to improve child oral health in Scotland. Its aim is to shift the balance of care towards a more preventive and anticipatory approach and to target early years through reorienting dental services and health promotion activities in communities, nurseries and schools. An action research approach to the evaluation of the programme has been adopted – which includes both process and outcome measures. This survey provides baseline NHS health needs assessment information against which future outcomes will be assessed. Aims To describe the baseline oral health status of a representative sample of 3-year olds in the Greater Glasgow and Clyde NHS Board (NHS GGC) area. Methods Following British

Association for the Study of Community Dentistry (BASCD) guidelines a stratified random sample of 3-year-olds attending local authority and partnership nurseries was drawn. The survey was undertaken by trained and calibrated dentists in accordance with the protocol of the statutory National Dental Inspection Programme (NDIP) series of epidemiological surveys. Dental inspections were undertaken in nurseries in 12 administrative areas within NHS GGC. The initial sample comprised of 2,860 children; of these, 2009 children completed the inspection. Full socio-demographic data were available from 1890 children, which included the assignment by child postcode of residence to one of seven Deprivation Categories (DepCat) – a measure of the socio-economic status of the area of residence. These categories range from DepCat 1 indicating the least deprived areas to DepCat 7 representing the most deprived areas. Results The overall prevalence of ‘no obvious signs of decay experience’ was 73.7% - however, this ranged from 63.6% in DepCat 7 to 89.2% in DepCat 1. In addition, the mean dmft (caries into dentine) overall was 1.1, ranging from 1.8 in DepCat 7 to 0.2 in DepCat 1. When only those children with ‘signs of obvious decay experience’ are considered, the mean overall dmft was 4.1, ranging from 4.9 in DepCat 7 to 1.9 in DepCat 1 communities. Conclusions These data provide evidence of the need to improve oral health and of the importance of the underlying socioeconomically determined inequalities in oral health for children as young as 3-years. The Childsmile programme has been developed to tackle these major challenges across the whole of Scotland.