

The fifth congress of the

# European Association of Dental Public Health

Marburg, 2001

The fifth congress of the European Association of Dental Public Health, EADPH, was held in Marburg, Germany on 21st and 22nd September. The Co-president of the congress was Professor Klaus Pieper. The abstracts were refereed by the scientific committee consisting of dr. Eeva Widström, Hilsinki, Finland; Prof Klaus Pieper, Marburg, Germany and Professor Gert-Jan Truin, Nijmegen, The Netherlands

## Topics

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## Epidemiology

1	<b>Caries prevalence among children in different socio-economic areas of Stockholm, Sweden</b> M GRINDEFJORD, E TELNE, A HJERN, I BARENTHIN*. Public Dental Service, Stockholm, National Board of Health and Welfare, Stockholm, Dental Care Committee, Stockholm, Sweden
<p>The dental health of children in the Stockholm county is generally good, but there are variations depending on where in the county children live. A major goal of the county's public dental authorities is to reduce this inequity. In order to see how children's dental health relates to the socio-economic background, a study was conducted in some parts of the county which represent different levels of socio-economic standard. Dentists in 7 public dental clinics were calibrated to examine dental health in detail in connection with regular check-ups of child patients. Ending 1998 and beginning 1999, the dentists examined 652 children 3 years old and 560 children 7 years old. The parents answered a questionnaire. It was found that in one of the areas with high socio-economic standard and low proportion of immigrants only 4% of the 3-year olds had caries, whereas the proportion was 26% in one of the areas with low standard and high proportion of immigrants. Among 7-year olds in the same areas, the figures were, for caries lesions in primary teeth, 20% and 71% respectively, and for caries lesions and/or fillings in permanent teeth 6% and 20%. The results from the remaining 5 clinics followed the same pattern of relationship between caries and socio-economic background. The factors significantly associated with caries among 3-year old children were, in falling order, immigrant background, consumption of sweets more than once a week and a mother with low level education. The corresponding factors among 7-year old children were immigrant background, high numbers of mutans streptococci and frequent snacks between meals. <b>It can be concluded that children's dental health does reflect the socio-economic and cultural</b></p>	

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**The prevalence of dental caries in handicapped children and adolescents in Germany** P CICHON. Dept of Periodontology, University of Witten/Herdeche, Witten, Germany

1 The aim of the present study was to assess the prevalence of dental caries in handicapped patients which had been treated in the dental clinic in Witten/Germany from 1995-2000. The findings of this study had been compared with the results of surveys about the caries prevalence of non handicapped children in Germany from the year 1997 and with the results of a former study about the oral health situation in handicapped patients from the years 1983-1985 (Cichon P, Kerschbaum TH. Dtsch Zahnärztl Z 1999; 54; 96-102). Related to the results of the study about the caries prevalence of handicapped patients in 1983-1985 a decreased number of decayed teeth had been found with an unchanged number of missing teeth. Compared to the results of the survey about the caries prevalence of non handicapped children from the year 1997 (Micheelis W, Reich E. Dritte Deutsche Mundgesundheitsstudie (DMS III). Ergebnisse, Trends und Problemanalysen auf der Grundlage bevölkerungsrepräsentativer Stichproben in Deutschland 1997. IDZ, Deutscher Ärzteverlag, Köln, 1999) handicapped children and adolescents still present a high level of dental caries, poor oral rehabilitation and a high degree of treatment needs. **There was only a small percentage of caries-free dentitions (31%), a poor oral rehabilitation (Restorative Index: 26%) and the WHO health goals for the year 2000 - a DMF/T below 2 for the age group 12 years (2,7) and 50% of all dentitions cariesfree in the age group 5 and 6 years (19,4%) had not been achieved.**

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**Changes in oral health of children between 1991 and 1999** A BORUTTA\*, J MOENNICH. Department of Preventive Dentistry, Friedrich-Schiller-University of Jena, Germany

In spite of a general improvement of oral health in children, there are still differences between several Federal States of Germany (DAJ 1997). The aim of this study was to analyse retrospectively the changes in caries prevalence (dmft, DMFT) between 1991 (baseline) and 1999 among 5- to 6- and 11- to 12-year olds from Erfurt, Thuringia. From a total of about 30,343 carious statistic data sheets from yearly dental examinations of children in these two age groups around 10% (n=3200) were randomly selected (for each age group 200 per year) for comparison of oral health. Results showed that the caries prevalence among 5- to 6-year olds has significantly increased over the time from 2.2 dmft in 1991 to 3.6 dmft in 1996, combined with a high treatment need. Afterwards a slight reduction was recorded up to 3.1 dmft in 1999. 36% (1991) to 42% (1999) of the subjects were caries free. Children with high caries risk (30%) showed on average 4.9 dmft at the baseline and 7.7 dmft at the end of the observation period. In contrast to this for the 11- to 12- year old school children a significant caries reduction from 1995 (2.1 DMFT) to 1999 (1.5 DMFT) was found. The DMFT values among high caries risk children decreased from 5.9 DMFT at baseline to 3.6 DMFT at the end. Grammar school children showed significantly lower DMFT-values as those from other school types. **It could be concluded that oral health has improved among schoolchildren, only. Preschool children still showed deficits in their oral health status. Beside a basic prevention for all children it seems to be important to pay more attention to children with a high caries risk.**

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**Caries prevalence of 5-, 11-, and 17-year-olds of Dutch and Turkish/Moroccan origin** JHG POORTERMAN\*(1), H KALSBECK(2), MAJ EIJKMAN(1)

1Dept. of Social Dentistry and Dental Health Education, ACTA, Amsterdam;  
2Division of Child Health, TNO Prevention and Health, Leiden, The Netherlands

In 1987, 1993 and 1999 caries data were collected in four middle-large communities in the Netherlands. The aim of this study was to compare the oral health status, measured by the DMFT score and the percentage caries free, of Dutch 5-, 11- and 17-year-olds with those of Turkish and Moroccan origin (i.e., with their mother born in Turkey or Morocco). All were insured in the Dutch National Health Service. On average per year and age group, 358 Dutch and 70 Turkish and Moroccan participants were clinically examined with light, mirror and probe. In these groups, only for Dutch 11- and 17-year-olds a positive trend ( $p < 0.001$ ) was found between 1987 and 1999. The dmft score for Dutch 5-year-olds was lower (2.7 resp. 6.5,  $p < 0.01$ ) and the percentage caries free higher ( $P < 0.01$ ) in all three years. The DMFT score for the 11-year-olds was significantly lower for Dutch children in 1993 (1.4 resp. 2.1,  $P < 0.05$ ), and the percentage caries free was lower in 1993 and 1999 ( $P < 0.01$ ). The percentage caries free was only lower in Dutch 17-year-old adolescents in 1999 ( $P < 0.01$ ). Their DMFT score was lower in 1993 (7.6 resp. 9.1,  $P < 0.05$ ) and in 1999 (5.2 resp. 8.2,  $P < 0.01$ ), but surprisingly higher in 1987 (5.6 resp. 12.2,  $P < 0.01$ ). It is supposed that the larger part of this Turkish and Moroccan cohort was born in its country of origin and spent its childhood there. Growing up in a relatively low caries prevalence environment, possibly due to different oral health habits or fluoride containing water, provided these youngsters with a head start. The other cohorts, mostly born in the Netherlands, lacked this opportunity and are definitely in need of additional support with respect to their oral health status. **In conclusion, these results clearly show that in general the Dutch participants have less caries than their Turkish and Moroccan contemporaries.**

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**Community oral health analysis: experiences from an area in Russian Karelia** A HIIRI\*, H HAUSEN, S KÄRKKÄINEN. Institute of Dentistry, University of Oulu, Oulu, Finland

In 1993, we started together with the local authorities an oral health promotion project in Pitkäranta region, Russian Karelia. At that time, the living conditions in the area were hard, and the oral health care system was functioning poorly. As the first step, we studied a random sample of children in the target area. The survey included clinical dental examinations and questionnaires on living conditions and oral health habits. The methods were the same that had been used in 1992 in two Finnish towns, Kuopio and Jyväskylä (Seppä L et al. Community Dent Oral Epidemiol 1998;26:256-262). We used the pooled data of the Finnish towns as the point of reference when assessing the situation in the target area. The percentage of 12-year-olds with no DMF surfaces was 12% and 38% in Russia ( $n=162$ ) and Finland ( $n=143$ ), respectively. The corresponding mean DMFS score was 4.7 (95% CI 4.0,5.4) in Russia and 2.5 (95% CI 1.9,3.1) in Finland. In Russia 70% and in Finland 10% of DMFS consisted of untreated cavities. The percentage of 12-year-olds who brushed their teeth at least once a day was 66% in Russia and 92% in Finland. Eleven percent of the Russian and 90% of the Finnish children used fluoridated toothpaste daily. During the three-year period preceding the dental examination, the Finnish children had received on average 2.4 sealants and 3.1 fluoride varnish applications. In Russia, such professional prevention was practically non-existent. Surprisingly, 69% of the Russian children reported consuming sweets daily. In Finland, the percentage was 9%. **Thus, obvious reasons were found for the higher caries frequency in the Russian area.** An intervention was started in 1994 with the aim of improving self-care and reorienting the ways of action of the oral health care system. The situation will be surveyed in 2001 by using the same methods as in 1993.

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**Dental caries in the permanent dentition of 7- to 13-year-old immigrant children in Hamburg** S LAUNHARDT \*, U SCHIFFNER. Department of Conservative and Preventive Dentistry, University of Hamburg, Germany

The objective of the study was to determine the caries prevalence in 7- to 13-year-old immigrant children in Hamburg and to compare it with that of German school children. A random sample of 543 immigrant children was examined according to the WHO-criteria by one calibrated dentist. Using a questionnaire which revealed the level of education of each child's father, data about the social class background of the children were collected. The DMFT- and DMFS-values were calculated and statistically compared using the U-test. The caries prevalence (DMFT) in the different age groups of the immigrant children varied between 0.3 ( $\pm$  0.8) and 3.1 ( $\pm$  2.9). The DMFS-value was between 0.5 ( $\pm$  1.6) and 5.1 ( $\pm$  5.6). In contrast, the caries prevalence (DMFT) in German school children varied between 0.2 ( $\pm$  0.6) and 1.3 ( $\pm$  1.8), and the DMFS was between 0.2 ( $\pm$  0.9) and 1.7 ( $\pm$  2.7). All values were significantly lower in German than in immigrant children ( $P < 0.05$ ). More-over, in immigrant children the caries prevalence differed significantly between children of different nationality. The high caries values of immigrant children can not exclusively be attributed to their unfavourable social background as children with specific social class affiliation exhibited significantly more caries than German children of the same social class. **The study showed a high caries prevalence in the permanent dentition of immigrant children. As the number of these children constitute about on quarter of all school children in Hamburg, specific programs with caries preventing interventions are required.** This study was supported by the Local Association for the Promotion of Dental Health in Children and Adolescents in Hamburg (LAJH e.V.).

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**Oral health of elderly and related social and behavioural factors** A E JESS\*, A BORUTTA, T FISCHER. Friedrich Schiller University Jena, Dept. of Preventive Dentistry, Jena, Germany

Data about oral health of elderly are limited. Therefore, a partial aim of this study was to examine oral health status among elderly in relation to factors that influence oral health, with particular consideration given to social and socio-demographic characteristics. The study was conducted in Thuringia in 1995 as a comparison of the German part (1991) of the WHO initiated International Collaborative Study of Oral Health Outcomes (ICS II). 1000 subjects aged 65 to 74 years were randomly selected from urban and rural areas. The clinical examination included among other dentition and caries status (DMFT) and periodontal status (CPITN). A standardised questionnaire about social data and oral health behaviour was performed right before the clinical examination. Results were based on 672 elderly (67% response). On average the elderly had 9 teeth. 28% of them were edentulous. Caries prevalence amounted to 24.6 DMFT. Men (MT=21) and rural subjects (MT=21.5) showed more missing teeth than women (MT=19.5) and urban dwellers (MT=18.4). Periodontal condition reflected for 41.8% progressed stages of diseases (CPITN=4). This was more frequent for men (51.3%) and in the rural population (49%) than for women (37.3%) and urban dwellers (35%). Insufficient oral hygiene behaviour and poor oral health were observed in particular among male and rural subjects. A low level of education and low-skilled jobs besides other variables were assessed as risk factors for oral health also. **In conclusion, elderly showed substantial deficits in oral health associated with social and behavioural factors. An improvement of oral health can only be realised by a lifelong preventive orientated self care in connection with an appropriate dental care.**

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**Caries prevalence of 12-year-old rural children in Gambia in 1996 and 2001**  
T LIETZ\*, A EBERT and P GAENGLER. Faculty of Dental Medicine, University of Witten/Herdecke, Germany

The aim of this study was to compare the caries prevalence in 12-yr-old schoolchildren in 1996 and in 2001 for future planning of OHE, ART and training of national Community Oral Health Workers. A group of German students/dentists started in 1995 a dental emergency and atraumatic restorative treatment (ART) programme in the village of Jahali (population ca. 2500, NGO - Jahali Health Centre). Previous assessment in Gambia has shown a DMF-T for 12-yr-old children of 2.3 in 1995 (WHO Oral Health Country/Area Profile Programme [www.whocollab.od.mah.se/afro/gambia/data/gambiacar.html](http://www.whocollab.od.mah.se/afro/gambia/data/gambiacar.html)). Calibrated investigators assessed in 1996 all 12-yr-old subjects (N=106) of the Jahali Primary School, and the survey was repeated for 12-yr-old schoolchildren (N=106) in 2001. Caries lesions were detected by probing of cavitation using mirror and daylight, no X-ray was performed. The DMF-T was 1.8, and 49.1% of children were free of dental caries in 1996. Five years later the DMF-T was 1.03, and 58.9% of children were caries-free, and there were less high risk subjects with DMF-T<sup>3</sup> 4 (7.5% in 2001 versus 20.8% in 1996). **There are impressive differences in caries prevalence within this 5 years interval despite the fact that health education, family-based nutrition and overall living conditions have not changed and the ART programme for this age group did not yet show effects.** We would like to thank the children of Jahali, the staff of Health Centre and the sponsors of the ART programme.

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**Caries decline in Hassia (Germany) in the period 1994- 2000**A. MOMENI\*, K. PIEPER, R. STOLL. Department of Pediatric and Community Dentistry, Dental School, University of Marburg, Germany

The aim of the present study was to assess the prevalence of dental caries and treatment needs of 12-year-old children living in Hassia (Germany) 1994, 1997 and 2000. A 5% sample was selected by a two-stage random sampling procedure. The sampling frame was the roster of schools and school districts maintained by the department of statistics. DMF-T-values were assessed according to WHO-criteria. During a pre-survey training period all examiners were calibrated by an experienced dental examiner (K.P.) including theoretical information, preliminary diagnostic training with slides, and examination of patients. The findings were coded on special survey sheets, later on transferred to a computer and processed using a special analysis program. 2250 children were examined in 1994, 2068 children in 1997 and 2257 in 2000. In 1994 32% of the children had a sound permanent dentition, the corresponding figure for 1997 was 44% and for 2000 59.4%. In 2000 the mean DMF-T (1.09) was significantly lower than the values obtained in 1994 (2.4) and 1997 (1.67), P-values < 0,001. A high proportion of sealed occlusal surfaces (mean value: 2.3 per child) was observed in 2000. An overall caries reduction of 54.6% was achieved within 6 years. The D-components were respectively 20.3% (1994), 18% (1997) and 22.7% (2000). In 1994 28.2%, in 1997 20.4% and in 2000 13.3% of the children needed dental treatment. **These results indicate a progressive caries decline in Hassia. The criteria for Europe in the year 2000 (DMF-T < 2) were attained in this federal state.**

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**Enamel opacities in schoolchildren in the Rhine-Neckar-district, Germany**MJ KOCH\*, B KUKSEN, U NIEKUSCH. Poliklinik für Zahnerhaltungskunde, MZK-Klinik des Universitätsklinikums, Heidelberg,

The aim of this study was to examine the prevalence of opacities in the dental enamel of migrants and non-migrants. School children (n=849) from five different schools in the Rhine-Neckar district were examined. The examination of all permanent teeth for diffuse opacities (DIFF) or demarcated opacities (DEM) in the enamel was performed using the diagnostic criteria of the DDE Index. Parents were asked to complete a questionnaire to determine where they and their child were born. Three different groups were defined: "Group A" if both of the parents and the child were born in Germany, "Group B" if the child was born in Germany and one or both of the parents were born outside, and "Group C" if the child was born outside Germany, regardless of its parents' country of origin. The groups were constituted as follows: group A n=563, group B n=163 (in which 46% of the parents came from Turkey, 18% from Italy, 4% from Lebanon; these were the three main countries of origin) and group C n=117 (37% from the Balkans, 15% from Turkey, 14% from the former Soviet Union). In Group A, 50.1 % of the children studied were found to have at least one tooth which exhibited opacities. This figure was 46.7% for group B, and 37.6% for group C. An analysis of contingency tables by  $\chi^2$ -tests revealed a statistically significant difference between the three groups ( $P=0.031$ ). DIFF's were discovered in 16.6% of the children in group A, 15.8% of those in group B, and 11.4% of group C. The figures for DEM's were 38.5% (group A), 36.1% (group B), and 28.2% (group C). After Bonferoni adjustment was made, no statistically significant differences could be found between the groups. However, the prevalence of opacities in children born outside Germany tends to be lower. **It is concluded that the relationship between migration and the prevalence of enamel opacities needs further research.**

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### **Caries prevalence in Lower Saxony (Germany) in the year 2000 A**

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The aim of the present study was to assess the prevalence of dental caries and treatment needs of 12-year-old children living in Lower Saxony. A 10% sample of the schools in this state was selected by a random sampling procedure. The sampling frame was the roster of schools and school districts maintained by the department of statistics. In these schools 50% of the children were selected by chance. DMF-T-values were assessed according to WHO-criteria. During a pre-survey training period all examiners were calibrated by an experienced dental examiner. The calibration sessions included theoretical information, preliminary diagnostic training with slides and examination of patients. The findings were recorded on special survey sheets, later on transferred to a computer and processed using a special analysis program. A total 2005 children were examined. 53.9% of the children had a sound permanent dentition, the mean DMF-T value was 1.2. In a similar study in 1991 the corresponding figures were 21.6% and 3.1 respectively. Thus a caries reduction of 61.3% was achieved within a time span of 10 years. In 2000 the D-component was 22%, in 1991 31.9% of the decayed teeth were untreated. **The results of our study indicate a striking caries decline in Lower Saxony compared to former studies. In the year 2000 the revised criteria for Europe in the year 2000 (DMF-T < 2) were attained in Lower Saxony .**

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### **The value of a base line caries risk assessment model in the prediction of caries incidence**

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 2 Catholic University of Leuven,  
 3 Flemish Dental Association - section Oral Health Promotion,

In this study we sought to ascertain whether a previous cross-sectional risk model assessed at the age of 7 could be used to predict future caries onset in the permanent first molars at the age of 10. Data were obtained from the Signal-Tandmobiel®, a longitudinal project in Flanders (the northern federal state of Belgium), following a representative cohort of schoolchildren in a prospective investigation. (Vanobbergen et al., Eur J Paediatric Dent 2000;2:87-96). The baseline material for the present study consisted of 3,303 children born in 1989. Three outcome measures, cumulative caries incidence, individual's caries increment and the caries incidence density were used to compare different classes of children based upon the believed risk, assessed in a baseline cross-sectional multiple regression model involving data on oral health habits and socio-demographic factors. For the given outcome measures the general and mutual difference between the believed risk groups was highly significant ( $P < 0.0001$ ). Cumulative incidence ranged from 22.4 in the believed low risk group to 43.2 in the believed high risk group, resulting in an increase of risk of 95%. Increment measures showed a similar result. Incidence density resulted in substantial greater differences with an increase of risk of 164%. A logistic analysis with the incidence density as outcome measure provided a sensitivity of 53.62% and a specificity of 63.20%, which indicates that the risk marker does not have an important predictive power. **Even when it is quite plausible and evidence based that different risk indicators, if present, are responsible for an increase in caries incidence, none of the socio-demographic and behavioural variables have enough predictive power at community level to be useful for identifying the high caries susceptible children.** Supported by Lever Fabergé - Unilever.

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**Oral health and related factors in the Baltic Countries and Finland S KÄRKKÄINEN\***, H HAUSEN, L SEPPÄ, S KARJALAINEN. Institute of Dentistry, University of Oulu, Oulu, Finland

Finbalt is a collaborative study project for monitoring health behaviour and related factors in Estonia, Latvia, Lithuania and Finland. Information is obtained through a mailed survey. In spring 1998, questionnaires were sent to a random sample of 15-65-year-olds ( $n=13\ 000$ ). The country-specific response rates ranged from 62% to 77%. Questions related to missing teeth, toothache episodes, visits to dentist, tooth brushing, use of sugary products and smoking were used for the current study. The reported percentages have been standardized for age by the direct method using the age specific total numbers of subjects as the standard population. The percentages of persons who had lost at least 10 teeth were 15%, 24%, 21% and 13% (women) and 14%, 22%, 16% and 14% (men) in Estonia, Latvia, Lithuania and Finland, respectively. The percentages of persons who had had toothache episodes during the last year were 14%, 13%, 13% and 8% (women) and 18%, 17% 17% and 9% (men). The percentages of persons who had visited dentist at least once during the last year were 67%, 71%, 56% and 69% (women) and 50%, 52%, 51% and 56% (men). The percentages of persons who brushed their teeth more often than once a day were 56%, 43%, 44% and 65% (women) and 30%, 26%, 20% and 37% (men). The percentages of persons using sugary products more than three times a day were 55%, 55%, 70% and 17% (women), and 63%, 66%, 69% and 48% (men). The percentages of persons smoking daily were 45%, 47%, 28% and 38% (women) and 58%, 67%, 62% and 45% (men). **Tooth loss and toothache were clearly more common in Baltic countries than in Finland. The patterns of dental visiting were similar in all countries. Oral health related habits were clearly more unfavourable in Baltic countries than in Finland.**

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**people in long care hospital.** M FOLLIGUET\*, P CHARRU, A VEILLE-FINET, M TAVERNIER. UFR Odontologie, Paris V ; Hôpital Louis Mourier, Colombes, AP-HP, France

The aim of the study was to determine the existing link between the level of denutrition and oral and dental status. The study was performed among 111 institutionalised patients in long care hospital (average age 81.1yrs; 75% women). Madding pathologies were observed in 62.2% of the patients. The nutritional evaluation was based on the following criteria: weight, Body Mass Index, brachial circumference, Mini Nutritional Assessment, albuminemy and prealbuminemy. 23.4% of the patients had a satisfactory nutritional status; 50.5% and 26.1% respectively had a moderate and severe denutrition. 17,1% of the patients were completely edentulous; 13,5% had a total prosthesis; 64% had natural teeth and 5,4% had natural teeth and a prosthesis. **A relation between dental status and denutrition was found, which led the authors to set up a prevention program adapted to the institutionalised people including screening and determination of the objective need for care, information of autonomous patients, and adaptation of various care protocols.**

## Health Services

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**Multi-agency oral health promotion activity in a socio-economically challenged community**

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In 1996, a pre-5-yr-old, oral health-gain project commenced in an area of socio-economic deprivation in Glasgow. The aims were to reduce the caries experience of pre-school children (baseline mean 5-yr-old dmft=7.1), and inform strategic development for dental health improvement in similarly socio-economically challenged districts of the Health Board. A community development approach was adopted, with individuals and groups from the locality interacting with health, education and other disciplines to devise and implement culturally appropriate oral health promoting activities. The general focus centred around pattern and frequency of sugar intake, exposure to fluoride and early contact with dental professionals. Activities included development of parenting skills; distribution of dentifrice, toothbrushes and infant feeding cups; nursery tooth brushing schemes; adoption of nursery snacking policies; and dental registration initiatives. At baseline, the proportions of caries-free children aged 3yrs, 4yrs and 5yrs were 38%, 17% and 13%, resp. After 4 years, the corresponding percentages had risen to 51%, 40% and 18%, resp. Significant changes ( $P < 0.01$ , Wilcoxon Test) in the distribution pattern of dmft scores were seen over the four years, and reductions in mean dmft of 46%, 37%, and 31% occurred in age categories 3yrs, 4yrs and 5yrs, resp. No improvement in the dental health of 5-yr-old children from socio-economically challenged communities within Glasgow, as a whole, occurred over the same timescale. **In conclusion, improvements in the dental health of pre-school children residing in an area of socio-economic deprivation were seen four years after commencement of a community development approach to oral health promotion.**

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**Urinary fluoride excretion in men and women with intake of fluoridated salt** A SCHULTE\*, R GRÄBER, HJ STAEHLE. Department of Operative Dentistry, University of Heidelberg, Germany

Information on sex-related differences in urinary F-excretion is rare and conflicting. The aim of the present investigation was to assess whether urinary F-excretion differs between men and women. A study and a control group were formed. The study group comprised persons who took their main meals in the staff cafeteria (VZM) of the Heidelberg Medical School which was to start serving food prepared with F-salt. The control group consisted of persons not taking such meals. Each participant submitted 24h-urine prior to and 9 months after the start of using F-salt by VZM. Urinary F-concentration was determined by means of a F-sensitive electrode. In the study group, the mean baseline F-excretion was  $31.9 \pm 17.4 \mu\text{g/h}$  for men ( $n=94$ ) and  $27.7 \pm 15.1 \mu\text{g/h}$  for women ( $n=104$ ). Nine months later these figures were  $37.7 \pm 21.3 \mu\text{g/h}$  for men ( $n=91$ ) and  $31.2 \pm 13.5 \mu\text{g/h}$  for women ( $n=94$ ). The corresponding mean baseline values in the control group were  $29.0 \pm 13.0 \mu\text{g/h}$  for men ( $n=29$ ) and  $26.7 \pm 15.6 \mu\text{g/h}$  for women ( $n=31$ ), while 9 months later  $28.0 \pm 15.4 \mu\text{g/h}$  for men ( $n=23$ ) and  $24.1 \pm 12.5 \mu\text{g/h}$  for women ( $n=30$ ) were measured. No statistically significant difference in F-excretion was found between men and women ( $P > 0.05$ , Mann-Whitney U-Test). Nevertheless, there was a significant difference, both for men and women, between the mean baseline and 9 months F-excretion values of the study group, but not between those of the control group ( $P < 0.01$ , Wilcoxon-Test). **It is concluded that F-excretion increases in men and women who eat food which public catering operators have prepared using F-salt. Furthermore, interindividual differences in F-excretion seem to be of much more importance than any related to sex.** This study was supported by the German Federal Health Ministry (Grant No. 227-42265-49).

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**Responder and non-responder analysis for a caries-preventive program** Ch SPLIETH\*, Ch SCHWAHN, A NOURALLAH, M ROSIN. School of Dentistry, University of Greifswald, Germany

In order to determine the generalisability of results of caries-preventive studies which are conducted with the participants' informed consent, it is important to know whether responders and non-responders differ significantly. Unfortunately, data on the non-responders are most often not available. In 2000, 319 1st and 2nd graders in Greifswald/Germany took part in a compulsory school examination for caries (deft/DMFT, defs/DMFS), sealants, plaque (QHI) and fluorosis (Dean-Index) conducted by one calibrated dentist according to WHO standards. Their parents filled out an anonymous questionnaire on oral health topics. Afterwards, the children were given the chance to participate in a school-based caries-preventive program with biannual topical fluoride applications with Elmex® fluid. The non-responders to the program were statistically significantly older ( $n=91$ ; 8.9 yrs) than the responders ( $n=228$ , 8.6 yrs,  $P < 0.001$ , t-test). This was mostly due to a few older children repeating a grade and it resulted in significantly higher caries and lower fluorosis values ( $P < 0.05$ , Mann-Whitney-test). In an age-specific analysis, differences decreased and were no longer statistically significant, but for 21 out of 30 parameters the non-responders had slightly higher caries values, less preventive measures and a lower rate of completing the questionnaire. **This study suggests that non-responders of caries-preventive programs and their parents comply less with preventive measures and have more plaque and a higher caries prevalence than responders. Results from caries-preventive studies cannot be compared to or generalised for non-responders. In a risk-specific community preventive program, special approaches have to be found for non-responders.**

**The Prosthetic Treatment Need Index PTNI: a new multidimensional**

This project aims at developing an index system for assessing prosthetic treatment need. Prosthetic treatment need is no more regarded as being sufficiently described by the number of missing teeth. Treatment need is highly influenced by lifestyle, social, and individual factors. Furthermore, a modern professional view considers the non-replacement of teeth under certain conditions. Based on a survey data set, analyses on normative and subjective need rates were carried out and an attempt to define a feasible need index was undertaken. A very high normative need rate (81%) and a significantly lower subjective need rate (13%, chi<sup>2</sup>-test, P<0.01) was found. In a multivariate analysis subjective need was associated with giving dentist's recommendation as significant reason for prosthetic restorations (odds ratio [OR]=5.43), not believing that the own teeth were all right (OR=0.17), and the existence of prosthetic restorations (OR=3.87 for fixed restorations; OR=4.05 for removable dentures). To link normative and subjective variables an index was drawn up which should be applicable on a population-based as well as individual patient level. The proposal for a Prosthetic Treatment Need Index includes the parameters health gain, quality of life and subjective need. These parameters are scored from 0 to 3 each, resulting in a comprehensive need score ranging from 0 (no need), 1 (low need, indication of therapy in few cases), 2 (moderate need, relative indication of therapy) to 3 (high need, absolute indication of therapy). **The PTNI Index may be a clue to an adequate prosthetic need definition including the aspects health gain, quality of life, and patients' preferences.** Supported by the German Ministry of Education, Research and Technology.

**Areal variation in caries levels according to economic factors among 6-year-olds in Kemi, Finland**

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Our aim was to study the variation of the percentage of caries free children (PCF) among 6-year-olds (n=208) in the 15 statistical regions in the Town of Kemi. The following areal factors were considered: percentage of unemployed (PUE), annual gross income (AGI), number of persons economically dependent on one employed person (economic dependency ratio, EDR) and percentage of household-dwelling units with poor standard of equipment (HPS). Caries data were obtained from patient records. Individual caries data were combined to the already existing economical GIS data set by using the social security numbers that indicate the present area of residence. In the entire Kemi PCF was 64.3%, PUE was 25.6%, EDR was 1.99, AGI was FIM 88,773 and HPS was 5.0%. The statistical region with the lowest PCF (33.3%) ranked poorest according to AGI (FIM 73,858), PUE (41.9%) and EDR (2.61) but ranked highest according to HPS (1.5%). The statistical region that ranked second poorest according to PCF (42.9%) ranked most favourable according to AGI (FIM 92,461), PUE (20.0%) and EDR (1.79). The two areas that ranked highest with regard to the PCF (77.3% and 72.7%) showed no clear trend with regard to their levels of AGI (FIM 91,709, FIM 84,259), PUE (24.5%, 29.8%), EDR (1.97, 2.20) or HPS (4.0%, 1.7%), respectively. **In Kemi, the variation of caries levels according to areal economic variables did not show similar patterns as reported elsewhere.** (Tickle M, Brown P, Blinkhorn A, Jenner T. Community Dent Health; 2000:17:138-144). This could be explained by the fairly homogenous structure of the Finnish society but needs to be studied further. This study was financially supported by the Town of Kemi.

20	<b>Determinants of costs of orthodontic treatment in the Finnish public health services</b> E WIDSTRÖM*, S JÄRVINEN. National Research and Development Centre for Welfare and Health (STAKES), Helsinki, Finland
<p>Factors affecting the costs of children's free orthodontic treatment were studied from patient records of a random sample of 193 successfully treated orthodontic patients, aged 7-14 years at the start of the treatment and treated by orthodontic specialists in the health centres of the cities of Joensuu, Oulu and Vaasa. The statistical analysis was done using regression analysis, two-tailed t-tests and chi-square tests. The results indicated that the number of appliances used, the patients' ages at the start of treatment, the number of missed appointments, differences between health centres, and the change in PAR scores accounted for 78.7% of the variations in treatment costs. The number of appliances used was the most important factor in the regression (<math>R^2=0.657</math>). The costs of treatment were lowest in one-stage treatments started in the permanent dentition, and were highest in two-stage treatments started in the mixed dentition. <b>Significant differences were found in treatment patterns and costs between the three health centres, reflecting low concern for cost-efficiency aspects.</b></p>	

21	<b>Underprivileged people: dental status and care access</b> A VEILLE-FINET*, H LE CLESIAU, M FOLLIGUET, E LAROSA, A MAHUTEAU, J GABINSKY, G TOROSSIAN, UFR Odontologie, ParisV, Centre Prévention Sanitaire et Sociale, Seine St-Denis, France
<p>The centres of social security health examination have, among others missions, practice of free medical check-ups for the population. Thus, it is possible to determine the general health of consultants and to propose, if necessary, a therapeutic approach and follow-up. The centre of Bobigny, located in the department of Seine St-Denis receives each year 12 000 patients. We currently have 3 full years of activity, that means 36 000 files. There is a classification of people in 2 groups according to an administrative way: the sub-group of active persons, consisting in people having wages and the sub-group of precarious and priority ones: precarious: unemployed, 16 to 25 years old people in work insertion and their beneficiaries; priority: elderly and alone women, often with children. In addition to the general medical assessment, collection of oral clinical examination data allows us to determine odontological characteristics of these populations (and particularly in a group included in a psychosocial suffering survey) and to make a cross checking with a validated score of underprivilege. Objective need for care is very high, the problem of access to care is asked. In Paris area, a reflexion was initiated on the establishment of health networks to facilitate care access for most underprivileged. Associations give a specific answer, such the Dental Social Bus, which does charitable work since 1996 with assistance of voluntary practitioners. <b>The 3 years activity shows a regular increase in request; from 1998 to 2000, consultations increased from 2 076 to 2 235 interesting especially people without social security cover ( 90% of them in 2000).</b></p>	

22	<b>Caries frequency versus health awareness in the light of our own research</b> K MAKIEWICZ*. Warsaw Medical University, Students Research Group at the Department of Conservative Dentistry, Warszawa, Poland
<p>Poland has its place in the leading group of European countries with a high presence of caries. Until now, the prevention and treatment programs have been focused on 7 and 12 year old children. Epidemiological data concerning 15 year old youth are not up to date and are rather superficial. The study was performed on students from schools in the Siedlce district,</p>	

agricultural region in the east of Poland which was randomly chosen. The aim of the study was to investigate the frequency of caries among 15-year-old children and to compare the results of the clinical examination with the level of health awareness in this age group. The examined group consisted of 139 15-year-old students from 5 randomly chosen schools from the Siedlce region, including 80 girls and 59 boys. Patients were examined with dental probes and mirrors in the light of a laryngological head-lamp. The results of examinations were described in clinical cards according to WHO standards. To assess health awareness, anonymous questionnaires were used. Data was collected at school in the presence of the author, after explaining to the children the aim of the study, and how to fill in the questionnaire. Analysis of the results showed a DMFT index of 8.2 ( D-4.2, M-0.7 , F-3.4). Analysis of questionnaires showed that 82.7% of the group assessed their dental status positively and 54.0% brushed their teeth twice a day with a fluoride toothpaste. **The relatively high percent of people who assessed their dental status positively was not in concordance with the results of clinical examinations.**

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**Daily toothbrushing and annual visits to the dentist in Portugal** CM ALMEIDA. Faculty of Dental Medicine, University of Lisbon, Portugal

This study presents data of daily toothbrushing frequency and dental attendance collected in the 1998-99 Portuguese National Health Survey which, for the first time, included two questions on oral health behaviour. The survey was performed on a representative sample, 2 to 103 years age, living in Continental Portugal and the Autonomous Regions of Madeira and Açores. The results showed that 43% of the Portuguese population brush their teeth twice a day or more, with a large range according to age (=85 years: 6%; 15 to 24 years: 66%) and a higher prevalence for females (M=37%; F=41%). The prevalence of individuals that performed, in the last 12 months, a visit to the dentist, was 38% (=85 years: 8%; 2 to 14 years: 56%), and again a higher prevalence for females (M=36%; F=39%). The main reason for the last appointment was scored under "other reasons" (13%), extraction of a tooth scored second (9%) and emergency treatment scored third (3%). The main reason for not heaving an appointment in the last 12 month was "no need for it" (53%). Immediately after "other reasons" scored 5%, too expensive was considered by 4% of the individuals. **Oral health needs more attention in Portugal.**

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**Caries-incidence at children under consideration of social factors** A GÜRSESLI\*, A TREIDE, A MAKUCH, B HENTSCHEL, M LÖFFLER. University of Leipzig, Germany

The determination of caries-risk gets more and more interesting for the objective preventive care. Under these circumstances it is interesting how far the caries-decline and the connection of polarisation of caries-incidence are influenced by social aspects. The caries-epidemiological examination of children and teenager aged 6 to 17 years old took place in schools of Leipzig. The examination included 6811 children and teenager. For the investigation of the social structure we evaluated the findings of pupils from middle-schools and grammar-schools. There were differences in the oral-health found. The percentage of pupils with healthy or supplied sets of teeth was in average higher at pupils from grammar-schools than at pupils from middle-schools. The factors to describe the social environment of the quarters of Leipzig were taken out of the "social atlas of Leipzig 1997" and out of a citizen-inquiry which was realized in 1998 in Leipzig. The social-economical-status (SES) was calculated, which is arranged in low, middle and high. The SES was created in addition to Winkler including the factors 'average household-income', 'occupation' and 'vocational training' out of the citizen-inquiry. 12-year-old children showed an average DMF/T of 1.77, while we found out that the average DMF/T from

children of the class with a low SES was 2.2, of the class with a middle SES was 1.78 and of the class with a high SES was 1.38. Also the average DMF/T from 12-year-old children of grammar-schools was 1.37, and from 12-year-old children from middle-schools was 2.26. **The investigation of groups of children with an increasing caries-risk makes it possible to look after these children more intensively.**

<p>25</p>	<p><b>Dental examinations in infants and preschool children in the Czech Republic; interregional differences</b>  Z BROUKAL*(1), J DUKOVÁ1, Z USTOVÁ Z (2)  1 Institute of Dental Research, 1st Faculty of Medicine, Prague,  2 Dental Clinic, Faculty of Medicine, Hradec Králové, Charles University, Czech Republic</p>
<p>High caries experience in preschool children (less than 30% caries free 5 yr-olds currently represents a major problem in oral health of the population of Czech Republic. The aim of study was to study dental attendance amongst infants and younger preschool children and interregional differences in dental attendance. For this purpose the 1999 and 2000-database of the General Health Insurance Scheme (GHIS) was analysed. GHIS covers health care expences for 92-95 % of children (two examination/treatment cycles per year). Data on dental examinations and care were calculated for children aged 0-&lt;3 and &gt;3-5 years separately for each of 8 regions and for the whole country. Up to the age of 2 years 10.3% of infants were seen once a year and 7.9% twice a year by a dentist. The country mean was exceeded in the city of Prague (22.1 and 18.5% resp.), while 5 from remaining 7 regions were under that country mean. Between 3-5 years of age 36.8% of children were seen by dentist once a year and 12.8% twice a year, in the city of Prague 52.1 and 19.7% resp. The proportions of examined children in remaining regions kept with the country mean. The reasons of visits to dentist in infant age group were examinations (89%) and/or need of first aid care (in 9% fillings, in 2% extractions). The ratio of filling/extraction needs fluctuated considerably among regions. <b>Results revealed inacceptably low proportion of children both in infant and early preschool age involved in oral health care with considerable differences in the demand of care among regions.</b> Institutional grant IDR No. 00002377901 for years 1999-2003, Min. of Health, Czech Republic.</p>	

<p>26</p>	<p><b>Dental Hygienists in the EEA, N. America and Japan in 1998</b>KA EATON*, E WIDSTROM. Eastman Dental Institute, University College London, UK and National Research and Development Centre for Health and Welfare, Helsinki, Finland</p>
<p>This study was designed to compare the relative numbers of dental hygienists to dentists and the populations of the countries within the European Economic Area (EEA), N. America and Japan. Data for the populations of the countries and numbers of active dentists and dental hygienists were collected by a questionnaire sent to Chief Dental Officers. Comparable data for Canada, Japan and the USA were obtained from Dental Associations and Universities in these countries. From the data the ratios of dental hygienist:population, dentist:population and dental hygienist:dentist were calculated. This abstract reports data for dental hygienist:population only. The results showed that dental hygienists were not employed in 6 of the 18 EEA countries. The ratio of dental hygienist:population was 1:2,150 in Canada (14,000 hygienists:30,000,000 population), 1:2,230 in Japan (56,5000 hygienists:126,000,000 population) and 1:1946 in the USA (140,000 hygienists:270,000,000 population). For the EEA as a whole the ratio was 1:28,687 (13,300 hygienists:381,400,000 population) with a range of from 1:2,774 in Sweden to 1:95,377 in Italy. The ratio of dental hygienists:population was</p>	

higher than 1:6,000 in the four Scandinavian countries (Denmark 1:5,663, Finland 1:4,398, Norway 1:4,901 and Sweden 1:2,774) and between 1:10,000 and 1:20,000 in Iceland (1:10,195), The Netherlands (1:11,629) and the UK (1:15,566). **It was concluded that in Comparison with Canada, Japan and the USA there were relatively few dental hygienists in the EEA in 1998, that other than in the Scandinavian countries there were more than 10,000 inhabitants per dental hygienist, that these data are useful when planning oral health care services and that the reasons for these wide variations within the EEA need further investigation.**

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**An appraisal of the overall performance of an urban community dental service** J JOKELA, P LUUKKONEN\*, P UTRIAINEN. Health Centre of Korpilahti-Muurame, Centre for Health and Social Services of Jyväskylä, Health Centre of Seinäjoki, Finland

The aim of this study was to identify such operating methods as would increase the overall performance of a community dental service. This assessment followed upon the decision of the municipal health committee to extend dental services to a population of underserved adults without entitlement to subsidised care. No promise was made of any additional resource, which of necessity implied new operating methods and enhanced efficiency. Two public health specialists, one for caries prevention and redistribution of tasks and the other for DEA and health economics did the study. The data was gathered from routine clinical and administrative statistics as well as interviewing dental staff. **The study shows that dental examinations in the age group of 0-18 years had been reduced from 78% in 1991 to 33% in 2000 while the proportion with new dental caries had decreased from 14% to 6%.** In this study the new dental caries signified all the new carious lesions detected and decided to be restored. **The cost-effectiveness would still improve if all the routine dental examinations and prevention were delegated to dental hygienists. That would be safe for the health of the patients. The study also indicates that the dentists' and hygienists' productivity varied notably;** the monetary value of a yearly product ranged from EUR 52138 to 92671 and from EUR 25228 to 75685, respectively. **The job attitudes of the work community were correlated with the quality of activity. Organisational development should be targeted at systematic feedback and evaluation.** Besides, reflective professionalism could be used in the development process. The study was funded by the Centre for Health and Social Services of the City of Jyväskylä, Finland.

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**Oral health habits of European schoolchildren between 1994 and 1998** E HONKALA\*, S HONKALA, C TUDOR-SMITH, J TYNJÄLÄ, L KANNAS. Universities of Kuwait and Jyväskylä, Finland, Health Promotion Division, National Assembly for Wales, Cardiff, UK

The aim of this study was to find out the possible changes of oral health habits among the European schoolchildren (5., 7., and 9. grades) between 1994 and 1998. This study was based on the WHO Collaborative Study, Cross-National Survey on Health Behaviour in School-Aged Children (HBSC study). The data were collected by questionnaires in school classrooms and the target sample was 1500 children from each age group in each country. The studied health habits were toothbrushing, use of sweets and soft drinks. The nationally representative samples were used in 1994 and in 1998 from Austria, Belgium (Flemish- and French-speaking), Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greenland, Hungary, Israel, Latvia, Lithuania, Northern Ireland, Norway, Poland, Russia, Scotland, Slovak Republic, Sweden, and Wales. Swedish, Danish and Norwegian children were brushing more often according to the recommendation (more than 80% from girls and

75% from boys) than the children in the other countries. Toothbrushing increased between 1994 and 1998 most in Russia, Latvia, Lithuania, Estonia and France. Sweets were used least often on daily basis in the Nordic countries (less than 30%). Daily use of them decreased among both genders in Lithuania, Poland, Israel, Denmark, Canada, and among girls in Estonia and in Finland. Soft drinks were used daily least often (19%) in Finland. Use of soft drinks decreased in Austria and in France among both genders and among the Belgium Flemish and the Slovak boys. **It could be concluded that the toothbrushing habits were best in the Scandinavian countries and the sweets and soft drinks consumption habits best in the Nordic countries.**

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**Oral health habits of Finnish schoolchildren between 1984 and 1998** S HONKALA\*, E HONKALA, J TYNJÄLÄ, L KANNAS. Faculty of Dentistry, Kuwait University; University of Jyväskylä, Finland

The aim of this study was to find out the possible changes of oral health habits among the Finnish schoolchildren (11-, 13- and 15-year-olds) between 1984 and 1998. This was part of WHO Collaborative Study, Cross-National Survey on Health Behaviour in School-Aged Children (HBSC study). The studied health habits were toothbrushing, dental flossing, consumption of sweets and soft drinks. The data were collected by questionnaires in school classrooms. The nationally representative samples were used in 1984 (n=3465), in 1986 (3219), in 1990 (2996), in 1994(4187), and in 1998 (4864). In 1984 only one fourth of boys and half of girls were brushing according to the recommendation, but one fifth of boys and one tenth of girls did not brush even once a day. However, there appeared small but consistent improvement in toothbrushing habit among both genders during the studied period. Daily use of dental floss was very rare (2-5%) all the time. In 1984 boys were using sweets daily more often than girls (37%/29%), but up to 1998 daily sweets consumption decreased to 22% among boys and to 16% among girls. Boys were also using more often soft drinks on daily basis than girls did. In 1984 33% of boys and 20% of girls used soft drinks daily, but in 1998 only 20% of boys and 8% of girls had the same habit. **It can be concluded that oral hygiene habits of Finnish adolescents have not been developed as expected, but sweets and soft drinks consumption have been improving considerably during the 14 years follow-up period.** This study was supported by the Finnish Ministry of Social Welfare and Health.

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**Changing clinical dental practice: general anaesthesia in primary dental care** DP LANDES\*, R MADHOK. County Durham and Darlington Health Authority, Durham, Hull and East Riding Health Authority, Hull, England

This case study describes our approach to high prescribing levels of general anaesthesia (GA) in Primary Dental Care. Various reports into the use of GA in the UK had demonstrated that prescriptions were not always given on the basis of clinical need (Poswillo, Standard Dental Advisory Committee UK 1990, Dental General Anaesthesia, Clinical Standards Advisory Group Department of Health 1995). Despite these, our area covering the East Riding of Yorkshire and Hull (pop. 580,000) continued to have a significantly higher level of use compared to the rest of England. Starting in 1998, various measures were introduced to ascertain reasons for the high use and to promote safe and appropriate prescribing of GA. These included investments in training and education in sedation, appointment of key professional leaders and data collection feed back to local practitioners. The main messages are that not only is it difficult to obtain meaningful data but that there is considerable confusion about roles and responsibilities. There is no whole systems regulatory framework- various agencies are working separately and lack the necessary powers to effectively address problems in clinical practice. **In conclusion, promoting changes in clinical practice requires a multi-faceted**

## Caries Prevention

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**HEALTHY TEETH; the educational program of oral health for the first level of the primary schools** | LEKESOVA\*, S FIALOVA, R IVANCAKOVA. Ministry of Education, Prague, Dept. of Paediatric Dentistry, Palackeho University of Olomouc, Dept. of Paediatric Dentistry University Hospital, Hradec Kralove, Czech Republic

The absence of collective preventive programmes for pre-school and school children and their deteriorating oral health in the last decade lead the authors of this project to propose and implement the program Healthy Teeth. The objective of the programme is to improve the oral health of the children and the youth, thus creating the preconditions for the improvement of the oral health of adults in the future. The influence of the programme will also increase the teachers's knowledge in the area of dental health, since teachers play the key role in the project. The programme consists of the manual for teachers - with vocational texts concerning oral health and the work sheets for the pupils, which interactively explain to the children the dental care for the deciduous and permanent teeth. The programme was distributed to all the primary schools in the Czech Republic and covers 605 007 children. The teachers and dentists were informed about the programme at special seminars, the parents were informed about the project through TV and radio programmes. The information about the programme can be also found on the web pages [www.zdravezuby.cz](http://www.zdravezuby.cz) and on the toll-free line 0800-1-62825. **With regard to the current situation in the Czech Republic it is assumed that the educational programmes implemented in the frame of the standard education in primary schools could play a significant role in the improvement of the dental health not only of school children but also of adult population.** This project has been supported by the General Insurance Office of the Czech Republic and the Wrigley, Ltd company.

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**Intensive fluoridation in group-prevention-programs, a long term observation** B BRUNNER-STREPP, Public Health Department - District of Osnabrück, Germany

In the district of Osnabrück, Germany, oral examinations in primary schools are carried out since many years. The DMF-T is documented since 1994, following the recommendations of the WHO. Once a year the children usually get instructions to improve the oral hygiene and health. One of the schools (school A) showed a strong increase in DMF-T in 1995, which led to an intensive fluoridation program, lasting 4 years. Once a week the children brushed their teeth with high concentrated fluoride solution (elmex® fluid) under the instruction of a prophylactic dental nurse. This test school was compared with one primary school in the same town (school B) and one primary school in a neighbouring town (school C). In school B the normal prevention program was conducted (theoretic oral hygiene instructions once a fluoridation with elmex® fluid 4 times a year) was carried out only for those children with a high risk for caries. The mean caries increase in the 4-year period was 0.48 DMF-T in the test school A, 1.04 DMF-T in school B and 0.46 DMF-T in school C. The caries increase in school A and C was statistically significant lower than the caries increase in school B (U-test: P=0.033 respective P=0.039). **This observation has shown that both prophylactic concepts in group prevention are effective in reducing the caries increase significantly and thereby**

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**Efficiency of treatment in children with early childhood caries (ECC)**G DIETRICH\*, G HETZER. Department of Paedodontics, University of Technology, Dresden, Germany

Early childhood caries (ECC) is a public health problem in many European countries. The aim of our study was the assessment of efficiency of dental treatment for children with rampant caries. Between 1992 and 1999 418 children with ECC got comprehensive dental care in university department of paedodontics. Now they were invited for check-up. 149 children (47%) were examined, 99 had moved unknown. Data were obtained by clinical examination and questionnaire, filled in by parents. Statistical analyses were performed by Chi-square test ( $P < 0.05$ ). Mean age at the beginning of dental treatment was 3.3 ( $\pm 1.3$ ) years, mean dmft-score was 10.0 ( $\pm 4.1$ ). 48% of children were treated under general anaesthesia. Treatment costs were 343 ( $\pm 153$ ) Euro per child. At check-up only 41% of all children had complete treated teeth : 56% of children, who had been treated conventionally, but only 35% of children after treatment under general anaesthesia. Children, attending after treatment paedodontic department at university, more often had healthy or treated permanent teeth than children, referred back to their own dentists ( $P < 0.05$ ). **Conclusions: Dental treatment of children with ECC is high expensively. Intensive preventive care is required after oral rehabilitation to certain results and to increase compliance of children and parents. Competent advices are important for changing oral health behaviour, also for development of healthy permanent teeth.**

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**Improvement of oral health in diabetic children; results after 3 years of intervention**

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The longitudinal intervention study was conducted in the cooperation with Child Clinic, Faculty of Medicine in Olomouc and started in 1997. The aim of study was to ascertain the impact of oral health promotion program in diabetic children and to compare clinical and laboratory findings in both diabetes and oral health. 65 diabetic children were included in the study with following onset data: age 14,4 yrs (SE 0,52), length of DM 5,63 yrs (SE 0,81), HBA1C 8,89 (SE 0,40), DMFT 3,36 (SE 0,58), GI 0,25 (SE 0,06), DI 0,30 (SE 0,05). Oral health promotion program included regular instructions in oral hygiene and its evaluation during every recall by a diabetologist (more than four times a year). During dental recalls following parameters of oral health were examined and calculated: DMFT and its components, gingival and plaque indices, microbiological samplings for oral diabetic markers - yeasts and staphylococci. When comparing oral health data between the onset of study and after two years it was found that the DMFT score did not changed significantly (3.36 (0.58) vs. 4.29 (0.64), where as both plaque and gingivitis scores significantly decreased (DI 0.30 (0.05) vs. 0.12 (0.04), GI 0.25 (0.06) vs. 0.14 (0.08). The frequency of isolation of Candida sp. and Staphylococcus epidermidis did not change significantly during the study but oral infection by these species was found to correlate significantly with blood levels of HBA1C in both examination stages. **Results of the longitudinal intervention study confirm the efficacy of the intensive motivative intervention on improving oral health of diabetic children and challenge diabetologists to pay continuous attention to oral health of their young patients.**

<b>35</b>	<p><b>Group prevention enlarged by fluoride varnish - results after 4 years S DOHNKE-HOHRMANN*</b>. Bezirksamt Neukölln von Berlin, Public Dental Health Services, Berlin, Germany</p>
<p>In 1996 the caries prevalence of pupils living in Neukölln (Berlin) was higher than the mean of total Berlin. Hence a special preventive programme was initiated. All 49 primary and special schools of the district with a total 18.600 children joined the project. The aim of the present study was to evaluate, if any improvement of oral health conditions was achieved. The programme included as well a basic- as an intensive- prevention programme. All children whose parent's consent is given (70%), received - in addition to the usual Berlin health education - 2 times a year an application of fluoride varnish. One preventive session including examinations took one hour, if one dentist works together with three assistants. Since 1996 a programme with intensive care could be realised for 1500 children with high caries risk including evaluation of plaque, oral hygiene instructions, professional tooth-cleaning, use of dental floss as well as 4 times application of fluoride varnish per year. All children were examined once a year. 80.589 records were used for calculation, approximately 16.000 per school-year. A decline of DMFT-values was observed in all age-groups and school-years. The major improvement was calculated for the school-year 1999/2000. The mean DMFT-value for 12 year olds decreased from 2.77 to 1.64. The percentage of 12 year olds with DMFT=0 increased in the period 1996 to 2000 from 23.3% to 46.4%. Likewise a decrease of children with high caries risk was observed, for example from 38.2% to 25.8% in the 7 year olds and from 17.6% to 8.4% in the 9 year olds. <b>The success of the intensified preventive measures is documented by the improvement of all oral health data in all age-groups from 5 to 12 years.</b></p>	

<b>36</b>	<p><b>Prevention of early childhood caries (ECC) needs more knowledge of mothers S KNEIST*, A BORUTTA, P CHEMNITIUS, D EHERLER.</b> Department of Preventive Dentistry and Department of Economic Sciences, University of Jena, Germany</p>
<p>The aim of the study was to analyse complex structured data sets of ECC in 155 children. The children were 30 months old and 45% of their mothers believe that caries is a transmitted disease. For each child an index of caries (dmft) had been recorded together with the number of primary teeth, oral hygiene and gingivitis, salivary mutans streptococci (MS), and drinking behaviour at night with a bottle of milk or sweetened drinks. Furthermore, a set of structured variables, such as mothers' characteristics (education, occupation) and their effort to control the toothbrushing of the child, was included. The cariogenicity of the food was registered as well. A conditional independence graph with precise statistical meaning, consisting of circles representing variables and lines representing significant associations, was used for analysis of data sets (Wermuth 1998). Studying the graph as a whole, it was apparent that MS and dmft formed a separate set with the highest significance (<math>j</math> 0.346). A negative correlation could be shown between mothers' education and serving of cariogenic food (<math>j</math> -0.222) and MS counts (<math>j</math> 0.214). Mothers with high education usually have an occupation (<math>j</math> 0.21) and check up the toothbrushing of their children (<math>j</math> -0.107), which have lower MS counts (<math>j</math> -0.246). Children of mothers with an occupation were put to bed without a nursing bottle of soft drinks (<math>j</math> -0.172) and had lower plaque indices (<math>j</math> -0.161). Plaque correlated positive with caries decay, especially with rampant caries (<math>j</math> 0.231). <b>In conclusion, the results could show that children of mothers with low education have a high risk for ECC. In addition mothers need more information about early transmission of MS.</b> (supported by Orion Diagnostica, Finland).</p>	

## Other

37	<b>Dental sepsis in 5 year old Scottish children</b> CM PINE*, <a href="#">G BURNSIDE</a> , MCW MERRETT. Dental School, University of Dundee, Scotland, UK and Tayside and Grampian Health Boards, Scotland, UK
<p>This paper reports on the prevalence of dental sepsis in Scottish 5 year old children and investigates relationships between sepsis, caries, plaque and deprivation. 6994 children of mean age 5.3 were examined as part of a survey conducted under the Scottish Health Boards' Dental Epidemiological Programme. The presence of dental sepsis was recorded, in addition to caries status, and presence of plaque. Postal code information was used to obtain a measure of material deprivation. Relationships between sepsis and its possible contributory factors were explored using both stepwise logistic regression and CHAID analysis. In the whole sample, 4.8% of children examined had dental sepsis, ranging from 2% in the most affluent areas to 11% in the most deprived. Children with sepsis had much higher caries experience (mean dmft 6.30) than those without sepsis (mean dmft 2.36). When these factors, and the presence of plaque, were entered into a logistic regression model to predict presence or absence of dental sepsis, the most important factor was not deprivation, but untreated decay. The data was partitioned using CHAID analysis to identify which groups were most at risk of dental sepsis. The groups which were most at risk were those with high caries experience, most of which is untreated. The children at highest risk were those with dt<sup>38</sup>, 26.4% of whom had dental sepsis. This can be compared with the group with dmft of 8 or more, but only 3 or 4 decayed teeth, none of whom had sepsis. <b>In conclusion, the proportion of children with sepsis increases markedly with caries experience. This disadvantage can be mitigated if more of the caries experience is treated. These findings would not support a policy of non-intervention for deciduous caries if oral sepsis is to be minimised.</b> (Thanks to the Scottish Health Boards for allowing use of the data.)</p>	

38	<b>Effectiveness of paediatric oral health education for socially deprived mothers of infants</b> H STRIPPEL. Medical Service of the Sick Funds' Head Organisation (MDS), Essen, Germany
<p>The aim of the study was to examine the effectiveness of structured oral health education (OHE) for socially deprived (SD) and non-deprived (ND) mothers of infants from 0 to 2 years in paediatric practice. A field intervention study with quasi-randomisation was performed. In the test group (TG), all 32 pediatricians in the city and rural district of Kassel (D) added extended and structured OHE to standard U3, U5 and U7 screening examinations (child age: 6 weeks, 7 and 25 months). 2 control groups in Kassel and Kiel/RE (D) received standard OHE only at the screening examinations. From 07/1996 to 03/1998 mothers completed questionnaires posted by the researchers. With 11389 questionnaires, the response rate was 88%. 11% of the population were socially deprived with a monthly equivalent net income of DM 667 or less, 50% below the population mean. At age 25 months (U7), 9% of the SD and 3% of the ND children had caries according to mothers' assessment (n=3140). CG (U7) received on average 2.7 information items on oral health, TG 4.2 (=+59%). Oral health knowledge did not change in SD but increased by 10% in ND. The percentage of mothers administering feeding bottles with cariogenic content every night (SD 6%, ND 4%) or at daytime (43%/28%) did not decrease. Frequency of toothbrushing did not increase (brushing every second day only: SD 21%, ND</p>	

10%). Use of fluoridated salt increased in SD (CG 40%, TG 56%). 30% of the U7 SD and ND children had seen a dentist. **Individual counselling moderately improves knowledge but is not sufficient to improve oral health in infants. Mass media information, social marketing and healthy public policy reducing the availability of plastic bottles and of sugar in baby drinks and medicines is needed to contain nursing bottle caries.** (Participants' incentives by: GABA, MAM, Pampolina, Sanetta, Lohmann).

39

**Treatment of replacement resorption with Emdogain® - results after 27 months** A FILIPPI\*, T VON ARX, Y POHL. Departments of Oral Surgery, University of Basel and Berne/Switzerland and Giessen/Germany

Ankylosis of traumatized anterior teeth may result in local growth disorders in children and adolescents. Therefore, the affected teeth should be removed while the jaw is still growing. Transplantation of premolars or primary canines with a vital periodontal membrane represents one possible therapy; any permanent prosthetic treatment is indicated only after completion of growth. In the case of early diagnosed ankylosis, intentional replantation using Emdogain® (Biora) may be considered as an alternative therapy. Preliminary results after 10 months showed promising results. During an investigation period of 27 months, ankylosis was diagnosed in 16 patients (mean age 14.4). All teeth showed markedly reduced or negative Periotest scores and an alteration in percussion. Some of them were in an infraposition. The ankylosed teeth were removed in all patients, followed by an endodontic treatment with retrograde insertion of a titanium post (Retropost®, Brasseler-Komet) carried out in an extraoral procedure after resection of the root apex. Emdogain® was applied to the root surface as well as into the alveolus without any pre-conditioning. The teeth were replanted or, in the case of an existing infraposition, were aligned correctly. This was followed by splinting for a maximum period of 14 days. Follow-up examinations were carried out once per month. The evaluated parameters included percussion and Periotest scores in addition to radiographic findings. During the evaluation period of 27 months, the replanted teeth could be checked over a mean period of 15 months (max 24, min 4). 4 teeth had a recurrence of ankylosis after 6 months on average, one tooth was lost in a second accident after 7 months. All the other 11 teeth were fully functional and exhibited no pathological clinical findings. For these teeth, clinical or radiographic findings suggesting recurrent ankylosis have not been observed. The Periotest scores corresponded to those of the adjacent teeth in all cases. **In the case of early diagnosed or small area replacement resorption, replantation using Emdogain® appears to prevent recurrence of ankylosis or results in a pronounced delay in many cases. This will enable about 3/4 of the young patients to reach an age where implant therapy becomes possible. This may be achieved by stimulating jaw growth and by retaining the width of the alveolar process without compromising esthetics or function.**

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**Research on tooth emergence: is there still a need for?** R LEROY\*, K BOGAERTS, E LESAFFRE, L MARTENS, D DECLERCK. Catholic University Leuven (Dental School, Biostatistical Centre), University Ghent (Dental School), Belgium

Review of the literature on permanent tooth emergence revealed several methodological problems: small sample size, uncertain representativeness of the sample, different definitions of tooth emergence, inappropriate statistical analysis, etc. The aim of the present study was to establish actual, reliable and precise emergence ages of permanent teeth. For this purpose data available from the Signal Tandmobiel® project were used. In this longitudinal survey data were collected from a representative sample of more than 4000 Flemish children, examined yearly (between 7 and 12 years of age) by trained dentist-examiners. (Vanobbergen J et al.

Eur J Paed Dent 2000;2:87-96). Tooth emergence was recorded by direct inspection. Logistic analysis was performed to calculate median values and 95% C.I. for teeth emerging during the first phase of the mixed dentition. The analysis indicated significantly earlier emergence ages in girls than in boys. The emergence pattern turned out to be symmetric in both sexes. Furthermore, the frequently cited preference for a cross-sectional approach of emergence analysis was evaluated based on this data set. No statistically significant differences were observed in the assessment of median emergence ages between the cross-sectional and longitudinal analysis. Moreover, the longitudinal approach yielded smaller C.I. **It can be concluded that there is a need for re-evaluation of the standards on permanent tooth emergence.** (Supported by Unilever, Belgium - Research Grant OT/00/35, Catholic University Leuven.)

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**Oral conditions of controlled abstinent alcoholics - a case-control-study** T MUUß, H EHRENREICH, E HORNECKER, R F MAUSBERG\*. Zentrum ZMK und Zentrum Psychologische Medizin, Universität Göttingen, Germany

Alcoholism is a serious problem in social medicine. In Germany 750,000 new cases a year are supposed. Apart direct toxic damage, as diseases of the liver, there are indirect effects, too, e.g. in the oral cavity. The aim of this study was to investigate the oral status of alcoholics. We examined patients participating in a special program who were abstinent for a one to four years period (group A: n=28; age  $\bar{x}$ 46 years) and matched abstinent control persons (group C: n=30; age  $\bar{x}$ 42 years). As the abstinent alcoholics were mainly smokers the control persons had to be smokers, too. The dental examination included the QHI, the PBI, the DMF-T and the CPITN (modif.: code 5=sextant no more existing). The mean QHI or PBI of the patients were 2,2, resp. 2, of the controls 1,6, resp. 1. Calculus was found in both groups in 61% or 57% of the participants. The DMF-T of group A was 21 and of group C 14. Whereas the mean D-T of the patients was 2 the controls had no untreated carious lesions. In the age class 25-34 years M-T was 2 in the patients, the controls had still all their teeth. In the age class 45-54 years M-T was 12 in group A in contrast to group C with 5 missing teeth. CPITN 0 was found in 2% of the sextants in group A and in 19% of the sextants in group C. CPITN 3 and CPITN 4 together showed similar findings in both groups: 54%, resp. 48% of the sextants. In group A one third of the sextants revealed CPITN 5, in group C it was 9%. Mainly the posterior sextants were involved. It is known that alcoholics often have poor oral conditions. **This study demonstrates for the first time the extent of the dental/periodontal damage and the lacking oral hygiene in heavy alcoholics under controlled conditions. It is necessary to improve the dental care of alcoholics even in the abstinence.**

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**Self-reported oral health behaviours among dental school students A** POLYCHRONOPOULOU\*, T ATHANASSOULI, T GATOU, M KAWAMURA. University of Athens Dental School, Greece, and Hiroshima University School of Dentistry, Japan

This study examined the oral health behaviours of Greek dental students and assessed the possible role of gender and university level on oral health beliefs. Five hundred thirty nine undergraduates, officially registered at the University of Athens Dental School, participated in the survey by filling a 12-graded-item questionnaire. A significant increase per year of study was observed in the number of students that reported careful brushing of the teeth [OR:1.1(1.0-1.3)], being able to clean their teeth well without the use of toothpaste [OR:2.5(2.0-3.1)], and using disclosing agents [OR:2.7(2.3-3.3)]. Each year of education significantly increased the probability of disagreement to statements as: I think my teeth are getting worse despite my daily brushing [OR:1.5(1.2-1.9)], I have never been taught

professionally how to brush [OR:1.7(1.4-2.0)], it is impossible to prevent gum disease with tooth-brushing alone [OR:1.3(1.1-1.5)], and I put off going to the dentist until I have a toothache [OR:1.3(1.2-1.6)]. After adjustment for gender differences, the above-observed significant trends remained in the same direction and level of significance. Examination of the summary questionnaire score revealed that females presented significantly higher total score. The score significantly increased in the fourth and fifth year of dental studies and this increment remained present after adjustment for gender differences. **Greek dental students acquire gradually the positive attitude towards prevention. This trend reflects basically the new perceptions that students breathe through the information and knowledge attained, and lesser the preparedness for action undertaking and behavioural modification.**

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**Levels of fluoride in public drinking water supply in Portugal** P ROMPANTE\*, E CUENCA, AM HEITOR, S QUINTANS, J FRIAS-BULHOSA. Dep. Saúde Oral Infantil e Prevenção, ISCSN, Portugal, Facultad Odontologia Univ. Barcelona, Spain, Lab. da Água, Instituto Ricardo Jorge, Porto, Portugal

This study presents the levels of  $F^-$  ion found in the water of public supply drunk in all of the districts in mainland Portugal. In the light of present-day knowledge the contribution of  $F^-$  ion, when topically used, will have a more relevant role in keeping dental enamel in the post-eruptive period. Therefore it is important to determine and evaluate this information with the purpose of planning preventive strategies in oral health. The methodology adopted consisted in collecting samples of water drunk in public consumption places. In the 279 places the level of  $F^-$  ion was 0.3 ppm; in 5.4% of the districts the value was between 0.3 ppm and 0.6ppm, and in the remaining districts (0.3%) the value is above 0.6 ppm. **The majority of the districts in continental Portugal present values below those established by the WHO. According to these values there is no relevant risk of dental fluorose occurrence in the latter is the only source of  $F^-$ .**

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**Oral health program for a refugee population in Greece** E BOUTSI, P DAMASKINOS\*, I LAMBADAKIS. Health Center of Lavrio and Evangelismos General Hospital, Athens, Greece

This study refers to the oral health program that has been applied to a population of 253 refugees at the Refugee Center located in Lavrio, Attica, Greece. Food, accommodation and personal hygiene items are provided for all. The average stay period for the refugees is nine months to one year and the majority comes from Iran, Iraq, Afghanistan and Turkey. All of them have free access to the Health Center of Lavrio and to the services of the National Health System for any health problem they may have. The above mentioned population includes 96 men, 47 women, 65 boys and 45 girls up to 18 years of age. All subjects have been examined and treated at the Health Center of Lavrio-located within walking distance from the Refuge Center- or at Evangelismos General Hospital, in Athens. The emergency cases, as soon as they arrived, were handled immediately either during the normal working hours in the morning or during the evening duties. Cases that were not emergencies were treated by appointment in the morning. This treatment includes primary health care and hospital dentistry except prosthetics and orthodontics. A preventive program is carried out throughout the year for all children up to 18 years of age, consisting of oral health promotion, prevention of caries, topical fluoride application and sealants. Providing treatment for refugee populations presents difficulties due to language barrier, different cultural backgrounds and increased treatment needs. **Concluding it is suggested that countries, which receive refugee populations, should exchange ideas and practices to improve the attention and care for refugees.**

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**The oral condition in homeless persons in Stockholm, Sweden** P DE PALMA\*, L FRITHIOF , L PERSSON. Institute of Odontology, Karolinska Institutet, Stockholm, Sweden

Oral health was examined in 31 homeless persons (10 women) in Stockholm as a part of pilot project in co-operation with Dept of Social Medicine, Karolinska Institutet in the autumn 2000. Besides the Odontological part the project included a medical examination and an extensive interview focusing on the social situation and drug problems. All examined persons were offered necessary medical and dental treatment. The mean age of the material was 48 years. The main part of the examined were alcohol (20) and/or drug addicts (amphetamine: 20). A majority had been exposed to one or all forms of hepatitis. Three of them were HIV-positive. They had been homeless from 6 months to 25 years. Latest dental visit was 6 years ago (range: 0-25); almost all had only got acute (emergency) treatment. Two subjects were edentulous and in the material as a whole 36 % of all teeth were lost. 17 subjects had between 1 and 11 remaining root rests with caries. All except two persons had extensive treatment need, 17-needed prosthetic treatment to restore aesthetics and function. The mean number of carious surfaces was 6.5 and DMF-T was 21. Caries seemed to be a dominating problem. All participants stated that the teeth are important for identity, looks and for function. Bad and unsightly teeth were regarded as a social stigma 80% of all tooth-surfaces had plaque and the gingiva was inflamed in 50% of measured sites (4 sites around each tooth). The mean number of deep gingival pockets was remarkably low considering the lack of oral hygiene. 27 patients wanted dental treatment and 25 came for their first treatment. 9 has been completed and 16 are still under treatment. The patients appreciated the treatment model applied in the present study; after one or two visits they were quite anxious to be on time and communicate appointment problems. Final year dental students showed great interest in helping these patients and performed a spontaneous action to be allowed to provide treatment in their spare time when the Institute normally is closed. **The study showed that there is a need of a special medical/social/dental examination and treatment unit for the 4000 homeless people in Stockholm. Obviously the homeless persons do not appreciate the presently available medical and dental facilities in the city.**