

Abstracts to be Presented During the European Association of Dental Public health (EADPH) Meeting in Constanta, Romania, on 10 and 11 September 2010

The following abstracts will be presented in sessions on 10 and 11 September during the EADPH congress. They have been grouped under the headings: oral epidemiology, oral health promotion, oral health services research, oral-health-related quality of life, and other topics and communications of interest to dental/oral public health.

ORAL EPIDEMIOLOGY SESSION 1

CHANGING PREVALENCE OF EARLY CHILDHOOD CARIES IN CZECH FIVE-YEAR-OLDS (1998-2008)

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Aims: To compare the prevalence of the early childhood caries (ECC) in the population of 5 year-olds in two nation-wide surveys conducted in 1998 and 2008. **Methods:** Dental examinations were conducted according to the World Health Organization caries assessment criteria (1997). After ethical committee approval and informed parental consent d3mft, d3t, significant caries (SiC) and ri (means and SD) were calculated. The caries involvement (d, m, f) of upper deciduous incisors higher than that of upper deciduous molars in children with all upper deciduous teeth present was taken as the putative epidemiological criterion for ECC (Lencova *et al.*, 2002). The data were statistically tested using Student *t*-test and χ^2 tests. Statistical significance was set at the $P < 0.05$ level. **Results:** Altogether 435 children were examined in 1998 and following basic characteristics were found: caries free=26.7%, d3mft=3.68, SD=2.33, d3t=2.51, SiC=7.71 and ri 25.3%. The survey in 2008 (n=905) revealed that 37.4% were caries free, mean d3mft was 1.96; SD 1.88, mean d3t 0.66, SiC 5.62 and ri 33.8%—a statistically significant improvement in all calculated parameters of dental status. In 1998, 94 of children examined (21.6%) came under suggested criteria for ECC, 4.1% with

one incisor involved, 8.3% with two incisors, 4.4% with three incisors and 4.8% with all upper incisors involved (mean d3mft=5.17, SD=3.87). The respective data in 2008 were 18.0% (n=163) of ECC children, 2.2% with one, 4.4% with two, 2.7% with three, and 8.7% with all upper incisors decayed (mean d3mft=4.39; SD=3.34). **Conclusions:** The significant decrease of the prevalence of ECC was found between 1998 and 2008 with the non-significant change of the d3mft means in ECC cohorts of five-year-old children. In both surveys (1998, 2008), 48.5% of children meeting the above ECC criteria have fallen into the SIC (one third with highest caries experience) cohorts.

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SEVERE EARLY CHILDHOOD CARIES IN CHILDREN ATTENDING A PRIVATE DENTAL CLINIC IN BUCHAREST

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Due to its relatively high frequency, as well as its local and general consequences, severe early childhood caries (S-ECC) still represents a public health issue. **Aim:** To evaluate the prevalence and severity of S-ECC in a group of children seeking various dental treatments in a private dental clinic in Bucharest, Romania. **Methods:** A retrospective study using dental records of children examined and treated in a private dental clinic between 2003 and 2007 was performed. Children aged 71 months or younger were selected. The study group consisted of 233 children (124 boys) aged 36 to 71 months (mean age 48.84 ± 16.79 months). One child was edentulous. The prevalence index for S-ECC (IpS-ECC) and carious experience indexes (dmft/dmfs and SiC) were calculated for the whole group and separately for boys and girls. The location and severity of carious lesions were recorded. Data were analysed using chi-square test. **Results:** Sixty-eight children (29.2%) were caries free. The preva-

lence of ECC was 38.19% (40.32% for boys and 35.21 for girls). Mean dmft=8.54±3.82 (boys: 8.44±3.73; girls: 8.67±3.98) (dt=8.20±3.85). Mean dmfs=18.43±11.96 (boys: 19.06±13.35; girls: 17.62±10.01) (ds=17.34±12.09), SiC=13.00. Seventy-two per cent of the S-ECC children that sought treatment were older than three years showing little parental concern on the matter during early stages of caries. Seventeen of the 89 S-ECC children (19.10%) had caries even on their lower incisors. Sixty-four of the S-ECC children (71.92%) already had pulp involvement, which was the reason for seeking treatment. **Conclusions:** S-ECC prevalence index was high, with high caries experience indexes, mainly given by the “d” component. Preventive programmes are still needed in order to improve parents’ knowledge of proper care for primary teeth, to raise awareness regarding the need for early treatment of this caries and to encourage the first dental visit before occurrence of pain.

PARENTAL KNOWLEDGE OF FACTORS INFLUENCING THE ORAL HEALTH OF RUSSIAN PRESCHOOL CHILDREN

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Aim: To describe parents’ views on the oral health of preschool children in Mirny, North West Russia.

Methods: A cross-sectional study was conducted in four (out of eight) randomly selected kindergartens. A self-administered 22-item questionnaire was distributed among 200 parents of preschool children attending these kindergartens in May 2009. The questionnaire covered parental knowledge and attitudes towards oral health of young children, views about their own health, and demographic information. Ethical approval was obtained from the Ethical Committee of the Northern State Medical University. **Results:** Altogether, 177 parents returned the questionnaire a response rate of 88.5%. Most respondents were aged between 25 and 34 years (67.2%) and were female (85.3%). The majority (67.2%) of respondents had education higher than secondary school level. Nearly all (89.8%) noted that the teeth of young children should be brushed twice a day, with (63.3%) choos-

ing a small brush. Most (62.7%) considered the appropriate position of supervised toothbrushing of children’s teeth “from the side of the child” to be the most effective method while 10.7% chose “from behind”. Over one fifth did not know, 22% were unsure if their child’s toothpaste contained fluoride and 84.2% did not know how much fluoride it should contain. Over one fifth (21.5%) answered that their child had been given a sweetened baby bottle or comforter at night. More than half of the respondents (54.8%) supposed that a child’s first dental visit should take place once all baby teeth were present whereas 31.6% thought it should be when the first baby tooth had appeared.

Conclusions: In general, the relatively low level of parental knowledge and low awareness of preventive care indicated a need for them to receive accurate information about factors influencing the oral health of preschool children in Mirny, North West Russia.

DENTAL CARIES AMONG HEALTHY AND MENTALLY RETARDED PRESCHOOL CHILDREN IN NORTH WEST RUSSIA

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Aim: To describe the dental caries experience among healthy and mentally retarded preschool children in Arkhangelsk, North West Russia.

Methods: In 2009-2010, 49 children (boys: 67.3%) with mental retardation aged 3-6 years living at a special orphanage and 65 healthy children (boys: 60%) aged six years attending randomly selected kindergartens in Arkhangelsk received a dental examination. Dental caries was recorded as recommended by the World Health Organization 1997 at the D3 level by two calibrated examiners. Caries prevalence is presented with 95% confidence interval (CI) using the Wilson method. Decayed-missing-filled (dmft) scores are presented as mean ± standard error. Pearson’s chi-square tests and Mann-Whitney tests were used for dichotomous and numerical data, respectively. The study was approved by the Ethical Committee of the Northern State Medical University, Arkhangelsk, Russia. Informed consent was obtained from all parents or tutors. **Results:** The mean age of the mentally retarded children was 5.06 years (SD=1.2). Altogether, 73.5% (95% CI 59-83) of the mentally

retarded and 92.3% (95% CI 83-96) of the healthy children had dental caries ($\chi^2=7.457$, $P=0.001$). The corresponding mean dmft values were 3.81 ± 0.6 and 5.33 ± 0.4 ($P=0.008$). Although the mean values for decayed and missing teeth were similar (3.06 ± 0.5 vs. 3.03 ± 0.3 , $P=0.467$ and 0.2 ± 0.08 vs. 0.35 ± 0.1 , $P=0.480$, respectively), there were fewer filled teeth in mentally retarded than in healthy children (0.55 ± 0.1 vs. 1.95 ± 0.2 , $P<0.001$). No gender differences were observed.

Conclusions: Although the small sample size cannot provide a very precise estimate, the findings should raise serious concerns. Dental caries levels among mentally retarded children in Arkhangelsk are lower than among healthy children. It may be attributed to the lower sugar consumption compared to healthy children in families. The lower proportion of filled teeth may reflect poor organisation of dental services for this particular group. The dental caries levels in Russia are still higher than in many European countries and special preventive measures are needed to improve the situation.

ORAL HEALTH LIFE-STYLE AND CARIES EXPERIENCE IN FIRST GRADE SCHOOL-CHILDREN FROM BUCHAREST

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Aim: To evaluate the relationship between the caries experience, socio-economic status and behavioural factors among schoolchildren in Bucharest. **Methods:** A cross-sectional survey was carried out between 2006 and 2008, in Bucharest, on a representative stratified random sample of 510 schoolchildren aged 6-8 years. Consent was gained from parents and school authorities and Ethics approval from the Ethics Committee of the Carol Davila University. The children's caries status was determined by clinical examination performed by two trained calibrated dentists, based on the WHO methodology and criteria (WHO, Oral Health Surveys, 4th Edition, 1997). Information regarding socio-economic status and behavioural factors (eating habits, toothbrushing, dental visits) were collected through a self-administrated questionnaire.

The data were analysed using Pearson correlations and a linear regression analysis was run using DMFS as a dependent variable. **Results:** The mean age of the children was 7.09 (± 0.49) years and the sex distribution was 52.9% female and 47.1% male. The prevalence of dental caries for the deciduous dentition was high: only 28.4% were caries free, defs scores ranged from 0 to 57, with a mean for the whole sample of defs=8.06 (± 8.67); for the permanent dentition, the mean for DMFS was 0.55 (± 1.25). DMFS was significantly associated with past caries experience ($r=0.24$, $P<0.01$), SES ($r=-0.220$, $P<0.01$) uncertain caries surfaces ($r=0.145$, $P<0.01$), cariogenic food consumption ($r=0.254$, $P<0.01$) and toothbrushing frequency ($r=0.171$, $P<0.01$). Linear regression analysis showed a significant and strong association ($P<0.05$) between DMFS and defs ($t=7.986$), and between DMFS and defs on mandibular molars ($t=2.546$). **Conclusions:** The sample of first grade schoolchildren from Bucharest showed a high caries experience, the most relevant factors associated with this high caries prevalence were past caries experience, socio-economic status, eating habits and the frequency of toothbrushing. The implementation of curative and preventive strategies for the deciduous dentition in this age group is strongly recommended.

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FIRST MOLAR'S CARIES PREVALENCE AND ORAL HYGIENE KNOWLEDGE IN CLUJ-NAPOCA

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Aim: To investigate both patient's knowledge and most frequent caries' surface localisation on first molar (M1), for children aged 10-15 years in Cluj-Napoca (Romania), during 2008-2009 and to compare the results with those of a meta-analysis of recent papers. **Methods:** A meta-analysis study of eight papers, published during the last ten years, all with similar evaluation criteria, was performed to identify both the main causes and the caries' localisation on M1's surface, for Eastern European children. Several types of caries, according to their position on tooth surface, were found. Using a stratified sampling

technique, in ten randomly selected Cluj-Napoca dental offices, a retrospective survey was performed on 105 individuals aged 10-15 years. They were asked about the different reasons (orthodontics, prophylaxis, recalls, caries, etc.) for treatment that they had received. Ethics approval and parents' informed consent were obtained. The O'Leary Plaque Control Record Index (PI) was recorded on a survey form together with four items completed by patients regarding socio-demographic data, oral hygiene knowledge, individual dental hygiene habits and recall visits attended/year (on average between the age of six years and their present age). Descriptive and multivariate regression analysis was performed.

Results: Among patients, it was found that 35 (33.3%) had occlusal caries, 30 (28.57%) mesial/distal-occlusal caries, 15 (14.28%) buccal/oral caries and 6 (5.71%) complete crown destruction. Meta-analysis of the ten papers results indicated 30.1%, 21.4%, 10.5% and 2.1% for these variables. Mean PI was 71.2% for patients with more than one decayed surface. There were no differences between genders. Wilcoxon signed rank test showed no significant difference between percentages of caries' causes identified within this study and those obtained from the meta-analysis ($P>0.05$). Multivariate regression analysis showed that only age and PI had an influence on caries localisation, whereas it was independent from the other factors (gender, socio-demographic data). **Conclusions:** More dental hygiene information should be given to teenagers, including motivating patients to attend recall visits on a regular basis. More fluoridation and fissure sealing should be performed.

ASSOCIATION OF DENTAL CARIES WITH EATING HABITS AND SMOKING IN 12-13 YEAR OLDS

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Aim: The aim of this study was to evaluate the influence of smoking and eating habits on caries prevalence in 12-13-year-old children in a high caries risk population. **Methods:** One hundred and eighty-four 12-13-year-old pupils were randomly selected from Gulbene district schools in Latvia. After parental acceptance, 135 (32.8% of 12-13-year-old population in Gulbene district) children were involved in a cross-sectional survey (response rate 73.4%). This research received ethical approval from Riga Stradins University Ethics

Committee. Consent was obtained from patients and their parents. Caries and plaque levels were measured using WHO 1997 examination criteria (DMFT, DMFS, SiC index, Silness-Löe Index) and International Caries Detection and Assessment System (ICDAS) was used to record early stages of enamel caries. Caries risk was reflected in percentages, detected by Cariogram (Malmö University, Sweden). Data were analysed using descriptive statistics. Correlations were analysed using the Pearson Correlation Test, CI=99%, $P<0.01$.

Results: Seventy per cent of children were eating and snacking more than six times per day. Just 23% of pupils were eating a low cariogenic diet (with a low content of fermentable carbohydrates). Thirty-one per cent had a high cariogenic diet. The mean water intake was 1.163 ml per day, 20% were drinking more than 2,000 ml during the daytime. Twelve per cent of children had smoked in the past half a year; there were no daily smokers. Mean DMFT index was 5.36, SiC=10.63, ICDAS1=18.41 surfaces. The sample had a Silness-Löe Index of 1.78 (mean value), indicating visible dental plaque on almost all surfaces. A significant correlation was found between smoking and DMFT ($r=-0.229$, $P=0.008$) and ICDAS1 ($r=-0.266$, $P=0.002$), but the stronger correlation was between diet and DMFT ($r=0.355$, $P=0.000$), ICDAS1 ($r=0.334$, $P=0.000$), Silness-Löe Index ($r=0.392$, $P=0.000$) and caries risk ($r=0.560$, $P=0.000$). **Conclusions:** Targeted caries prevention programmes are necessary to improve dietary and oral hygiene habits, eliminate smoking, and reduce caries prevalence in Gulbene district in Latvia.

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ASSESSING CHILDREN'S TOOTHBRUSHING BEHAVIOUR: QUESTIONING THE CHILDREN OR THEIR PARENTS?

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A tendency exists to report one's behaviour more favourably than it really is; that may lead to interpreting the results of questionnaires with caution. **Aim:** To compare the results of two surveys of children's toothbrushing behaviour reported by themselves and their parents. **Methods:** Multi-stage sampling procedures, from all the public primary

schools, supplied two representative samples of children and their parents living in two big cities in Iran. In Tehran, third-grade schoolchildren ($n=457$) and their parents filled in two self-administered questionnaires on the child's toothbrushing behaviour, in 2005. In Isfahan, parents of the second-grade schoolchildren ($n=908$) were asked to answer to the same questions on their children's toothbrushing behaviour, in 2008. Voluntary clinical examinations based on the WHO 1997 criteria were made for the assessment of dental caries for all the children. Ethical approval was obtained. ANOVA was employed for the statistical analysis of the resulting data. **Results:** In Tehran, 76% of the children reported that they brushed their teeth once daily and more. The agreement of reports between parents and children was high (84%) regarding children's toothbrushing less than once daily, but only 44% of parents agreed that their children brush their teeth at least once daily. In Isfahan, 40% of parents reported that their children brushed their teeth once daily and more. Among the children in Tehran, no association was found between self-reported toothbrushing and dental caries ($P>0.05$), whereas more sound dentitions were found among the children with more favourable toothbrushing behaviour reported by their parents ($P<0.01$). In Isfahan, children with more favourable toothbrushing behaviour had more sound teeth in their primary and permanent dentition ($P<0.0001$). **Conclusion:** Parents could provide more actual information about children's toothbrushing behaviour. This matter should be taken into account when designing oral public surveys.

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DENTAL CARIES EXPERIENCE AND TREATMENT NEED AMONG 6-, 12- AND 18-YEAR OLDS IN ALBANIA

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Aim: To assess the dental caries experience and treatment needs among the age group of 6-, 12- and 18-year olds in Albania. **Methods:** The study was a cross-sectional survey, using the dft, DMFT and SiC indices to measure the dental caries experience. Treatment needs were assessed using the ratio of

d/dft and D/DMFT, representing the prevalence of untreated caries. Ethical approval was obtained from the University of Tirana's Faculty of Medicine's Dental Department. Consent was obtained from the school authorities, parents and children. A cluster sampling technique was used. Schools and classes were selected randomly. The 1,075 participants were from six regions, public schools in both towns and the suburbs, and represented different socio-economic levels, based on the Institute of Statistics of Albania data. Calibration was performed for the 12 examiners, two from each region. The study employed WHO 1997 criteria. A dental examination form was completed for each participant. **Results:** For the 6-year olds, the mean dft=2.9 and SiC=6.4, and the prevalence of caries free was 26%. For the 12-year-olds the mean DMFT=3.1 and SiC=5.8 and the prevalence of caries free was 15%. For the age of 18 year-olds the mean DMFT=5.7 and SiC=9.6 and the prevalence of caries free was 5%. The prevalence without active caries (d or $D=0$) for each age group was around 27% and the prevalence of untreated caries was $d/dft=1$, $D/DMFT=0.59$ (12 year-olds), $D/DMFT=0.33$ (18 year-olds). **Conclusions:** Dental caries experience and untreated dental caries is high. There need work to be done toward treatment and preventive programme for these age groups.

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SOME CHARACTERISTICS OF THE SALIVA MINERAL COMPOSITION AMONG CHILDREN WITH ENDOCRINE PATHOLOGY

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Arkhangelsk region is an area of high endocrine pathology prevalence among children. The changes in mineral composition of saliva due to diabetes mellitus (type 1) and thyroid gland pathology have not been studied previously in North West Russia. **Aim:** To describe some characteristics of the salivary mineral composition among children with diabetes mellitus (type 1) and different thyroid gland pathology. **Methods:** In 2007-2009, values of total calcium, phosphorus, ionised calcium were assessed in 61 randomly selected (from Arkhangelsk' register of

patients with endocrine diseases) children with thyroid pathology (boys- 42.6%) aged 6- 17 years and 74 children with diabetes mellitus (type 1) (boys – 47.3%) aged 4- 17 years. Altogether 135 healthy children from several schools in Arkhangelsk were selected for two control groups (matched-pair method). Analysis was performed with reagents “AVL 9180” (“Snap Pack”) and “Ca AS FS”, “P UV FS” (“Diasys”). Minerals values are presented as median (Me), 25 and 75 percentiles. Groups were compared by Wilcoxon signed-rank test. The study was approved by the Ethics committee of the Northern State Medical University, Arkhangelsk. Informed consent was obtained from all participants.

Results: Total calcium values in saliva were 0.70 (0.55; 1.15) mmol/l vs. 1.68 (1.1; 2.75) mmol/l ($P=0.001$) among children with diabetes mellitus and control group. Children with thyroid gland pathology had 1.06 (0.71; 1.65) mmol/l of total calcium vs. control group 1.56 (0.99; 2.64) mmol/l ($P=0.011$). The total phosphorus value was lower among children with diabetes (mean=1.18 (1.01; 2.54)) than with healthy children (mean=2.67 (2.11; 3.22), $P=0.018$).

Conclusion: Children with diabetes have lower values of total calcium and phosphorus and with thyroid gland pathology – lower values of total calcium in saliva in comparison with healthy children. This may influence the mineralising capacity of saliva. These results could be used in caries prevention programmes for children with endocrine pathology.

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ORAL HEALTH KNOWLEDGE AND BEHAVIOUR AMONG STUDENTS FROM TWO UNIVERSITIES IN BUCHAREST

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Aims: To assess the level of knowledge and behaviour, regarding oral health prophylaxis, attitude and knowledge of students in Bucharest. **Methods:** A cross-sectional study was conducted on 352 students, randomly selected from two universities in Bucharest, in 2009-2010, who answered a self-administered questionnaire regarding their hygiene, dietary and smoking habits, their interaction with the dentist and their knowledge regarding oral

health-related issues. 160 students were from the Faculty of Dental Medicine (FDM) (before studying Preventive Dentistry) and 192 students from the Politechnica University (UPB). The data were analysed using descriptive statistics and chi-square test. **Results:** The mean age of the group was 21.48 years (SD=1.31). The results show that, knowledge of the information related to oral health preventive facts was good overall; 45.5% thought they needed dental treatment but 64% didn't think they needed professional prophylaxis; 35.3% didn't know or think that oral hygiene prevents periodontal disease and 26% didn't know or think smoking affected periodontal health. In terms of attitude, most students had correct hygiene habits but only 35.2% visited a dentist regularly; 79.5% had received treatment for caries and 40.3% endodontic treatment, but only 39.8% had received professional prophylaxis. Fifty-five per cent reported they received oral-health related information from their dentist. The dental students had better knowledge regarding the prevention of periodontal disease and make regular visits to the dental office than the UPB students, the difference being statistically significant ($P<0.05$). **Conclusions:** The results suggest the need to further improve oral health attitudes related to regular visits to dentists, and knowledge, regarding periodontal disease. Dental students were better informed and their attitude was more oral-health prophylaxis oriented than UPB students. The preventive awareness and approach of dentists in Bucharest has to be strengthened.

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ORAL HEALTH ATTITUDES AND BEHAVIOUR BETWEEN DENTAL AND CHEMISTRY STUDENTS IN ROMANIA

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Aim: The aim of this study was to determine the difference in oral health attitudes and behaviour between dental and chemistry students in

Bucharest, Romania. **Methods:** A self-administered questionnaire based on a modified version of the Hiroshima University Dental Behavioural Inventory (HU-DBI) survey was used in this cross-sectional study. The questionnaire contained twenty simple responses (yes-no) regarding oral health attitudes and behaviour items. Students from the third academic year of two faculties, Faculty of Dental Medicine and Faculty of Chemistry were invited to complete the questionnaire in their classrooms, anonymously, during faculty hours. Students had to specify only their gender, age and faculty. The SPSS 17.0 statistical program (SPSS Inc., Chicago IL, USA) was used to process and analyse the data. The significance level (p-value) was set at 0.05. **Results:** From a total 127 dental students, 94 students (74.01%) filled out the questionnaire. Twenty-four students were absent on the day of the survey and nine students chose not to participate. There were 29 (30.9%) male and 64 (68.1%) female students. From a total of 110 chemistry students, 70 students (63.63%) filled out the questionnaire. Twenty-nine students were absent on the day of the survey and 11 students chose not to participate. There were 13 (18.6%) male and 57 (81.4%) female students. The medium age of subjects was 21 years. Eighty-three per cent of dental students brushed regularly twice daily or more. Thirty-seven per cent (18.1% dental and 61.4% chemistry students) reported that they did not go to the dentist unless they had a toothache. Also, only 31.1% (46.8% dental and 10% chemistry students) used dental floss and 39% (52.1% dental and 21.4% chemistry students) used mouthwash on regular basis. **Conclusions:** This study showed both dental and chemistry students still need to improve their attitudes and behaviour toward prevention and personal oral care.

CARIES EXPERIENCE, ORAL HYGIENE AND DIETARY HABITS OF MAGHREBIAN STUDENTS FROM CLUJ-NAPOCA

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Aim: To investigate changes in the diet and oral hygiene habits of students originating from Tunisia and Morocco, after they moved to Romania and to evaluate their caries experience according

International Caries Detection and Assessment System (ICDAS II) in 2009. **Methods:** 195 students were randomly selected from all students of the University of Cluj-Napoca's French Section. We recorded their ICDAS II index (scores 0 to 6) and Plaque Index. On a survey form students filled-in six items regarding socio-demographic data, diet, individual hygiene habits and dental visits in the past (while they lived in their families) and in the present (the last year). Ethics approval and an informed consent of each patient were obtained. Descriptive and multivariate regression analysis was performed.

Results: The mean age of the students was 21.7 years. The sample included 75 women and 120 men. Fifty students (26.15%) smoked 10-20 cigarettes per day and 33 (17%) smoked more than 20 cigarette per day. The diet was fast-food oriented for at least one meal for 148 subjects (75.89%) with more than 70% of the calories coming from glucides, among which half was hidden sugar. The participants, knowledge of toothbrushing was correct for 935 (94.7%), but almost nobody used auxiliary oral hygiene techniques. The mean ICDAS values were 1.8 (SD= $\hat{A}\pm 1.42$) with a DMF-S index of 1.3 (D=1.08 M=0.02 F=0.20). The logistic regression model revealed that the monthly income had a statistically significant influence on oral hygiene behaviour and dietary habits ($P<0.05$). There was a significant correlation between ICDAS index, sugar intake and also hidden sugar intake and the number of years spent abroad. **Conclusions:** Although Tunisian and Moroccans have a good cario-resistance, students should be motivated for a healthy diet, with less hidden sugar and to practise better oral hygiene, once they move abroad.

PREVALENCE AND RISK FACTORS OF DENTAL EROSION IN GREEK ADOLESCENTS

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Aim: The purpose of the present study was to investigate the prevalence of dental erosion in adolescents, using the recently proposed Basic Erosive Wear Examination index (BEWE) and to detect possible dietary, behavioural and biological erosion risk factors. **Methods:** A cross-sectional study was conducted (last trimester of 2009), in which a random and stratified sample of 502 adolescents aged 14-16 years was examined according to the BEWE.

clinical criteria. The sample was drawn from seven schools of the Attica prefecture, Greece. A questionnaire concerning the potential risk factors for erosion was given to the adolescents, 30 minutes before the clinical examination. The Ministry of Education as well as the Ethical Committee of the Athens Dental School gave their approval prior to the start of the study. A parental consent was also required for the children to participate. **Results:** Fifty-eight per cent of the adolescents had at least one tooth with signs of dental erosion. However, severe erosive lesions were relatively uncommon. Univariate analysis (non parametric tests) revealed that the following risk factors were significant for dental erosion's onset: increased consumption of carbonated soft drinks, fruit juice and apple, consumption of erosion drinks immediately after intense physical exercise, regurgitation more than twice daily, long term use of tranquillisers, and socio-economic level. In addition, multivariate analysis (binary logistic regression) indicated that between the aforementioned risk factors the most significant were the increased consumption of carbonated soft drinks and fruit-juice (OR=3.23, CI:1.36-7.63 and OR=1.50, CI:1.00-2.25 respectively) and the low/medium socio-economic level (OR=1.72, CI:1.09-2.71). **Conclusions:** A significant number of Greek adolescents aged 14-16 years had experienced dental erosion as measured with the BEWE and a variety of risk factors were found to be associated with dental erosion. These factors could be mostly attributed to the modern way of life in developed countries. Thus, specific actions should be taken by dental public health policy makers, in order to reduce the prevalence of erosion at younger ages.

ORAL HEALTH PROMOTION SESSION

CARIES PREVENTIVE PROGRAMME FOR CHILDREN WITH HIGH CARIES RISK

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Aim: In the context of a clinical observation study over three years in elementary school students, this study aimed to assess the effectiveness of an intensive prevention programme by taking into account the changes in caries experience of first permanent

molars. **Methods:** Two hundred and eighty-two first graders (mean age 6.2 years) from six primary schools with caries risk classification were involved in this study. The children brushed their teeth under supervision with Elmex Geleé (GABA GmbH, Lorrach, Germany) weekly. Tooth and surface related oral examinations based on the DMF-criteria (WHO 1997) were performed at the beginning of the study and after three years of observation. Statistical analysis was based on the Wilcoxon test at a significance level of 5%. A null hypothesis was that the difference of the caries prevalence between baseline and final examination would not be statistically significant. **Results:** There was a drop out rate of 42% due school changes or illness at the investigation date of 118 children. The results are based on the findings from 164 children who participated and completed the programme and were examined both at baseline and after three years. At the beginning 92.7% of the children had caries free first molars. The caries prevalence was 0.1 for both DMFT and DMFS. After three years 74.4% still had caries free first molars. The mean DMFT-values increased to 0.46 for DMFT and 0.68 for DMFS. This was an increase of 0.36 for DMFT and 0.58 for DMFS. Statistically, the differences in the caries prevalence between baseline and final observation were not significant. **Conclusion:** As the caries incidence was very low the null hypothesis could be confirmed. However in further studies a control group is recommended to verify the effectiveness of fluoride gel.

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URINARY FLUORIDE EXCRETION IN PRESCHOOL CHILDREN: A PILOT STUDY

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Aims: A regular supply of fluoride is the most important public health measure for caries prevention recommended by the World Health Organization (WHO). One of the accepted methods for monitoring fluoride intake is the measurement of urinary fluoride excretion. The aim of this pilot study was to investigate the daily excretion of urinary fluoride (F) of kindergarten children under their customary conditions of fluoride intake to evaluate whether F intake is optimal for caries prevention. **Methods:** The study comprised 40 kinder-

garten children, aged 3-7 years, permanent residents of Targu-Mures, Romania, where the drinking water fluoride concentration is low (<0.2 ppm F). The study was approved by the Research Ethics Committee of the University of Medicine and Pharmacy Targu-Mures. Informed consent was obtained from parents prior to the beginning of the study. This urinary excretion study followed the supervised 16-hour time-controlled urine sampling method recommended by the WHO. The rates of fluoride excretion in two separate eight-hour periods were used to estimate the 24-hour fluoride urinary excretion. The fluoride was analysed using ion-selective fluoride electrode (9609 BN) connected to a fluoride meter (ORION 720A). Data were entered into database for analysis and processing by computer program for statistics. One sample *t* test was used to compare the urinary fluoride data. The null hypothesis was that there is no significant difference between the sample mean and the value 0. **Results:** The estimated daily fluoride urinary excretion mean value (S.D.) of the investigated children was $0.317 (0.209)$ mg F/24h ($P < 0.0001$), which is a consistent value with the upper limit for a low F-intake community, presented in the WHO guidelines (Marthaler, 1999) for this age group. **Conclusions:** The urinary F excretion data appear to indicate that fluoride intake in most of the investigated preschool children (67.5%) was below the optimal recommended level. The findings suggest that before introducing any fluoridation programme it would be necessary to estimate the fluoride exposure of the children by monitoring the daily urinary fluoride excretion.

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INTEGRATION OF DENTAL STUDENTS IN A PREVENTIVE PROGRAMME FOR EARLY CHILDHOOD CARIES

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Early childhood caries (ECC) is the most common infectious disease in childhood and affects children's growth and diminishes their overall quality of life. Against the background that the failure of dentists in general practice to cope with this severe disease in small children, preventive and intervention strategies of ECC were integrated in the dental undergraduate curriculum of dental students at

Jena. **Aims:** To study the integration of dental students, with midwives and paediatricians, into an interdisciplinary preventive programme. **Methods:** The students received lectures about the aetiology, risk factors and effective intervention of ECC including practical toothbrushing training for infants. The students put in to action the content of this educational tool by running training courses for parents in family centres, paediatric clinics and for midwives in private practice. They gave general anticipatory guidance for the mothers/parents and practised toothbrushing with the caregivers and their children. The families were instructed in oral hygiene, tooth friendly diet, use of fluorides and the importance of the first dental visit when the first teeth erupt. A dentist took part as a professional assistant to support and supervise the students. **Results:** After one year a survey among the students and the participating parents revealed positive reactions and good learning outcomes. Twenty-eight parent courses were carried out and 256 families were reached in 2009. Seventy-six per cent of the parents evaluated the course as very good and 22% as good. **Conclusions:** Integration of dental students in preventive programmes of ECC enabled them to implement preventive strategies in their future practice in the partnership with other health care providers for young children.

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THE NATIONAL PREVENTION PROGRAMME IN CONSTANTA: RESULTS BETWEEN 2001-2007

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In order to decrease the caries prevalence in children, in 2001 in Constanta District started the National Programme P.N.I.5, a school-based programme involving weekly mouth rinsing with a fluoridated solution. **Aim:** The aim of the study was to estimate the results after six years of the programme, using the DMFT, DMFS and SiC indices, evaluated in 6- and 12-year-old children before starting and during the programme. **Methods:** The present study analysed the results of three epidemiological cross-sectional surveys, made on randomly selected representative samples of 6- and 12-year-old children from Constanta District in 2001, 2005, and 2007. The three surveys have been con-

ducted using the same protocol, by trained and calibrated examiners. Dental caries were diagnosed at the caries into dentine (D3) threshold and the World Health Organization 1997 criteria were used to produce DMFT (Decayed, Missing, Filled permanent Teeth), DMFS (Decayed, Missing, Filled Surfaces) indices and their components (DT, mean number of decayed teeth; MT, mean number of missing teeth; FT, mean number of filled teeth; DS, mean number of decayed surfaces; FS, mean number of filled surfaces) and SiC (Significant Caries) Index, which were statistically analysed (SPSS version 12; [SPSS Inc, Chicago IL, USA] and *t*-test). **Results:** In the 6-year-olds, between 2001 and 2007 the caries indices showed a significant increase for all the caries indices ($P<0.05$). For 12-year-olds, the study showed a constant and significant decrease in DMFT, DMFS, SiC, DT and DS ($P<0.05$) and a significant increase in FT and FS ($P<0.05$) between 2001 and 2007. **Conclusions:** In the absence of any preventive programme for the preschool children, their dental health status has worsened between 2001 and 2007. In contrast over the six years of P.N.I.5 there was a significant improvement in the dental health of the 12-year-old children.

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THE NATIONAL DENTAL PREVENTION PROGRAMME: THE EXPERIENCE IN IASI

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Aim: The study evaluated the changes in children's oral health after the implementation of the National Prevention Programme in Iasi. **Methods:** The study was longitudinal (cohort study) and took place between 2003 and 2008. Its sample was representative, randomly selected, using the probabilistic method, and included 639 children aged 6-12 years. No control group was used and drop-outs were excluded. Informed consent was gained from participants and parents. The Programme consisted of weekly fluoride mouthrinses, dental sealants and simple treatment of caries with fillings. Oral health status was assessed using the DMFS, DMFT indices and their components (DS, MS, FS) in permanent teeth. All the examiners were previously calibrated according to the WHO 1997 methodology. Data were statistically analysed with the SPSS 10.0 program and compared with chi-square and *t*-

pairs tests. **Results:** Caries prevalence decreased in all age groups, except in the last year when it increased slightly. In 12-year-olds caries prevalence was 75.6% in 2003, 68.4% in 2007 and 69.3% in 2008. DMFS and DMFT indices increased with age group but decreased constantly during the study in all age groups. The lowest values were found in 2007, when the DMFS index was 0.16 in 6-year-olds and 3.76 in 12-year-olds, and the DMFT index was 0.16 and 2.24, respectively. DS and MS indicators decreased, whereas FS indicator increased over time; the differences between its lowest values (in 2003) and its highest ones (in 2007) were statistically significant in children aged 8-12 years ($P<0.05$). Sealants prevalence in first permanent molars increased with age group and study progression ($P<0.05$). **Conclusion:** In the children studied, longitudinal analysis of dental indicators in schoolchildren in Iasi shows the decline of dental caries in all age groups and the trend of oral health status improvement following the implementation of the National Dental Prevention Programme.

ORAL HEALTH STATUS OF 7- AND 12-YEAR-OLD CHILDREN INVOLVED IN A PREVENTIVE PROGRAMME IN THE SLOVAK REPUBLIC

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Aim: To compare the impact of the preventive programme "Healthy Smile" among 7- and 12-year-old children over a period of 11 years as compared to a control group not participating in the preventive programme. **Methods:** Epidemiological examinations were performed in the years 1998, 2001, 2003, and 2009. School children aged 6 years to 12 years participating in the "Healthy Smile" project were asked to contact the dental care assistant six times within the course of one school year. Within each session (about 45 minutes), oral hygiene instructions and the use of Elmex® gel were provided to the children. To evaluate the efficiency of the project, children from a nearby city who were not involved in the prevention programme were examined as a control group. The caries level was assessed according to WHO 1997 criteria on the basis of the DMFT/dmft index for permanent teeth and the dmft index for deciduous teeth. Examinations for test and control groups were made by experienced dental practitioners within a

one to two week period. Caries levels were assessed using DMFT for 150 7-year-old children and 256 12-year-old children. Deciduous dentition on the basis of the dmft index was assessed in 150 7-year-old children. The Mann-Whitney test (tables containing average values) and chi-square test (tables containing the percentage evaluation) were used to determine statistical significance.

Results: The DMFT index of the 12-year-old children recorded between 1998 and 2009 decreased from 5.24 to 1.14 in the test group and from 4.65 to 3.21 in the control group. The difference in the decrease in the index between groups was statistically significant ($P < 0.01$). Between 1998 and 2009, the DMFT index of the 7-year-old children decreased from 1.35 to 0.18 for the test group and increased from 1.82 to 2.32 in the control group. Again, the difference in the DMFT index was statistically significant ($P < 0.001$). The mean dmft change between 1998 and 2009 was only significant for the test group [5.91 to 4.55, ($P < 0.001$)].

Conclusion: The results of this study indicate the success of the prevention project "Healthy Smile". A strong improvement in caries levels was observed within the tested group compared to the controls group. A higher quality of oral hygiene was achieved by providing regular oral hygiene instructions and intensive fluoridation six times per year.

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CARIES PREVENTION BY USE OF FLUORIDE VARNISHES IN PRIMARY SCHOOLCHILDREN

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Aim: The aim of this four-year follow up study was to evaluate the caries preventive effect of fluoride varnish Bifluorid12 (VOCO GmbH, Cuxhaven, Germany) and its components on permanent molars. **Methods:** After a baseline examination according to D3-4MFT/D3-4MFS and d3-4mft, 512 first graders (mean age 6.24 years) from primary schools in Minsk, Belorussia were randomly divided into three test groups (A, B, C) and a control group (D). Each group was then divided into three sub-groups (U) depending on their existing level of caries in primary molars (d3-4mft). Sub-group U3 received one third of children with the

highest caries prevalence and sub-group U1 those without caries (d3-4mft=0). The remainder formed sub-group U2. Children were treated twice per year, those in group A were treated with Bifluorid12, in the group B with NaF-varnish and in the group C with CaF₂. Those in the control group (D) only received preventive advice. Oral examinations took place yearly. Statistical analysis was performed using the Mann-Whitney test at a significance level of 5%. **Results:** Based on the findings of 420 subjects (92 subjects dropped out) the caries incidence reduction of permanent molars in all test groups was significantly higher in comparison to the control group after four years. The highest reduction was found in group A with 38% (based on D3-4MFT) ($p = 0.028$) respectively 46% (DMFS) ($p = 0.02$), the lowest in group B with 19.4% (based on D3-4MFT) ($p = 0.05$) respectively 24.4% (based on D3-4MFS) ($p = 0.048$). In the sub-groups the incidence reduction was different. While in group A the highest value (52.07%) was found in sub-group U3, in the groups B and C the highest caries incidence reduction was found in the sub-group U1 (group B U1: 33.33%, group C U1: 59.56%). **Conclusion:** Bifluorid12 and its components showed a significant caries incidence reduction on permanent molars.

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EVALUATION OF HEALTH PROMOTION ACTIVITIES BASED ON DRAMA PAEDAGOGICS AMONG SIX-YEAR-OLDS

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In a county of Sweden, Örebro, drama paedagogics have been used as a method to promote oral health. Games are an easily accessible educational tool and therefore a possible way to conduct health promotion among children. **Aims:** To evaluate if a semi-structured interview technique is a suitable way to evaluate oral health promotion lessons among schoolchildren at the age of six. **Methods:** A semi-structured interview technique was used with a questionnaire, adjusted for children at the age of six, as an interview guide. Questions were modified to evaluate an oral health lesson based on drama paedagogics. Repeated interviews were conducted in three different schools with children born in 2002. Parents' permission was obtained. For

knowledge based questions, a facial visual scale with pictures of a happy, neutral or sad tooth was used. For questions about experience of the lesson, a modified facial visual scale with pictures of a happy, neutral or sad face was used. To test the reliability, the interviews were repeated after 2 weeks. Wilcoxon signed rank test was performed to test for statistical differences. **Results:** Fifty-three children were interviewed on the first occasion and 53 the second time. Of those, 40 children participated both times. The internal consistency between the two interviews was high for all 11 questions except one that significantly differed, $P < 0.04$. **Conclusions:** Both knowledge of oral health and experiences from a given lesson were investigated. This pilot study was a starting point for a forthcoming extensive study about the use of drama pedagogics as a method in health promoting activities among children. The technique used was useful as an evaluation method.

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MODEL OF SCHOOL-BASED ORAL HEALTH PROMOTION PROGRAMME FOR ADOLESCENTS

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Aim: The main aim was to implement a programme of oral health promotion in schools and connect the regular science curriculum with oral health education. The programme was focused on improvement of adolescents' periodontal health and oral health related knowledge, attitudes and behaviour. **Methods:** The programme was developed for use by teachers with 15-16 years olds in secondary schools. It was integrated into the biological sciences curriculum using three 45-minute sessions over three weeks. Each session involved a class experiment in pairs (plaque colouring and brushing teeth, recording the health status of teeth, producing acid from sugar) and a slide presentation. The content of the programme stressed self-care and the distinction between prevention and cure. Other concepts included the nature of bacterial plaque, the causes of decay and gum disease and the importance of the frequency of sugar consumption.

Emphasis was placed on discovering and developing skills that adolescents already possessed. A random pretest and post-test study design with control group (190 adolescents in experimental and 60 in control group) was implemented to evaluate effects on adolescents oral health. In both group DMF score, Gingival Index (Silness-Löe) and Plaque Index (Löe-Silness) were recorded before and one month after Programme was implemented. Follow-ups will be conducted after one year. **Results:** Both mean PI and GI in the control group did not vary significantly before and after the programme (PI before = 1.53; PI after = 1.51; GI before = 2.4; GI after = 2.1), whereas plaque and gingival scores in experimental group decreased significantly one month after the programme was finished (PI before = 1.60; PI after = 0.95; GI before = 1.64; GI after = 0.86). **Conclusion:** Short-term evaluation showed an improvement in the gingival health of the adolescents.

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THE IMPLEMENTATION OF AN ORAL HEALTH CARE GUIDELINE IN NURSING HOMES

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Aim: The key factor in realising good oral health is daily oral hygiene care. In 2007, the Dutch guideline "Oral health care in care homes for elderly people" was developed to improve oral health of institutionalised elderly. The overall aim of this study was to compare a supervised versus a non-supervised implementation of an oral health care guideline in Flanders (Belgium). **Methods:** A random sample of 12 nursing homes was randomly allocated to the intervention or the control group. Representative samples of 30 residents in each home were monitored during a 6-month study period. The intervention included a supervised implementation of the guideline. The outcome variables

considered were: denture, dental and tongue plaque. The study was completed by 297 subjects, 146 in the intervention group and 151 in the control group, which represents a loss to follow-up of 20%. **Results:** Bivariate analysis revealed significant differences between both study groups for mean denture plaque at a six-month follow-up visit, with a beneficial effect for the intervention group ($p < 0.01$). A slight non-significant beneficial effect for the intervention group was observed for both mean tongue and dental plaque. In linear mixed regression models, including a random institution effect, differences in plaque levels were no longer statistically significant at the 5% level. **Conclusion:** Oral hygiene has been improved by the implementation although with lower benefits than expected. Factors on institutional level, difficult to assess quantitatively, may play an important role in the final result.

Acknowledgement: Data collection was supported by GABA International.

USING THE ENNEAGRAM APPROACH IN MOTIVATING DENTAL PATIENTS FOR ORAL HEALTH CARE

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Oral health promotion is an important element in dental public health. In order to promote the patient's oral health, effective education through appropriate communication is needed. In a dentist-patient relationship, the dentist must know how to communicate with the patients in order to encourage them to implement oral health recommendations and promote their oral health. For a successful communication, a dentist should have an idea about the patient's personality type. There are different methods that can help a dentist to have an effective communication. **Aim:** The aim of this presentation is to introduce an effective approach called the "Enneagram". **Methods:** The Enneagram history dates about two centuries ago from Asia and the Middle East. The meaning of the word "enneagram" is nine points that is composed of a Greek word. These nine core personality types are based on three main influences (unintellectual, emotional and physical) which reveal individual behavioural patterns. Each type has three subtypes which amount to 27 personality subtypes. This approach is used for two main reasons: self-consciousness and relationship awareness (so that there can be

more harmonic mutual relationships). The basis of Enneagram is teaching responsibility of taking one's actions. It encourages people to be self-motivated with consciousness. "Accepting" the oral health care is the main theme for attracting dental patients which can be covered with the Enneagram. **Results:** By using the Enneagram (asking some special questions and considering the patient's responses & behaviour) during a routine dialogue with the patient, a dental clinician can relatively recognise the patient's personality resemblance to each of the Enneagram types. **Conclusions:** Through the application of Enneagram the dental team can have effective communications with patients in order to encourage patient for a better oral health care.

SUPPORTING SELF-CARE OF PEOPLE WITH PERIODONTAL DISEASE: AN INTEGRATED REVIEW OF THE LITERATURE

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Almost all people suffer from periodontal diseases at some point of life even though these diseases could be prevented and treated with proper self-care. Self-care consists of a combination of regular toothbrushing; inter dental cleaning and clearing the bacterial build-up from the surface of the tongue. However, several studies have been reported non-compliance with oral health-care recommendations. **Aim:** The aim of this review was to explore which are the essential patient education methods in supporting the self-care of people with periodontal disease and what their main results are. **Methods:** The international database MEDLINE was used to find the relevant literature. The time frame was from the earliest data possible to 1st March 2010. The search involved using both MeSH and free text terms. The following search terms and combinations of them were used: gingivitis, periodontitis, inflammation, periodontal disease, oral health, oral hygiene, patient education, health education, health promotion, teaching, training, advising, instructing, guiding, demonstration, supervise, health behaviour, oral hygiene behaviour and self-care. All type of studies was accepted and the search was limited to the English language. **Results:** A total of 149 articles were identified. Preliminary results show that a wide range of psychological models and theories are used.

Improvement in self-care was attained in most of studies. Which methods are the most efficient is still under investigation. The eventual results of this review will be presented as a poster presentation at the 2010 Conference of EADPH. **Conclusion:** Conclusions of how the results of this review could be implemented in practice or further studies will be presented.

ACCEPTANCE OF ORAL HEALTH PROMOTION PROGRAMMES IN PUBLIC HEALTH CARE IN VANTAA, FINLAND

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Two different programmes on oral health promotion of small children were started and compared with the routine programme given prior the study. **Aim:** The aim of this study was to analyse how dental hygienists and in-service trained dental nurses accepted new health promotion programmes, how they used them in practice and how this affected their attitudes to work. **Methods:** The subjects were all the dental hygienists and nurses (n=28) involved in health promotion of children. Education and written instructions on two intervention programmes had been given to the subjects in intervention groups; the control group used the routine programme. The transtheoretical model was selected as the theoretical framework for counselling. A structured questionnaire of 31–35 items was sent to all subjects. Independent-Samples Mann-Whitney U and Pearson chi-square tests were used as statistical methods. Additionally, all the dental nursing chiefs (n=6) were interviewed about their knowledge and experiences. **Results:** The response rate was 89%. All subjects felt that the work they had done had always been mostly important during their working career. Eighty-four per cent of the subjects reported that the instructions and education were suitable for oral health promotion. The subjects in the intervention groups ($P=0.020$) and the subjects with less than 10 years of experience ($P=0.006$) felt they matured more as health professionals than the control group and those with longer experience. The subjects in the intervention groups ($P=0.018$) gained more confidence from the education they had been given compared to the control group. All of the dental nursing chiefs agreed that the dental hygienists and nurses had matured to some degree and that their knowledge and skills had improved as a result of the education.

Conclusions: The two intervention programmes for small children were well accepted by health professionals and they gained confidence in their work from the education.

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MICROBIAL AEROSOLS EVALUATION IN DENTAL PRACTICE: IMPROVING HEALTH CARE SAFETY

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Aims: Airborne transmission may occur by projection of aerosol from an infected person onto the mucous membranes while coughing, spitting, singing or talking, or when microbial aerosols dispersed into the atmosphere are inhaled by others” (ECDC, 2008), promoting an increased risk of cross infection. Dental professionals and patients are daily exposed to a great variety of infectious agents and toxic substances transported by aerosols produced during dental appointments. This study aimed at evaluating the aerosol microbial contamination (by means of quantifying the colony forming units (CFU)) during dental practice, when different treatments were performed and to check the air quality in dental practice treatment areas. **Methods:** This cross-sectional, descriptive study analysed the aerosols projected during dentistry and endodontic treatments, in 26 dental units of the Health Sciences Faculty, of the University Fernando Pessoa (UFP). Blood agar plates were placed in each dental unit (two at 0.5m and two at 2m from the patient head position) and were left open for two to four hours. The plates were then incubated at 37°C/48h. Colonies were counted and the CFU calculated. SPSS®vs.17.0 was used for descriptive and inferential analyses using both parametric and non parametric tests with the level for statistical significance set at 0.05. **Results:** The air quality was found to be good compared with the Air Microbial Contamination Index (Pasquarella *et al.*, 2000). During operative dentistry and endodontic treatments aero-transported CFU counts were significantly higher at 0.5m than at 2m (Wilcoxon test,

$P < 0.004$) and significantly higher for endodontic treatment (Mann-Whitney test, $P = 0.003$). Longer treatment times (> 2 hours) produced significantly higher levels of contamination, both for operative dentistry (Mann-Whitney test, $P < 0.004$ for both distances) and endodontic ($P < 0.002$ for both distances) procedures. **Conclusion:** CFU counts in dispersed aerosols are influenced by the dental treatment performed, the distance from the dental units and the treatment times. Although the air quality was found to be good, preventive measures should be implemented in order to avoid dissemination of pathogenic microorganisms.

ORAL EPIDEMIOLOGY SESSION 2

ASSOCIATION BETWEEN CIGARETTE SMOKING AND ORAL HEALTH. A SYSTEMATIC REVIEW OF THE LITERATURE

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Aim: The goal of this review was to summarise the current empirical data regarding the link between cigarette smoking and oral health and its effect on the whole oral cavity. **Methods:** Original research papers on this topic published between 1 January 1997 and 11 February 2008 and listed in PubMed database were selected by applying a systematic search according to the current PRISMA- and MOOSE- Statement (Moher *et al.*, 2009; Stroup DF *et al.* 2000). The search took place on 18 and 19 February 2008 and revealed 1,569 original publications. Using a multistage procedure 640 duplicates were identified and excluded. By using the inclusion and exclusion criteria, which had been defined prior to the search, 270 publications were found that could be taken into account for further evaluation. **Results:** In these studies associations between smoking and the following items were investigated: periodontal diseases or periodontal treatment ($n = 125$), alterations or neoplasms of the oral mucosa ($n = 61$), saliva ($n = 22$), caries ($n = 20$), dental implants ($n = 20$), oral clefts ($n = 17$), aesthetics/well being ($n = 8$), endodontology ($n = 4$), bruxism and CMD ($n = 3$). In 10 articles more than one of these items was under investigation. In each of these selected categories the majority of the studies

showed a negative association between smoking and oral health thus increasing the risk of developing an oral neoplasm (OR 2.3-6.1), a significant prevalence of carious defects and a double relative risk of alveolar bone loss especially in the region of the maxillary anterior teeth. A significant association between loss of dental implants and smoking was observed (OR 1.7-2.0). Smoking by pregnant women increases the risk that their children are born with orofacial clefts (OR 1.3-2.5). In several studies a dose-response-relationship was demonstrated (i.e. with respect to caries experience, neoplasm, loss of implants). **Conclusions:** Tobacco consumption appears to be worldwide the most important personal behaviour-based risk factor in the deterioration of oral health. According to most of the studies that were assessed discontinuing tobacco use has a positive effect on oral health. This underlines the need for public health intervention to change a behaviour which could be avoided completely.

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ALCOHOL AND ORAL CANCER AMONG NON-SMOKERS AND BETEL NON-CHEWERS: A META-ANALYSIS

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Aims: Alcohol consumption is an oral cancer (OC) risk factor with convincing evidence. Nevertheless, recent studies have suggested that drinking without concomitant exposure to tobacco smoking or betel chewing would not increase the OC risk. The Special Interest Working Group of the EADPH "Prevention of Oral Cancer" has been charged with the meta-analysis of observational studies, in order to achieve consensus, within the EADPH, on the carcinogenic role of alcohol intake. **Methods:** Observational studies regarding alcohol intake and OC in non-smoking non-chewing individuals, published between 1990 and 2010 were located through MEDLINE. Data were extracted and crude odds ratios (OR) for OC of drinking computed. Original data set were corrected for publication bias using the "Trim & Fill" method and the pooled OR estimate was assessed with the random-effect model. Robustness of estimates was investigated

through sensitivity analysis to inclusion criteria and subgroup analyses were made to assess the differences between Asian and American/European studies and between heavy and non-heavy drinkers. **Results:** Although MEDLINE search provided 369 papers, only 13 met the inclusion criteria. Relevant publication bias was found and data were corrected including three more studies. The pooled OR estimate was 0.640 (95% confidence interval -95CI- 0.551- 0.743; $P<0.05$). Major heterogeneity was found. Nevertheless, sensitivity analysis corroborated such estimate. The risk estimates among Asian and American/European studies were 1.723 (95CI, 1.264-2.382; $P<0.05$) and 0.606 (95CI, 0.509-0.722; $P<0.05$), respectively, the risk estimate for heavy drinking relative to non-heavy drinking was 0.509 (95CI, 0.364-0.713; $P<0.05$). **Conclusions:** Although, due to the high degree of heterogeneity, the results of meta-analyses of observational studies must be interpreted carefully, these data suggest that alcohol consumption might decrease the risk for OC among individuals who are not concomitantly exposed to other important risk factors. American and European subjects would benefit more from such protective activity than Asian subjects, probably because of different health-related lifestyle and genetic polymorphism. Neyman's bias (i.e., significant associations from case-control studies may be spurious if the risk factor affects survival) could potentially explain why heavy drinkers resulted at lower risk than non-heavy drinkers.

SMOKING HABITS AMONG ROMANIAN DENTAL STUDENTS: A PILOT STUDY

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Aims: The role of oral health professionals in tobacco control programmes has been highlighted. Smoking habits among dental students reflect their attitudes towards smoking cessation activities in the dental setting. The objective of the present study was to investigate smoking habits of Romanian dental students. **Methods:** An anonymous questionnaire survey among all dental students in the Faculty of Dental Medicine in Targu-Mures, Romania was conducted in 2010. In addition to their smoking habits, the students from 1st

to 6th study year (n=622) were asked about their opinion of smoking cessation in the dental setting. The response rate was 73%. Chi-square tests were applied to the data. **Results:** Of the 454 students participating in the study, 46% (52% of men and 42% of women, $P<0.05$) reported that they had smoked at least 100 times during their lifetime. Current smoking was reported by 43% of the students. Almost half of the current smokers (49%) smoked daily and 51% occasionally. Filtered cigarettes were most commonly (>90%) used. One third of the smokers (28%) had smoked cigarettes every day in the past 30 days. A majority of the smokers (62%) had tried to quit smoking. Nevertheless, 88% of the students were willing to advise patients to stop smoking. **Conclusions:** Frequent cigarette smoking among the dental students was observed. The male students smoked more than the female students. These results call for more activity in smoking prevention and cessation education for the future oral health professionals.

KNOWLEDGE, ATTITUDES AND PRACTICE OF TOBACCO CONSUMERS FROM GARAMANI VILLAGE IN NEPAL

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South Asian communities are thought to be at high-risk for oral cancer, primarily because of various tobacco-related habits. There has been little research on the rural community's perception on these habits. **Aim:** The aim of this study was to assess the knowledge, attitudes and practice (KAP) of Garamani villagers towards use of tobacco. There was no data regarding prevalence of oral cancer in this population. **Methods:** Community Diagnosis Programme, a census-based survey, was conducted at Garamani village to determine the health needs of the community. The tobacco-related KAP study was a part of this major study conducted in November 2009. The village had a population of 15,000 and consisted of 52% males. Illiteracy was observed among 12.5% males and 25% females. The 2,676 participants were respondents from all households in the village and came from diverse socio-economic and cultural backgrounds. None of the respondents refused participation. **Results:** All respondents were tobacco consumers. Although 42% were aware of its ill-effects

like cancer, ulcers and addiction, 42% believed it had beneficial effects. There were 78% smokers and 24% of them smoked more than five times a day. It was observed that the traditional method of tobacco use is being replaced with readily available processed tobacco products. About 56% respondents accepted that the use of tobacco products caused stained teeth and halitosis, 67% knew it was possible to quit and 92% refused to allow adolescents to consume tobacco. Moreover, 70% supported banning the advertisement, production, sale and consumption of tobacco products. **Conclusion:** Various forms of tobacco consumption are a common habit among this population. However, people are opposed to tobacco and its products and know their hazards. It is recommended that health promotion activities against tobacco use be targeted to this population for the prevention and control of oral cancer.

PREVALENCE OF TONGUE ANOMALIES AMONG STUDENTS AT THREE EDUCATIONAL LEVELS IN RASHT, IRAN

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Tongue anomalies: geographic tongue, fissure tongue and partial ankyloglossia have different prevalence among races in different countries. Owing to their clinical features they are worrisome and in some cases cause pain and soreness. However, they are classified as being within normal anatomical variation. **Aim:** The aim of this study was to determine the prevalence of tongue anomalies; geographic tongue, fissure tongue and ankyloglossia among students at three different educational levels in Rasht, Iran, during 2003 and 2004. **Methods:** This study was approved by Guilan University and Education Committee of Ethics. Students at three stages of education: primary, secondary and high school were recruited for this cross-sectional, multi-stage cluster, random sampling study. They were selected randomly for both schools (private and public), classes and individual students. Twelve clusters of students were recruited. They were examined by an oral medicine specialist and three dentists, who had been calibrated in the assessment of tongue abnormalities. Oral examinations were carried out in open spaces, with natural light, after deflecting lips and cheeks with a

tongue blade. Informed consent was sought before the examinations. The chi-square test was used for statistical analysis, *P*-value 0.05 was considered significant. **Results:** From a total of 1561 subjects 782 were females and 779 male, the prevalence of geographic tongue was 7.9% (CI 95% 6.31-8.89), fissure tongue was 4.3% (CI 95% 3.42-5.28) and ankyloglossia was 7.8% (CI 95% 7.13-8.47). Prevalence of fissure tongue increased significantly with age (*P*=0.006). The prevalence of tongue anomalies was significantly higher in males than in females. **Conclusion:** This study revealed that tongue anomalies were more prevalent in our region in comparison with other studies. Etiologic factors may contribute to this, in addition to racial factors.

Acknowledgement: This study was supported financially by educational organisations in Rasht, Guilan.

TRENDS IN INCIDENCE AND MORTALITY RATE OF ORAL-OROPHARYNGEAL CANCER IN NORTHERN GERMANY

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Oral cancer is a serious public health problem. In Germany, more than 10,000 individuals are diagnosed each year with oral and oropharyngeal cancer and more than 4,000 individuals die from this condition. The 5-year survival rate for oral and oropharyngeal cancer is 47% for men and 55% for women. **Aim:** It was the aim of the study to present the first population-based results from the Schleswig-Holstein Cancer Registry on incidence and mortality of oral and oropharyngeal cancer with regard to gender and age over the period from 2000 to 2006 within the state of Schleswig-Holstein, Germany. **Methods:** Key questions were formulated to research the data base of the Cancer Registry with regard to the aims of the study. From the records all oral and oropharyngeal cases were identified and evaluated. **Results:** From 2000 to 2006 more than 3,000 new cases of oral and oropharyngeal cancer were diagnosed within the state, an average of more than 450

cases per year. More than 70% were men. In this time period, more than 1,000 patients died of this tumour, of whom more than 70% were men. The highest mortality rate for women was found in the age-group 60 to 79 years. The mortality rate for men was mainly distributed among two groups 40 to 59 and 60 to 79 years. A more detailed analysis with regard to the different localisation will be presented. **Conclusions:** Neither the incidence nor the mortality rates showed any signs of improvement during the period from 2000 to 2006. Men still had a higher risk of getting and of dying of this condition than women.

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ORAL HEALTH SERVICES RESEARCH & ORAL HEALTH RELATED QUALITY OF LIFE SESSION

DENTAL ATTENDANCE OF FLEMISH PRE-SCHOOL CHILDREN (BELGIUM)

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Aim: To describe the dental attendance pattern of young children in Flanders (Belgium). **Methods:** Data were collected from 1057 children at age 3 years (2007) and at age 5 years (2009). These children served as controls in an oral health promotion study (Smile for Life) and were followed since birth (between October 2003 and July 2004). At age 3 and 5 they were examined by trained dentists and parents completed, at both occasions, a validated questionnaire on oral health related behaviour and dental attendance. **Results:** Data were available for 56% and 66% of originally selected children (age 3/5 respectively). At the age of 3 years, 62% and by 5 years, 21% had never visited the dentist. Multivariable logistic regression analyses revealed that a higher educational level of the mother and a recent parental visit to the dentist are significantly related with early dental attendance in 3- and 5-year-olds. Of 3 year-olds who had already visited the dentist, 67% did so for a check-up, 1% because of a toothache and 14% because of dental trauma. Parents of 7% of 3-year-olds and <1% of 5-year-

olds reported that their child did not cooperate during the dental appointment. The first dental visit was considered a pleasant experience for 71% and 65% of the 3 and 5-year-olds, respectively; 2% and <1% respectively reported it was a traumatic experience for their child. According to 6% (age 3) and 7% (age 5) of parents, the dentist they consulted did not want to treat carious deciduous teeth.

Conclusions: Parents of young children need to be informed about and motivated for an early dental visit by their child. The majority of parents confirm that a dental visit is not traumatic at all for their pre-school child. Dentists need to be motivated to treat (or refer) their youngest patients.

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PATTERN OF ATTENDANCE AND MANAGEMENT OF CHILDREN LIVING IN DEPRIVED COMMUNITIES

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Aim: To evaluate the dental attendance patterns of and care accessed by children living in the most deprived communities in Leeds. **Methods:** The following were assessed: (i) Referral records between January and May 2009; (ii) National Index of Multiple Deprivation; (iii) Non clinical assessment; (iv) Outcome of clinical assessment; (v) Treatment outcome. **Results:** Of the 295 referrals received from deprived communities, parents/guardians of 34 children failed to book an appointment after contacting them via telephone and post. One hundred and forty-one were offered an appointment within 40 working days from the receipt of referral. Fifty-two refused the first offered appointment. The commonest reason for refusal was the location of the assigned clinic. Interestingly, 22 still failed to attend the next offered appointment in their preferred clinic. One hundred and forty presented with multiple carious lesions at assessment. Sixty-three did not attend the assessment appointment. Eight refused care offered. One hundred and twenty-six completed necessary intervention. Seventy-two were treated under general anaesthesia, 48 of these were aged from one to five years. Failure to contact the clinic and missed appointments result in inefficient use of resources, and subsequent loss of revenue. Very young children with little or no previous dental experience were seen to present late, with

multiple and extensive carious lesions. Teeth were often symptomatic; cooperation was limited and sometimes insufficient for the comprehensive care required. Treatment under General Anaesthesia was often the remedial management. However, it is expensive to provide this service due to the manpower and technical resources required. **Conclusions:** With the high rate of poor attendance and multiple lesions observed, introduction of: (i) community based interventions which effectively reduce caries incidence (e.g. water fluoridation); and (ii) Oral health education strategies which positively engage parents/guardians, highlighting lifestyles which can be detrimental to their wards, would be beneficial in these areas and could considerably reduce the quantity and cost of future clinical interventions.

REASONS FOR SEEKING PAEDIATRIC DENTAL CARE IN KINSHASA, DEMOCRATIC REPUBLIC OF CONGO

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Epidemiological data on the oral health condition of children from Kinshasa, D.R. of Congo, are scarce and information on their dental attendance pattern is completely lacking. **Aim:** The objective of the present survey was to investigate reasons for seeking dental care at paediatric dental care units in Kinshasa. **Methods:** A cross-sectional survey was undertaken including all children (between 1 and 17 years of age) attending five paediatric dental clinics, both public and private institutions, between April 2007 and January 2008. After having obtained consent from the parent, an oral examination was carried out and a questionnaire was completed by the accompanying person. Among other variables, the reason for attending the paediatric dental care unit was recorded. **Results:** A total of 736 children attended the different centres. From these, 710 children (96.5%) were included in the study: 372 girls (52%) and 338 boys (48%). The

mean age of the children was 9.3 years (+/-3.61) (median: 9). The largest group of children was between 7 and 9 years old (28.6%). Reasons for non-participation were: insufficient cooperation, refusal to complete questionnaire, no participation without financial recompense. The principal reason for seeking dental care was related to the presence of caries (and complications thereof) (79%), followed by dental trauma (6.3%), orthodontic problems (4.8%), periodontal problems (3.5%) and routine check-ups (1.8%). **Conclusions:** The main reason for the dental attendance of children in Kinshasa was the relief of pain caused by carious breakdown of teeth. Preventive dental check-ups were rare.

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BARRIERS TO ORAL CARE IN A PRIMARY HEALTH CARE CENTRE

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In 2006, a centre of primary oral health care (CEMOB) was started within the existing primary health care centre Botermarkt, located in a multicultural, socially deprived area. The objectives of CEMOB policy are to increase access to oral health care for the most vulnerable groups and, in this way, to reduce socio-economic health inequities and inequalities. **Aim:** The present study aimed to explore barriers to oral health care experienced by immigrant and socially deprived target groups and to evaluate the effect of the access-increasing measures used in CEMOB. **Methods:** A convenience sample of 85 CEMOB patients was asked to complete a questionnaire. Data were collected on socio-economic background (income, education, employment), number of and reasons for dental visits, reasons for avoidance or delay of visits to dental services and changes in reasons for dental visits since the start of CEMOB. **Results:** Forty-three per cent of the patients did not have a Belgian ethnic background, 37.3% did not possess a high school leaving diploma and 52.4% were retired, students or not working. Pain was the main reason for a dental visit (35.3%) but 45.9% reported at least one annual preventive dental visit.

The main reasons for not making a dental visit were fear, financial problems, a bad experience in the past and not having pain. Fifty-seven per cent reported changes in reasons for visiting a dentist related to the CEMOB initiative. A shift was observed from curing pain to avoiding pain by early treatment. **Conclusion:** The results of this study demonstrate that dental services that pay attention to barriers to access to oral health care, can stimulate vulnerable population groups to seek preventive oral health care although psychosocial factors such as fear, and financial restraints still remain important barriers.

WILLINGNESS TO PAY FOR UNEXPECTED DENTAL EXPENSES

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In 2002, younger adults' free choice between public and private dental services was widened to cover those born in 1956 and before. **Aim:** To assess willingness to pay (WTP) for unexpected dental expenses, among middle aged adults, in an emergency. **Methods:** Postal questionnaires on the use of dental services were sent to a random sample of 1500 47-59 year old adults living in the Helsinki region. After one reminder the response rate was 66.2%. The main question used in this study was: "What would be the highest price you would be prepared to pay to have a lost filling replaced immediately or, at the latest, the day after the filling was lost?" Logistic regression analysis was used to model the probability of being willing to pay the same or a higher price than that in the private sector. **Results** Most respondents (74.4%) were willing to pay more than EUR 45 (the price charged in the Public Dental Service, PDS) and 38.8% more than EUR 80 (private reference price) for immediate restoration of a filling. Respondents earning more than EUR 50,000 per year had 41% greater likelihood of exceeding the WTP for the private fee than those earning less than EUR 10,000. Having previously visited the PDS resulted in a 23% lower and perceiving a treatment need in a 21% lower probability of exceeding the WTP for the private fee. Those who thought free choice between treatment sectors offered no or just a small advantage had 19% higher probability of exceeding the WTP for the private fee than great-advantage respondents. Time since the last dental visit and care costs during the last two years had no statistically significant effect on WTP. **Conclusion:** There was a strong and

statistically significant relationship between income and WTP for private treatment.

QUALITY MANAGEMENT AND PROVISION OF ORAL HEALTH CARE IN THE REPUBLIC OF MOLDOVA IN 2008/2009

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Aim(s): To quantify the number of stomatologists and their opinion of the quality of oral health care in Moldova in 2008 and 2009. **Methods:** All stomatologists who attended continuing education meetings in Chisinau during 2008/2009 were given a questionnaire which asked about their specialty, place of work and opinions of the current system for the provision of oral health care in Moldova. Questions included the following topics: the need for improvement in medical institutions, the location of clinics, how much information should be provided for patients, the use of new technologies, professional education and main obstacles to efficient practice. **Results:** 383 stomatologists (63% males and 37% females) completed the questionnaire of whom 79% were working in the urban areas and 21% in rural areas. Forty-seven per cent were fixed and removable prosthetists, 36% endodontists, 12% oral surgeons and 4% orthodontists. In answer to the question "what is your opinion of the quality of the oral health care service?" 32% rated it as very good, 41% rated it as good, 18% as satisfactory and 9% as unsatisfactory. Seventy-three per cent of respondents stated that the organisation and management of the parent medical institution where they worked was good. However, 65% stated that their stomatological clinics needed to be improved. Seventy-seven per cent felt that they had received good practical professional education. Fifty-seven per cent of the respondents said that they thought that quality, politeness and the attitude of medical personnel were very important to patients. Sixty-four per cent stated that the quality of service and materials were the most important criteria in determining their satisfaction at work. **Conclusions:** This study amongst a self-selected group of Moldovan stomatologists has given insights into their perceptions of the quality of their working life in 2008/2009.

PERCEPTIONS OF BULGARIAN DENTISTS

OF THE HEALTH CARE REFORM IN BULGARIA

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Aim: To study Bulgarian dentists' assessment of the health care reform in Bulgaria and, based on this, to outline the possibilities for subsequent development of the reform process. **Method:** A national sociological survey was conducted as a part of the project "Analysis of the Bulgarian Health Care Reform" performed in 2005-2007. Direct standardised interviews were performed with 78 dentists from the whole country. A questionnaire consisting of 27 closed and three open questions was developed and used. **Results:** More than 73% of the dentists support the necessity of health care reform in Bulgaria. At the same time 44% of them think that there were significant discrepancies between the reform principles and the problems, which had to be resolved after 1990. Most of the dentists linked the health care reform in Bulgaria with the creation of the health insurance system. Forty-nine per cent of the respondents assessed the impact of the reform negatively with regard to actions on the functioning of the system and 41.3% considered that the reform was being carried out slowly but was proceeding in the desired direction. Almost 71% did not support the monopoly status of the National Health Insurance Fund. Ninety-five per cent thought that the health care reform in Bulgaria is not over yet. The Bulgarian dentists in this sample supported the health care reform but they were not satisfied with the rate and the direction of the reform. **Conclusions:** In their opinion the health care reform has to continue through decentralisation and demopolisation of the health insurance system. The dentists perceived the possibility for citizens to freely choose a fund for obligatory health insurance as the main priority for further change.

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MIGRATION OF HEALTH PROFESSIONALS IN ROMANIA AND BULGARIA

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In Bulgaria and Romania immigration is negligible in its size and importance and emigration is the prevailing migration process. Both are predominantly "sending" countries. Since 2007, Romanian and Bulgarian nationals, on becoming citizens of the European Union (EU), have been accorded rights of

movement through the EU and partner states that are greater than those available to other groups of migrants. After that, emigration movements in both countries were intensified. This poster presents the results from the qualitative and quantitative research from the first (macro) phase of research project "Mobility of Health Professionals" (funded by European Commission within the 7FP) for Romania and Bulgaria. **Aim:** The general objectives of the project were to investigate and analyse current trends of the mobility of health professionals to, from and within the EU. **Methods:** The research was being conducted in 25 countries all over the world. **Results:** The most important shortage of health professionals in Romania and Bulgaria is that of medical doctors and nurses. The specialties where the biggest deficit of medical doctors is experienced include the following: intensive care, paediatrics and psychiatry (for Romania) and anaesthesiology, intensive care, infectious diseases, neurology, psychiatry and paediatrics (for Bulgaria). Between 10 and 15% of this deficit is due to emigration. Between 2007 and 2009, 5,000 physicians left Romania and 4% of the Romanian physicians requested documents allowing them to leave the country to work abroad. The migration potential of Bulgarian health professionals is also very high – 55% of medical students, 37% of practising doctors and 68% of the nurses have the intention to migrate abroad. The migration of Bulgarian and Romanian dentists is not so intensive, compared to other health professionals, but the influencing factors and the motives are the same. The main reasons motivating the Bulgarian health care specialists to emigrate (including internal migration) are related to better remuneration, according to 86.7% of the responses; better employment conditions and opportunities for work with modern equipment (60%); stable professional career (46.7%). Some of the main reasons for preferring to work abroad for Romanian health professionals are the low level of wages in the Romanian health system (55%) and the poor working conditions (40%). The health professionals are also unsatisfied with the level of health system financing (48%) and health system organisation (40%). **Conclusions:** The dynamics of migration of health care specialists is also connected with the socio-economic changes and the health reforms. The main obstacles to migration are the linguistic barriers, age and family responsibilities, separation from the native environment and cultural differences. One of the significant factors to stay in their native country, especially for dentists, is the possibility to have their own private practice.

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COST-INCOME ANALYSIS OF ORAL HEALTH UNITS OF HEALTH CARE CENTRES IN SOUTHERN IRAN BETWEEN 2001 AND 2003

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Economic analysis is one of the tools for oral health care policy making. **Aim:** The aim of this study was to assess the capital and consumption expenditure of Oral Health Units in Health Care Centres in the Fars province of Iran and its influence on oral health indices. **Methods:** The data regarding dental services that were provided and their costs were collected from Health Care Centre data forms for the period 2001 to 2003. **Results:** The numbers of patients referred to Oral Health services in the 3-year period were 252,348; 239,280 and 240,924 respectively. Mean DMFT in 1998 and 2003 were 0.21 and 0.32 for 6-year-olds and 1.0 and 1.3 for 9-year-olds respectively. The mean number of dental staff in the Oral Health units was 112 in each year. A total of 732,752 people were referred to Dental Health units of whom 262,977 (35.9%) had been targeted by the national Oral Health programme. Oral Health Unit service expenses were 6,871,471,160 Rials in 2001, 6,243,026,540 Rials in 2002 and 7,009,570,880 Rials in 2003. Cost/Income ratio was 20% in 2001 and was 25% and 26% in 2002 and 2003 respectively. The average inflation rate in Iran during the study period was estimated at 16.6% annually. **Conclusion:** Regarding the low tariff of dental services and also subsidiary payment to target groups, the Oral Health Unit expenses were always higher than its income. According to OHSIC reports in 1998 and 2003, these costs had no significant effect on oral health indices in Fars province which did not justify their continuation. Other alternatives such as training dental hygienists, the establishment of an Oral Health Garden, and community dentistry programmes, all as joint projects with a local dental school, should be considered as mechanisms to improve Oral Health practice in Fars province.

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USING AUXILIARY DENTAL PERSONNEL IN PRACTICE BY IRANIAN DENTISTS

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A large amount of preventive care can be delivered to patients by auxiliary dental personnel helping dentists to allocate their time to more specialised services.

Aim: The present study investigated the extent to which Iranian dentists employed auxiliary dental personnel. **Methods:** A questionnaire was distributed among participants at two annual dental meetings, in Tehran, Iran: one in December 2004 and the other in July 2005. The survey was conducted anonymously using a self-administered questionnaire enclosed with the meeting documents, to be returned during the meeting days. Dentists were asked to indicate if they employ the following: dental hygienists (DH), dental nurses (DN), assistants (A) and secretary(s) (S) in their practice for oral hygiene instruction (OHI) or applying preventive measures (professional tooth cleaning, fissure sealing, and chair-side application of fluoride) for patients. Details of gender and age, working experience and practice location were collected. Statistical evaluation was by chi-square test.

Results: A total of 1033 dentists returned the questionnaire of which 980 were eligible, with a mean age of 37.2 years (SD=7.5), 64% of whom were men. Of the respondents, 57% reported that they use at least one of the personnel for OHI; more men than women, and dentists from other cities more than dentists from Tehran ($P<0.01$). Regarding applying preventive measures, just 32% reported using at least one of the personnel and 64% reported using no personnel.

Conclusion: To deliver basic preventive dental services to patients more widely and at a lower cost, employment of auxiliary dental personnel should be facilitate in dental practices.

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WORKFORCE SKILL-MIX: MODELLING THE USE OF DENTAL THERAPISTS

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Operational research modelling can simulate the contribution of skill-mix within the dental team.

Aims: To examine scenarios for use of dental therapists to meet dental needs and demands in one

English Strategic Health Authority serving 4 million people, making recommendations on the need for commissioning of dental therapy training up to 2013. **Methods:** Data on population demography, oral health needs and demands, NHS workforce, activity (UDAs) and dental attendance were obtained to populate the simulation model. Demand, supply and linear programming models were created for specific age-cohorts and for the total population. The supply model was based on dentist: therapist workforce ratios. Linear programming was used to obtain the optimal make-up of the dental team from the baseline of 1,794 dentists and 118 therapists, examining numbers and costs across a range of scenarios up to 2013. **Results:** The optimal scenario in terms of costs and volume of staff was based on therapists working full time and providing 70% of care that is within their job competency; this scenario required 483 therapists by 2013, a figure which appears achievable with a major recruitment drive. In comparison to 'no skill mix', it achieved total cost savings up to 28.4%. In the case of maximum skill-mix where dental therapists are allowed to perform the maximum future proportion of dental care, cost savings of up to 20.8% on the baseline can be achieved even when therapists work part-time. However, many additional therapists would be required (n=4993). Baseline levels of dental therapists were estimated as only achieving 10-20% of the current job competency. Increasing the level of job competency revealed higher benefits in terms of reduced cost and staff levels. **Conclusion:** This project demonstrated the potential for greater development of skill-mix using dental therapists in primary care, and supports continued training of therapists.

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DO VALUES PREDICT UK PRACTITIONERS' DRIFT TO PRIVATE SECTOR?

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Over 90% of UK practitioners undertake a mix of National Health Service (NHS) and private work, although the proportion of private work is increasing. Values are defined as 'desirable goals varying in importance that serve as guiding principles in people's lives'. Values can be classified as being either extrinsic (materialistic) or intrinsically

(socially) orientated. It was hypothesised that dentists who are more socially orientated are more likely to provide a higher mix of NHS services. **Aim:** to investigate whether values predict the proportion of NHS care provided by English practitioners. **Method:** A postal questionnaire was sent to a national random cluster sample of 1116 English dental practitioners. Personal values were measured using the Aspiration Index, a 30-item questionnaire with known psychometric properties. Five-part Likert scales for the perceived importance of six job facets known to be determinants of job satisfaction were also included. The outcome variable was the percentage of NHS and private work undertaken by the practitioner. **Results:** Response rate was 44% (452). Using hierarchical regression analysis controlling for age and gender, the proportion of NHS work was predicted by a higher importance placed on the job facet 'Helping people' ($\beta=0.28$, $P<0.001$) and a lower importance placed on the job facet 'Developing clinical skills' ($\beta=-0.13$, $P<0.05$). Importance placed on extrinsic and intrinsic values did not reach significance. The model predicted 19% of the variance in proportion of private work undertaken. **Conclusion:** Importance placed on certain job facets is more likely to predict a shift away from public sector work, than extrinsic or intrinsic values.

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"DOCTEURS SOURIRE"—A STEP TOWARDS IMPROVED ORAL HEALTH FOR ROMANIAN UNDERPRIVILEGED CHILDREN

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In Romania special needs and socially deprived children have little access to dental care. "Docteurs Sourire" project emerged from this reality. This poster presents the project design, outcomes and further development directions. **Aim:** To assess and improve oral health of underprivileged children. **Methods:** "Docteurs Sourire" is a dental care programme for Romanian children that had little/no access to such services. Entirely based on volunteer

work, the project was initiated by a group of French and Romanian dentists in cooperation with Motivation Foundation and Special Olympics Romania. One hundred and sixty-nine underprivileged children/youngsters aged 4-22 years (113 mentally challenged, 119 institutionalised) were examined and treated, in 2007 (in Cornetu-IIfov) and 2008 (in Suceava), in dental offices set up in day-care centres for disabled children. In 2008 and 2009 follow-up and further treatment for 21 previously treated children from Cornetu were provided. In 2009, six of the children from Cornetu requiring treatment under GA were treated in a children's hospital in Bucharest. Patients and care-givers were instructed on appropriate oral hygiene means and techniques according to the children's abilities and perception, and information was reinforced during follow-ups. **Results:** Examination revealed high needs for dental care (mean DMF-T=5.28 \pm 5.13; dmft=4.3 \pm 4.3) and very few or no previous treatments. Follow-up, in 2008 and 2009 of patients treated in 2007/2008, showed noticeable improvement in their oral status, hygiene and cooperation. Most of the patients allowed themselves to be treated in dental offices. **Conclusions:** The availability of dental services for underprivileged children and youngsters in Romania is still far from meeting the actual needs. Disabled patients can often be treated in dental offices. Prevention programmes targeted on these categories of patients could help improve oral health and thus decrease the need, complexity and costs of dental treatment.

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ORAL HEALTH AND OHRQOL IN ITALIAN PSYCHIATRIC IN-PATIENTS. A PILOT STUDY

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Aim: Psychiatric patients' Oral Health (OH) and OHRQoL surveys are infrequent. Italy's peculiar psychiatric care system abolished long-term psychiatric hospitals in 1978. The aim of this cross-sectional pilot study was to assess OH and OHRQoL in this new psychiatric care system. **Methods:** Data were recorded in November 2008 from all the in-patients

of a small Residential Facility (SR) of the Department of Mental Health (DSM) district C in Rome, using the EGOHID standard clinical form and OHIP-14 questionnaire. **Results:** There were 12 in-patients in the SR, of whom 11 (91.6%) consented to the visit. The majority (6) (54.5%) reported dental access in the last year; 4 (36.4%) had irregular oral hygiene; 7 (63.6%) had > 4 daily nutritional intakes and 7 (63.6%) were smokers. OHIP-14 showed that 6 patients often suffered psychological discomfort (54.5%), 4 functional discomfort (36.3%) and 3 physical pain (27.2%). Only 1 patient was edentulous. No obvious decay was observed in 5 (50%) of the dentate subjects. Overall D3MFT was 5.5 and D1MFT was 5.9. DMF in the 20-29 years olds was 1 for both the diagnostic thresholds. The M(issing) component increased significantly with age. Periodontal data (CPI and CAL) detected in subjects 20-29 years old only bleeding on probing, in the 30-39 age group 60% had calculus and in only those in the 40-49 age group had 4-5 mm pockets. CAL=0 in 50% of the 20-29 age group, subjects older than 30 years had CAL>0, increasing significantly with age ($P<0.05$). **Conclusions:** This pilot study highlighted, in line with earlier studies on psychiatric patients, the increment of risk factors, and periodontal status worsening with age. Nevertheless, caries experience appears to be lower than previous studies, with lesser treatment needs. This can be explained by the closer attention and autonomy that exist in the small residential facilities for psychiatric care in Italy. Since the sample was not randomly selected and not representative, results should be confirmed by more extensive studies.

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ORAL HEALTH RELATED QUALITY OF LIFE AMONG ELDERLY IN IASI, ROMANIA

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Aim: To assess oral health related quality of life in a group of elderly in Iasi. **Methods:** A cross sectional study was developed in 2009 by a team of three calibrated dentists. The study population comprised 140 elderly patients over 60 years, consecutively

recruited in connection with dental treatment. 68 came from the “St. Parascheva” asylum in Iasi and 72 from a Community Dentistry Clinic where they had attended for routine examination. The study was approved by the Department of the Trust who gave ethical approval. Quality of life was assessed with the OHIP-14 Ro questionnaire. The relationship between physical, social and psychological dimensions of the quality of life and clinical and socio-demographic indicators was assessed with the logistical regression analysis. Data were statistically analysed using the SPSS 14 statistical package. **Results:** The most affected aspects of the quality of life was physical disability for 82.1% of the elderly, followed by psychological discomfort, for 76.1%, and physical pain for 65.4%. The least reported aspects were functional limitation, for 29.3% of the interviewed subjects and handicap, for 13.5% of them. The results showed that the risk of a low quality of life caused by physical disability was much higher for institutionalised subjects OR=2.265, CI=[1.106 – 5.616], for untreated totally edentulous subjects OR=2.357, CI=[1.089 – 5.103] and for subjects needing removable prosthetic therapy OR=2.505, CI=[1.855 – 7.354]. In psychological and social dimensions, statistically significant values ($P<0.05$) were found for the educational level OR=3.142, CI=[1.161 – 8.847] and for female subjects OR=1.685, CI=[1.212 – 2.344]. **Conclusions:** The study showed that oral health status was more likely to be perceived as impacting negatively on the quality of life by institutionalised elderly and subjects needing removable prostheses.

Acknowledgement: This study was supported by a grant from the University of Medicine and Pharmacy “Gr. T. Popa” Iasi, Romania.

ORAL EPIDEMIOLOGY SESSION 3 & OTHER TOPICS

EXAMINER PERFORMANCE IN CALIBRATION EXERCISES VERSUS FIELD CONDITIONS WHEN SCORING CARIES EXPERIENCE

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In oral health surveys, calibration exercises are organised in order to guarantee the reliability of the

data obtained by different examiners. However, calibration exercises are often take place in circumstances widely different from the conditions experienced by the dental examiners during the survey.

Aim: To verify how valid misclassification measurements obtained in a “classical” caries experience (CE) assessment calibration exercise are by comparing them to the scores obtained under “field” conditions. **Methods:** Validation data were collected in the context of the “Smile for Life” project, a survey involving eight dentist-examiners. A calibration exercise was organised under “classical” conditions (32 children examined by all 8 examiners and the benchmark scorer, before start of the survey). In addition, using a pre-determined sampling scheme blinded to the examiners, the benchmark scorer re-examined (within a few hours) between 6 and 11 children screened by each of the dentists during the survey. Factors influencing sensitivity and specificity for scoring CE (at d1-level) were investigated, including: examiner, tooth type, surface type, tooth position and calibration setting. In order to account for the clustering effect in the data, Generalised Estimating Equations (GEE) were used for statistical analysis. **Results:** Sensitivity scores were influenced by the calibration setting (lower under field conditions, $P<0.01$), but also by examiner, tooth type (lower in molars, $P<0.01$) and tooth position (lower in mandible, $P<0.01$). Specificity was influenced by examiner, tooth type (lower in molars, $P<0.01$) and surface type (occlusal lower than all other surfaces, $P<0.01$) but not calibration setting ($P=0.57$). **Conclusions:** Sensitivity and specificity of scoring CE are influenced by several factors. The calibration setting seems only to influence sensitivity, with lower scores obtained when measuring data validity under “field conditions”.

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CLINICAL AND MICROBIOLOGICAL STATUS OF ROMANIAN YOUNG ADULTS FROM IASI

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Aim: The aim of this study was to assess dental status in a young adult population from Iasi, Romania in

correlation with microbial status. **Methods:** A cross-sectional study of a representative sample of 679 young randomly selected individuals 15-25 years old was conducted between 2007 and 2009 at "Gr. T. Popa" University of Medicine and Pharmacy, Iasi, Romania. The clinical examination was performed by two calibrated dentists in accord with WHO 1997 criteria, using the DMFT index. Based on the DMFT scores, the individuals were divided into low - DMFT= 3, medium - $3 < \text{DMFT} \leq 6$ and high caries risk - DMFT > 6. Two supragingival plaque samples (one from 16, 21, 24 and one from 36, 41, 44) were collected from each individual and analysed by the "checkerboard" DNA-DNA hybridisation method for six streptococci and four lactobacilli species. This study was approved by the ethics committee of the University. All patients gave informed consent. Correlation between clinical data and microbiological findings was tested using Pearson's correlation coefficient (r). **Results:** The results of this study showed a mean of DMFT 2.8 for the low caries risk group, 5.9 for the medium caries risk group and 9.8 for the high caries risk group. The total bacterial counts were in the following order: the high-risk group (mean *S. mutans*=4.13; mean *S. sobrinus*=3.98) > the medium risk group (mean *S. mutans*=2.87; *S. sobrinus*=2.46) > the low risk group (mean *S. mutans*=1.89; *S. sobrinus*=1.16). There were statistically significant positive correlations between the high risk group and *S. mutans* and *S. sobrinus* ($r=0.523$, $P<0.01$; $r=0.349$, $P<0.05$). The other bacteria did not show a correlation with caries risk. **Conclusion:** Microbial data identified *S. mutans* and *S. sobrinus* as predominant species associated with high caries risk.

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ORAL HEALTH AND OBESITY PREVALENCE OF YOUNG ADULTS FROM CLUJ IN 2008-2009

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Aims: To investigate the oral hygiene knowledge, self-assessed oral health level and obesity prevalence, within young adults aged between 13 -35 years. The

study was performed in Cluj-Napoca, Romania between 2008 and 2009, in order to redesign and improve the existing dental prophylaxis programme managed by Preventive Dentistry Department since 2000. **Methods:** 1287 subjects (691 males and 596 females) were randomly selected from students of 8 randomly selected high-schools and 5 colleges in Cluj county. They answered a previously validated questionnaire on their tobacco and alcohol consumption, oral hygiene, dietary habits (a list of 10 cariogenic items and 5 non-cariogenic), self-assessed gingival health, dental visits and professional oral hygiene treatments. In addition to the 13 specific items mentioned above, the questionnaire also included demographic items (weight, height, age, gender, monthly income per family member). Descriptive summary statistics, bivariate and regression analyses were performed. Informed consent was obtained from subjects or of their parents. **Results:** The mean age of the participants was 19.2 years ($SD=\pm 4.6$ years). Only 550 (42.73%) the study group did not smoke, whereas 353 (27.43%) consumed more than 20 cigarettes per day. The self-assessed level of gingival health was poor for 319 (24.78%). The knowledge regarding oral hygiene procedures were correct for 1025 subjects (79.64%). Obesity prevalence for the group was 9.94%, with a peak of 15.15% in the 18-25 age group. The logistic regression model revealed that the monthly income had a statistically significant influence on oral hygiene behaviour, dietary habits and on overweight and obesity prevalence ($P<0.05$). **Conclusions:** Young adults' education is totally insufficient regarding dietary habits, auxiliary means of oral hygiene and dental check-ups. The obesity prevalence recorded is higher than the WHO mean, therefore within the new redesigned prophylaxis programme it is mandatory to include a stronger motivation towards a healthy diet and an assessment of behavioural changes regarding these problems.

ORAL HEALTH STATUS AMONG THE ADULT POPULATION OF AZERBAIJAN

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Aim: The aim of this study was to assess the prevalence of dental caries, non-carious lesions (e.g. tooth hypersensitivity, abrasion) and periodontal diseases among adult population of Azerbaijan living in 7 regions with different natural climatic conditions.

Methods: Home-based and on-the-job dental exami-

nations focusing on the age groups of 15-19, 20-29, 30-39, 40-49, 50-59, 60 years and older were held among 4900 subjects (700 people from each region with men and women represented nearly in equal numbers) residing in Kurdamir (lowland area), Shamkir (sub-mountainous area), Gedabey (mountainous area), Jalilabad (subtropical area), Zira (endemic area of fluorosis), Sheki (endemic area of goitre and iodine deficiency) and Baku. The examined regions, except Baku city, represented the countryside. During examination, mouth mirrors and dental probes were used with daylight (natural light) illumination. Tooth hypersensitivity was assessed by interview. Student's *t*-test was applied. **Results:** The highest prevalence of caries and periodontal diseases (gingivitis, chronic periodontitis and aggressive, early onset periodontitis) was observed in the endemic area of goitre (100%; $45.1 \pm 1.88\%$) whereas the lowest prevalence was seen in the endemic area of fluorosis ($87.7 \pm 1.24\%$; $27.5 \pm 1.68\%$) and the mountainous area ($82.5 \pm 1.43\%$; $32.0 \pm 1.76\%$). The prevalence of tooth hypersensitivity varied between $26.3 \pm 1.66\%$ (endemic region of fluorosis) and $50.8 \pm 1.89\%$ (lowland) and was most frequently found in persons with periodontal diseases. Rate of tooth abrasion ranged between $\sim 7.62 \pm 1.0\%$ (endemic area of fluorosis) and $13.3 \pm 1.28\%$ (endemic region of goitre), respectively. A physiological type of abrasion prevailed. **Conclusions:** In this study, prevalence of caries, non-carious lesions and periodontal diseases varied depending on the regions of Azerbaijan. The authors consider that existing natural climatic conditions (high content of fluorine in drinking water, iodine deficiency in water and foodstuff, microelement composition of drinking water and favourable conditions of mountain region) of concerned settlements have a certain influence on the prevalence of such dental disorders. It is necessary to consider these geographical factors in the preparation of a dental aid programme.

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PERIODONTAL STATUS OF 15-YEAR-OLDS IN RUSSIA OVER A TEN-YEAR-PERIOD

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The first National Oral Health Survey (OHS) among population of Russia was conducted in 1996-1998 (I) and the second in 2007-2008 (II).

Key age groups of population (6, 12, 15, 35-44, 65 years and older) were examined. **Aim:** The aim of this study was to follow the tendency of changes in periodontal diseases prevalence among 15-years-old adolescents in Russia during ten year period between the two surveys. **Methods:** Randomly selected 15-year-olds (I – 10300, II - 12231) from different Russian regions were clinically examined by calibrated specialists with using the WHO criteria and assessment form (1997). Periodontal status was evaluated with CPI Index codes. **Results:** The results showed that 43.2% and 59% of 15-year-olds had healthy periodontal tissues in 1996-1998 and 2007-2008 respectively. Prevalence of gingival bleeding diminished from 31.1% to 22%, dental calculus – from 24.5% to 19%. Periodontal pockets 4-5 mm were observed in 1.2% of adolescents during the first OHS. The mean number of healthy periodontal sextants increased from 3.0 (I) to 4.58 (II). The mean number of sextants with gingival bleeding diminished from 2.0 to 0.92 and dental calculus from 1.0 to 0.50. Level of bleeding prevalence (according to WHO criteria) changed from high to moderate while level of dental calculus prevalence remained the same. **Conclusion:** The results showed that periodontal status of 15-year-old adolescents had tendency of to improve over the 10-year period between two National Oral Health Surveys but there is still a necessity to develop and implement preventive programmes in different regions of Russia.

ASSESSING PERIODONTAL NEEDS OF 15-19-YEAR-OLD HIGH SCHOOL PUPILS FROM CONSTANTA

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Periodontal disease is one of the most widespread diseases in the world and the Community Periodontal Index of Treatment Needs (CPITN) has been widely used for estimating periodontal prevention or treatment needs. **Aim:** To estimate the periodontal treatment needs in high school population (urban and rural areas) aged between 15 and 19 years from Constanta District, using the CPITN Index. **Methods:** The study was made on a sample of 362 high school pupils (0.07 sampling error; 95% C.L.) between 15 and 19 years-old. A stratified sampling design was applied, based on three variables: rural or urban living, localities and high schools (randomly proportional selection). The final sample was drawn by systematic sampling,

using the lists of high school pupils as the sampling frame. The subjects' periodontal status was assessed using the CPITN Index and the World Health Organization 1997 criteria. The examination was made by calibrated examiners, in the high schools dental offices. Six index teeth (16, 11, 26, 36, 31, 46) were examined; clinical data were registered on individual charts. Ethics approval and written consent were obtained. Statistical analysis was performed using SPSS 12 and ANOVA.

Results: The mean number of sextants in each CPITN category was as follows: 3.06 ± 2.26 for CPITN score 0, 1.37 ± 1.34 for CPITN score 1, 1.42 ± 1.57 for CPITN score 2, 0.10 ± 0.40 for CPITN score 3 and 0.00 ± 0.05 for CPITN score 4. The mean number of sextants requiring professional treatment (CPITN score 2, 3 and 4) was 1.51 ± 1.70 and was significantly higher in boys than in girls and for subjects from rural areas than from urban areas ($P < 0.05$). **Conclusion:** These results demonstrated a need for both preventive and curative periodontal services in this group of 15 – 19 year-olds, especially for males from rural areas. A new approach capable of bringing meaningful improvements in community periodontal health is required in Constanta District.

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PATIENT-REPORTED ORAL HYGIENE MEASURES, SMOKING AND PERIODONTAL CONDITION

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Aim: The aims of this study were to determine the individual oral hygiene practices, smoking and periodontal status, as measured by CPITN index and maximum probing depth (PD), on a convenience sample of adults. **Method:** This study included samples of <35 years, 35-44, 45-55 and >55 years of age subjects (n=896) recruited from patients who attended the Clinics of Constanta Dental Faculty between 2007 and 2009. They completed a questionnaire about their oral hygiene practices and smoking. A full-mouth clinical examination was performed, recording CPITN score, maximum Pocket Depth and the Plaque Index (PI). **Results:** The results showed the average age of the study group was 40 years (SD: 18.2), with an average of 44 years (SD: 19.5) in non-

smoker's group and 34 years (SD: 14.1) in the smoker's group. Overall, 40% (n=357) of the subjects reported that they currently smoked, and only 5% (n=43) reported that they had quit smoking. A high percentage of women, 31% (n=152) declared they smoked and 50% of the male group (n=205) are current smokers. Twenty-five per cent of the subjects consider that they had excellent oral hygiene, and 41% good oral hygiene, despite the high average of PI in both smokers -1.34 (SD: 0.69) and non-smokers -1.36 (SD: 0.72). Dental floss was used only by a low percentage of patients (15%), more use tooth picks (42%) and 35.4% did not use any secondary method for oral hygiene. Young patients were more likely to use dental floss (24% of < 35 years). Age groups 45-55 and over 55 were using more likely to use tooth picks -55%, respectively 49% for each age category. CPITN index was in all age groups highest among smokers ($P < 0.0001$). Smokers had also a higher average maximum Pocket Depth in all age groups, the differences between smokers and non-smokers were 0.83mm ($P < 0.0001$), 0.68mm ($P = 0.72$), 0.73mm ($P = 0.03$), and 0.74 mm ($P < 0.0001$), in <35, 35-44, 45-55, >55 years of age. **Conclusion:** It was concluded that in the group studied a high percentage of both men and women smoked, oral hygiene needed to be improved in all categories and smoking was a significant risk indicator for deeper pocket depth and by extension, attachment loss.

Acknowledgement: The study was funded by the Faculty of Dental Medicine Constanta from internal funds.

DENTAL CHECK-UPS ASSOCIATED WITH PERIODONTITIS IN THAI ADULTS

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Periodontitis is an important oral health problem affecting Thai people and people of other nations as well. Not much epidemiologic evidence concerning periodontitis and dental check-ups among Thai people has been reported although the prevalence of periodontitis among this population is still high. **Aim:** This study aimed to evaluate the relationship between periodontitis and dental check-ups, in the presence of several other variables, among the Thai people residing in Nakorn Pathom Province, central part of Thailand during the year 2009-2010. **Methods:** The study subjects included 143 males and 283 female adults, aged 35-93 years, who volunteered to take

part. The data were obtained through oral examination and interview. Periodontitis was measured using the Community Periodontal Index (CPI) and the amount of debris was determined using the Simplified Debris Index (DI-S), while dental check-up was assessed as whether or not people had had a dental check-up during the past year. Results were analysed by means of descriptive, bivariate, and multivariable logistic regression analyses. **Results:** Descriptive results showed that 69.7 per cent of people had shallow (4-5 mm) and/or deep (6 mm or more) periodontal pockets and only 5.2 per cent had had a dental check-up during the past year. The final multivariable logistic regression model having periodontitis as an outcome had an r-square of 0.59. Findings from the final model revealed that in addition to dental check-up during the previous year, moderate, mild and heavy debris deposit as well as calculus with bleeding were significantly related to periodontitis, with the odds ratio (95% CI) being 4.939 (1.174,20.769), 4.780 (3.098,7.377), 2.974 (2.203,4.016), 2.724 (1.765,4.203), and 0.412 (0.308,0.550) for dental checkups, moderate, mild, heavy debris and calculus with bleeding, respectively. **Conclusion:** The findings highlight the importance of dental attendance towards reduction of periodontitis. Therefore, frequent dental check-ups may lead to a reduction in the prevalence of periodontitis in the Thai population. Furthermore, since this study was not able to find the relationship between dental check-up frequency and periodontitis, future research should take into account the frequency of dental check-ups during a longer duration towards improvement of periodontitis.

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CORONAL AND ROOT CARIES PREVALENCE OF INSTITUTIONALISED ELDERLY IN PORTUGAL

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Aims: To determine the coronal and root caries prevalence in an institutionalised aged population of Porto district (Portugal). **Methods:** An observational and cross-sectional study was conducted

after its approval by the Ethical Commission of the University. Twenty-two residential homes in the Porto District were selected as a cluster random sample from which 257 dentate individuals aged 60+ years were examined in 2007 after gaining informed consent from the individuals concerned. Oral examinations were conducted in the homes by a trained examiner. Assessments were made using the DMFT, RCI indexes and the WHO 1997 criteria. Descriptive and inferential analysis was carried out through using the SPSS version 17.0. The prevalence of the different factors investigated was expressed in percentages and corresponding confidence intervals (IC95%), and by using both parametric and non-parametric tests. The threshold for statistical significance was set at $P < 0.05$. **Results:** The mean age was 78.8 (± 9.1 standard deviation) years (range 60-101 years). Women accounted for 69.9% of the group, 30.4% were illiterate and 81.7% were able to perform daily oral hygiene. Only 15.1% had 20 or more teeth and 37.4% were edentulous. The average, DMFT was of 25.6 (± 7.3) and the percentage of coronal decay in this index was 7.1%. Nearly half (49.5%, 95% CI: 44.4%-54.6%) of the sample had some coronal caries and 28% (95% CI: 23.4%-32.6%) had filled teeth. The age, degree of independence, educational level and the type of removable prosthesis used were seen to be associated with the DMFT values (Chi-square tests, $P < 0.05$). A RCI of 43.8% [95% CI: 37.5%-50.0%] was found, and 77.0% [95% CI: 71.9%-82.2%] experienced untreated root caries. The RCI was significantly associated with gender, age and date of the last one visit to the Dentist (chi-square tests, $P < 0.05$). **Conclusions:** As the population ages a new challenge is developing for clinicians. In order to preserve more natural teeth, holistic preventive measures and regular monitoring of this population's oral health status is needed.

FACTORS AFFECTING FUNCTIONAL DENTAL STATUS IN INSTITUTIONALISED ELDERLY IN PORTUGAL

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Aims: To evaluate the relationships between a functional dental status (FDS) and several socio-demographic and oral hygiene habits, in institutionalised

elderly. **Methods:** An observational and cross-sectional study approved by the Ethical Commission of the University was conducted in 2007. Twenty-two homes of Porto District were selected as a cluster random sample from which 257 dentate persons aged 60+ were examined by a trained examiner (after signing an informed consent). Evaluations were made using the DMTF index and the application of a questionnaire about the socio-demographic and oral hygiene habits. Descriptive and inferential analysis was carried out through the SPSS® vs.17.0, using non-parametric tests ($P < 0.05$) and a backward stepwise binary logistic multivariate regression analysis ($P = 0.05$ for factor inclusion; 0.1 for exclusion). **Results:** The mean age was 78.8 (± 9.1 S.D) years. Men accounted for 30.1% of the group, 30.4% were illiterate and 81.7% were able to perform daily oral hygiene. Only 15.1% had 20 or more teeth. A multivariate regression analysis ($n = 253$), using age (years), gender, educational level, independence degree and toothbrushing, showed a significant and independent association between having a FDS and toothbrushing as well as between the educational level, but the other three factors did not remain as independent predictors. An institutionalised elderly person who brushed his teeth at least once a day increased the odds of having a FDS by 3.3 (OR=3.3 (95% CI: 1.5-6.9, $P = 0.002$)) in relation to those who did not, and those who has at least 12 years of education increased the odds of having a FDS by 3.5 in comparison with illiterate ones (OR=3.5 (95%CI: 1.2-10.8, $P = 0.027$)). Possessing a degree increases the odds by 6 (OR=6 (95%CI: 1.6-21.8, $P = 0.007$)). **Conclusions:** In this cohort of institutionalised elderly people, with a FDS was significantly associated with the toothbrushing and the educational level.

SELF-PERCEIVED ORAL HEALTH AMONG OLDER PEOPLE IN TWO SWEDISH COUNTIES

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Aim: To investigate self-perceived oral health in an elderly Swedish population (born in 1932 or 1942), and its relations to background factors such as socio-economic, individual, and dental health service system factors. An objective was to study changes in self-perceived oral health over a 15-year

period for those born in 1942. **Methods:** In two counties in Sweden, all persons born in 1942 have been surveyed by mail every fifth year since 1992. In the year 2007, all persons born in 1932 were included. In 2007, the population consisted of 9,813. The response rate was 72%. Non-response analysis showed that the sample was representative. Ethical approval was obtained at the study baseline in 1992. Data were analysed with descriptive statistics and contingency tables with c2 analysis. Multivariable analysis was performed by using multiple regression analysis. **Results:** Factors significantly, $P < 0.05$, related to self-perceived oral health, were age group, social network, ethnicity, education, general health as well as tobacco habits, oral hygiene routines, dental visit habits, and cost for care. Following the progress in oral health over time for people born in 1942, "having all teeth left" fell from 22% in 1992 to 13% in 2007. **Conclusions:** The self-perceived oral health was overall rather high, especially in view of the age group studied, although it was worse for those of age 75 years. Background and socio-economic factors, dental health service system as well as individual lifestyle factors affected self-perceived oral health.

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SOCIO-DEMOGRAPHIC DETERMINANTS FOR ORAL HEALTH RISK PROFILES

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Aims: Oral health risk profiles may be unevenly spread over the various groups in populations. The aim of the present study was to explore the association between oral health risk profiles and different socio-demographic factors. **Methods:** the study sample ($n = 104$) was randomly selected, after stratification by age, within the population of a metropolitan area in Flanders-Belgium: Ghent and surroundings. Five age groups were defined. Data from health anamnesis, clinical examination, salivary tests and oral health habits questionnaire were used to assess oral health risks. Three risk levels have been defined: low, moderate and high. Age, gender and socio-economic status were extracted from social insurance

data files. Social indicators were 'occupational status', 'being entitled to the increased allowance for health care interventions' and 'having access to the mechanism known as the "Maximum Bill", or "Maximum" (MAF)'. The two last mentioned initiatives were undertaken to improve access to the health care system and to protect deprived families from large health care expenses. Non-parametric bivariate analyses and multiple logistic regression were performed to estimate the contribution of the risk indicators. The analyses were carried out using SAS® statistical programme. **Results:** In the bivariate analysis risk profiles were not significantly different between age groups and between males and females. There were significant differences between occupational groups ($P<0.001$), between entitled and non-entitled individuals to the increased allowance ($P=0.02$) and between access and no-access to the MAF ($P<0.01$). The multiple model showed that the chance of being in the low risk group for individuals with no access to the MAF was 14 times higher compared to the individuals with access to the MAF (OR: 14.33 – 95% C.I. 2.14- 95.84 – $P<0.01$). **Conclusion:** for each social category a gradation has been observed between the three different oral health risk levels.

CHANGING THE ATTITUDE OF YOUNG DENTAL STUDENTS TOWARDS EARLY CARIOUS LESION DETECTION

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Despite decreasing prevalence, dental caries is still an important oral public health problem. Therefore the diagnosis of early carious lesions remains a challenge. **Aim:** To raise dental students' awareness regarding the importance of using modern diagnostic devices together with the clinical examination in early lesion detection in enamel, in order to choose the appropriate treatment. **Methods:** This cross-sectional study involved 86 third year students randomly selected from the Faculty of Dental Medicine (Bucharest, Romania) in November 2009. Each student was examined and the O'Leary plaque index was calculated. After professional prophylaxis the students were examined for early carious lesion detection in enamel by visual inspection and laser fluorescence (DIAGNOdent KaVo, Germany), both performed by the same examiner. The data were analysed using descriptive statistics. **Results:** Seventy-one per cent of the students had an O'Leary

plaque index less than 30%. On the anterior teeth, according to Lussi's score (12-21 US for early decay in enamel), students had more early lesions on approximal surfaces (52%) than on smooth surfaces (26%). On the posterior teeth, 48% of the lesions were on occlusal surfaces and 37% on smooth surfaces. The lesions on posterior teeth were mostly detected using laser fluorescence. The findings with visual inspection and laser fluorescence were correlated on smooth and approximal surfaces. For occlusal surfaces only, laser fluorescence detected early lesion in enamel. **Conclusions:** There is a need to apply primary preventive methods and to increase dental students' awareness regarding dental hygiene for the remineralisation of early enamel lesions. Using modern diagnostic devices during training in Preventive Dentistry laboratories increased students' interest and active participation in the clinical activities. The students were interested in the use of modern diagnostic devices and were happy to be involved in the study.

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EVALUATION OF THE EFFECT OF PATIENTS' SMOKING HABITS ON COMPOSITE RESTORATIONS:

A TWO-YEAR TRIAL

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Aims: To evaluate the two-year clinical performance of Class II composite restorations and to quantify the influence of patients' smoking habits on aesthetic performance of composite restorations. **Methods:** This longitudinal trial approved by the University Fernando Pessoa (UFP) ethical commission was conducted in the Faculty of Health Sciences of the UFP between 2005 and 2007. Twenty-six patients, after signing informed consent, received 105 Class II restorations, distributed randomly into three groups of 35 each. In Group A restorations were composed of CeramXmono [CXM] material (Dentsply DeTrey, Germany), placed by the oblique incremental technique (OIT). In Group B restorations were composed of CXM and SureFil [SF], (Dentsply) materials placed by the modified incremental technique (MIT).

In Group C restorations (control group) were composed of SF material placed by the OIT. Restorations were evaluated according to modified U.S. Public Health Service criteria. SPSS® vs. 15.0 was used for descriptive and inferential analyses using non parametric tests with a p value <0.05 . To quantify the relative influence of patients' smoking habits on restorations' performance the Mantel-Haenszel Odds Ratio estimate was used. **Results:** At a two-year follow-up 92 (88%) restorations were available for examination. Groups A, B and C restorations showed success rates of 96.7%, 96.8% and 100%, respectively. Longitudinal analysis revealed significantly lower aesthetics (cavo-surface marginal discoloration (SMD)) and functional (marginal integrity) performance of group B restorations (McNemar test, $P<0.031$). Only group B restorations distribution at the two-year follow-up revealed differences from baseline in SMD (Fisher exact test, $P=0.01$) among patients who smoked. The relative risk of SMD was 21 times higher (95% [CI], 1.7-263.6) in group B restorations than in groups A or C restorations ($P<0.01$) among smokers. **Conclusions:** Group B restorations showed lower esthetic and functional performance. CXM and SF composites are effective in Class II clinical situations either with the OIT or MIT. SMD changes at two years were not independent of patients' smoking habits.

XEROSTOMIA AND HYPOSALIVATION IN NURSING-HOME RESIDENTS AND THE SUITABILITY OF THE XEROSTOMIA INVENTORY

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Aim: The study objective was to explore the diagnostic suitability of the Xerostomia Inventory and the association between xerostomia, hyposalivation, and medication use in a group of nursing home residents. **Methods:** A cross-sectional study was carried out in 50 (20 men and 30 women) among selected physically impaired nursing home residents. Exclusion criteria were: terminally ill, cognitive impairment, fever, dehydration, Sjögren's syndrome, and previously received radiotherapy in the head and neck region.

The Xerostomia Inventory-Dutch version was completed for all residents and the data were subjected to exploratory factor analysis to determine the diagnostic suitability. Residents' data on xerostomia, whole saliva secretion rates, and hyposalivation-related medications used were collected and statistically analysed. The study design was reviewed and approved by the Medical Ethic Committee of the Netherlands. **Results:** Only the DXI items 'My mouth feels dry when eating a meal', 'My mouth feels dry', 'I have difficulty in eating dry foods', 'I have difficulties swallowing certain foods', and 'My lips feel dry' demonstrated Pearson's correlation coefficients above 0.6. The prevalence of xerostomia was 52%, without gender and age difference. The prevalence of hyposalivation was 24% for resting, 60% for chewing-stimulated and 18% for acid-stimulated whole saliva. All whole saliva secretion rates were significantly lower in women than in men and in older than in younger residents. Forty-four per cent of all medications used were hyposalivation-related and women used significantly more medications than men. Xerostomia was significantly negatively correlated with the resting whole saliva secretion rate. The number of hyposalivation-related medications used was not significantly correlated with the various whole saliva secretion rates. **Conclusion:** The diagnostic suitability of the Xerostomia Inventory-Dutch version seems restricted. Xerostomia, hyposalivation and using hyposalivation-related medications seem common and partially associated features in nursing home residents.

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COMMUNICATIONS OF INTEREST TO DENTAL/ORAL PUBLIC HEALTH

PLANS FOR A DENTAL CARIES RISK STUDY IN DIABETIC CHILDREN WITH A PROSPECTIVE CASE-CONTROL STUDY DESIGN

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Diabetes mellitus (DM) is associated with increased susceptibility to periodontal disease, which has been well documented in the literature. However, the rela-

tionship between DM and dental caries frequency and progression has not been fully clarified yet. The working hypothesis of the proposed study is that type 1 DM increases a risk of dental caries in children similarly to that of periodontal disease. **Aims:** The aim of the study was to determine the prevalence of dental caries in a population of diabetic children and to assess, to what extent DM-related changes of oral environment (saliva, bacteria) and/or oral health-related behavioural variables of children and their parents/care-givers contribute to the increased risk of dental caries. **Methods:** The research was designed as a prospective longitudinal case-control study on the oral health of diabetic children compared to the control group of sex- and age-matched healthy children, including the subsample of the patients' healthy siblings. At least 50 children with type 1 DM 4 to 16 years old will be recruited (from the population of patients followed at the Clinics of Paediatrics of the Prague teaching hospitals). The ethical committee approval has been obtained for the study and the parents' ICF has been prepared. Research methods will be: 1) Periodical clinical dental examinations (ICDAS criteria); 2) Evaluations of specified salivary parameters (flow rate, buffering capacity, amount of cariogenic bacteria); 3) Questionnaires (focused on dietary and hygiene habits and relevant medical history of the patients and oral care-related attitudes and socio-economic status of the patients' parents); 4) Determining the correlations between the oral health status and DM variables collected from the medical records (DM onset and duration, insulin substitution, metabolic control – HbA1C). All the data obtained from the both groups will be processed statistically with the aim of confirming or rejecting the above hypothesis.

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PERIODONTAL DISEASE AND DIABETES

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Aim(s) To compare patients with periodontal disease and diabetes with patients with periodontal disease without systemic disease. **Methods** The study was performed between 2002 and 2007. It consisted of both clinical examinations and histories taken from

patients. All 67 patients (41 females, 26 males), with either type 1 (27 patients) or type 2 diabetes (40 patients) referred to the Stomatological Clinic of "Nicolae Testimianu" University from an Endocrinology department were included in the study. Their mean age was 54 years. Twenty-three randomly selected patients, without diabetes or any systemic diseases, with a mean age of 52 years formed a control group. Ethics approval for the study was obtained from the university and the patients gave informed consent. Four examiners were calibrated and recorded: missing teeth, attachment loss, gingival bleeding, gingival recession, furcation involvement at baseline. To monitor the degree of "diabetes control" blood samples were taken and the glycaemic index recorded. All patients then underwent non-surgical periodontal therapy. Two weeks after it had been completed all patients were re-examined and the same variables recorded. **Results** At baseline the patients with diabetes and periodontal disease had a mean of 13.5 teeth, and mean pocket probing depth (PPD) of 4.5mm. Fifty-two per cent had gingival recession, 15% furcation involvements, 58% of all gingival sites bled on probing. After treatment the mean PPD was 4mm and 25% of all gingival sites bled on probing, gingival recession and furcation involvements remained unchanged. In general, the glycaemic index was unchanged but four of the 12 patients with the highest value experienced a reduction. Thirty-eight per cent of diabetic patients experienced complications after tooth extractions. The mean values in the control group at baseline and after treatment were mean number of teeth 18, mean PPD 2.5 mm and 2.0 mm, gingival recession 30% and 30%, furcation involvements 2% and 2%, gingival sites that bled on probing 20% and 7%. Only one non-diabetic patient experienced a complication after an extraction. **Conclusions** The diabetes group had more periodontal breakdown than the age matched control group. The reduction in glycaemic index for four patients with the highest score suggests that the periodontal therapy may have contributed to improved control of their diabetes.

HISTORICAL DEVELOPMENT OF SALT FLUORIDATION AND ITS CARIOSTATIC EFFECTIVENESS

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Aim: To present an historical overview of the use of fluoridated salt and its effectiveness in the prevention

of dental caries. **Methods:** Dental caries, the most prevalent disease in children, affects an estimated 90 per cent of the world's population. Fluoride use has been shown to reduce the disease incidence and prevalence, and, based upon studies in the USA and Canada in the 1940s, has resulted in implementation of water fluoridation. Water fluoridation has limitations for community coverage based on availability of treated water, socio-political, economic, and technical reasons. The alternative approach of fluoridated salt was initiated in Zurich, Switzerland, in 1955. Successful community trials; WHO and FDI recommendations; reconfirmation by the EU of sodium and potassium fluoride as approved food additives; and adaptation to local political, technological, and cultural environments, facilitated access to this approach for caries prevention. **Results:** Following evidence from Hungary, Switzerland, and Colombia, several countries implemented salt fluoridation from the mid 1980s. Reports after 20 years' experience illustrate reductions in caries prevalence at age 12 years comparable to or better than water fluoridation, largely dependent upon method of community application, but at reduced cost. Automatic fluoridation of all domestic salt has shown up to 80% reduction in prevalence with over 90% of product market share. Salt fluoridation is identified by 12 countries in the Americas and 8 countries in Europe (est. 250 million population), and several others have the product available. **Conclusions:** Fluoridated salt has illustrated the capability to reduce dental caries prevalence both independently and in combination with additional fluoride and preventive products; is compatible with iodisation; does not increase salt consumption; is safe, and not a factor impacting heart disease or increased unaesthetic enamel fluorosis. Demonstrated effectiveness in different cultures, under different climatic conditions and diet, permits various marketing approaches from total coverage to individual selection, and is economically sustainable in developing economy countries.

ORAL HEALTH PROMOTION IN DAY-CARE CENTRES PROVIDED BY DENTAL STUDENTS

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Aim: The aim of this poster is to describe the German curriculum for dental students, which includes oral health promotion (OHP) as an education and training issue and to present the OHP activities of dental stu-

dents from the University of Jena who are actively involved in OHP-programmes in day-care centres.

Methods: Students initially receive lectures about OHP, the legal background, institutions involved, design of age-based toothbrushing instruction and dietary counselling programmes, efficient and safe use of fluorides and promoting regular visits to a dentist. The students then view an educational video-film demonstrating the practical implementation of OHP in day-care centres by dental students and take part in an OHP-workshop. Next in groups of two to four, they visit nursery schools every second week during a semester, providing active OHP to groups of 10–15 children aged 2–6 years. Students accompany and instruct the children in toothbrushing, prepare tooth-friendly-meals together, provide playful oral health related topics in order to awake curiosity and invite the children to visit the dental school. **Results:** The results have been cooperation and contract between the University Hospital, the Dental Public Health Service and each day-care centre participating in the OHP-programme. A survey by questionnaire among students of the 10th semester after one year OHP in day-care centres revealed: best learning progress resulted in reduced dentist-related fear and discomfort felt by children. The children performed daily toothbrushing and tooth friendly dietary behaviour as assessed by the students. 59% of the students observed a very positive and 39% a positive reaction. Students benefitted from “learning by doing” OHP, having a lively practical experience, improving their communication skills and becoming more comfortable in handling children. **Conclusions:** The children receive high quantity and quality OHP, since a large number of trained students were able to visit the day-care centres. With this approach also children with high caries-risk were reached by these OHP measures independent of their individual visits to dental practices.

LEGIONELLA: DISINFECTING THE WATER SUPPLY SYSTEM OF TWO PRIMARY HEALTH CARE CENTRES (PHCC) IN GREECE

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Legionella pneumophila (L.p.) in the water distribution system of a health care unit is a threat to public health, not only for immunosuppressed patients, and

a hazard for dentists and all health care workers. In May 2008, *L.p.* and *spp* were identified in non-acceptable concentrations ($>100\text{cfu /ml}$) in the water distribution systems of two PHCCs in the islands of Paros and Milos. **Aim:** To present all actions that were taken to disinfect the water supply in the two PHCCs and make them safe. **Methods:** The dental departments stopped their operations immediately. With the collaboration of the Department of Microbiology, National School of Public Health and the technical advice of engineers, the central heating system was replaced, and thermally flushed causing the buildings' internal pipework to be overheated and flushed for three days, the systems were then flushed with chlorinated water ($> 0.4\text{ ppm}$), all pipes in the dental units and showerheads were replaced and checked for "blind points". A chlorination system was installed and only sterile bottled water is now used in the dental units. In addition, an automatic water chlorinator and two UV (Ultra Violet) devices were installed in Milos. **Results:** After the procedures

were completed laboratory tests showed that the water systems were fully disinfected. A further check was carried out four months later. Low concentration colonies of *L.p.* were detected in four of the eleven samples from the PHCC in Paros and one of sixteen from the PHCC in Milos but the samples from dental units remained negative.

Conclusions: The disinfection methods have been proven to be effective in short term, but a long-term result has been difficult to achieve. A successful *Legionella* prevention programme requires periodic routine environmental surveillance with cultures. Even though the cost of the appropriate measures to follow up and sustain the quality of the water is very high for small units, such as the PHCC, it is important to strengthen the controls for *Legionella*, and the measures must also be extended to detect other microorganisms in water (*cryptosporidium*, etc.).

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