



Abstracts Presented At the EADPH Annual Congress on 13 September 2019

The authors of the first four abstracts competed for the GSK research awards and gave 15 minute oral presentations they were:

ABSTRACT 4304 POTENTIAL COST-EFFECTIVENESS OF ORAL CARE IN INSTITUTIONALIZED OLDER PEOPLE: A HEALTH-ECONOMIC EVALUATION

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Aim: There is need for optimized oral care in institutionalised older people. The aim of this health-economic evaluation was to evaluate cost-effectiveness of different alternatives for preventive and curative oral care in institutionalized older people.

Methods: An age- and gender-specific Markov model was used to compare estimated costs and healthy oral years (HOYs) arising from four alternatives: (1) usual care; (2) in-house preventive care; (3) in-house preventive care + curative care in the community; and (4) in-house preventive care + in-house curative care. A healthcare payer perspective was adopted, the time horizon was 10 years, and the setting was Flanders (Belgium). Sensitivity analyses were performed.

Results: Alternatives 2 and 3 were predominantly dominated by the two other alternatives. Thus, they were not considered relevant. The incremental cost-effectiveness ratio (ICER) of in-house prevention + in-house curation (alternative 4) compared to usual care (alternative 1) was 1,132€ per HOY gained. The probability that an intervention would be cost-saving, compared to usual care, was less than 5% for all interventions.

Conclusions: Several assumptions based on expert opinion were needed to populate the model. However, based on these findings it is recommended to adopt a policy which combines preventive and curative oral care, and consider in-house solutions for oral health care in institutionalized older people. In that case. It should be kept in mind that large investments are required at the beginning of the intervention, and that - given the older population and the high costs of oral health care - even in the long term it is unlikely that this intervention will become cost-saving.

Acknowledgements: The authors would like to thank Prof. Dr. Lieven Annemans (Ghent University) for his health-economic expertise and Dr. Barbara Janssens (Ghent University) and Prof. Dr. Joke Duyck (KU Leuven) for their expertise in oral care. The project was funded by “Vlaams Agentschap voor Zorg en Gezondheid (VAZG), (the Flemish Agency for Care and Health . Grant number AZG/PREV/GE/2016-01)

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**ABSTRACT 4325 ECONOMIC EVALUATION OF THE PROTECTING TEETH
@ 3 RANDOMISED CONTROLLED TRIAL**

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Aims: To conduct an economic evaluation of a sub-intake of the Protecting Teeth @ 3 Study (PT@3) – a two-year parallel group randomised controlled trial, which aimed to explore the additional preventive value of fluoride varnish (FV) application at six- monthly intervals in nursery schools compared to supervised tooth-brushing in the same nursery schools (treatment as usual, TAU).

Methods: The economic evaluation was a within-trial cost-utility analysis (CUA) comparing the FV group with the TAU group. CUA was conducted from a National Health Service perspective and followed the United Kingdom's National Institute for Health and Care Excellence guidance. Within-trial costs included intervention costs and health and social care resource use costs. Health outcomes were expressed in terms of quality- adjusted life-years (QALYs) accrued over the two-year period. The Child Health Utility 9 Dimensions questionnaire was used to obtain utility scores. Staff travel and labour costs were collected using a staff costs form. Information on other costs was requested from the trial coordinators. National reference costs were used, a discount rate of 1.5% for public health investments was adopted, multiple imputation methods for missing data were employed, sensitivity analyses were conducted and incremental cost-effectiveness ratios calculated alongside cost-effectiveness acceptability curves. Ethical approval for the study was from the West of Scotland Research Ethics Service.

Results: The data for 534 participants from the 2014/15 PT@3 intake (46% of 1,160 children evaluable participants in the PT@3 overall) were used in the economic evaluation analyses. Of these, 265 (50%) were in the FV and 269 (50%) were in the TAU arm. The mean difference in costs between the FV and TAU group was £68.37 (p=0.382; 95% CI, -18.04 143.82). The mean difference in QALYs was -0.004 (p= 0.636; 95% CI, -0.016, 0.007). The FV intervention was found to be dominated by the TAU. The probability that the FV intervention was cost- effective at the £20,000 threshold was 11.3%.

Conclusions: There was no substantial difference in total costs and QALYs between the two groups. The results indicate that applying FV in nursery schools in addition to supervised tooth-brushing seems not to be cost-effective.

Acknowledgements: PT@3 was funded by the Scottish Government;

**ABSTRACT 4352 LIFE COURSE SOCIO-ECONOMIC POSITION AND ORAL
HEALTH IN OLDER CHINESE POPULATION**

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Aims: Early-life socioeconomic position (SEP) has been associated with later oral health. However, studies are mostly in middle-aged populations or in a high-income context. This study investigated the association between SEP across the life course and oral health status of older adults, with an assessment of life course models (sensitive period, accumulation, and social mobility models).

Methods: Data were drawn from the seventh wave (2014) of the Chinese Longitudinal Healthy Longevity Survey (CLHLS). Data were collected by interview from 6,877 Chinese (≥ 65 years) in 23 provinces. SEP measures were childhood SEP (father's educational attainment and occupation), adulthood SEP (individual's educational attainment and occupation) and old-age SEP (household income, pension status and self-rated economic status). Number of teeth was used to assess oral health status at old age. Life course models, adjusted for age, gender and residential place, were assessed using logistic regression models.

Results: In the sensitive period model, participants who attended primary school and those who attended secondary school or above had respectively 28% (odds ratio [OR]=1.28, 95% confidential interval [CI]=1.17-1.40) and 39% (OR=1.39, 95%CI=1.24-1.56) more teeth than those who had no schooling; those with average and high self-rated economic status had 1.27 (95%CI=1.16-1.39) and 1.32 (95%CI=1.15-1.51) times more teeth than those who reported being poor, respectively. There was a gradient in the association between times of experiencing disadvantage SEP and number of teeth. In the social mobility model, participants who had an upward social mobility (OR=1.33, 95%CI=1.16-1.51) or were in stable advantaged SEP (OR=1.63, 95%CI=1.42- 1.87) were more likely to retain more teeth at old age than those stayed in disadvantaged SEP.

Conclusion: In the population studied, the sensitive roles of adulthood and old-age SEP in predicting number of teeth at old age were found. Number of retained teeth was associated with times of experiencing disadvantage SEP and social mobility.

ABSTRACT 4354 CHILDHOOD INJURIES – DO SOCIAL RELATIONSHIPS MATTER? FINDINGS FROM THE MILLENNIUM COHORT STUDY

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Aim: Injuries, including traumatic dental injuries, are a public health problem with multifactorial aetiology. Whilst previous research has explored the role of individual characteristics and the physical environment, evidence on how social relationships influence injury risk is lacking. This study aimed to explore associations between parent- child relationships and injury experience across childhood among UK children.

Methods: Secondary data analysis of the nationally representative UK Millennium Cohort Study (MCS). We analysed separately five MCS sweeps, when cohort members were aged 3, 5, 7, 11 and 14 years. Sample sizes were 10,626; 11,758; 10,863; 10,568; and 8,930 respectively. The outcome was injury experience measured using parental reports of the number of medically attended injuries since the last sweep. Separate models were run for measures of positive (i.e. closeness) and negative (i.e. conflict, smacking, shouting) experience of parent-child relationship. Associations were estimated using negative binomial regression, adjusting for child, maternal, family and socioeconomic factors.

Results: The prevalence of overall injury ranged from 3,127 (24.3%) at age 5 to 4,583 (38.3%) at age 7 whereas the prevalence of dental trauma was very low and ranged between 65 (0.5%) at age 14 and 208 (1.5%) at age 3. Therefore, multivariable analyses were conducted on overall injuries only. No association between positive parent-child relationship measures and injury was found at any sweep, but negative relationship traits were linked to injury experience at some of the sweeps. Increased injury rates were associated with higher conflict levels between parents and children at age 3 (IRR=1.01, 95% CI 1.00-1.01; p=0.037), smacking at age 7 (IRR=1.12, 95% CI 1.02-1.22; p=0.019) and more frequent arguing at age 14 (IRR=1.12, 95% CI 1.01-1.23; p=0.032).

Conclusions: In the population studied there was evidence of a weak association between negative parent-child relationships traits and overall injury risk. Further research should explore this association longitudinally.

All other abstracts were presented as posters and 5 minute oral presentations, which were arranged in 8 sessions. Details of the sessions are as follows:

Session 1 a: Oral Epidemiology and Caries
Chairs: Vaseleos Margaritis and Ruxandra Sava-Rosianu

13.30h	4251	Caries experience among 12-years old children from the Republic of North Macedonia	Ambarkova V.
13.38h	4258	Caries experience in relation to oral hygiene status in type 2 diabetic patients in Tirana	Hysi D.
13.46h	4263	Caries experience among 65-year-olds and older in Russia in 1998 and 2018	Kuznetsov P.
13.54h	4268	The effect of Calcium Glycerophosphate containing Toothpaste in Children with Early Childhood Caries: A pilot study	Kargul B..
14.02h	4279	Study of Lithuanian adolescents' malocclusions, extracted teeth and oral health	Sutkus J.
14.18h	4287	Caries prevalence in the Bekaa district of Lebanon and corresponding risk factors: a baseline study	Tarabaih A.S.
14.26h	4288	Community Water Fluoridation (CWF) Cessation in Juneau, Alaska: Impact on dental caries procedures and restoration costs in children and adolescents	Margaritis V.
14.34h	4341	Reliability of examiners using ICDAS for the Romanian Oral Health Survey	Sava-Rosianu R.

Session 1 b: Health Services Research
Chairs: Eeva Widström and Carmen Trullois

13.30h	4276	Dental Emergencies in a University Paediatric Dentistry Clinic	Durhan M.S.
13.38h	4286	The Public Dental Service in Finland – a good work place for dentists?	Widström E.
13.46h	4292	Dentists' health and well-being in England: influences and possible solutions	White S.
13.54h	4294	Career issues among Lithuanian dental hygienists: a challenge or a problem	Rederiene G.
14.02h	4296	Can the new French Case Mix identify patients requiring special care dentistry?	Faulks D.
14.10h	4308	The Dental Care Index in the City of Volgograd Children from 3 to 15 Years	Maslak E.E.
14.18h	4310	Diversity in applying oral hygiene guidelines by Flemish orthodontists	Sederel R.
14.26h	4313	Motivation of Ghent dentists regarding compliance with the ALARA-principle	Piccardi C.
14.34h	4342	Human Factors Science for implementing and evaluating dental public health interventions	Ross A.J.

Session 1 c: Oral Health Promotion
Chairs: Jacques Vanobbergen and Katarina Jerković

13.30h	4264	Dental fluorosis prevalence among 12-year-olds in Russia	Pazdnikova N.
13.46h	4289	Assessment of Oral Hygiene Knowledge and Practices of 15 to 17 year old French adolescents	Inquimbert C.
13.54h	4295	Toothpicks in Dutch Catering areas and Fitness-Sport Centres really work!	Gortzak J.J.C.
14.02h	4298	An oral health coach at Dutch well-baby clinics: study protocol for a RCT	Van Spreuwel P.
14.10h	4299	Preventive treatment in Finland needed but neglected	Linden J.
14.18h	4300	The Prevalence and determinants of eating difficulties among old home care residents in Finland	Salmi A.
14.26h	4302	Patients experiences and expectations of different brush heads on electric toothbrushes	Vankeirsbilck L.
14.34h	4306	A model for developing theory-based and evidence-based health promotion programmes	Buunk-Werkhoven Y.A.B.

Session 1 d: Quality of Life
Chairs: Paula Vassallo and Griet De Reu

13.30h	4247	Social inequality in the mirror of children oral health	Asgari I.
13.38h	4248	Oral Health attitudes of adolescents in Lithuania and Portugal: An international comparative study	Andruskiene J.
13.46h	4254	Prevalence of work related musculoskeletal symptoms among students in a Macedonian dental school	Nikolovska J.
13.54h	4262	Oral-Health-Related quality of life in institutionalized elderly In Manipur (India)	Kshetrimayum N.
14.02h	4265	Effect of district economic indicators on preschoolers' oral health in Serbia	Vukovic A.
14.10h	4273	Oral Health and Halitosis Status of Type 1 Diabetic Children: A Descriptive Study	Tekcicek M.
14.18h	4274	Capabilities, opportunities and motivations supporting oral health behaviour of adolescents in Nigerian schools	Lawal F.B.
14.26h	4278	Oral health-related quality of life after treatment of children with Molar-Incisor Hypomineralization	Durmas B.
14.34h	4303	Factors associated with poor oral hygiene among school-aged students in Mongolia	Javzan B.

Session 2 a: Tooth Surface Loss, Periodontal Epidemiology and Oral Health Promotion

Chairs: Jenny Gallagher and Rebecca Harris

15.15h	4266	Salivary flow rate survey in a multicentre erosive tooth wear study	Székely M.
15.23h	4283	The link between periodontal health and socio-demographic characteristics in Lithuanians aged 65-74 years	Liaudanskaite D.
15.31h	4316	Cigarette and e-cigarette smoking – a risk factor for gingivitis in Polish 15-year-olds	Antoniszczak D.
15.39h	4333	Combined therapy for periodontal diseases with the use of pigment-free laser photoablation	Chunikhin A.A.
15.47h	4383	Impact of periodontitis on quality of life of adults in England	Tsakos G.
15.55h	4311	Delivering Better Oral Health Guideline Development Manual: Methodology for Version 4	Gallagher J.E.
16.03h	4315	Oral Health Knowledge of Turkish Senior Child Development Students	Bahar D.
16.11h	4347	Association and independence effect of individual Childsmile interventions with child oral health	Kidd J.B.R.
16.19h	4422	Do patients value Traffic Lights or photographs over verbal information on risk?	Harris R.V.

Session 2 b: Quality of Life (2) and Health Services Research

Chairs: Colwyn Jones and Ruth Sederel

15.15h	4307	Living with Dementia: pilot study of oral care beliefs, understandings and practices	Curtis, S.A.
15.23h	4309	Oral health status of school children in Herat Afghanistan	Rezaie M.
15.31h	4339	Spanish GDP (general dental practitioners) workforce trends and effects on the dental school in Majorca, (ADEMA/UIB)	Jones C.
15.39h	4345	Delivery of dental services for drug users: experiences with inter-professional collaboration	Hovden E.S.
15.47h	4348	Continuing professional development among Public Dental Service dentists in Finland	Savanheimo N.
15.55h	4382	The oral health needs of people with disabilities as perceived by managers and caregivers	Phlypo I.
16.03h	4390	Society and Oral Health in England and Wales - The Last 50 Years	Harris M.
16.11h	4387	The patterns and predictors of dental service utilization by people living with HIV in British Columbia, Canada	Jessani A.A.

Session 2 c: Gerodontology and Caries

Chairs: Luc De Visschere and Andreas Schulte

15.15h	4344	Cross-sectional association between oral health and frailty: findings from ELSA study	Petrauskiene E.
15.23h	4346	Provision of preventive dental care in adults with Down's Syndrome in Germany	Schulte A.G.
15.31h	4350	The link between residency and dental care visits of the Belgian Elderly	Brabant S.
15.39h	4385	The evaluation of oral health interventions in vulnerable older adults based on the CReDECI 2	Janssens L.
15.47h	4386	Mentorship for Implementing an Oral Health Policy in Nursing Homes	Palmers E.
15.55h	4430	Delivering oral health care to older adults in Flemish dental practices	Bots-Vantspijker P.C.
16.03h	4349	Oral health behaviour and attitude towards caries among mothers with toddlers	Petrauskiene S.
16.11h	4384	An audit of the completion of paediatric caries risk assessment a community dentistry clinic	Sibanda L.

Session 2 d: Other Topics

Chairs: Roxanna Oancea and Martijn Lambert

15.15h	4269	Temporo- Mandibular Joint dysfunction in Turkish children with juvenile idiopathic arthritis	Giray E.F.
15.23h	4272	Pathological refluxes effect on some saliva parameters	Ivannikova A.V.
15.31h	4277	Teaching of Dental Public Health at the Undergraduate Level in Turkey	Sen Yavuz B.
15.39h	4280	Predisposing factors for post-traumatic osteomyelitis in the mandible. A retrospective study	Blazys D.
15.47h	4281	Healing determinants after tooth extraction from the angle of the mandible fracture	Kulpaviciute M.
15.55h	4297	Knowledge and attitude regarding Hepatitis B amongst a group of dental students	Kalyoncu I.S.
16.03h	4301	Tooth loss and risk of cardiovascular disease in a middle-aged, Polish urban population	Pająk-Łysek E.
16.11h	4381	Microchromographic 3-dimensional examination of teeth to understand caries better	Kustra P.

Session 1 a: Oral Epidemiology and Caries (1)
Chairs: Vaseleios Margaritis and Ruxandra Sava-Rosianu

**4251 CARIES EXPERIENCE AMONG 12-YEAR-OLD CHILDREN FROM THE
REPUBLIC OF NORTH MACEDONIA**

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Aim: The aim of this study was to assess dental caries in 12 year-old children from three different regions of the Republic of North Macedonia.

Methods: The ethics committee of the Faculty of Dental Medicine at the University of St. Cyril and Methodius approved the study and parental consent was obtained for each child. Dental status was evaluated using the 2013 World Health Organization caries diagnostic criteria for Decayed, Missing and Filled Teeth (DMFT) by two calibrated examiners, who worked in clinics in the schools. Data obtained during the survey were stored in a database and statistical analysis with SPSS 13.0 for Windows was performed. The data were tested for possible statistically significant differences using the Kruskal-Wallis ANOVA test. A p value < 0.05 was considered statistically significant. The study was conducted during 2013. In this cross-sectional study, primary school children from seventh grades were selected from 15 central and 15 regional primary schools in three regions.

Results: The total number of children in the sample was 610 comprising 294 (48.20%) females and 316 (51,80%) males. The mean DMFT was 1.94± 2.49 in the Southeast region, 2.75± 2.56 in the Vardar region and 3.46± 2.9 in the Eastern region , with standard deviations of ±2.49, ± 2.56 and ± 2.9 respectively and with a 95% confidence interval of 1,5-2,37 for Southeast region , 2,2-3,31 for Vardar region and 3,46± 2,9 for Eastern region. The 12 year old children from the Southeast, Vardar and Eastern regions had highly significantly different values for the DMFT scores for caries in permanent teeth (p = 0,0001).

Conclusions: The severity of dental caries was low in children from the Southeast region and moderate among the children from the Vardar and East regions.

The presenter of this abstract was awarded a Colgate travel award

**4258 CARIES EXPERIENCE IN RELATION TO ORAL HYGIENE STATUS IN TYPE
2 DIABETIC PATIENTS IN TIRANA**

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Background: Diabetes mellitus (hyperglycaemia) can cause reduced salivary flow rate and increased glucose level in saliva. This can lead to the growth of acid-producing bacteria, which are a major cause for the development of dental caries.

Aim: The aim of this study was to assess dental caries experience in relation to oral hygiene status among type II diabetic hospitalized patients (T2HP).

Methods: In 2019, a cross sectional study of hospitalised patients at the Endocrinology Clinic in Tirana University Hospital Centre (QSUT) was conducted. . Permission for the study was granted by the relevant health authorities. All Type 2 diabetes patients, who were dentate were invited to participate in the study. Those who gave written consent

were included in the study and were given an oral examination following the World Health Organisation (2013) Basic Methods protocol. They then completed a structured questionnaire which included questions about education level, income, alcohol consumption and smoking. Two calibrated clinical examiners performed the oral examinations with single use instruments. Caries experience was measured by the DMFT index and the ratio of D/DMFT, representing the prevalence of untreated caries. The “Silness-Löe (1963) oral hygiene index was used to assess plaque. . The data were analyzed by SPSS 22, one way ANOVA was used for quantitative and categorical variables and bivariate Pearson correlation statistics for quantitative variables.

Results: Of 66 T2HPs only 43, with a mean age of 54 years, agreed to have an oral examination. Their mean DMFT score was 18.0 (SD+/-7.2), D/DMFT=0.33(SD+/-0.2), M/DMFT=0.52(SD+/-0.28). Their mean plaque score was 1.61 (SD+/-0.44). One way ANOVA showed no significant correlation between education level, income, alcohol consumption and smoking and caries experience. Bivariate analysis showed a positive correlation between plaque score $r=0.47$ ($p<0.05$), age $r=0.68$ ($p<0.05$) and DMFT.

Conclusion: T2HP showed a high caries experience related to a moderate plaque accumulation, which could be distinguished visually, indicating a need for them to practice regular oral hygiene.

The presenter of this abstract was awarded a Colgate travel award

4263 CARIES EXPERIENCE AMONG 65-YEAR-OLDS AND OLDER IN RUSSIA IN 1998 AND 2018

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Aim: The aim of the study was to evaluate the caries level among 65-year-olds and older in Russia over a 20-year period.

Methods: In 2018, as part of the 3rd National Oral Health Survey, 8489 65-year-olds and older from the 49 regions of Russia were randomly selected and examined using WHO (2013) criteria. Dental examinations were performed by calibrated dentists. Mean DMFT data were compared between 1998, 2008 and 2018 using the t-test. The number of 65-year-olds and older people having 20 and more natural teeth, dental prosthetics and those edentulous were assessed. The study was approved by the Ethical Committee of Moscow State University of Medicine and Dentistry.

Results: The prevalence of dental caries among the 65-year-olds and older was 99% in 1998, 100% in 2008 and 100% in 2018. Mean DMFT values significantly increased within the 20-year period: from 21.79 ± 0.28 in 1998 to 23.00 ± 0.28 in 2018 ($p<0.01$). However, there was a decrease in the “D”- component of DMFT from 2.52 ± 0.11 to 1.51 ± 0.08 ($p<0.001$) with a simultaneous increase in the “F”- component from 1.98 ± 0.08 to 3.51 ± 0.15 ($p<0.001$) from 1998 to 2018, respectively. The number of missing teeth had not changed significantly (17.29 ± 0.34 in 1998 and 17.98 ± 0.35 in 2018, $p>0.05$). In 2018, among the examined 65-year-olds and older, 1868 (22%) had 20 and more natural teeth with a mean number of natural teeth of 11.54 ± 0.31 . The numbers of 65-year-olds and older with dental prostheses were 4831 (60%) in 2008 and 4414 (52%) in 2018, respectively. The mean number of edentulous in 65-year-olds and older were 1127 (14%) in 2008 and 1273 (15%) 2018, respectively.

Conclusion: There was an increase in caries level among the 65-year-olds and older in Russia over the 20-year period. These data can be used for monitoring caries experience and as a baseline for planning oral health strategy for elderly people.

The presenter of this abstract was awarded a Borrow Foundation travel award.

4268 THE EFFECT OF CALCIUM GLYCEROPHOSPHATE CONTAINING TOOTHPASTE IN CHILDREN WITH EARLY CHILDHOOD CARIES: A PILOT STUDY

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Aim: The aim of this study was to investigate the efficacy of Calcium Glycerophosphate containing toothpaste R.O.C.S.® kids Toothpaste on remineralisation, short term effect on S mutans, buffering capacity and pH of saliva in children with Early Childhood Caries (ECC).

Methods: The study was reviewed and approved by The Human Research Ethics Committee of Yeditepe University, School of Medicine (protocol number of 392). It took place in 2018. Signed informed consent forms were obtained from the children's parents. A convenience sample of 26, four- to- five-year-old children with ECC who attended the Department of Paediatric Dentistry, Marmara University was recruited. Thirteen otherwise healthy children with 198 teeth were randomly allocated to the intervention group and were given Calcium Glycerophosphate and Xylitol containing toothpaste. A further 13 otherwise healthy children with 183 teeth were given Fluoride toothpaste and formed the control group. Parents were asked to brush their children's teeth twice a day for one minute every day for 4 weeks. Stimulated saliva samples were collected and used to measure salivary pH, buffering capacity and S. mutans levels. The teeth were quantitatively examined using a portable laser fluorescence system (DIAGNOdent). The statistical significance of the results was assessed using SPSS paired sample t-test and an independent sample t test.

Results: DIAGNOdent scores decreased following the application of the Calcium Glycerophosphate/Xylitol containing toothpaste and control. A significant difference was found after 1 month in both groups. ($p > .0001$). The remineralising potential of Fluoride Toothpaste was not significantly higher than that of R.O.C .S.® kids toothpaste. ($p = 0.866$). Salivary buffering capacity and pH increased after using both toothpastes. The frequency of S mutans decreased in both the intervention and control groups. The decrease in S. mutans was not statistical significance possibly due to the small sample size. **Conclusions:** In the small sample studied , it can be concluded that the Calcium Glycerophosphate and Xylitol containing toothpaste has positive effects on enamel remineralisation and might be a suitable choice for prevention in children with ECC.

Conclusions: In the small sample studied, it can be concluded that the Calcium Glycerophosphate and Xylitol containing toothpaste has positive effects on enamel remineralisation and might be a suitable choice for prevention in children with ECC.

The presenter of this abstract was awarded a Borrow Foundation travel award.

4279 STUDY OF LITHUANIAN ADOLESCENTS' MALOCCLUSIONS, EXTRACTED TEETH AND ORAL HEALTH

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Aim: The aim of this study was to evaluate the prevalence of malocclusions, oral hygiene status and the number of teeth extracted due to caries in Lithuanian adolescents aged from 11 to 16 years (mean age 13.4 years).

Methods: In 2017- 2018, this study was conducted in 10 Lithuanian counties in randomly selected educational institutions, where 792 pupils were clinically evaluated and interviewed. using WHO (2013) Basic Methods. Oral hygiene of the subjects wasevaluated using the Simplified Oral Hygiene Index (OHI-S). Statistical analysis of the data was performed using Pearson's chi-squared test. The study was approved by the Bioethics committee of Vilnius University.

Results: Excellent oral hygiene was found in 14 (2%) , and good in 272 (34%), fair in 372 (47%) and poor in 134 (17%) of the subjects. Five hundred and ninety two (75%) had a normal occlusion, 67 (9%) had deep overbite, 104 (13%) had an anterior or posterior cross-bite, 23 (3%) had an open bite, 6 (1%) had an edge-to-edge bite. Four hundred and sixty four (59%) had no tooth crowding, 214 (27%) – mild, 86 (11%) – moderate and 28 (4%) – severe teeth crowding. Thirty six (5%) had had a molar and 8 (1%) a premolar tooth extracted due to caries. Cross-bites were statistically significantly associated with poor oral hygiene ($p=0.0001$). There was no difference in the prevalence of malocclusions between the sexes. Female subjects lost their teeth statistically more often due to caries compared to males ($p=0.0029$).

Conclusions: The oral hygiene status of over half of the Lithuanian 11-16 year adolescents, who took part in this study was only fair or poor. A number had had at least one permanent tooth extracted due to caries. Malocclusions were common in that : 50.3% of 11-12-year-olds and 56.5% of 14-15-year-olds had crowded teeth or other symptoms of malocclusion. Anterior and posterior cross-bites were statistically significantly associated with poor oral hygiene.

The presenter of this abstract was awarded a Borrow Foundation travel award.

4287 CARIES PREVALENCE IN THE BEKAA DISTRICT OF LEBANON AND CORRESPONDING RISK FACTORS: A BASELINE STUDY

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Aim: The aim of this descriptive cross sectional study was to assess and compare the caries status of children aged 6-9 years living in West Bekaa region - Lebanon and to determine risk factors for dental caries in this group.

Methods: A representative cluster stratified sample, composed of 442 randomly selected preparatory school children (233 males and 209 females) was recruited from three public, three private and two boarding schools. Samples were taken from school drinking water sources and a double blinded test for fluoride concentration was performed using the fluoride ion chromatography test. The children were then examined by one calibrated dentist examiner for dental caries (dmft) according to World Health Organization criteria [WHO, 1997]. The Institutional Review Board of Beirut Arab University approved the study and all parents of all participants signed a consent form.

Results: The mean dmft of children aged 6-years old was 5.77 ± 3.69 . A one way ANOVA test showed significant differences for the mean difference between the three school sectors ($p=0.02$). Private school students had a statistically significant lower dmft mean (5.70 ± 3.32) than boarding school students (6.78 ± 3.83) with $p=0.021$. There was a significant difference in mean dmft ($p=0.014$) between students drinking from different levels of fluoridated water. However, Tukey HSD results indicated that the mean differences between the groups were only significant at fluoride levels of 0.20 mg/L and 0.24 mg/L with dmft values of 7.18 ± 2.83 and 5.13 ± 2.90 respectively. Differences in age, gender and type of water source were not significant.

Conclusions: Despite the presence of fluoride in drinking water the caries prevalence of the school children who participated in this study was high compared to WHO recommendations. Further investigations are needed to identify social and behavioural risk factors.

4288 COMMUNITY WATER FLUORIDATION (CWF) CESSATION IN JUNEAU, ALASKA: IMPACT ON DENTAL CARIES PROCEDURES AND RESTORATION COSTS IN CHILDREN AND ADOLESCENTS.

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Background: Recent trends toward CWF discontinuation in public water systems represent an opportunity to evaluate caries epidemiology and caries treatment cost variations under suboptimal CWF conditions. Given the relatively new phenomenon of policy change inspired by CWF cessation advocacy groups, the impact on population health after removing exposure to optimal fluoride levels in public water systems remains understudied.

Aim: The aim of this study was to determine the extent to which CWF cessation impacted on dental caries-related procedures and restoration costs among Medicaid-eligible children and adolescents, in Juneau, Alaska.

Methods: All 853 Medicaid dental claims records for 0- to 18-year-old patients residing in Juneau, Alaska during an optimal CWF year 2003 were compared to all 1,052 claims for the same age group from 2012, five years after cessation of CWF. Walden University's Institutional Review Board approved the study (#10-31-16-0075333) A bivariate

analysis (Mann-Whitney U test) of the mean number of caries procedures performed per child was conducted in the study groups under both independent CWF conditions. Logistic regression was also performed using the dependent variables of caries procedures and the cost of caries-related procedures, with adjustments for CWF group, gender, and race.

Results: There was a significantly higher mean number of caries-related procedures among 0- to 18-year-old and < 7-year-old patients in the suboptimal CWF group in 2012 than in 2003 (2.35 vs. 2.02, $p < 0.001$; 2.68 vs. 2.01, $p = 0.004$). The mean caries-related treatment costs per patient were also significantly higher for all age groups, ranging from a 28% to 111% increase among the suboptimal CWF cohorts, after adjusting for inflation. Binary logistic regression analysis revealed a protective effect of optimal CWF for the 0- to 18-year-old and < 7-year-old age groups (OR = 0.748, 95% CI [0.62, 0.90], $p = 0.002$; OR = 0.699, 95% CI [0.52, 0.95], $p = 0.02$, respectively).

Conclusions: CWF cessation promoted a marked increase in the number of caries-related procedures and treatment costs for Medicaid-eligible children and adolescents aged 0-18 years who lived in Juneau. Additionally, the results indicated that children in the younger age group cohorts underwent more dental caries procedures than the older age group cohorts, who had benefited from early childhood exposure to optimal CWF. These results add to the growing body of information available regarding CWF cessation epidemiology by both confirming the dental caries prevention benefit of CWF and expanding the evidence base regarding the oral health and economic impacts of CWF cessation under contemporary conditions.

4341 RELIABILITY OF EXAMINERS USING ICDAS FOR THE ROMANIAN ORAL HEALTH SURVEY

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Aim: The aim of the study was to evaluate the inter- and intra-examiner reliability in caries detection using the ICDAS system for the examiners participating in the Romanian Oral Health Survey for children.

Methods: For the implementation of the oral health survey, 10 examiners are meant to cover each part of Romania. All examiners participated in the initial training, which was divided into theoretical discussions, practical activities, and calibration exercises. After obtaining ethical approval from the national and local authorities, 21 schoolchildren aged 6-7 years and 12 years were selected by a dentist according to their caries activity. Before the examination, parents or caregivers signed an informed consent form. For the examinations the ICDAS criteria were used to classify visual caries lesion severity (0-6 scale), and presence of filling material (0-8 scale) of all available tooth surfaces of permanent and primary teeth. The examination used a clinical light, mirror, probe and air syringe. Kappa statistics were used to determine inter-and intra- examiner reliability at baseline.

Results: The baseline calibration on 21 subjects indicated an inter-examiner kappa ranging from 0.74-0.86 and intra-examiner kappa ranging from 0.81-0.92. The kappa coefficient for fillings was consistently in the excellent range, while for lesion severity it was in the good to excellent range.

Conclusion: The baseline training/calibration in ICDAS was crucial to ensure the examiners reliability over the examination period and give consistent results of the ongoing epidemiological survey.

Session 1 b: Health Services Research (1)
Chairs: Eeva Widström and Carmen Trullois

**4276 DENTAL EMERGENCIES IN A UNIVERSITY
PAEDIATRIC DENTISTRY CLINIC**

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Aim: A significant number of children visit a dentist for the first time due to emergency situations. However, little is known regarding the prevalence, aetiology, and treatment provided for children at emergency dental visits. This study aimed to evaluate the profile of children attending a dental school, paediatric dentistry, emergency clinic, the reasons for seeking dental care, and the treatment provided at a dental school in Istanbul, Turkey.

Methods: One hundred seventy children who attended to the paediatric dentistry emergency clinic between February 2019 and April 2019 were analysed. Ethical approval for the study was obtained from the Ethics Committee of Marmara University Faculty of Dentistry and written consent was obtained from the parents. Information on demographic (age, gender); the main complaints, diagnostics and the treatment performed was collected from their records. The data were numerically coded and entered into Excel. Summary statistics were calculated to include frequencies, percentages, and means where indicated.

Results: Children's ages ranged from 1 to 13 years, and the mean child age was 7.28 (3.13) years. For 170 children, 84 (49%), pain was the main reason for the emergency visit. Thirty five (20%) of the visits were due to trauma, and the most frequently required treatment was endodontic intervention 104 (61%). Of the decayed teeth, 80 (47%) were primary posterior teeth and 37 (22 %) permanent posterior teeth. Pain caused by dental decay was the most frequent chief complaint. Fifty six (33 %) of children were brought to the dentist with complaints that had started one to three days, for which 36 (21 %) of them had not used medications.

Conclusions: Dental emergencies in a paediatric dentistry, emergency clinic based setting were predominantly related to caries and trauma. A significant number of the emergency visits were due to caries in primary posterior teeth. Further studies should assess the socio-economic profile of patients attending the dental emergency services and differences in dental service use between social classes.

The presenter of this abstract was awarded a Borrow Foundation travel award.

**4286 THE PUBLIC DENTAL SERVICE IN FINLAND – A GOOD WORK
PLACE FOR DENTISTS?**

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Background: The Public Dental Service (PDS) is the main oral health care provider in Northern Norway and Finland where recruiting dentists is challenging.

Aim: To survey public dentists' willingness to stay in the PDS and how they experienced their work environment.

Methods: Based on theories by Karasek & Theorell (1990) a self-administered questionnaire was developed and sent to all 190 public dentists in Northern Norway and 117 in Northern Finland, 114 (60%) from Norway and 74 (67%) from Finland responded. The chi squared test was used for statistical analysis. Ethical approvals were given by REC (2015/1637; Norway) and THL (8/2014; Finland).

Results: Twenty seven (24%) of the Norwegian and 16 (22%) of the Finnish respondents stated that they had often thought of not continuing to work in the PDS. A greater proportion of the Finnish than the Norwegian respondents experienced reported stressful working conditions ; 72 (97%) Finns and 97 (86%) Norwegians ($p < 0.05$) claimed that that the working pace in their clinics was hard, and 51 (70%) Finns and 44 (39%) Norwegians ($p < 0.001$) felt that that they had too many patients . “Difficult patients” were often encountered by 42 (58%) Finns and 57 (50%) Norwegians ($p < 0.01$). A greater proportion of the Norwegians than Finns recognized positive job characteristics. For example, 111 (97%) Norwegians but only 49 (66%) of Finns ($p < 0.001$) felt that they could make independent decisions on their own work. Furthermore, 99 (88%) Norwegians and 52 (70%) of Finns ($p < 0.001$) reported that the employees in their clinics shared knowledge and supported each other on a daily basis. Thirty one (43%) Finns and 68 (60%) Norwegians (ns) felt that that their employer appreciated their work. Most respondents (170, (90%) perceived the quality of care provided as good.

Conclusions: The PDS in Norway caters primarily for the young and adult special needs patients and in Finland for all types and age groups of patients. Thus, there is more adult and emergency treatment in the PDS in Finland. In both countries, the dentists experienced their work as demanding.

4292 DENTISTS’ HEALTH AND WELL-BEING IN ENGLAND: INFLUENCES AND POSSIBLE SOLUTIONS

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Aim: To explore the factors influencing dentists’ health and well-being in England and possible solutions.

Methods: Semi-structured interviews were conducted from May to October 2018 with a purposive sample of dentists working in England, taking account of age, gender, career-stage, work sector, geographical area, position and route of entry to registration. King’s College London ethics committee approved the study and participant consent was obtained prior to the interviews. A topic guide informed by past research was used to guide the discourse. Dentists were approached via gatekeepers across England, followed by snowball sampling. Interviews were recorded and transcribed for analysis. Framework analysis led to the development of theory taking an interpretative phenomenological approach.

Results: Twenty dentists, working in England, were interviewed. Whilst the health and well- being of dentists were reported to be positive among late career dentists, early career dentists and/or with high National Health Service work commitment shared concerns about their physical, psychological and emotional health. Influential factors identified ranged from regulation and system, through workplace and job specification, to their professional careers and personal life at the micro level. Dentists reported feeling driven to deliver, highlighting their lack of control and ethical concerns. ‘Escaping’ from certain aspects of dentistry through ‘mixing’ NHS with private care or a dental job with a non-clinical activity were options together with leaving the profession. Whilst ‘strengthening their social network’; and ‘embracing self-care’ were reported as potential solutions, there was evidence that some had made or were contemplating complete escape.

Conclusion: In the population studied, multiple factors and challenges at organisational, system and practice levels, affected dentists’ health and well-being. Potential solutions were suggested, particularly relating to early-career dentists, and the urgency of tackling these issues highlighted to ensure that in England the expertise of a trained workforce is retained.

Acknowledgement of sources of funding: Public Health England and King’s College London.

4294 CAREER ISSUES AMONG LITHUANIAN DENTAL HYGIENISTS: A CHALLENGE OR A PROBLEM

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Background: There are about 1200 registered dental hygienists in Lithuania. Each year around 150 new dental hygienists graduate.

Aim: The aim of this study was to evaluate the employment of dental hygienists in Lithuania.

Methods: In 2018, based on similar studies in other countries and studies previously performed in Lithuania, a questionnaire was developed. It included questions on demographics, professional, practice characteristics, opinion about dental hygienists employment in the workforce. The questionnaire was distributed by email to all registered dental hygienists in Lithuania. The survey was approved by the Lithuanian Dental Chamber, who license all dental hygienists. The resulting data were statistically tested using chi-squared and Mann Whitney U tests.

Results: The response rate was 52%. The majority of respondents were women 564 (97%) and their mean age was 29.9 years ranging from 21 to 55 years. Four hundred and fifty eight (79%) of respondents lived and 426 (74%) worked in the five largest Lithuanian cities, whereas 121 (21%) lived elsewhere and 153 (26%) worked in the other cities or villages. Four hundred and fifty four (78%) had a vocational education bachelor's degree, 453 (78%) worked in the private sector and 398 (69%) had one workplace. Almost 80% of respondents always or sometimes experienced a shortage of patients. The most common additional job they performed was dental assistant 190 (68%). However, only 122 (21%) of them had a dental assistant education. Dental hygienists who had less than 10 years of experience more often worked as dental assistants than dental hygienists, who had more than 10 years of experience ($\chi^2 = 8.052$, $df=3$, $p=0.045 < 0.05$). In the private sector dental hygienists more often worked as dental assistants than in the public sector ($\chi^2 = 22.099$, $df=2$, $p=0.000 < 0.05$). Four hundred and twenty eight (74%) respondents reported that they only wanted to work as a dental hygienist and not in other roles and 447 (77%) respondents stated that they considered that there is an excess of dental hygienists in Lithuania. Also the large majority (488 - 83%) thought that finding a dental hygienist job in Lithuania is difficult. Most of them (408, 75%) would like governmental regulation of the dental hygienist workforce in the country.

Conclusions: In the population studied, Lithuanian dental hygienists reported a shortage of patients, time available to treat additional patients and the need to work in an additional job, which was mostly as a dental assistant. Most of respondents reported a surplus of dental hygienists and thought that there was a need for effective governmental regulation of the dental workforce in Lithuania.

4296 CAN THE NEW FRENCH CASE MIX IDENTIFY PATIENTS REQUIRING SPECIAL CARE DENTISTRY?

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Background: A new French dental public health measure provides a financial incentive for dentists for each treatment session with a patient with severe disability. This payment is dependent upon the patient receiving a certain type of disability benefit, a criterion contested as inappropriate. A French Case Mix tool (APECS questionnaire) was previously developed and tested by the French association for disability and oral health, as an alternative criterion.

Aim: This pilot study aimed to evaluate whether the APECS questionnaire can identify patients requiring special care in dentistry.

Methods: The APECS questionnaire lists seven domains for which the dentist may have to adapt their management of patients requiring special care dentistry (communication; cooperation; need for sedation or GA; medical health; dental risk; autonomy; coordination). APECS is relevant for a given patient at a given treatment session. APECS data were extracted from patient files over one month (November 2018) in three centres – one general practice with a session a week for patients with disability, and two special care hospital units. This retrospective, cross-sectional, convenience sample, pilot study was given ethics approval by the Clermont-Ferrand University Hospital Institutional Review Board.

Results: Data were recorded for 153 patients from general practice (mean age 39 (range 2 to 89) years; 69 (45%) were male and for 239 from special care units (mean age 40 (range 2 to 102 years); 136 (57%) were male). Twenty nine (19%) of the general practice patients were considered to require moderate to major adaptation for their management (major 15 (10%), corresponding to the appointments for special care dentistry). Of the other 124 general practice patients, five needed minor adaptation only. In specialist units, 211 (88%) of the patients required moderate to major adaptation, major for 132 (55%).

Conclusions: In the population studied, APECS was able to differentiate between patients requiring special care dentistry or not. A nationwide study is needed to validate the sensitivity and specificity of this case mix tool.

4308 THE DENTAL CARE INDEX IN THE CITY OF VOLGOGRAD CHILDREN FROM 3 TO 15 YEARS

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Background: The dental care index helps to assess dental service provision in children.

Aim: To study the dental care index in children in 4 groups from 3 to 15 years old.

Methods: The study was conducted in the National Epidemiological Study in 2015. The sample size was calculated according to WHO recommendations for epidemiological studies (40-50 participants of the same age from each district/area). Dental examination was organised in randomly selected kindergartens (for 3- and 6-year-olds) and schools (for 12- and 15-year-olds) in seven out of eight districts of the city. The children aged 3 (n=306), 6 (n=328), 12 (n=349) and 15 (n=336) years were examined by two experienced and calibrated dentists. Among 1,319 participants 663 (50.3%) were girls. Informed consent was obtained from parents. The dmft/DMFT were used to record dental caries at cavity level. The mean dmft/DMFT-indexes, means of f/F components, and the standard error of means ($\pm m$) were calculated. The dental care index was measured as the proportion (%) of the filled teeth in dmft/DMFT-indexes. Student t-tests was used to assess the differences (at $p \leq 0.05$).

Results: The means of dmft-index were 1.60 ± 0.55 in 3-year-olds and 4.42 ± 0.20 in 6-year-olds; the means of DMFT-index were 0.04 ± 0.02 in 6-year-olds, 2.06 ± 0.29 in 12-year-olds and 3.34 ± 0.16 in 15-year-olds; f/F components were 0.58 ± 0.04 , 2.37 ± 0.13 , 0.02 ± 0.01 , 1.52 ± 0.15 and 2.83 ± 0.16 respectively. Dental care index was 36.2% in 3-year-olds, 53.6% for primary teeth and 50.0% for permanent teeth in 6-year-olds, 73.8% in 12-year-olds and 84.7% in 15-year-olds. The differences between age groups (between dmft/DMFT-indexes and dental care indexes) were significant statistically, $p < 0.05$.

Conclusions: In the population studied the dental care index was significantly higher in 12- and 15-year-old children compared to 3- and 6-year-olds; these findings emphasise the need to improve dental services for young and preschool children.

4310 DIVERSITY IN APPLYING ORAL HYGIENE GUIDELINES BY FLEMISH ORTHODONTISTS.

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Aim: Orthodontic treatment with fixed appliances complicates the maintenance of good oral hygiene. Therefore, preventive measures applied by orthodontists are recommended. This study investigates the application of oral hygiene instructions by Flemish orthodontists and compares its contents with evidence-based guidelines.

Methods: All Flemish orthodontists registered in the Belgian Union of Orthodontic Specialists received an online questionnaire (n=254). The questions were based on a clinical guideline (Oosterkamp et al., 2016) containing preventive measures for two phases: before and during the orthodontic treatment. The answers were scored on a scale from 1 to 10 for applying the criteria per phase. SPSS was used for the statistical analysis. The study was approved by the Ethics Committee of the University Hospital Ghent.

Results: Seventy-eight orthodontists filled in the questionnaire (30.7%). Mean scores for applying the criteria were 5.59/10 (1.44) for phase 1 and 8.28/10 (1.57) for phase 2. In phase 1 female orthodontists and orthodontists in the age group 41-60 scored higher. No significant differences were found in phase 2. The analysis of the individual criteria demonstrated a significant association between questioning the oral hygiene habits and the graduate school and receiving education in oral hygiene during the education. More female orthodontists recommended brushing with a powered toothbrush. Advice concerning fluoride in toothpaste was influenced by age, year of graduation, graduate school and attitude towards oral hygiene.

Conclusions: In the population studied, the prevalence of giving oral hygiene instructions was high. Most of the Flemish orthodontists reported using a protocol, mostly self-developed. The study confirms a lack of homogeneity in the use of practical guidelines to support oral hygiene before and during treatment with fixed appliances. Development of a Belgian practice guideline is recommended. The role of the dental hygienists in orthodontic practice may be beneficial in the future.

4313 MOTIVATION OF GHENT DENTISTS REGARDING COMPLIANCE WITH THE ALARA-PRINCIPLE

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Aim: The current literature suggests that radiation awareness among dentists is poor. The aim of the study was to explore the rationale for radiation protection within Ghent dentists and their motivation regarding the compliance with the ALARA- principle (As Low As Reasonably Achievable).

Methods: The present study followed a qualitative design. The random sample consisted of twelve dentists (total number of dentists in Ghent is 157) whose practice was located in Ghent (Flanders, Belgium). The average age of the dentists was 52 years (range: 30-74 years) and consisted of eight men and four women. Data were obtained through semi structured face to face interviews until data saturation was completed. Interviews were audio-recorded and transcribed verbatim. The data were coded and thematically analysed using NVivo 12 Pro. Each participant gave his/her informed consent. The study was approved by the ethics committee, affiliated to the University Hospital of Ghent (Belgium).

Results: The dentists report that they take as few radiographs as possible. They often minimise the effects of dental radiation. Their views about informing patients on radiological protection were very divergent. Their reasons for applying radiation protection were two-fold; there were issues of peace of mind, health, education and routine on the one hand, then time constraints and vagueness on the other.

Conclusions: There is a need for further implementation of radiation protection in educational programs. Furthermore, the results show that patients need to be better informed about the effects of radiation.

The presenter of this abstract was awarded a Borrow Foundation travel award.

4342 HUMAN FACTORS SCIENCE FOR IMPLEMENTING AND EVALUATING DENTAL PUBLIC HEALTH INTERVENTIONS

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Public health interventions are routinely delivered through modern health care systems which are highly complex and face multiple barriers to achieving successful outcomes. Human Factors (also known as Ergonomics; HF/E) is the scientific discipline concerned with interactions between people and other elements in organisational systems and has a focus on improvement through designing optimal ways of working. HF/E theory, principles, and methods are strongly endorsed by leading international institutions such as the World Health Organisation (WHO, 2019), the European Union (EU, 2019), and the UK's National Institute for Health and Care Excellence (National Quality Board, 2013). Despite some progress, dental applications are still relatively rare (Ross, 2018). This presentation will outline the benefits for dental public health of incorporating HF/E as part of multi-disciplinary approach to designing, implementing and evaluating interventions across a range of primary and secondary health care settings. Examples to be presented include applying the Functional Resonance Analysis Method (FRAM; Hollnagel, 2012) for studying and improving child caries prevention in general practice (Ross et al., 2018), and adapting a Work Domain Analysis (Cassin, 2012) for studying the implementation of a national oral health strategy for care of the dependent older person (Selveindran et al. 2018). Discussion of future possibilities will include reference to the recent setting up in the UK of the National Advisory Board on Human Factors in Dentistry.

Session 1 c: Oral Health Promotion (1)

Chairs: Jacques Vanobbergen and Katarina Jerković

4264 DENTAL FLUOROSIS PREVALENCE AMONG 12-YEAR-OLDS IN RUSSIA

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Aim: The aim of the study was to evaluate the prevalence of dental fluorosis among children living in areas of Russia with different fluoride concentration in drinking water.

Methods: In 2018, as a part of the 3rd National Oral Health Survey, 11978 12-year-old children were randomly selected from 228 areas of Russia and examined by calibrated dentists using WHO (2013) criteria. Dental fluorosis prevalence was scored using Dean's index. Fluoride (F) concentration in drinking water was measured in all areas. The study was approved by the Ethical Committee of Moscow State University of Medicine and Dentistry.

Results: Fluoride content in drinking water was: low in 205 areas (0.22 ± 0.01 mg/l, varying from 0.01 to 0.64), optimal in 12 areas (0.79 ± 0.04 mg/l, varying from 0.70 to 1.00) and high in 11 areas (3.48 ± 0.72 mg/l, varying from 1.20 to 8.95). The prevalence of dental fluorosis in 10864 12-year-olds from the areas with low fluoride concentration in drinking water was 2% (questionable - 1%, very mild - 1%). In optimal F- concentration areas dental fluorosis among the 685 who were examined it was observed in 33% (questionable – 11%, very mild – 11%, mild – 6%, moderate – 5%). In high F-concentration areas the prevalence of dental fluorosis in the 429 who were examine was 53% (questionable – 12%, very mild – 15%, mild – 17%, moderate – 8%, severe – 1%).

Conclusions: Fluoride concentration in drinking water was low in most areas of Russia. The prevalence of dental fluorosis was low among 12-year- olds in Russia. Questionable, very mild and mild were the most prevalent forms of dental fluorosis in those who were examined . The results provided important data for planning oral diseases prevention programs in different regions of Russia with priorities to set to take into account the prevalence of the observed conditions.

The presenter of this abstract was awarded a Borrow Foundation travel award

4270 AN ANALYSIS OF SITUATION-BASED INFLUENCES ON TOOTH-BRUSHING LAPSES AMONGST YOUNG AUSTRALIAN ADULTS

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Aims: These were to 1) explore the presence of situation-based barriers, 2) examine how situational-based changes may influence lapses in tooth-brushing behaviour, and 3) explore how motivational beliefs and attitudes towards tooth-brushing may relate to interactions with situational-barriers. All in a group of young adults.

Methods: The study took place from March to October 2018. A sample of 23 young adults (14 males and 9 females, average age 25 years (SD 4,25), was recruited via advertisements within the University of Melbourne and the Royal Dental Hospital of Melbourne. They were interviewed regarding their attitudes/beliefs/knowledge around tooth-brushing and their tooth-brushing routines. The semi-structured interviews sought to uncover what might be the key reasons for random changes (if any) to individual tooth-brushing routines, and to explore how pre-held beliefs and situational reactions might play a part in unintentional tooth-brushing lapses. The study was approved by the Human Research Ethics Committee of Melbourne University.

Results: Participants tooth-brushed 11.87 (SD = 2.30) times per week, tertiary-educated participants were less likely to cite aesthetic or social motivations as reasons for tooth-brushing, and there were clear differences in individual approaches to oral hygiene. Hectic and tired feelings were primary barriers to morning and night-time tooth-brushing, respectively, and reliance on sensing the presence of plaque or social circumstances as behavioural triggers was associated with a lower frequency of tooth-brushing overall. Concerning approaches, differences were observed in the timing of lapses, the triggers for maintaining planned tooth-brushing, and in overall patterns of behaviour - with participants exhibiting tendencies towards either intrinsic motivations, extrinsic motivations, and complacency.

Conclusions: In the population studied, situation-based influences impacted on tooth-brushing and were seemingly influenced by pre-held beliefs and (to an extent) approaches to tooth-brushing. Future quantitative studies may consider exploring tooth-brushing approaches in real-time to determine how they may precisely influence the presence of, or reaction to, situational barriers. This line of research is expected to benefit oral health counselling and preventive efforts.

4289 ASSESSMENT OF ORAL HYGIENE KNOWLEDGE AND PRACTICES OF 15 TO 17 YEAR OLD FRENCH ADOLESCENTS

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Introduction: According to the World Health Organisation, adolescence is a period of development between infancy and adulthood (10-19 years). This transition is critical since there are numerous changes as much on a biological level as on a psychological and behavioural level, which puts this population group at risk.

Aim: This study aimed to evaluate the state of knowledge and practices in terms of oral hygiene in adolescents aged between 15 and 17 years.

Methods: This cross-sectional descriptive study was carried out in 7 dental faculties. A questionnaire survey was conducted from 13 March 2018 to 25 February 2019. An informed consent was signed by each adolescent as well as by one of their parents. The study was approved by the Ethics Committee of Montpellier University on 10 January 2018. The questionnaire comprised 55 questions, based on the validated ESCARCEL questionnaire. The first part concerned the adolescent and his/her environment. The second part described the characteristics of the consultation. The third part investigated oral hygiene practices and knowledge. The last part focussed on the adolescent's perception of their general and oral health status.

Results: 392 adolescents responded to the questionnaire. The gender distribution was 55% girls and 45% boys. There were 246 (61%) of responses from the South of France, 76 (20%) from the East and 70 (19%) from the North-West. The mean Body Mass Index (BMI) was 21.1, which is within the interval range (18.5 – 25) defined by the WHO as a normal body weight. 215 (55%) had at least one filled tooth (57% of boys compared to 54% of girls) and 208 (53%) had already had orthodontic treatment (59% of girls compared to 46% of boys). 172 (44%) consumed at least one sugary or soda drink per day and close to almost three adolescents in ten consumed sweets every day. As for oral hygiene, 270 (69%) brushed their teeth twice a day, and 243 (62%) had received oral hygiene education from their parents. Only half of the adolescents were aware that fluorides reduce the risk of dental decay. There was a significant relationship between tobacco, alcohol and drugs consumption and the adolescent's perception of their general health status.

Conclusion: This study provided an insight into the current health and oral hygiene practices of the adolescents who completed the questionnaire. They appeared to have dangerous eating habits and lack of knowledge about oral hygiene.

4295 TOOTHPICKS IN DUTCH CATERING AREAS AND FITNESS-SPORT CENTRES REALLY WORK!

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Background: Previous findings have shown that promoting the use of toothpicks in hotels, restaurants and catering areas (HORECA) were promising in encouraging inter-dental oral self-care (Buunk-Werkhoven, 2017).

Aim: This third ‘Pick a T’ pilot study was aimed to evaluate people’s opinion about their oral health related to healthy lifestyle, and to implement the availability of toothpicks in a catering area within a Fitness Centre.

Methods: In 2016, -in collaboration with Oral-Vision, a dental hygiene clinic, this study was conducted in an In-house healthy brasserie in a Fitness Centre at the Olympic Stadium in Amsterdam. In total, 40 persons completed a short questionnaire, which included nine questions. The cocktail picks (round and sharp-ended points) were in single wrapped wooden triangle toothpicks, and the toothpicks were distributed at the tables. For three months, each day, the number of toothpicks that were taken by the customers was counted and replaced by the investigator. The protocol for the pilot was reviewed by the Central Committee on Research Involving Human Subjects. It concluded that it did not fall within the scope of medical research involving human subjects.

Results: Twenty six of the participants (65%) were men. The average age of participants was 37.3 (SD = 15.2) years. Their educational level was advanced vocational training 17 (43%), up to higher professional education 15 (38%) and university 8 (20%). Eleven participants (27%) had never been to a dental hygienist, 11 (27%) participants had visited a dental hygienist once and 16 (40%) participants had visited a dental hygienist twice a year. They evaluated their perceived oral health as ‘good’, with a mean value of 8, on a scale of 0 - 10, (SD = 1.1), and 25 (63%) reported not using a toothpick each day. Most participants 36 (90%) evaluated the use of a toothpick after eating as (very) important for a fresh mouth feeling and optimal oral health and 27 (68%) evaluated the availability of toothpicks in the HORECA as (very) important.

Conclusion: Catering areas within Fitness-sports Centres can provide the opportunity to distribute professional toothpicks in order to promote oral self-care and a healthy lifestyle among the public.

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4298 AN ORAL HEALTH COACH AT DUTCH WELL-BABY CLINICS: STUDY PROTOCOL FOR A RCT

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Background: Early childhood caries (ECC) can be prevented by adopting healthy oral hygiene and dietary habits. Nevertheless, 30% of Dutch 5-year olds still have ECC and 10% have severe-ECC (dmfs ≥ 6). Many infants are first seen in dental practices around the age of 4 years. In the Netherlands, conventional oral health education for infants is provided at well-baby clinics (WBCs), with little success. Therefore, a ChildSmile like preventive oral health programme has been developed and has started to be implemented at WBCs, where oral-health coaches (OHCs) are specifically dedicated to this task.

Aim: This project aims to optimize preventive oral health care for infants and provide evidence for (cost)effectiveness and feasibility of the programme.

Methods: After ethics approval from the UMC Utrecht's research ethics committee, parents/caregivers with babies of 8(±3) months, who visited selected WBCs, are invited to participate in this pragmatic RCT with concealed allocation of intervention. 400 Dyads (effect size 0.33 at T2) are assigned, using a 1:1 ratio and stratified by SES (3 groups), into control or intervention groups. The control group receive conventional oral health education at WBCs. The intervention group receive conventional oral health education plus tailored preventive oral health care from an OHC, during regular WBC visits, between the ages of 8-48 months. Data will be collected at baseline T0, at 24 months (T1) and 48 months (T2). Primary study-outcomes are the (cost)effectiveness measured by proportion caries-free children at 48 months, caries-free survival time and parental oral health behaviour-changes.

Discussion: Expected findings from this research will advance evidence based practice in this field of dentistry by determining whether an OHC is more effective in preventing ECC in infants, than usual care alone. So far, parents, WBC staff and the professional field are positive about this innovation. If proven effective, this approach may be applied more broadly through WBCs, with a visitors loyalty of $\geq 95\%$. Results (T2) are expected in 2022.

Acknowledgement of sources of funding: This research is funded by the Taskforce for Applied Science (SIA Raak) and the Netherlands Organization for Scientific Research (NWO).

4299 PREVENTIVE TREATMENT IN FINLAND NEEDED BUT NEGLECTED

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Aim: In Finland, the Public Dental Service (PDS) has provided annual examinations and free care to all the young (<18 years) since 1972. In addition, adults have had full access to subsidized treatment in the PDS since 2002. This study aimed to survey preventive care provided for children and adults in relation to their treatment needs.

Methods: Data on patients (<18 years and 18+ years), their treatment needs to achieve a healthy periodontium and no active caries (CPI>2, D+d>0), and the time allocated to preventive treatment measures from 2001 to 2013 were collected retrospectively from municipal databases in five PDS-units in towns with a total of 320,000 inhabitants. The National Institute for Health and Welfare gave ethics approval for the study. Trend analysis was performed to study changes in preventive treatment during the study period.

Results: About 40,000 children visited the PDS each year. Adult visitors increased from 37,000 to 67,000. The percentage of children in need of treatment decreased from 39% to 25% and for adults from 75% to 66% respectively. Children not in need of treatment received 2.6 minutes per patient of preventive care in 2001 and 7.6 minutes in 2013 (trend estimate 0.14, $p=0.03^*$). Those in need of treatment had 1.4 minutes in 2001 and 5.2 minutes in 2013 (trend estimate 0.07, $p=0.41$). The adults not in need of treatment received 2.1 minutes per patient in 2001 and 4.3 minutes in 2013 (trend estimate 0.08, $p=0.05$). Those in need of treatment received 1.3 minutes in 2001 and 1.2 minutes in 2013 (trend estimate -0.05, $p=0.72$).

Conclusions: Little time was used for preventive measures, the healthy ones had more treatment than those in need of treatment and there was a diminishing trend in this treatment among adults in need of treatment.

4300 THE PREVALENCE AND DETERMINANTS OF EATING DIFFICULTIES AMONG OLD HOME CARE RESIDENTS IN FINLAND

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Background: Among older adults the risk of malnutrition is often under-diagnosed and under-treated. Difficulties in eating can affect satisfaction with dietary life and cause malnutrition.

Aim: The aim of this study was to investigate the prevalence and determinants of self-reported eating difficulties screened separately by a nutritionist and a dental hygienist in old home care residents.

Methods: Data came from the Nutrition, Oral health and Medication (NutOrMed) population based representative study sample of ≥ 75 -year-old home care clients living in three cities (random sample of two cities and total sample of one city) in Eastern and Central Finland. A nurse, a nutritionist, a pharmacist and a dental hygienist conducted personal interviews in the subjects' homes. All participants or their proxy gave a written informed consent to participate. Participants who answered the questions about general difficulties in eating and oral health related difficulties in eating ($n=250$) were included.

Results: The mean age of the participants was 84.5 years (SD 5.4) and 185 (74%) were female and 65 (26%) were male. When asked by a nutritionist, 114 (46%) answered that they had problems in eating. When asked by a dental hygienist, 46 (18%) reported oral health related eating difficulties. Participant's lower Mini Nutritional Assessment values (MNA) and difficulties in chewing associated statistically ($p=0.0001$) with both general and oral health related eating difficulties. Self-reported tooth ache or pain when using dentures was associated ($p=0.0001$) with more frequent eating difficulties. Edentulousness in participant's denture status was associated with general eating difficulties ($p=0.001$).

Conclusions: In the population studied eating difficulties were common. To reveal the true scope of nutritional deficiencies or eating difficulties questions asked should be many-sided and include both general and oral health related questions.

4302 PATIENTS EXPERIENCES AND EXPECTATIONS OF DIFFERENT BRUSH HEADS ON ELECTRIC TOOTHBRUSHES

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Background: Dental caries and periodontal diseases, such as gingivitis and periodontitis, are worldwide the most common oral diseases (World Oral Health Report, 2003). Good oral hygiene by effective tooth-brushing plays a key role in the prevention of these diseases. In the Western world powered tooth-brushes have become established as an alternative to manual methods of tooth-brushing. Different types of replacement brush heads have been developed and promoted by the manufacturers of powered tooth-brushes, therefore it is interesting to understand what people feel and experience when using this kind of tooth-brushes and brush heads.

Aim: The aim of this qualitative survey was to explore the experiences, opinions and expectations of the users of different brush heads for electric tooth-brushes.

Methods: The data for this study were collected through qualitative face-to-face interviews. Semi- structured interviews were conducted, between the end of January and the end of February 2019, until data saturation had occurred.

Eighteen interviews were conducted and respondents were recruited through convenience sampling. Interviews were audio-recorded and transcribed verbatim. A thematic analysis was conducted using QSR- NVivo 12. The study was approved by the Ethics Committee of the University Hospital Ghent and each subject gave their consent.

Results and Conclusions: In the population studied, it was found that all respondents claimed that they had the feeling of cleaner teeth after brushing with an electric tooth-brush in comparison with a manual toothbrush. Furthermore, it appeared that the choice of brush head was mainly based on the hardness of the bristles and the feeling experienced when using a brush head. However, the participants had little belief in the extra inter-dental cleaning and whitening effects ascribed to some brush heads. Nearly all participants valued the timer and the pressure sensor integrated in the tooth- brushes.

Acknowledgement of sources of funding: The authors are grateful to Oral-B and Philips for providing the electric toothbrushes for this survey.

4306 A MODEL FOR DEVELOPING THEORY-BASED AND EVIDENCE-BASED HEALTH PROMOTION PROGRAMMES

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In order to improve oral hygiene self-care behaviour, interventions should target the determined predictors of oral health and hygiene behaviour (OHB). As a central theme in developing interventions, and also for the implementation, including evaluation, it is important to explore whether the determinants of OHB were the same or different in various contexts. Following the PATH (Problem-Analysis-Test-Help) model (Buunk & Van Vugt, 2008), some examples in relation to the Help Phase, i.e. the practical implications for the development of tailored oral hygiene self-care interventions will be presented. The OHB index (Buunk-Werkhoven, et. al., 2011) is a useful method for assessing and evaluating actual oral hygiene self-care behaviour of individuals; it may be used in more theoretical research on the factors determining oral hygiene behaviour, as well as in applied research in various contexts to assess the level of oral hygiene behaviour. Methods for interventions are mostly derived from theoretical frameworks; for instance, the Theory of Planned Behaviour (TPB), which focus on the psychological factors that should be changed in order to change behaviour (Buunk-Werkhoven, et. al., 2011). An adequate intervention targets one or more causal factors that are modifiable and have the largest effect on the outcome variable. After deciding what psychological factors will be targeted with the intervention in order to change OHB, the correct communication channel must be chosen, appropriate methods must be selected, and the strategies must be developed. The channel is the way in which the target group is reached, for example, flyers, magazines, internet/e-mail, radio/television, and counselling/therapy or through a community intervention. Intended changes can only take place when the target group is exposed to that channel. Examples of methods, i.e., the psychological principles of how change can be brought about, are experiences, argumentation, fear-appeals, framing, feedback and social comparison.

Session 1 d: Quality of Life (1)
Chairs: Paula Vassallo and Griet De Reu

4247 SOCIAL INEQUALITY IN THE MIRROR OF CHILDREN ORAL HEALTH

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Aim: Research in health disparities is one of the most important research areas in health systems. The current study aimed to investigate the influence of socioeconomic differences on oral health and oral health behaviours in children in Iran so that the faults of existing programmes could be addressed and a plan developed to address the oral health inequalities in children.

Methods: During a four month period in 2018, in this cross-sectional study, 289 children aged 5-6 years were selected randomly by two-stage cluster sampling from the pre-schoolers in Isfahan city and their caries status (dmft and PUFA) were recorded in accordance with the recommendations of WHO Basic Methods (2013). Ethics approval was granted by the Ethics Committee of Isfahan University of Medical Sciences and the children's parents gave consent. One calibrated examiner performed the clinical examinations and they took place in kindergartens. Socioeconomic status (SES) of the family and oral health behaviours (OBH) were assessed using a pre-piloted questionnaire which included questions on family wealth and parental educational status, assessed using the Wealth index and SES followed by Principal Component Analysis and classified by Latent Class Analysis. The associations between dmft, OHB and SES were investigated.

Results: Mean dmft of the children was 3.24 (sd +3) and 69 (24%) children were caries-free. There were 163 boys (56.4%) and 54 (19.7%) of children had a tooth or teeth with pulpal/ peri-apical involvement. SES was assessed using a model which included, the components of mother's educational level, father's educational level, asset-based wealth index, and total family income and families were then divided into three wealth status groups. It was found that mean dmft had an inverse relationship with SES as well as related oral health behaviours ($p < 0.0001$). The mean dmft value in the high SES (wealth) group (0.9) was significantly less than the middle group (2.8) and this was in turn significantly less than in the low level group (6.3).

Conclusion: By exploring a representative sample of children and their family status by direct/indirect indicators, an obvious inequality in oral health and oral health behaviours among the 5 - 6 year-old children who lived in a large city in Iran was identified. Lower SES, frequent sweet snack consumption, tooth-brushing solely by the child and visits to dentists, only when in pain, were significant indicators of high dmft.

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4248 ORAL HEALTH ATTITUDES OF ADOLESCENTS IN LITHUANIA AND PORTUGAL: AN INTERNATIONAL COMPARATIVE STUDY

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Aim: The aim of the study was to compare oral health attitudes of adolescents in Lithuania (aged 9 - 18 years) and Portugal (aged 12 to 20 years).

Methods: The adolescents were recruited from a random sample of schools in Lithuania in 2017 and in Portugal in 2012-2013. All respondents completed a questionnaire translated into the languages of the two countries. Parents of adolescents, younger than 18 years, gave informed consent. The study was approved by Ethics Committees in Klaipeda State University of Applied Sciences and University of Lisbon. Data were analysed using IBM SPSS.20

software. Student's t test was used to compare mean scores, presented with standard deviations. Higher mean scores, assessed by Likert type scale, in the domains of Dental fear and aesthetics and lower scores in concern with health, prevention and general health, showed a positive attitude to oral health.

Results: The Lithuanian sample consisted of 1150 adolescents (603 (52.4%) were female, mean age 13.4 years), from 5 randomly selected schools (total number of schools 28). The response rate was 95.3%. There were 27 drop outs. The sample in Portugal included 1203 adolescents from randomly selected schools (562 (46.7%) in Lisbon and 641 (53.3%) in northern, central or southern Portugal). In Portuguese sample 671 (55.8%) were female, mean age 14.9 years. Adolescents in Portugal had significantly ($p<0.001$) higher mean scores, as compared with Lithuanian adolescents, for dental fear (3.72, SD=0.70 vs. 3.33, SD=0.78) and for aesthetics (4.64, SD=0.48 vs. 4.57, SD=0.57). Adolescents in Lithuania had significantly ($p<0.001$) higher mean scores, as compared with adolescents in Portugal, for concern with health (1.98, SD=0.71 vs. 1.67, SD=0.71), prevention (1.86, SD=0.63 vs. 1.65, SD=0.54) and general health (1.81, SD=0.73 vs. 1.48, SD=0.60).

Conclusions: The adolescents in Portugal had a better attitude towards oral health, as compared with adolescents in Lithuania. Adolescents in Portugal had less dental fear and greater concern about prevention of dental diseases as an essential component of general health.

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4254 PREVALENCE OF WORK RELATED MUSCULOSKELETAL SYMPTOMS AMONG STUDENTS IN A MACEDONIAN DENTAL SCHOOL

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Aim: The aim of the study was to investigate the prevalence of work-related musculoskeletal problems in third, fourth and fifth (final) year students at Ss. Cyril and Methodius University Dental School, Skopje.

Methods: In November 2018, all third, fourth and fifth year dental students were invited to take part in the study, which involved completing the extended Nordic Musculoskeletal Questionnaire (NMQ-E). This questionnaire facilitates an assessment of troubles (ache, pain or discomfort) with neck, shoulders, upper back, elbows, wrists/hands, lower back, hips/thighs, knees and ankles/feet. Ethical approval was obtained from the Faculty of Dental Medicine. The data were analyzed using the SPSS 13 statistical package. The analyses were made using chi-squared tests and the corresponding C- coefficient.

Results: Out of a maximum possible number of 146 students, 116 (33 males and 83 females) agreed to participate and completed the questionnaire. The response rate was 79.5%. The mean age of students was 22.6 years (SD=1.52), ranging from 20 to 26 years. During the previous 12 months students had problems mostly with neck 48 (41.4%), upper back 43 (37.1%) and lower back 43 (37.1%). Mean clinical working hours per week were 12 hours, which included clinical medical subjects and 4 hours dental pre-clinical with phantom heads, for third year students, 31 hours for the fourth and 51 hours for fifth year students. There was a significant difference between the third year and those from the fourth and fifth years regarding: neck problems when the results were assessed using the chi-squared test for the upper back ($p<0.05$) and lower back ($p<0.05$). The significant differences were thought to relate to the higher percentage of students in the fourth and fifth years who reported problems. In comparison with those of the third year, who undertook fewer clinical working hours.

Conclusions: This study reported a high prevalence of musculoskeletal symptoms among the dental students, who worked more than 30 hours per week in clinical dentistry. Preventive measures and more teaching in ergonomic dentistry are indicated.

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4262 ORAL-HEALTH-RELATED QUALITY OF LIFE IN INSTITUTIONALIZED ELDERLY IN MANIPUR (INDIA)

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Aim: To investigate the oral health related to quality of life (OHRQoL) of elderly people (aged 65 years and older) living in residential homes in Imphal, (India) in 2019.

Methods: In this cross sectional study, four of the seven residential homes for the elderly in Imphal agreed participate. Selection criteria were subjects aged 65 and older, residing in a home for the elderly with no cognitive impairment. Out of 152 elderly residents, only 94 met these criteria and constituted the sample. Ethical approval was obtained from the Institutional Research Ethics Board. The dependent variable was OHRQoL according to the Geriatric Oral Health Assessment Index (GOHAI). Independent variables were socio-demographic data, last dental visit, oral health conditions including presence of caries, number of filled teeth and teeth absent, using the Decayed Missing Filled Teeth Index, periodontal status and prosthetic status. A single calibrated examiner, who achieved a Kappa score on 0.85, performed the clinical examinations and followed the methods advocate in World Health Organisation's Basic Methods for Oral Epidemiology (2013). Data were analyzed using descriptive statistics, Mann-Whitney and Kruskal-Wallis tests. The significance level was set at $p < 0.05$. The multiple logistic regression model was used to determine the factors associated with OHRQoL.

Results: Mean age of the subjects was 73.2 ± 4.5 years. Forty six (47%) were men and 48 (53%) were women. Mean GOHAI score was 44.03 ± 8.2 , with 63 (66.%) having a low perception of oral health. The average DMFT index was 20.6, with a mean 11.2 remaining teeth. According to the Community Periodontal Index only 2 (2.4%) were healthy. Sixty six (69%) needed dental prostheses and only 5 (5%) had visited a dentist in the past year. Poor OHRQoL was found to be associated with self-reported problems and opinions about teeth/ gums/ denture and were also associated with edentulism.

Conclusions: In general, the study population had poor OHRQoL associated with both subjective as well as objective oral health conditions. These findings suggest that in the population studied oral health had significant influence on the overall health of the institutionalized elders and can be an indicator of general health and quality of life.

The presenter of this abstract was awarded a Borrow Foundation travel award.

4265 EFFECT OF DISTRICT ECONOMIC INDICATORS ON PRESCHOOLERS' ORAL HEALTH IN SERBIA

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Aims: Although Serbia has universal health coverage for paediatric dental care, high prevalence of caries has been observed in preschool children. This study therefore aimed to assess association between observed oral health outcomes (prevalence, treatment and consequences of primary teeth caries) and indicators of economic development in Serbian districts.

Methods: After approval by the Ministry of Health and School of Dental Medicine University of Belgrade Ethics Committee, the cross-sectional survey was conducted during 2018 in the Republic of Serbia. It involved 1636 preschool children who constituted a nationally representative sample. Stratified cluster sampling according to WHO Basic Methods for Oral Health Surveys (2013) was used - 17 locations in 8 Serbian districts were randomly chosen. The data were obtained using calibrated paediatric dentists from primary health care centres who examined pre-schoolers

after informed consent from their parents. The indicators of district economic development that were analyzed involved: gross value added (GVA), social and health care expenditures, local self-government funding, unemployment rate, population density, density of physicians and dentists.

Results: The final sample involved 864 preschool children aged 36 to 71 months and 772 pre-schoolers aged 72 to 91 months. Physician and dentist density were not statistically significantly associated with observed oral health outcomes. Prevalence of caries in primary teeth ranged statistically significantly ($p < 0.001$) according to districts from 45.8% ($n=92$) in Western Serbia to 67.2% ($n=121$) in Central Serbia. Prevalence of caries in primary teeth, untreated primary teeth caries and prevalence of caries in permanent first molars were statistically significantly associated with district economic indicators - caries affected children, and children with untreated caries lived in districts with lower GVA, social and health care expenditures, population density, and local self-government funding.

Conclusions: The results of this study showed strong association between oral health outcomes in pre-schoolers and socioeconomic determinants of health. Oral health preventive strategies should target deprived Serbian areas.

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4273 ORAL HEALTH AND HALITOSIS STATUS OF TYPE 1 DIABETIC CHILDREN: A DESCRIPTIVE STUDY

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Aim: The aim of this study was to evaluate the oral health status and halitosis of healthy and type 1 diabetic children.

Methods: Between January and April 2018, a non-representative sample of type 1 diabetic ($n=50$) and healthy children ($n=50$), who were attending an endocrinology clinic and paediatric dentistry clinic, were recruited for this descriptive study. Data were gathered using a questionnaire, administered via face-to-face interview. Hacettepe University Non-Interventional Clinical Researches Ethics Board approval and parental written informed consent were obtained. Oral examinations were performed by one calibrated examiner in a paediatric dental clinic. Oral health status was evaluated by dmft/s, DMFT/S, ICDAS II, PUFA, index, plaque (PI) and gingival (GI) indices and halitosis by organoleptic assessment and sulphur monitoring methods. The statistical significance of differences were evaluated by Chi square, Fisher's Exact and Mann Whitney U tests.

Results: The mean age of the type 1 diabetes children (24 boys, 26 girls) was 10.3 ± 2.1 years, and for the 50 healthy children (30 boys, 20 girls) it was 9.9 ± 1.5 years. The mean dmft, dmfs, DMFT and DMFS indices of the children with type 1 diabetes were 4.0 ± 3.7 ; 10.6 ± 9.4 ; 1.0 ± 1.5 , 1.3 ± 2.2 , and 4.9 ± 3.7 ; 12.5 ± 11.4 ; 0.8 ± 1.3 , 1.3 ± 2.3 for the healthy children. Carious lesions were observed in 30 (60%) of the diabetic children and in 29 (58%) of the healthy children. PUFA was found in 10 (20%) of children in each group. The mean PI was significantly different between diabetic and healthy children (1.2 ± 0.8 and 1.4 ± 0.7 ; respectively ($p=0.04$)). The mean GI was 0.5 ± 0.6 in both groups. Six (12%) of diabetics and 9 (18%) of healthy children had halitosis.

Conclusions: In the population studied, the oral health status of diabetic children was better than that of the healthy children. However, it is important to emphasize the importance of oral health, regular oral care and dental visits for all children

The presenter of this abstract was awarded a Borrow Foundation travel award.

4274 CAPABILITIES, OPPORTUNITIES AND MOTIVATIONS SUPPORTING ORAL HEALTH BEHAVIOUR OF ADOLESCENTS IN NIGERIAN SCHOOLS

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Aims: To determine the oral health capabilities, opportunities and motivations supporting oral health behaviour among adolescents in schools in a low-income country.

Methods: In 2018, this cross-sectional study was conducted among 2097 students in the 10th and 11th grades of 30 randomly selected secondary schools in Ibadan, Nigeria after obtaining ethical approval from the Institution's Ethics Review Board. Data were obtained with self-administered questionnaires to assess capabilities (oral health knowledge (K), attitude (A) and practices (P)) as well as motivation. A checklist was used to assess availability of oral health promotional activities/materials (opportunities) in the schools concerned. Data were analyzed with SPSS; bivariate analysis was performed using chi square and multivariate analysis with logistic regression. p value for significance was set at 0.05.

Results: The response rate was 99.5%. Poor oral KAP scores (<50%) were recorded among 2096 (99.9%) for K, 1288 (61.4%) for A and 1519 (72.4%) for P respectively. There were no oral health promotional materials in any of the schools and the only oral health promotional activity was oral health education in 8 (26.7%) schools; only 331 (15.8%) students had been educated about their oral health. About half 1161 (55.4%) were motivated and will participate in an oral health programme in school. Students; aged 12- 15 years (OR=1.6,95%CI=1.3-1.9, p<0.001), with skilled-worker parents (OR=1.9,95%CI=1.1- 3.3, p=0.020), had received previous oral health education (OR=1.6, 95%CI=1.2-2.0,p<0.001) or had consulted a dentist (OR=2.5,95%CI=1.6-4.0,p= <0.001) had better capabilities. Students who had \geq 50% final KAP scores (OR=4.7,95%CI=3.3-6.7, p<0.001) had been educated about their oral health (OR =1.7,95%CI=1.1-2.4, p=0.011) were better motivated.

Conclusions: In the population studied there were gross inadequacies in the oral health capabilities, existing opportunities and motivations for positive oral health behaviour. There were disparities related to socio-demographic characteristics of the students and capabilities, opportunities, motivation influencing oral health behaviour. Oral health capabilities and opportunities were significant predictors of motivation for positive oral health behaviour.

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4278 ORAL HEALTH-RELATED QUALITY OF LIFE AFTER TREATMENT OF CHILDREN WITH MOLAR-INCISOR HYPOMINERALIZATION

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Aim: The aim of the study was to investigate the effect of treatment on the Oral Health-Related Quality of Life (OHRQoL) of children with Molar- Incisor Hypomineralization (MIH).

Methods: The study was reviewed and approved by The Human Research Ethics Committee of Marmara University, Dental School with the protocol number of 2016-43. A consecutive sample of children (11-14 years), who attended the Paediatric Department of the Marmara University Dental School, in need of treatment, participated in the study. An informed consent form was signed by the children and their parents/caregivers. Data collection was performed between August 2016-March 2017. The participants answered the self-reported 37 item Child Perception Questionnaire (CPQ11-14) and were clinically assessed by a trained research assistant. Children included in the study were diagnosed with MIH when at least one first permanent molar was affected, with or without the involvement of the incisors, according to the criteria proposed by the European Academy of Paediatric Dentistry. Before treatment, the OHRQoL of the 40 children, who participated in the study was assessed by CPQ11-14 using a self-report. at baseline. It was then reassessed six months later. All children filled in the questionnaire and were interviewed. The t-test and paired-t were used for statistical analysis (p<0.05).

Results: Data at baseline and follow-up were collected for all 40 children. Their mean age was 11.85 (SD=1.02) years. The overall CPQ11-14 score ranged from 3-83 (average 33.27 \pm 16.46) at baseline and 0-61 (average 11.67 \pm 11.21) at follow up. Emotional well-being received the highest score at baseline. A significant decrease between baseline and

follow-up ($p < 0.001$) in the mean values occurred for overall CPQ11-14 and in the oral symptoms, functional limitations, emotional and the social well-being limitations domains.

Conclusions: Amongst the children with severe MIH, who participated in this study, there was an association between higher impact on oral symptoms and the emotional well-being domains of OHRQoL. The OHRQoL of children with MIH requiring treatment was seriously impaired. After treatment there was a significant improvement in the children's OHRQoL.

The presenter of this abstract was awarded a Colgate travel award.

4303 FACTORS ASSOCIATED WITH POOR ORAL HYGIENE AMONG SCHOOL-AGED STUDENTS IN MONGOLIA

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Aims: Regular tooth brushing (at least twice a day) is one of the most effective methods for the control and prevention of dental diseases. The aim of the present study was to determine the prevalence and associated factors of adolescent oral hygiene in Mongolia.

Methods: A secondary analysis of nationally representative data from the 2013 Mongolian Global School-based Health Survey (GSHS) was performed. In the survey a questionnaire was completed by 5393 students in grades 7, 8, 9, 10, and 11. The prevalence of poor oral hygiene (brushing teeth less than once per day) and its association with some independent variables (e.g., smoking in the student's family) were analyzed by frequency distribution, chi-squared test and logistic regression (using SPSS 24.0). The study was approved by the ethics committee of the Health Science University of Mongolia.

Results: Male gender (AOR=1.5; 95%CI [1.40-1.81]), parental (one or both) smoking (AOR=1.2; 95%CI [1.07-1.39]), inadequate fruit intake (AOR=1.8; 95%CI [1.37-2.38]) and inadequate vegetable intake (AOR=1.8; 95%CI [1.57-2.18]) significantly increased the odds of poor oral hygiene. Those whose parents did not check their homework (AOR=1.1; 95%CI [1.02-1.35]), or did not understand their troubles (AOR=1.2; 95%CI [1.11-1.47]), physical inactivity (AOR=1.52; 95%CI [1.33-1.74]) and those who sat for more than 3 hours were (AOR=1.37; 95%CI [1.20-1.56]) more likely to have poor oral hygiene compared to their fellow students. Students who ate fast food (AOR=0.73; 95%CI [0.64-0.83]) and drank soft drinks (AOR=0.84; 95%CI [0.73-0.96]) were found to be less likely to be poor tooth-brushers.

Conclusions: Several lifestyle and behavioural risk factors were identified in connection with poor oral hygiene. The identification of these factors can guide programmes to improve oral hygiene behaviour of this adolescent population.

Session 2 a: Tooth Surface Loss, Periodontal Epidemiology and Oral Health Promotion (2)

Chairs: Jenny Gallagher and Rebecca Harris

4266 SALIVARY FLOW RATE SURVEY IN A MULTICENTRE EROSIVE TOOTH WEAR STUDY

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Background: In 2017, an erosive tooth wear (ETW) survey was conducted in Romania as part of a multicentre study designed by the Tooth surface loss Special Interest Group (SIG) of the European Association of Dental Public Health.

Aim: This study was the first phase of the ETW survey and was aimed to assess the salivary flow rate in young adults living in Romania.

Methods: The subjects of the study were first year dental students of the University of Medicine, Pharmacy, Science and Technology of Targu Mures, Romania. Ethical approval was obtained from the Research Ethics Committee of the university whose name at that time was the University of Medicine and Pharmacy of Tirgu-Mures. The convenience sample consisted of 87 dental students (aged 18-21 years) of both genders, who gave their informed positive consent. They completed an interview-based questionnaire, developed by the SIG, to assess potential erosive diet and behaviour of the participants. Unstimulated and stimulated whole mouth saliva was collected from each subject and their saliva flow rate was measured. For the assessment of salivary flow rate the following cut-off values were set: <0.1 ml/min hyposalivation and 0.1-0.25 ml/min reduced salivary flow rate for unstimulated saliva; <0.7 ml/min and 0.7-1.0 ml/min for stimulated saliva, respectively (Alaraudanjoki et al., 2016).

Results: Reduced salivary flow rates were observed in 20 (22.9%) subjects and 3 (3.4%) of them presented with hyposalivation. Low saliva flow rate was found in significantly more females 19 (95%) than males 1 (5%). No association was revealed, in the group of dental students, between reduced salivary flow rate and a potentially erosive dietary behaviour.

Conclusions: The results suggest that in the group of dental students, who were studied, reduced salivary flow rate, which is a risk factor of ETW, was more likely to be found in females. This study provided data for the SIG multicentre study.

The presenter of this abstract was awarded a Colgate travel award.

4283 THE LINK BETWEEN PERIODONTAL HEALTH AND SOCIO-DEMOGRAPHIC CHARACTERISTICS IN LITHUANIANS AGED 65-74 YEARS

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Aims: The aim of the present study was to examine the periodontal condition in people aged 65-74 years and compare it to their sex, place of residence, type and duration of their education.

Methods: The data reported in this abstract were gathered during the 2017-2018 Lithuanian National Oral Health Survey, which took place in all parts of the country and was multi-cluster with a stratified randomised sample. The

methods advocated by WHO (2013) were followed. One calibrated examiner performed the clinical examinations in dental offices and clinics. Approval for the survey was obtained from the Vilnius Regional Biomedical Research Ethics Committee, Periodontal index (CPI modified), bleeding on probing, pocket probing depth and clinical periodontal attachment loss were assessed in a group of 370 65-74-year-olds, of whom 116 (31.4%) were men and 254 (68.6%) women. Two hundred and seventy (73%) came from urban areas, 55 (15%) lived in peri-urban and 45 (12%) in rural areas. The data were subjected to statistical analysis using Statistical Package for Social Sciences Version 17.0. Shapiro Wilk and Kolmogorov Smirnov tests were used to check the normality of the data.

Results: The results showed that men 68 (58.6%) had more 6+ mm periodontal pockets than women 126 (49.6%), ($p=0.044$) and they had more loss of attachment at the 6-8 mm level (men 75 (64.7%), women 139 (54.7%), ($p=0.015$) and at the 12+ mm level (men 14 (12.1%), women 8 (3.1%), ($p=0.001$)). The study suggested that residents of urban areas had less bleeding on probing (36 - 13.3%) than residents of peri-urban areas (11 - 20.0%) and rural areas (12 - 26.7%), ($p<0.001$). Furthermore, people who had undertaken higher education were less prone to periodontal pocketing (22 - 13.2%) than the subjects who had not (37 - 18.2%), ($p=0.017$). **Conclusions:** The differences observed in this study provide strong support for using broader socio-demographic models in oral health programs.

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4316 CIGARETTE AND E-CIGARETTE SMOKING – A RISK FACTOR FOR GINGIVITIS IN POLISH 15-YEAR-OLDS

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Aim: To assess the impact of cigarette and e-cigarette smoking on gingival health in Polish 15-years-olds.

Methods: In 2017 after receiving consent from participants and Bioethical Commission approval (KB185/2018), cross-sectional studies among 992 children aged 15-year-old [552 (52.6%) females, 514 (51.8%) from urban areas] in 10 different voivodships (administrative provinces) of Poland were conducted. Following WHO methodology, periodontal status (gingival bleeding, depth of periodontal pockets - PD, loss of attachment - CAL) was clinically assessed by calibrated researchers ($\kappa = 0.875-1$, agreement 98.4% - 100%). Data collected by questionnaire related to socio-demographic factors, oral health-related knowledge and behaviours (cigarettes/e-cigarettes smoking, oral hygiene, nutrition and use of dental services). Statistical analysis was performed using Spearman's Rank Correlation, logistic regression analysis. p -values <0.05 were considered as statistically significant.

Results: 71 (7.2%) respondents declared that they smoke cigarettes, 116 (11.7%) e-cigarettes. Gingival bleeding occurred in 249 (25.1%) participants, PD equal to 4-5 mm – 7 (0.7%), CAL – 11 (1.1%). Factors increasing risk of gingival bleeding were: male gender (OR=1.41; $p=0.019$), consumption of snacks containing salt (OR=2.03; $p=0.006$) and cariogenic products directly before sleep (OR=1.41; $p=0.03$), cigarettes (OR=2.5; $p<0.001$) or e-cigarette smoking (OR=1.92; $p=0.002$). Positive factors identified were: mother higher education (OR=0.67; $p=0.018$), teeth brushing at least twice daily (OR=0.5; $p<0.001$), use of dental floss (OR=0.70; $p=0.018$). Negative impact of cigarette or e-cigarette smoking remained after the introduction of socio-demographic factors and oral behaviours (adjusted OR=2.54; $p<0.001$ and AOR=1.85; $p=0.004$ respectively).

Conclusions: In the population studied analysis confirmed that risk factors of gingivitis in adolescents, apart from improper oral hygiene and dietary habits, are low level of parents' education and cigarette or e-cigarette smoking. Part of oral health education should be an implementation of anti-smoking recommendations.

4333 COMBINED THERAPY FOR PERIODONTAL DISEASES WITH THE USE OF PIGMENT-FREE LASER PHOTOABLATION

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Aim: Periodontal diseases are widespread in all age groups. It has been suggested that, in the last 25-30 years, they have become a more frequent cause of tooth loss. The aim of the current study was to compare the clinical results produced by the use of pigment-free laser photoablation and photodynamic therapy of periodontal diseases.

Methods: The study, commenced in 2018 and is ongoing. It was approved by the ethics committee of Moscow State University of Medicine and Dentistry and included the first 30 patients with moderate periodontitis treated in the university clinic who volunteered to take part. Their average age was 43 (range 35 -55) years and 19 were female and 11 were male. The patients were divided into two equal groups. All patients were examined and classified using Russell's periodontal index RPI (1956). Their treatment was started with scaling and root planning, together with irrigation of pockets with 0.2 % Chlorhexidine solution. In group 1 pigment-less laser photoablation was performed using a laser device with a wavelength of 1265 nm in a nanosecond pulsed mode with an exposure dose of 234 J/cm². In group 2, the standard periodontal therapy was provided together with the use of a chlorin e6 photosensitizer. Assessments and treatment were performed by three calibrated clinicians. Patients were reassessed after 6 and 12 months.

Results: In group 1 - 386 teeth were examined before starting treatment RPI scores were: 0 - 32 teeth, 1- 58 teeth, 2- 108 teeth and 6 -188 teeth. After 6 months the RPI scores in group 1 were: 0 - 78 teeth, 1 - 123 and 2 - 201 teeth, no teeth with a score of 6 were identified. After 12 months RPI scores were 0 - 73 teeth, 1 - 105 teeth, 2 - 183 and 6 - 25 teeth. In group (II) - 375 teeth were examined before starting treatment. Their RPI scores were: 0 - 34 teeth, 1 - 56 teeth, 2 - 105 teeth and 6-180 teeth. After 6 months the RPI scores were: 0 - 55 teeth, 1 - 92 teeth, 2 - 142 teeth, 6 - 86 teeth and after 12 months: 0 - 44 teeth, 1 - 83 teeth, 2 - 118 teeth, 6 - 130 teeth. Thus after 12 months there was a far greater reduction in the numbers of teeth with an RPI score of 6 in group 1 (from 188 to 25) than in group 2 (from 180 to 130).

Conclusions: In the group studied, after 12 months, the inclusion of laser pigment-free photoablation with a wavelength of 1265 nm into the therapy contributed to the regeneration of periodontal tissues and an improvement in periodontal health.

4383 IMPACT OF PERIODONTITIS ON QUALITY OF LIFE OF ADULTS IN ENGLAND

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Aim: This study aimed to assess the association between periodontitis and Oral Health-Related Quality of Life (OHRQoL) among the adult population in England.

Methods: Secondary analysis of data from the Adult Dental Health Survey 2009. OHRQoL was assessed through: the Oral Health Impacts Profile (OHIP-14), which assessed the frequency of oral impacts, while the Oral Impacts on Daily Performances (OIDP) and the condition- specific version of the OIDP (CS-OIDP) for periodontal conditions assessed the severity of oral impacts. Periodontal markers referred to bleeding on probing (BOP), periodontal pocket depth (PPD \geq 6mm) and loss of attachment (LoA \geq 6mm; available only among those aged 55+ years). Analyses were weighted and associations between periodontitis and OHRQoL outcomes were assessed through logistic regression models, sequentially adjusting for age, sex, socioeconomic position (education level and occupation), oral health-related behaviours (oral hygiene, smoking and dental attendance pattern) and number of missing teeth.

Results: Of the 5607 dentate participants clinically examined, the analytical sample consisted of 5532 participants with complete data, while analyses with LoA were carried out only among participants aged 55 or more (n=2094). In the fully adjusted models, BOP was significantly associated with higher odds for both the OIDP and the CS-OIDP, but not the OHIP-14. Participants with PPD \geq 6mm had higher odds to report oral impacts compared to those without PPD irrespective of OHRQoL outcome (OR: 1.4, 95%CI: 1.1-1.8, p=0.020 for OHIP14; OR: 1.6, 95%CI: 1.2-2.0, p<0.001 for OIDP; OR: 1.7, 95%CI: 1.1-2.4, p=0.011 for CS- OIDP). LoA was not significantly associated with OHRQoL with the exception of its association with CS-OIDP (OR: 1.9, 95%CI: 1.1-3.3, p=0.024).

Conclusions: Adults with periodontitis were more likely to report more frequent and more severe oral impacts on their daily lives. The associations were more evident, with stronger estimates and more associations being significant when the condition-specific OIDP was used.

4311 DELIVERING BETTER ORAL HEALTH GUIDELINE DEVELOPMENT MANUAL: METHODOLOGY FOR VERSION 4

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Clinical practice guidelines are systematically developed statements to assist decision-making and evidence-based care. Delivering Better Oral Health: an evidence-based toolkit for Prevention (DBOH) represents an important collaboration between key agencies across the United Kingdom (UK), led by Public Health England. Initiated at the request of the Department of Health it has involved a unique collaboration between the British Association for the Study of Community Dentistry, the Department of Health and the National Health Service. First published in 2007, it is updated regularly. Internationally this work, used by clinicians and educators, is recognised by the Platform for Better Oral health in Europe. The aim of this project is to develop the 4th edition of DBOH using contemporary evidence and principles. **Methods:** The guideline development process has been reviewed drawing on AGREE II principles (Appraisal of Guidelines for Research and Evaluation) and engaging individuals and agencies including Cochrane Oral Health and the Scottish Dental Clinical Effectiveness Programme (SDCEP). **Results:** A Guideline Development Manual has been developed drawing on SDCEP methodology. Governance of the project involves three tiers: I) Development Oversight Group (DOG) which has responsibility for initiating, consulting on, and signing off the project; II) Guideline Working Group (GWG) which has day-to-day responsibility for conducting the evidence-reviews and running the project; III) Guideline Development Groups (GDG) which advise on the key research questions; review the evidence and suggest revisions, drawing on the expertise of academics and front-line dental team members across the UK. A rolling programme of disease-based GDGs has been approved: oral cancer, dental caries, tooth surface loss and periodontal diseases. **Conclusion:** This initiative involves wide collaboration in support of preventive oral care drawing on contemporary evidence and the views of frontline practitioners and supported by key agencies to produce an important resource for the dental workforce.

4315 ORAL HEALTH KNOWLEDGE OF TURKISH SENIOR CHILD DEVELOPMENT STUDENTS

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Background: Child Developers are non-dental healthcare workers who provide advice on healthcare to children, families, educators and communities. They are in an ideal position to teach children good oral hygiene practices.

Aim: The aim of this study was to evaluate oral health related knowledge of a group of senior Child Development students from one Health Sciences Faculty in Turkey.

Methods: In 2019, the data for this descriptive pilot study were gathered via a structured self-administered questionnaire which was given to 76 senior students, with the intention of developing a future cross-sectional study, which will cover all senior students studying child development in Turkey. Ethical approval and verbal informed consent from students were obtained.

Results: The mean age of the students was 22.9 years (range 20-32); 73 were female. Few of the students (2, 3%) could define what dental plaque was. However, most of them (71, 93%) knew the eruption times of primary teeth but only 16 (23%) correctly reported the number of primary teeth. Fifty (66%) agreed that 'dental caries of primary teeth is an important issue for the child'. Only 47 (62%) stated that children under two years of age could have dental caries. The appropriateness of toothpaste use between 0-2 years of age was understood by 56 (74%). Although 52 (68%) reported they were aware of fluoride, only 5 (7%) fully understood the role of fluoride in the prevention of dental caries. Most of the students (73, 96%) reported incorrectly that children between 2 and 6 years of age should brush their teeth by themselves. Only 2 (3%) stated that they had had education regarding oral health. Only 9 (12%) felt their level of oral health knowledge was sufficient. On the other hand, 74 (97%) requested more education about oral health.

Conclusions: The oral health knowledge of the child development students who participated in this pilot study was not adequate. The present curriculum should be reviewed and lectures on this topic should be given.

4347 ASSOCIATION AND INDEPENDENCE EFFECT OF INDIVIDUAL CHILDSMILE INTERVENTIONS WITH CHILD ORAL HEALTH

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Background: Childsmile delivers targeted and proportional universal oral health interventions to children and their families in Scotland, from an early age, through daily supervised tooth-brushing and fluoride varnish application (FVA) in nurseries and schools; FVA and oral health advice in dental practices; and Dental Health Support Worker (DHSW) support in community settings.

Aims: To evaluate the individual Childsmile interventions association with obvious caries experience and to measure their independent effects.

Methods: The association between each of the interventions and caries (measured via the National Dental Inspection Programme) of 50,379 five year-olds (85% of the population) in 2014/2015 were analysed and adjusted by area-based deprivation, age and sex. Interactions between the interventions and area-based deprivation were tested. The Childsmile interventions were then adjusted by each other.

Results: A dose response was observed for: years of supervised tooth-brushing compared to those without consent (>two-years-consent adjusted odds ratio 0.81, 95%CI 0.76-0.87); and attendance at Childsmile dental appointments (adjusted odds ratios: five-contacts 0.64, 95%CI 0.58-0.71, ten-plus-contacts 0.33, 95%CI 0.18- 0.60). In comparison to those targeted, but not successfully contacted by a DHSW, children had a similar reduced risk to those not targeted after one DHSW contact (adjusted odds ratio=0.63, 95%CI 0.54-0.72). Children with two-plus DHSW contacts had no reduction. In comparison to those targeted for, but not receiving an FVA application, there was a reduced risk of caries once a child had received four FVAs (adjusted odds ratio=0.89, 95%CI 0.82-0.96). The effect of years of supervised tooth-brushing was greatest in the most deprived fifth, and in the second most deprived fifth for FVAs in nurseries and schools. Only slight changes were observed after adjustment for the other Childsmile interventions.

Conclusions: Each Childsmile intervention is independently associated with reduced risk of caries. Some variation in their effects were observed in favour of children living in more deprived areas.

4422 DO PATIENTS VALUE TRAFFIC LIGHTS OR PHOTOGRAPHS OVER VERBAL INFORMATION ON RISK?

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Background: Although rating of oral health risk is often emphasized in health education approaches, it is unclear how best to communicate this information to patients.

Aim: To compare patients' preferences for risk information presented verbally (V); by traffic light diagram (TL); or by a quantitative light fluorescence photograph (P). Objectives: a) a secondary analysis of RCT data to investigate whether patients' strength of preferences changed after they received their information and b) to explore reasons for their choices.

Methods: Liverpool-East National Research Ethics Committee approved the study (14/NW/1016). Four hundred and twelve adults from 4 English dental practices were given descriptions of the 3 formats of personalised oral health risk information. Using a computer-based questionnaire, they were asked to order their preferences. Preference strength was measured using Willingness-to-Pay. Patients were then randomised to receive one of the 3 information forms and re-scored their value for the form of information they received. Reasons for their choices were explored using semi-structured interviews (30 patients). Statistical analysis was by Wilcoxon Signed Rank test on 236 patients with protest zeros excluded. Qualitative data was summarised using thematic analysis.

Results: TL information was the least preferred initially (median = £6.5; IQR =£18); and after receiving this type of information (median = £8; IQR=£18), $p<0.05$. Patients in both the V (median = £20; IQR=£20) and P arms (median =£20; IQR=£35) valued their information higher initially. In both of these arms, patients reduced their values after receiving their information ($p<0.05$); with a median of £18.8 (IQR=£15) for V and median of £17.0 (IQR=£25) for patients in the P arm. Interviews identified all methods require to be supported by a good verbal explanation from the dental team, to be valued.

Conclusion: TL information was valued the least and should not reduce detailed verbal explanations about risk.

Session 2 b: Quality of Life (2) and Health Services Research (2) Chairs: Colwyn Jones and Ruth Sederel

4307 LIVING WITH DEMENTIA: PILOT STUDY OF ORAL CARE BELIEFS, UNDERSTANDINGS AND PRACTICES

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Background: Little is known about how community-dwelling people with dementia and their carers look after their oral health and dental care.

Aim: To explore the beliefs, understandings and practices relating to oral health of people living with dementia, and their carers, from their perspective.

Methods: King's College London (KCL) provided ethics approval for this study (HR-17/18-5364). Participants were volunteers registered with the online UK Join Dementia Research network and responding to an invitation to the study. Face-to-face interviews were conducted with people diagnosed with dementia and their carers in their homes, or at KCL, at mutually convenient times. Only people with capacity to consent were eligible to take part in the study. The research team followed guidance set out by the Mental Capacity Act 2005 (c9). Informed written consent was obtained at the beginning of each interview and monitored throughout. Drawing on a flexible topic guide informed by the literature, we used a phenomenological approach to collect data. Interviews were recorded, transcribed and analysed using a thematic approach.

Results: Seventeen participants with an interest in dementia research were recruited, and 12 interviews were conducted (five women and two men with dementia; seven female and three male carers). Five interviews were conducted with carers alone, two with the person with dementia alone, and five with the carer and person with dementia jointly. Three main themes emerged: Oral health is not prioritised; Access is shaped by decreasing independence; and Continuity of support is considered beneficial.

Conclusions: In the population studied, the findings suggest that oral health does not emerge as a priority until problems arise, and that provision of oral health care support (both informally and professionally) may be insufficient. Many find it difficult to undertake or assist with self-care and access or engage with dental services, particularly as the dementia condition progress.

4309 ORAL HEALTH STATUS OF SCHOOL CHILDREN IN HERAT AFGHANISTAN

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Aim: The present study aims to explore the oral health status and treatment need for dental decay in schoolchildren in Herat, Afghanistan, in order to set effective policy goals after decades of conflicts.

Methods: Data were collected in a convenience sample of 13 primary and secondary schools. A randomized sample selection at both school and individual level was impossible to perform due to political instability. All schools were located in the urban areas near Herat and were selected through allocation by the Minister Of Health, who also approved the study protocol. In the schools. Classes were allocated by the principal of the school. All children in the allocated classes were included in the survey. Data collection was performed in the school setting by trained Afghan dentist-examiners. To measure caries experience, DMFT/dmft scores were used as one of the outcome variables, counting the number of decayed (measured at both white spot (D1) and cavitation level (D3), according to WHO criteria), missing and filled teeth. The level of provided care was approached through the Restorative Index (RI=(FT/(D3+FT)) *100), ranging from 0 to 100%.

Results: The study sample consisted of 2089 schoolchildren between 5 and 18 years old, selected in 13 schools. Mean age was 10.9. Mean D1MFT score was 4.69 (SD=3.20). 1431 (68.5%) children had untreated dental decay at cavitation level, with a mean D3-score of 2.09. The overall care level was low. Only 33 (1.6%) children had one or more fillings, the mean restorative index was 1.18%.

Conclusions: In the population studied, dental caries is a considerable oral health problem. The present sample not only reports high levels of untreated decay, but also very low care levels. The results of the present survey confirm the need for professional curative and preventive oral health care in this region.

Acknowledgement of sources of funding: This study was supported by Fida (Finland) and Shelter Now International (Germany). With special thanks to Marc Jeannin for working tirelessly to help the people of Afghanistan and for collecting the data.

4339 SPANISH GDP (GENERAL DENTAL PRACTITIONERS) WORKFORCE TRENDS AND EFFECTS ON THE DENTAL SCHOOL IN MAJORCA, (ADEMA/UIB)

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Aim: The aim was to study trends in the number of general dental practitioners in Spain and to assess if demand for undergraduate dentistry is an appealing and popular further education opportunity for young people in Mallorca.

Methods: Data were gathered from the Spanish National Institute of Statistics on the number of dental practitioners in Spain from 1952 to 2018, the number of dental schools, students in each dental school, the number of new graduates per year and practitioner's retirement forecast. The number of Spanish qualified dentists registered in UK was also recorded. The establishment of the new dental school in Palma de Mallorca in 2017 allowed assessment of demand for undergraduate places. The ratio of students to applicants was calculated for each of the two first years. As the study used existing information consent from students and ethics approval was not required.

Results: The number of dentists working in Spain has grown from 2,465 in 1952 to 36,689 in 2017. During the academic year 2017-18 some 1098 students graduated from the 21 Spanish dental schools. Professional emigration is apparent and 598 Spanish dental graduates were registered to work in the UK in 2019. The new Mallorca dental school planned an annual student intake of 30 full time students. This was achieved in both student intakes (33 in 2017 and 32 in 2018). The total number of suitable applications was 250 in 2017 and 145 in 2018. The ratio of student acceptances to applications was 1:7.5 in 2017 and 1:4.5 in 2018. In 2017, 66% of accepted students were female and in 2018, 90% were female.

Conclusion: The results suggest that there is a demand to study to be a dentist in Mallorca and it is an attractive and sought-after opportunity for many young Spanish people, especially among women.

4345 DELIVERY OF DENTAL SERVICES FOR DRUG USERS: EXPERIENCES WITH INTER-PROFESSIONAL COLLABORATION

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Aim: To assess dentists' and dental hygienists' experience of inter-professional collaboration with the rehabilitation institutions, related to dental treatment of drug users.

Methods: The study population comprised 141 dentists and dental hygienists (response rate 73%) working in the public dental service (PDS) in three counties in Norway. All participants completed an electronic questionnaire with open response alternatives in which clinicians' experiences, regarding inter-professional collaboration with rehabilitation institutions (RIs), were assessed. Responses were analysed using thematic content analysis with an inductive coding approach. The study was approved by the Norwegian Centre for Research Data (NSD).

Results: Three themes were extracted from the responses regarding the facilitators and barriers for collaboration; the role of health professionals, patient's role and organizational context. Most of the respondents agreed that the professionals can positively influence inter-professional collaboration by being available for each other, by having knowledge about drug users and their statutory rights to free of charge dental treatment and by close follow-up and motivation of patients before dental treatment. At the same time, lack of communication, lack of knowledge and lack of patients' follow-up were seen as barriers for collaboration. Leadership, accessibility and routines were the key characteristics connected to an organizational context. A participatory leader and functioning routines were mentioned as facilitators, whereas lack of time due to high number of patients at the dental clinic and appointments drop-outs were the factors that were seen to counteract successful collaboration.

Conclusions: Organizational barriers regarding leadership, accessibility and collaborative routines, as well as lack of inter-professional communication suggest current models of dental care delivery to drug users need to be reviewed.

4348 CONTINUING PROFESSIONAL DEVELOPMENT AMONG PUBLIC DENTAL SERVICE DENTISTS IN FINLAND

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Background: In Finland continuing professional development (CPD) is considered the responsibility of both Public Dental Service (PDS), dentists themselves and their employers.

Aim: The aim of this study was to explore CPD activity among PDS dentists and identify the development objectives related to CPD.

Methods: A questionnaire was sent by e-mail in March 2019 to all 2014 members of the Finnish Dental Association who worked mainly in the PDS. The data were collected anonymously as part of a larger annual FDA survey. Statistical analyses (ANOVA and t tests) were conducted by age group.

Results: Six hundred and seventeen (31%) of PDS dentists responded to the questionnaire and completed it of whom 142 were <35 years old, 131 were 35-50 years old and 340 were 50+ years old. The respondents were predominantly female (495 females and 105 males). The mean number of CPD courses per person which they had completed (counted in days), in the last year was 7.0 (SD=5.0). The mean number of CPD days delivered through other methods (e.g. reading professional literature, discussion with colleagues and e-learning) was 3.0 (SD=5.2). For <35-year-olds, there were 4.1 (SD=7.2) days, for 35-50-year-olds 3.3 (SD=4.5) days and for 51-year-olds or older 2.4 (SD=4.3) days ($p=0.008$). One hundred and ninety six (32%) of respondents reported that they had not undertaken enough CPD; for 35-50-year-olds this was 41% and for the other age-groups 29–30% ($p=0.033$). The main reasons for not undertaking enough CPD were: 'too expensive for employer' 73 (37%) and 'lack of time' 63 (32%). The most common CPD topics were: Current Care Guidelines 305 (49%), cariology 260 (42%) and endodontics 222 (36%). Endodontics was not so commonly undertaken by under 35-year-olds (28% vs. 35–39%, $p=0.044$). CPD Topics which dentists said they needed more of were: prosthodontics 123 (20%), general medicine 115 (19%) and emergency dental care 109 (18%). Under 35-year-olds reported they needed more CPD in emergency dental care (25% vs. 15–18%, $p=0.033$) and prosthodontics (35% vs. 14–19%, $p<0.001$). There were no statistically significant gender differences in these results.

Conclusions: In the population studied, dentists engage themselves in CPD actively. However, there were differences between age-groups. There are barriers to CPD participation that should be resolved.

4382 THE ORAL HEALTH NEEDS OF PEOPLE WITH DISABILITIES AS PERCEIVED BY MANAGERS AND CAREGIVERS.

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Aim: To assess the perception of oral health and oral care needs, barriers and current practices as perceived by managers and caregivers in organisations for people with disabilities in Flanders.

Methods: Two questionnaires were developed, one for managers and one for caregivers. The questionnaires were distributed in all 570 organisations for people with disabilities in Flanders. The survey was carried out in February 2018. Descriptive statistics were calculated. Proportions were tested with a Chi Square Test or Fisher's Exact Test, if the conditions for the Chi Square Test were not met. Ordinal variables were tested with a Mann Whitney U Test. The level of significance was predetermined at a p-value ≤ 0.05 (two-sided). Approval for the study was given by the Ethics Committee of Ghent University Hospital.

Results: Sixty-five managers completed the questionnaire and 63 of them could be linked to 57 unique organisations (10% of the contacted organisations). Managers perceived oral health to be better ($p = 0.019$) and mentioned less oral health needs ($p = 0.049$), when collaboration with a dentist was reported. When an oral health policy had been established in their organisation, oral health was also perceived to be better ($p = 0.048$). The responses of 91 caregivers were included for analysis and 87 of them could be linked to 39 unique organisations (7% of contacted organisations). In organisations with an oral health project, more caregivers indicated that the organisation was open to oral health questions than in organisations without such a project ($p = 0.045$). When there was a collaboration with a dentist, the organisation was more open to caregivers' questions ($p = 0.004$) and a clear contact point was more readily available ($p = 0.004$). Furthermore, caregivers were more interested to receive oral health education ($p = 0.023$) and claimed to be more aware of the oral health of their clients ($p = 0.015$). About 23% (21/91) and 30% (23/76) of the caregivers indicated that guidelines were used in their organisation for cleaning natural teeth and prostheses, respectively.

Conclusions: Despite the low response rate to the survey, this study indicates relevant issues to be incorporated when formulating recommendations for oral health promotion.

Acknowledgement of sources of funding: The study was commissioned by the Flemish Agency for Care and Health. We like to thank Prof. Dr. Jacquet and the members of the steering group for their critical review of the questionnaires. We also acknowledge Prof. Dr. Marks and Dr. De Tobel for their critical review of the manuscript.

4390 SOCIETY AND ORAL HEALTH IN ENGLAND AND WALES - THE LAST 50 YEARS

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Aim: The aim of this presentation is to highlight societal changes and the improvements in oral health which have occurred in England and Wales over the last 50 years.

Methods: Government reports produced by the Office for National Statistics and on behalf of the Department (Ministry) of Health were reviewed to obtain data for 1968/1969 and 2018/2019, or the years nearest to these dates. The

following topics were considered: Population, Life Expectancy, Percentage of adults (over 16 year- olds) without any natural teeth, Mean D3MFT in 12 year-olds, Numbers of dentists and dental hygienists, comparison with Scotland for current dental attendance and D3MFT in 12-year- olds

Results: In 1969 the population of the United Kingdom (UK)* was 55,406,435; by 2018 it was 66,436,000. Combined life expectancy (male and female) was 72 years in 1969; by 2018 it was 79 years for males and 83 years for females. In 1968, 37% of adults had no natural teeth; by 2009 the percentage had fallen to 6%. In 1973, mean D3MFT for 12 years-olds was 4.8; by 2013 it was 0.60. In 1969 there were 17,516 registered dentists and 464 enrolled dental hygienists in the UK; by 2019 here were 42,123 dentists and 7,274 dental hygienists. In 2017, in Scotland 70% of adults and 78% of children visited an NHS dentist in a 12 month period and mean D3MFT for 12-year-olds was 0.49. In England in 2017, 58% of children visited an NHS dentist and 51% of adults had visited an NHS dentist over the preceding 24 months, mean D3MFT for 12-year-olds was 0.8 in 2013.

Conclusions: The population of the UK has grown and aged over the last 50 years. In general, oral health at all ages has improved greatly. * Approximately 90% of the population of the UK lives in England and Wales.

4387 THE PATTERNS AND PREDICTORS OF DENTAL SERVICE UTILIZATION BY PEOPLE LIVING WITH HIV IN BRITISH COLUMBIA, CANADA

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Aim: To identify the predisposing, enabling and need factors of the Andersen and Newman (A&N) model and their associations with the pattern of dental service utilization in a sample of People Living with HIV (PLHIV) in British Columbia (BC).

Methods: Participants were identified via the e- newsletters of two HIV-organizations. They responded anonymously to a self-reported, 40-item online questionnaire to explore the patterns of dental service utilization. In order to be included, participants had to meet the following inclusion criteria: 1) be at least 19 years old; 2) self-identify as HIV-positive; 3) be able to provide consent and be willing to voluntarily participate in the study; 4) be residing in British Columbia; and 5) be able to proficiently respond to the questions in English. Following the descriptive statistics, the associations between the A&N model factors and main outcome variables (dental visit within the last year and reasons of dental visit) were evaluated using simple and multiple logistic regression analyses. The University of British Columbia Behavioural Ethics Committee approved the study.

Results: Out of 600 potential PLHIV participants approached electronically, 210 responded to the survey and 186 met the inclusion criteria. The experience of being discriminated against by dental professionals ($p = 0.005$), having dental anxiety ($p < 0.001$), not having dental insurance ($p = 0.001$) and having living difficulties ($p = 0.004$) were significantly associated with non-emergency dental visits. In multiple logistic regression analysis, dental anxiety (OR = 0.1; 95% CI 0.0; 0.4), having a regular dentist (OR = 3.7; 95% CI 1.1; 12.6) and visiting a dental office in the last year (OR = 21.6; 95% CI 6.1; 76.5) were the strongest predictors of dental service utilization in this study.

Conclusions: Several predisposing (e.g., self- perceived discrimination), enabling (e.g., dental anxiety, lack of dental insurance) and need factors (e.g., self-reported oral health) from the A&N model were associated with dental service utilization of PLHIV in BC, which remains low for this population. In addition to various psychosocial barriers, a significant number of respondents reported experiencing stigma and discrimination from their oral care providers.

Session 2 c: Gerodontology and Caries (2)

Chairs: Luc De Visschere and Andreas Schulte

4344 CROSS-SECTIONAL ASSOCIATION BETWEEN ORAL HEALTH AND FRAILITY: FINDINGS FROM ELSA STUDY

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Aim: To assess cross-sectional association between oral health (OH) and frailty in older English adults.

Methods: A random representative sample of 8,810 individuals aged ≥ 50 years from Wave 3 (2006-2007) of English Longitudinal Study of Ageing (ELSA) was used (response rate 73%). Demographic (sex, age, marital status), socioeconomic (education, total non-pension wealth), and behavioural (smoking, alcohol consumption) characteristics were obtained from participants. Oral Health (OH) was assessed through: (1) presence of natural teeth (dentate vs. edentate), (2) self-rated oral health (very good, good, average vs poor or very poor) and (3) an aggregate measure of prevalence of oral impacts (yes/no), based on the Oral Impact on Daily Performance (OIDP) measure. A frailty index was computed using the methodology of Rockwood and colleagues (Searle et al., 2008). Multivariable logistic regression models assessed the cross-sectional association between OH and frailty, adjusting for demographic, socioeconomic, and behavioural factors. After excluding respondents with missing information, the final sample of 6,575 individuals was analysed. The National Multicentre Research and Ethics Committee approved the study.

Results: Out of 6,575 respondents, 1083 (16.5%) were edentate. They were 1.3 (OR=1.30, 95% CI 1.1, 1.6) times more likely to be frail compared to dentate adults after adjustment. Respondents who rated their oral health as poor or very poor were 2.3 (OR=2.3, 95% CI 1.9, 2.7) times more likely to be frail than those who rated their oral health as very good, good or average. Additionally, older adults who reported one or more oral impacts were significantly more likely to be frail (OR 3.0, 95% CI 2.4, 3.6) when compared to adults who have not reported any oral impacts after adjustment.

Conclusions: Older adults with poor OH status were more likely to be frail. These findings suggest that maintaining good oral health may help preventing frailty in older individuals. Further studies are required to explore longitudinal association and pathways linking OH and frailty.

4346 PROVISION OF PREVENTIVE DENTAL CARE IN ADULTS WITH DOWN'S SYNDROME IN GERMANY

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Background: In Germany there is a lack of information with regard to the provision of dental care for persons with Down's Syndrome. To overcome this, a questionnaire was sent to parents of adults with Down's Syndrome.

Aim: The aim of the present study was to investigate the preventive care that adults with Down's Syndrome (ADS) had received.

Methods: In 2017, the 610 members of the Association for Down's Syndrome in Germany were asked to complete a questionnaire that contained 70 questions and return it to the study group. The study was approved by the ethical committee of Witten/Herdecke University (#165/2017).

Results: The questionnaire was completed by 168 (28%) of whom 89 were men and 79 women aged between 18 and 55 years (mean age 28 years). According to 65 (39%) of the parents who responded, it was not easy to find a dentist who is familiar with the provision of dental care for persons with Down's Syndrome. Nevertheless, nearly all (160 - 95%) had attended a dentist within the preceding 12 months for a regular check-up. One hundred and fourteen (67%) had received at least one professional tooth-cleaning in the precedent two years and 119 (70%) were educated how to brush teeth. Tooth-brushing after the age of 2 years started in 57 (34%) of the ADS. Two thirds (112 - 67%) of the parents reported that their family members had received F-tablets in childhood. Thirty eight (23%) of the ADS had never received a dental examination from a community dentist in school.

Conclusion: Dental students, general dentists and community dentists should receive a specific training to improve the provision of preventive dental care for persons with Down's Syndrome.

4350 THE LINK BETWEEN RESIDENCY AND DENTAL CARE VISITS OF THE BELGIAN ELDERLY

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Aims: Frail Belgian elderly have poor oral health (De Visschere 2016) and this study aims to investigate the regularity of dental care visits (DCV) of the (frail) Belgian elderly.

Methods: Anonymised administrative data were obtained from the National Federation of independent health insurance funds, representing 2,2 million members, including 213,675 persons of 70 years and above. These represent 14.5% of the total Belgian population aged 70 years and above in 2017. The population was divided into 3 categories based on their residence in 2017 (home or retirement home (RH; 7.8%)) and, for those residing at home, professional home care (HHC; 5.5%) or not (HNC; 86.7%). Three age-groups were considered: 70-79 years (n=119,507; 55.9%), 80-89 years (n=75,824; 35.5%) and 90+ years (n=18,344; 8.6%). Residence was identified by agreements between our Insurance Funds and retirement homes. DCV and professional home care were identified using the nomenclature codes of health care consumption. Regularity of DCV was defined as 'at least 2 years with a dental care visit over a period of 3 years. t-tests were performed to test the significance of the findings.

Results: A total of 102,296 (47.9%) persons in the study population had regular DCV in the period 2015-2017. Regarding age we found that 65,975 (55.2%) of 70-79 year olds had regular DCV, 31,841 (42.0%) of 80-89 year olds and 4,480 (24.4%) of 90+ year olds. Regarding residence, we found that 2,911 (17.4%) of RH had regular DCV, 3,378 (28.9%) of HHC and 96,007 (51.8%) of HNC. These differences between categories were observed within each age group, except for the difference between RH and HHC for the 90+ age group.

Conclusions: The share of elderly with regular dental care visits is reduced with increasing age. Higher frailty (living in resident home or at home with professional care) is associated with less regular dental care visits for every age group.

4385 THE EVALUATION OF ORAL HEALTH INTERVENTIONS IN VULNERABLE OLDER ADULTS BASED ON THE CREDECI 2.

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Aims: The aims of the current study were making an inventory of, and evaluating studies reporting oral health interventions in vulnerable older adults.

Methods: A literature search (2000-2018) was performed in Medline. Interventions included were set in a vulnerable older population (>65 years, home- or residential care) with an oral health indicator on older adult or caregiver level as primary outcome. Interventions were categorised by components of the Cochrane EPOC data collection checklist (2013). Each intervention was evaluated by one researcher using a slightly modified version of the CredeCi2. This tool consists of criteria for Reporting the Development and Evaluation of Complex Interventions in healthcare. One criterion concerning the effect evaluation was added. Scores were calculated, with a maximum of 42.

Results: Forty publications were included, with 34 in long-term care settings, five in homecare and one on a geriatric ward. The majority of the interventions focused on caregivers, while five interventions targeted older adults. In general, scores were low to moderate (range between 6 and 32) with a mean score of 19.2. The interventions scored moderate to high on effect evaluation and on theoretical framework, with attention to internal and external enabling

and disabling factors. Shortcomings were a lack of piloting, absence of control groups and almost no performance of a process evaluation. Furthermore, little attention was paid to feasibility and practical execution. In addition, information on financial or economic aspects was missing.

Conclusion: Multi-component interventions scored better compared to their simpler counterparts. However, the overall score of the interventions was low, with a consistent lack of process- evaluation. Therefore, in order to establish high quality oral health interventions in vulnerable older adults, attention needs to be paid to the development, implementation and evaluation of these interventions.

4386 MENTORSHIP FOR IMPLEMENTING AN ORAL HEALTH POLICY IN NURSING HOMES

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Background: In 2018 the Flemish Agency for Care and Health initiated the project “Mentorship for prevention in nursing homes” to guide the implementation of health policies by using expert mentors. Two hundred out of a total number of 700 Flemish nursing homes subscribed for one of the four themes (fall prevention, psychotropic drugs, malnourishment, and oral health), of which 80 chose to focus on oral health.

Aim: Development of a methodology to implement oral health policies in nursing homes by using oral health mentors.

Methods: An implementation plan was developed based on the Plan-Do-Check-Act circle of Deming , with seven steps for implementing a health care policy in organizations. A needs and barrier survey was performed and identified the importance of having an oral health professional guiding the organization. Each of the seven steps consists of several tasks that must be performed by the organization under supervision of the oral health mentor. Based on the process evaluation of earlier Belgian projects that focused on both preventive and curative care for elderly in residential care, several enabling factors were taken in account during the development. First, the preparation phase was extended to a period of six months to create support on all levels within the organization and to make time for education and base line evaluation. The nursing homes will go through the seven steps over a period of two years, with a third year to establish the oral health policy without the mentor. Second, the project emphasises a participatory model in which each organization determines its own pace and actions. Ownership of the goals, actions and materials is promoted in caregivers and organization to increase the continuation of the oral health policy and actions. Third, a health implementation matrix will be used as a tool to guide the organization in drafting actions on several levels (individual, department, organisation and family) and with a mix of different strategies (education, environment, guidelines, care). The effect and process of the methodology will be evaluated stepwise with the organizations on the waiting list as control group.

4430 DELIVERING ORAL HEALTH CARE TO OLDER ADULTS IN FLEMISH DENTAL PRACTICES

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Aims: To investigate the delivery of oral health care in dental practices to older adults by Flemish dentists and to gain insight into the barriers perceived by these dentists.

Methods: A convenience sample of 170 Flemish dentists were personally requested to participate. Every participating dentist was asked to select the first scheduled older patient in their dental office who met the following selection criteria: 65 years or older and at least 2 years regularly visiting the participating dental practice. Both, the dentist and the patient, completed a comprehensive questionnaire previously used in a similar study in the Netherlands. Socio-demographic data of both parties and the oral health status of the patient were collected. Ethical approval was given by Ethics Committee UZ Ghent: B670201835319.

Results: The response rate of the dentists was 55% (n=93). Their mean age was 48.5 years and 46 (49.5%) were female. The mean age of the older patients (n=93) was 74.8 years and 56 (57.0%) were female, 28 (32.6%) were without any health problems, 83 (89.2%) were physically mobile and 85 (92.4%) care independent. Four patients were edentulous and the mean DMFT of the other 87 was 23.7. Twenty nine (38.3%) of the dentate patients had a mean number of 18.9 natural teeth, pockets of at least 4 mm with bleeding and calculus were present. Seventy-four patients (80%) presented with objective treatment needs while only 25 (27.2%) expressed complaints. Barriers to oral healthcare delivery were experienced by 20 (21.7%) dentists and depended on the general health, self-care, oral hygiene and perceived oral health need of the patient. Significant correlations were found between the personal data which has been collected and the perceived barriers.

Conclusions: The population of older adults studied, often had good general health, in contrast to their oral health. Their subjective treatment need was lower than their objective treatment need. One fifth of the dentists experienced barriers to providing oral health care for older adults. These barriers were influenced by patient dependent factors.

4349 ORAL HEALTH BEHAVIOUR AND ATTITUDE TOWARDS CARIES AMONG MOTHERS WITH TODDLERS

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Aim: to investigate oral health behaviours of mothers with young children and their attitudes towards Early Childhood Caries risk factors.

Methods: The study enrolled 123 mothers with children under three years attending a primary health care centre (Department of Family Medicine at the LSMU Hospital) in Kaunas, Lithuania. The survey was carried out from August of 2016 to August of 2017. The self-administered questionnaire inquired about background characteristics, smoking, mothers' attitudes toward oral health and behaviours to the potential transmission of oral bacteria to child, dietary habits of both mother and child, their own and child's tooth brushing. The Bioethics Centre of the LSMU approved the study (No. BEC-OF-14). Statistical evaluation was by means of Chi-squared tests. A p-value ≤ 0.05 was set to indicate statistically significant differences. The probabilities of an event/events given a certain risk indicator/

indicators were calculated using univariate/multivariate logistic regression analysis, including odds ratio (OR) and with a confidence interval (95 % CI).

Results: Most of mothers (97 - 87%) reported themselves as non-smokers and 79 (69%) of mothers brushed their teeth twice-a-day. A statistically significant association was found between the mothers brushing their own teeth twice-a-day and cleaning their child's teeth likewise (OR=5.42, 95% CI 1.28-6.63; p=0.005). The significant associations were observed among those giving sugar sweetened beverages (SSB) for a child daily and mothers' college or lower education (OR=6.51, 95% CI 1.59- 27.19; p=0.010) and maternal tooth brushing less than twice-a-day (OR=3.88, 95% CI 0.99-15.18; p=0.05).

Conclusions: About one-third, of the Lithuanian mothers, who participated in this study, did not follow the universal recommendations for tooth brushing and a majority of them did not brush their offspring's teeth as recommended. Mothers with lower education who brushed their teeth less than twice-a-day offered their children SSB more frequently. Consequently, more emphasis on child's oral health promotion and education about importance of proper oral hygiene habits is needed.

4384 AN AUDIT OF THE COMPLETION OF PAEDIATRIC CARIES RISK ASSESSMENT A COMMUNITY DENTISTRY CLINIC

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Background: Quantifying caries risk for paediatric patients is critical for clinical decision-making regarding diagnostic, fluoride, dietary, and restorative protocols, to ensure that patients receive the most effective prevention, treatment plans and appropriate recall interval.

Aim(s): To ensure that all paediatric patients are receiving the highest standard of care by auditing the completion of caries risk assessments, retrospectively during paediatric new patient examinations, in accordance with national guidelines.

Methods: The records of 100 new patient examinations were retrieved from the clinic's software system, using stratified sampling, and were audited by five paediatric dentists. who worked in the community dental service. The new patient examinations took place in a community dental clinic between August 2018 and June 2019. Inclusion criteria were that each patient had to have their course of treatment (starting from the new patient examination) completed. Exclusion criteria included: referrals for orthodontic extractions, referrals for trauma assessments, where it was not possible to conduct a complete examination and patients attending for assessments prior to a general anaesthetic.

Results: Fifty patient notes did not include a caries risk assessment. Thirty three (67%) of the patients who had a complete caries risk assessment were classed in the high-risk category,5 (10%) were in the moderate risk category and 2 (5%) in the low caries risk category and 3 (7%) of patient's caries risk described using other categories.

Conclusions: Two of the five clinicians recorded the caries risk assessment without using a standardised proforma and clinicians who measured caries risk seemed to do this as part of a standardised clinical note proforma. Following this initial audit, the action plan is to modify the electronic paediatric examination proforma and to consider highlighting the suggested recall interval guided by caries risk and other factors in discharge letters to GDPs.

Session 2 d: Other Topics
Chairs: Roxanna Oancea and Martijn Lambert

**4269 TEMPERO- MANDIBULAR JOINT DYSFUNCTION IN TURKISH CHILDREN
WITH JUVENILE IDIOPATHIC ARTHRITIS**

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Background: Juvenile idiopathic arthritis (JIA) is a heterogeneous group of systemic inflammatory diseases affecting one or more joints. It is characterized by pain, swelling, and stiffness, and can lead to growth disturbances and in some cases to destruction of the joints.

Aim: The aim of this study was to investigate the oral health-related quality of life (OHRQoL) of a group of children with juvenile idiopathic arthritis (JIA).

Methods: Patients with JIA aged between 11-14 years were recruited from Umraniye Training Research Hospital between September 2018 and March 2019. Information regarding OHRQoL was collected from the children using the Turkish version of Child Perceptions Questionnaire (CPQ11–14) and the Fonseca Anamnestic Index (FAI) was used to measure Tempero-mandibular Dysfunction (TMD). The CPQ consisted of 39 questions including two general questions about the effect on oral health and life and 37 questions covering four topics. The total score of FAI allows for classification of TMD severity: 0 to 15 points = absence of TMD; 20 to 45 points = mild TMD; 50 to 65 points = moderate TMD; and 70 to 100 points = severe TMD. Ethical approval for the study was obtained from The University of the Marmara, Faculty of Dentistry Sciences Research Ethics Committee (Ethics approval number 2018/187)

Results: From an enrolment of 145 children, 31 children (19 girls (61%) and 12 boys (39%)) gave consent to participate in the study. Mean age of the children was 13,12 ±1,49 years. The most common subgroup suffered from enthesitis- related arthritis (12; (38%) followed by oligoarticular JIA (10; (32%) and polyarticular JIA (9; (30%). The mean CPQ11–14 score was 41,03±17,40. According to FAI, 13 (42%) of JIA children showed no TMD symptoms, 12 (42%) mild, 3 (10%) moderate and 2 (6%) showed severe symptoms of TMD.

Conclusions: In the group studied, over half reported TMD symptoms. Further studies are needed to assess the association between JIA and specific domains of OHRQoL. Longitudinal studies are also needed to study the cause and effect of different variables on OHRQoL.

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4272 PATHOLOGICAL REFLUXES EFFECT ON SOME SALIVA PARAMETERS

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Background: In the oral cavity gastroesophageal reflux disease (GERD) manifests itself in clinical and pathophysiological changes.

Aim: To investigate possible associations between the clinical state of the oral mucosa and the level of nitric oxide (NO) and bilirubin metabolites in the saliva of patients with GERD with different pathological refluxes. **Methods:** The study took place in the Department of Therapeutic Dentistry of the Moscow State Medical and Dental University and the University's Internal Diseases Clinic, between 2015 and 2017 all gave positive consent to take part. It was approved by the Ethics Committee of Moscow State Medical and Dental University. It involved 92 adults, with a mean age of 43.5±0.5 years. Patients were divided into 4 groups: group 1 –control (n=25); group 2-patients with

acid refluxes (n=25); group 3-patients with a slightly acid refluxes (n=25); group 4 - patients with a slightly alkaline refluxes (n=17). The clinical state of the oral cavity as well as the NO metabolites level (NOxL) in unstimulated saliva, the direct, indirect and total bilirubin level (DBL, IBL, TBL) in mixed saliva, and the correlation between the NOxL and the TBL and DBL in saliva were assessed.

Results: The oral condition was characterized by the following changes: plentiful plaque on the tongue (100.0% in group.4, 76.0% in groups.2 and 3, 72.0% in group.1), xerostomia (100.0% in group.4, 56.0% in group.3, 64.0% in group.2, 28.0% in group.1); mean TBL in group. 4 was significantly higher (3.60+0.14 mmol/l) vs group.2 (3.19+0.81 mmol/l); group.3 (3.18+0.55 mmol/l) and group.1 (2.36+0.17 mmol/l). Mean NOxL in saliva from the right parotid salivary gland in group. 1 was 6.84 +2.55 mmol/l vs 14.57+5.16 mmol/l in group.2; 16.98 +4.18 mmol/l in group.3 and 20.93 +11.23 mmol/l in group.4. The results of other findings from this study will be presented at the 2019 EADPH congress in a poster.

Conclusions: Most patho-physiological changes (the NOxL, TBL and DBL increases in saliva) in the oral cavity were observed among patients with slightly alkaline refluxes. There was a direct correlation between NOxL, TBL and DBL in saliva among patients with GERD.

4277 TEACHING OF DENTAL PUBLIC HEALTH AT THE UNDERGRADUATE LEVEL IN TURKEY

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Aim: The aim of this study was to assess the curriculum, the teaching-learning experiences and also Dental Public Health (DPH) based strategies at undergraduate level in dental schools in Turkey.

Methods: In 2018, a questionnaire consisting of questions concerning the teaching of DPH was distributed among Turkish dental schools that have DPH in their syllabus. There were 22 dental schools (14 public and 8 private) which participated in this cross-sectional study. The questionnaire had two sections. The first section was related to the presence of a department co-ordinating undergraduate teaching in DPH and the teaching methods delivered at the schools. The second section was related to the topics taught.

Results: The mean of the number of students graduating each year from each of the twenty-two dental schools was 77. There was no specific department or section of dental public health at 11 schools. Six schools (27%) had a DPH programme director or a chairman of a DPH section and all of them indicated that they planned to extend the teaching of DPH in the future. Eleven schools (50%) were unaware of the existence of the Association of Dental Education in Europe curriculum guidelines for DPH. Nine schools (41%) operated outreach visits for treating patients. Ten schools (45%) taught DPH in specific block and 9 schools (41%) taught it longitudinally throughout the undergraduate course. The grade of appointment of the head of department was full professor in 3 private and 4 public dental schools. The departments that coordinated undergraduate teaching in DPH were paediatric dentistry at 17 schools and other departments in private schools.

Conclusions: The aim of the DPH curriculum should be to raise awareness and knowledge about dental public health and population-based strategies for improving oral health. This study shows that a flexible DPH curriculum is available in 22 dental schools in Turkey. It also demonstrated a need for increased teaching of dental public health topics.

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4280 PREDISPOSING FACTORS FOR POST-TRAUMATIC OSTEOMYELITIS IN THE MANDIBLE. A RETROSPECTIVE STUDY

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Aim: To evaluate predisposing factors for post-traumatic osteomyelitis following fractures of the mandible.

Methods: The retrospective study of all bilateral fractures of the mandible treated at the Zalgiris Clinic of Vilnius University Hospital, between 1 January 2015 and 1 January 2019, analysed. the case-histories and radiographs of 447 patients. The factors which were evaluated were: gender, age, number of cases treated with osteosynthesis surgery, number of cases in which pre-surgical immobilisation of the mandible was left in situ , number of osteosynthesis plates placed during the surgery and the development of post-traumatic osteomyelitis. A statistical analysis of the resulting data was performed using the Pearson's chi- square test and the Chi- squared test. Ethics approval for the study was given by the Vilnius Regional Biomedical Research committee.

Results: Of the 447 patients, 52 (12%) were women and 395 (88%) were men. The mean age of all patients was 32 (± 11.4) years. Osteosynthesis surgery was performed on 146 (33%) of the 447 of the patients, post-traumatic osteomyelitis developed in 107 (24%) of the 447 patients . After osteosynthesis surgery 102 patients were left with pre- surgery jaw immobilization material in situ. The mean number of osteosynthesis plates placed was 3.4 plates (± 1.09) per patient and the total number of plates was 496. In the other 301 patients osteosynthesis surgery was not performed and in 82 of these patients post- traumatic osteomyelitis developed. Post-traumatic osteomyelitis also developed in 25 of the patients who had undergone osteosynthesis surgery. The Chi-square test showed that the number of patients who developed post-traumatic osteomyelitis was statistically significantly lower after osteosynthesis surgery ($p=0.0187$) and it developed less frequently when the mandible was not immobilised after the surgery ($p=0.0003$). A significant relationship was found between the development of post-traumatic osteomyelitis and the number of plates used for treatment ($p=0.02$).

Conclusions: In the patients who were reviewed in this study post-traumatic osteomyelitis development was associated with the treatment modalities which had been employed.

4281 HEALING DETERMINANTS AFTER TOOTH EXTRACTION FROM THE ANGLE OF THE MANDIBLE FRACTURE

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Aim: To evaluate factors that determine the healing after fractures at the angle of the mandible.

Methods: A retrospective study of all patients who had attended the Zalgiris Clinic of Vilnius University Hospital. between 1 January 2014 and 1 January 2019, with a fracture at the angle of the mandible was performed. Case-histories and radiographs were reviewed. The following factors were evaluated: gender, age, the degree of eruption of the third molar in the fracture line and the healing process after tooth removal. Statistical analysis of data using Pearson's chi-square criterion was carried out. Ethics approval for the study was given by the Vilnius Regional Biomedical Research committee.

Results: The mean age of the 392 patients, 26 (7%) of whom were women and 366 (93%) men ,whose records were reviewed, was 30 years (± 9.4). In 263 (67%) of the patients the mandibular third molar was fully erupted and in 162 (41%) of patients these teeth were extracted during a jaw fixation and immobilisation procedure. After mandibular third molar removal and osteosynthesis surgery, post-traumatic osteomyelitis developed in 46 (12%) of cases, of which 7 occurred when the third molars were unerupted and 39 when the teeth were partially or fully erupted. More than half of patients (262 -67%), with a unilateral mandibular fracture, had one erupted third molar extracted. Tooth extraction during the jaw fixation and immobilization procedure had a statistically significant influence on development of post-traumatic osteomyelitis ($p=0.0259$).

Conclusions: The position of extracted third molars in the fracture line had a statistically significant influence on wound healing and development of post- traumatic osteomyelitis.

4297 KNOWLEDGE AND ATTITUDE REGARDING HEPATITIS B AMONGST A GROUP OF DENTAL STUDENTS

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Aim: Hepatitis B virus (HBV) is a major public health concern in the world. Effective intervention strategies for HBV prevention and control are essential. The current study aimed to evaluate the knowledge of HBV infection amongst dental students and their attitudes towards patients infected with the virus.

Methods: In 2018, a cross-sectional survey was conducted amongst dental students in the Marmara University Dental School. Approval was obtained from the Clinical Research Ethics Committee of Marmara University, Faculty of Dentistry. A self-explanatory questionnaire comprising 17 questions was designed to assess and compare students' knowledge, attitude and risk perception regarding HBV. Data were entered, cleaned and analyzed using SPSS version 20.0 (SPSS, Chicago, IL, USA).

Results: A total 346 students (93% response rate) from 372 randomly selected dental students completed questionnaire. Of the study participants, 122 (35%) were male and 224 (65%) were female. Their mean age was 24,2 years (ranging from 20 to 30 years). Three hundred and thirty (95%) reported washing their hands after every patient. Three hundred and forty six (100%) reported changing gloves after every patient. Only 60 (17%) claimed that they always used a protective eye shield during dental procedures and a protective disposable apron was claimed to be used always by 129 (37%). Three hundred and thirty seven (97%) reported that they autoclaved their instruments, including hand pieces and burs, between the patients and 83 (24%) that they knew that HBV cannot live in a dry environment. Two hundred and ninety six (85%) were immunized against HBV. 69 (20%) and 69 (20%) knew which hepatitis viruses were spread by parenteral transmission. However, only 44 (13%) had completed the three dose schedule of HBV vaccination.

Conclusions: These results demonstrated a satisfactory knowledge about HBV infection amongst dental students, but some gaps were observed. The results also demonstrated the need for teaching knowledge, attitude, and practice in some aspects of HBV during the early years of dental student education.

4301 TOOTH LOSS AND RISK OF CARDIOVASCULAR DISEASE IN A MIDDLE-AGED, POLISH URBAN POPULATION

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Aim: To assess the relationship between tooth loss and risk of fatal and non-fatal cardiovascular disease (CVD) in a middle-aged, Polish urban population.

Methods: This study was performed on a random subsample of 10,728 residents of Kraków, who participated in the Health Alcohol and Psychosocial Factors in Eastern Europe (HAPIEE) Study. After baseline examination in 2008-2009, participants were followed up for CVD incidence until the end of 2015. Information on age, education and smoking was collected using a standard questionnaire. An intraoral examination was carried out by dentists trained in

the study methods. CVD risk was assessed using the Systematic Coronary Risk Estimation (SCORE). Data on new CVD incidents were collected through a postal questionnaire and confirmed by the review of medical records. Data on deaths and their causes were collected from local and central registries of residents and by interviewing participant's relatives. Association between number of teeth and CVD incidents was assessed using the Cox proportional - hazards model. The study was approved by the Jagiellonian University Bioethics Committee. Informed consent was obtained from each participant.

Results: The final analysis included 778 participants, who were free of CVD at baseline. Participants were classified into the following groups: edentulous (115), 1-5 teeth (73), 6-19 teeth (354), at least 20 teeth (236). There were 31 new CVD cases registered. After adjustment for age and gender, compared to participants who had at least 20 teeth, the risk of CVD was more than 9 times higher in participants who were edentulous and in participants who had 1-5 teeth. Adjustment for SCORE, education, obesity and diabetes attenuated the relationship slightly, but did not change the statistical significance; HR= 6.8, 95% CI:1.44- 32.04 for edentulous participants.

Conclusion: In the population studied, tooth loss was associated with CVD incidence independently of CVD risk estimated from the exposure to main risk factors, education, obesity and diabetes.

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4381 MICROCHROMOGRAPHIC 3-DIMENSIONAL EXAMINATION OF TEETH TO BETTER UNDERSTAND CARIES

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Aim: The present research was aimed at imaging predentine, the structure of the walls of the dentinal tubules, and the distribution of collagen fibres from which the dentinal tubules are built, using microtomography to find new mechanisms for the development of caries.

Methods: The teeth were first demineralised then treated with uranyl acetate and osmium tetroxide. Both reagents are used to contrast biological material when using transmission electron microscopy. In the next stage, these contrasted teeth were analysed radiographically with the use of Nanotom S microtomography. The Fiji Is Just ImageJ and VG Studio Max programmes were used to view the acquired images and to conduct numerical analysis of the data. Then a 3D model was made. The study was approved by the bioethics commission of the Jagiellonian University Collegium Medicum (no. 122/6120/13/2016).

Results: The teeth serving as reference material were not subjected to contrasting agents. The images obtained via microtomography were poorly differentiated. When the teeth contrasted with uranyl acetate were assessed, the spatial image of the entire tooth became very clearly visible. The teeth contrasted with osmium tetroxide differed in terms of contrast. Thus, the techniques which were used enabled the differentiation of sharper details throughout the tooth model.

Conclusions: The 3D models of collagen network in dentin, using a digital model (without damaging tooth structure), can contribute to further understanding of the mechanism of development of caries lesions and the use of restorative materials, such as: bonding systems, fillings and restorations. This may improve the quality of treatment for patients. It was possible to show vessels and odontoblast spikes in the pulp chamber. It was also possible to follow the course of the dentinal tubules and to link the structures of the walls of the tubules with collagen fibres in 3D images, using Nanotom S micro