### Abstracts from the 2003 National Oral Health Conference

### 1. Timothy L. Cooke, BDS\*, Jayanth V. Kumar, DDS, MPH, Donna Altshul, RDH, BS, University Albany School of Public Health, New York State Department of Health, Albany, NY

#### ASSESSING ORAL HEALTH DISPARITIES IN CHILDREN

Objective: To assess disparities in oral health in 3rd grade children at county level in New York State. Methods: A surveillance system has been established to monitor oral health status in 3rd grade children. A stratified random sample of schools was selected in each county. Data regarding school lunch participation, fluoride tablet use, dental visit in the previous year, and dental insurance coverage were gathered by questionnaire. Screenings were conducted to record caries experience, untreated caries, and the presence of sealants. Estimates were obtained using appropriate statistical techniques for high- and low-income groups. Results: In these counties, there was a significant difference in caries experience [68.0% (95% ±CI, 3.8%) vs 48.0 percent (±4.1%)] and untreated caries [54.3% (±5.7%) vs 26.3% (±4.2%)] between low- and high-income children. Although the insurance coverage was similar in the two groups [72.6% (±2.6%) to 76.9% (±2.5%)], there was a significant difference in the percentages with a dental visit in the past year [(51.9% (±2.7%) to 85.0% (±3.4%)]. Conclusions: The surveillance data clearly shows disparities in oral health between high- and low-income groups despite similar rates of dental insurance coverage. Supported by a grant from the Centers of Disease Control and Prevention.

2. J. D. Hardison<sup>\*1</sup>, M. C. Manz<sup>2</sup>, J. C. Cecil<sup>1</sup>, M. R. Mullins<sup>1</sup>, J. A. White<sup>3</sup>, G. A. Ferretti<sup>1</sup>, <sup>1</sup>University of Kentucky College of Dentistry, <sup>2</sup>University of Michigan, <sup>3</sup>Arizona Department of Health Services THE 2001 KENTUCKY ORAL HEALTH SURVEY OF SCHOOLCHILDREN

Objective: Provide a point-in-time benchmark of oral health status of school-aged children in Kentucky. Methods: A stratified cluster PPS sample was selected across five regions. After completion of a parental questionnaire, visual screening exams using Basic Screening Survey (BSS) protocols were completed on third (n=3244) and sixth (n=2718)graders; eighth graders (n=4156) completed a questionnaire. Screeners were standardized and kappa statistics were calculated for interexaminer reliability. SUDAAN statistical software was used to create weighted estimates. Results: Mean (SE). 74.9 percent (0.9%) had been to the dentist ≤12 months; 17.9 percent (0.6%) had a toothache in last 6 months; 22.3 percent (0.7%) had Medicaid or KCHIP insurance. The clinical screening of 3rd and 6th graders showed that 56.1 percent (1.3%) had caries experience; 28.7 percent (1.1%) had untreated caries; 28.8 percent (1.4%) had sealants on any permanent molar; 20.1 percent (1.2%) were judged as being in fair or poor condition by the screener while parents made the same assessment 9.5 percent (0.9%) of the time. Conclusion: Kentucky's schoolchildren have substantial oral health problems. Supported by the Kentucky Department for Public Health.

3. Judy A. White, RDH, MPH<sup>\*1</sup>, James D. Hardison, DMD<sup>2</sup>, Michael C. Manz, DDS, MPH<sup>3</sup>, Kneka P. Hayward, RDH, BS<sup>1</sup>, <sup>1</sup>Arizona Department of Health Services, Office of Oral Health, <sup>2</sup>University of Kentucky College of Dentistry, <sup>3</sup>University of Michigan

#### ORAL HEALTH STATUS OF 9TH GRADERS IN ARIZONA

*Objective:* To assess the oral health status of Arizona 14–15-year-olds (9th graders). *Methods:* Consent forms were distributed to a convenience sample of 1,769 9th graders at six high schools (four urban and two rural) in Arizona; 247 students were screened. After students completed a written questionnaire, two standardized screeners used Basic Screening Survey (BSS) definitions to assess oral health status. Results were analyzed using SAS, JUMP (SAS Institute Inc., Cary, NC) and EpiInfo (CDC, Atlanta, GA). *Results:* Ninth graders self-reported on length of time since last dental visit (within the last year, 58.3%; never, 2.8%), a toothache in the last six months (25.9%), and the impact of the toothache

on activities (1.2% missed school). Screeners identified 9th graders with untreated decay (27.1%), missing permanent teeth (1.2%), restorations present (33.6%), sealants present (47%), oral injury (4.1%), and urgent or early treatment needs (33.3%). Differences in oral health status were found by rural/urban residency and by race/ethnicity. *Conclusions:* Oral health status of this convenience sample of 9th graders in Arizona fell below some Healthy People 2010 oral health objectives for 15-yearolds. Supported by the Arizona Department of Health Services, Office of Oral Health, and the Maternal and Child Health Block Grant.

4. Eino Honkala, DDS, DDPH, MSc, PhD\*; Sisko Honkala, RN, RSN, DDS, PhD; Arja Rimpelä, MD, MSc, PhD; Lasse Pere, MSc; Matti Rimpelä, MD, MSc, PhD, Faculty of Dentistry, Kuwait University, Kuwait, and School of Public Health, University of Tampere, Finland

#### THE TREND OF PERCEIVED TOOTHACHE AMONG ADOLESCENTS IN FINLAND FROM 1977 TO 2001

Objective: To find out the possible decline in perceived toothache among Finnish adolescents from 1977 to 2001. Methods: This study is a part of the Adolescent Health and Life-style Survey, which is based on self-administered questionnaires were mailed to a representative sample of 12-, 14-, 16- and 18-year-old Finns every second year since 1977. The sample sizes varied from 2,422 to 11,105, and response rates from 85 percent to 90 percent. The total number of respondents in these studies was 77,643 individuals. Results: The perceived toothache was asked in 1977, 1985, 1991, 1995, 1997, and 2001; the prevalence figures were 31 percent, 25 percent, 28 percent, 29 percent, 37 percent, and 33 percent, respectively. The increasing age, female gender, nonskilled blue-collar worker parent, less-than-once-a-day brushing, and study year 1997 seemed to be related to risk of toothache. Suburban or rural area of residence and the study years 1985 and 1991 were related to low risk for toothache. Conclusions: There was no tendency for perceived toothache to decline over the study period, despite the consistent improvement in caries experience in Finland. The increase of toothache experience from 1995 to 1997 could be explained with the economic regression, which has leveled off in 2001.

### 5. Britt C. Reid, DDS, PhD\*, Mark Macek, DDS, DrPH, Department of Oral Health Care Delivery, University of Maryland School of Dentistry, Baltimore, MD; Jeffrey J. Hyman, DDS, PhD NIDCR, NIH, Bethesda, MD DISPARITIES IN UNTREATED DENTAL DECAY AMONG US ADULTS

Objectives: To assess the independent ability of race/ethnicity and income to explain variation in untreated dental decay among US adults. Methods: Data from 5,233 dentate adults aged 20 through 50 years who participated in the NHANES III were analyzed with weighted multivariate logistic regression models. Results: Bivariate analyses indicated that untreated dental decay displayed strong statistically significant associations with race/ethnicity, and income levels. However, race/ethnicity alone or in combination with income explained little of the variation in untreated decay among adults (McFadden's adjusted R<sup>2</sup>s (MAR) of 2.0 percent and 7.0 percent, respectively). The addition of variables age, sex, smoking status, quartile of mean attachment loss, employment status, limitation of activities, history of dental visit, obesity, and missing teeth raised the amount of variation explained (MAR of 20.0%) and resulted in race/ethnicity becoming statistically nonsignificant. Conclusions: The prevalence of untreated decay among adults was largely explained by socioeconomic and clinical variables other than race/ethnicity and income indicating a complex multifactorial mechanism underlying the observed disparities. Future research will need to look beyond race/ethnicity and income in seeking useful explanations for disparities in untreated decay among US adults.

6. Rachel L. Badovinac, DMD, MSc\*, Department of Oral Health Policy and Epidemiology, Harvard School of Dental Medicine, Boston, MA

### CAN A SCREENING EXAM OF THE PRIMARY DENTITION PRE-DICT CARIES IN THE FIRST PERMANENT MOLARS?

Objective: The present study aimed to determine the ability of a screening exam to identify the relationship between caries in primary and permanent teeth in elementary-school children. Methods: Screening exams were performed on 2,344 children in grades 1-4 using the dmft and DMFT indices. Cross-tabulations were used to identify the threshold number of primary caries that had the highest sensitivity and negative predictive value for discriminating between children with and without permanent caries (1) in the entire population and (2) in subpopulations defined by grade, race, gender, and language spoken at home. This threshold then was entered into logistic regression models. Results: We determined that dmft>0 had the highest sensitivity (0.73) and negative predictive value (0.69). Using this test criterion, univariate logistic regression revealed an odds ratio of 3.18 (P<.0001) for presence of permanent caries. Controlling for gender, grade, race, and language spoken at home, the odds ratio increased to 3.71 (P<.0001). Conclusions: There is a relationship between primary and permanent caries in elementary school children. Using the dmft>0 criterion may have utility in helping public health providers determine which children should receive sealants when resources do not allow the delivery of sealants to all children.

7. Judy A. White RDH, MPH<sup>41</sup>, James D. Hardison, DMD<sup>2</sup>, Michael C. Manz, DDS, MPH<sup>3</sup>, Kneka P. Hayward, RDH, BS<sup>1</sup>, <sup>1</sup>Arizona Department of Health Services, Office of Oral Health, <sup>2</sup>University of Kentucky College of Dentistry, <sup>3</sup>University of Michigan

### VALIDATION OF SELF-REPORTED ORAL HEALTH STATUS OF 9TH GRADERS

Objective: To test the ability of 14- and 15 year-olds (9th graders) to accurately self-report oral health status via written questionnaire, and how well survey questions on oral health status predicts actual clinical findings. Methods: Consent forms were distributed to a convenience sample of 1,769 9th graders at six high schools (four urban and two rural) in Arizona; 247 students were screened. After students completed a written questionnaire, two standardized screeners used Basic Screening Survey (BSS) definitions to assess oral health status. Results were analyzed using SAS, JUMP (SAS Institute Inc., Cary, NC) and EpiInfo (CDC, Atlanta, GA). Results: Subjects seemed best able to report presence of sealants and oral injuries, slightly less able to report presence of restorations, and least able to report presence of untreated caries. Differences were seen by gender, urban/rural residency, and race/ethnicity. Conclusions: Use of a written questionnaire may be useful in assessing some oral health status indicators of 9th graders in Arizona. Supported by the Arizona Department of Health Services, Office of Oral Health, and the Maternal and Child Health Block Grant.

# 8. Bhavna S. Talekar, BDS<sup>1</sup>, R. Gary Rozier, DDS, MPH<sup>1</sup>, Gary D. Slade, BDSc, DDPH, PhD<sup>2</sup>, <sup>1</sup>UNC Chapel Hill, Chapel Hill, NC, <sup>2</sup>University of Adelaide, Australia

#### PARENTAL PERCEPTIONS OF THEIR PRESCHOOL CHILDS ORAL HEALTH

Objective: To determine parental perceptions of their preschool child's oral health status and factors that predict these perceptions of health. Methods: Data for 3,424 children aged 2-5 years from the clinical examination and youth questionnaire of NHANES III (1988-94) were analyzed using OLS regression with SUDAAN. The dependent variable was based on the question, "How would you describe the condition of -s natural teeth?" Explanatory variables included, demographic variables (age, race-ethnicity, sex), parent education, family income, previous dental visits, parental perception of child's general health and need for dental treatment, and presence of 1+ decayed tooth surfaces. Results: Overall, 43 percent of the sample rated their child's oral health as excellent, 23 percent as very good, 23 percent as good, 7 percent as fair, and 4 percent as poor, with a mean of 2.1 on a 5-point scale, with 1 being excellent. The full model explained 43.1 percent of the variance in the dependent variable. Tooth decay, perceived need for treatment, lower income, and poorer general health perceptions were significantly associated with poorer oral health ratings by parents. Demographic and visit variables were not significant. Conclusions: Actual disease and perceived need are significant predictors of parent perceptions of their

child's oral health when controlling for other factors. Future research needs to examine whether reducing actual disease and perceived need improves parental perceptions of their child's oral health, as well as the impact of other social environmental factors on the child's quality of life.

#### 9. J. Veronneau, DDS, MPH\*, P. J. Allison PhD, McGill University, Montreal, Canada

### EARLY CHILDHOOD CARIES DIAGNOSTIC AGREEMENT BETWEEN DENTISTS AND HYGIENISTS

Objective: Early childhood caries (ECC) remains a major problem in many parts of the world. As part of the preliminary work to develop such an intervention in Quebec, the aim of this study was to evaluate the degree of agreement between dentists and hygienists in diagnosing ECC among 12-24-month-old children. Methods: Five dentists and seven hygienists, working in 12 dentist/hygienist (D/H) pairs, examined a total of 390 children (i.e., an average of 32 children per pair) in community vaccination clinics using the D\-3 system to diagnose caries. All erupted teeth surfaces were examined using a headlight, mirror, and cotton gauze only. Both members of the D/H pairs examined each child, with each member of the D/H pairs being blind to the caries evaluation of the other. Evaluation of the degree of agreement in caries diagnoses within D/H pairs was performed through generation of a kappa statistic (K). Results: K ranged from 0.96-0.99 for all surface observations for the 12 pairs with a mean K of 0.98. Among the 85 children (21.2 percent) diagnosed with caries, there were 289 lesions, the large majority of which were D\ lesions. The K for these lesions only ranged from 0.7-1.0 for the 12 D/H pairs, with a mean K of 0.86. Conclusions: The results suggest a good level of agreement between dentists and hygienists in diagnosing caries among 12-24-month-old children using minimal examination materials and in a nondental office setting. This has important implications for public health interventions.

10. Mark Macek, DDS, DrPH,\* University of Maryland Dental School, Baltimore, MD; Thomas Matte, MD, PhD and Thomas Sinks, PhD, National Center for Environmental Health, CDC; Dolores Malvitz, DrPH, Division of Oral Health, CDC, Atlanta, GA

### WATER FLUORIDATION AND BLOOD LEAD LEVELS IN US CHILDREN

Objective: The purpose was to use national data to determine whether an association exists between type of water fluoridation (WF) and blood lead levels (BLL) among children aged 1-16 years. Methods: Data on BLL and known demographic correlates of BLL came from the Third National Health and Nutrition Examination Survey. The 1992 Water Fluoridation Census was used to determine WF for the water systems serving each jurisdiction. The dependent variable was BLL (micrograms/dL), and independent variables were WF, age, gender, race/ethnicity, poverty status, and age of dwelling (before 1946, 1946-1973, 1974-present). SUDAAN was used to account for the complex sample design. Results: Multivariate linear regression showed that the WF/BLL association was part of a significant interaction with age of dwelling. Using [age of dwelling=1974-present plus WF=no fluoride] as the reference, BLLs for [WF=all types plus age of dwelling=before 1946], as well as [WF=unknown, natural, and none plus age of dwelling=1946-73] were significantly higher than the reference. Conclusions: Any WF/BLL association appears to be dependent on, and strongly influenced by, age of dwelling. Findings should be viewed in the context of other biological and environmental findings.

11. Steven M. Levy, DDS, MPH\*, James S. Wefel, PhD, Judy Heilman, MS, John H. Himes, PhD, MPH, Joanne Holden, MS, Rena Cutrufelli, BS, Katherine Phillips, PhD, Pamela Pehrsson, PhD, University of Iowa, University of Minnesota, USDA, Virginia Polytechnic Institute

### NATIONAL FLUORIDE DATABASE AND INTAKE ASSESSMENT STUDY

*Objective:* Past fluoride (F) intake research has been hindered by the lack of a database for food and beverage F levels, and standardized approaches to assess dietary and nondietary F intakes. This presentation presents an overview of the National Fluoride Database and Intake Assessment Study, a new collaborative effort of the University of Minnesota School of Public Health (MN), the USDA Nutrient Data Lab (NDL), the University of Iowa College of Dentistry (IA), and Virginia Polytechnic Institute (VPI). Methods/Results: The study will estimate F concentration levels and variability in a national sample of commercial drinking waters, beverages, and foods. Product sampling, purchasing, and review of quality control are by NDL, preparation of sample aliquots by VPI, and fluoride assay by IA. MN will develop a computerbased assessment for F intake in individuals, including dietary and nondietary sources and incorporating the national F database. The assessment methodology will include questionnaires of previous F intake and incorporation of assayed F values for actual water and water-based beverages consumed. The F module will be incorporated into the Minnesota NDS-R software for estimating intake of other nutrients. Conclusions: Results will assist future research concerning F intake by providing national average F levels for many foods and beverages, by standardizing approaches and allowing quantitative estimates of F intake for individuals. Supported by NIDCR and NHLBI.

### 12. Woosung Sohn, DDS, DrPH\*, Amid I. Ismail, BDS, DrPH, University of Michigan, Ann Arbor, MI

### CARIES RISK-BASED FLUORIDE SUPPLEMENTATION

Objectives: This study aims to evaluate primary care physicians' recommendation of fluoride use for its appropriateness regarding caries risk of children. Methods: A representative sample of family physicians (FP) and pediatricians (PD) in the United States was surveyed. A questionnaire comprised case scenarios of two 1-year-old children, one with low caries risk and the other at high risk, and questions about opinions on fluoride use was developed and pretested. The physicians opinions on fluoride supplements use were compared with CDC experts consensus on the same scenarios. Results: Both family physicians and pediatricians had a high agreement level (75.8% and 79.8%, respectively) with the CDC experts regarding the need for fluoride supplementation of the high-risk child. For low-risk child, however, the physicians showed significantly lower level of agreements with the CDC experts (14.9% for FP; 7.4% for PD). Conclusions: The results indicate that physicians follow the existing fluoride supplementation guidelines regardless of the risk status of the child. Hence, implementing appropriate recommendation of fluoride use in primary care setting will require an educational program to introduce not only guidelines on proper fluoride use, but also on risk assessment.

13. Peter C. Damiano, DDS, MPH<sup>1</sup>, Jean Willard, MPH<sup>1</sup>, Kimberly McBroome, DDS<sup>+2</sup>, <sup>1</sup>University of Iowa, College of Dentistry, <sup>2</sup>Public Policy Center, Iowa City, IA

### EFFECT OF THE IOWA STATE CHILD HEALTH INSURANCE PROGRAM ON ACCESS TO DENTAL CARE

Objective: To determine if providing insurance through Iowa's State Children's Health Insurance Program (hawk-i) affected access to and utilization of dental services. Methods: A longitudinal pretest posttest panel study design was used with a 60-item baseline survey mailed at enrollment and a similar 76 item follow-up survey one year later. Analyses are with data collected between July 2000 and September 2002 (approximating the second year of the program) for 2,005 children. Preand postsurveys were compared using McNemar's test and Wilcoxon test. Results: In the year prior to the program (i.e., uninsured children), dental problems were the second most common chronic condition (11%) after allergies/sinus problems (13%). Unmet need for dental services also affected more children than any other service area in the year prior to the program. After one year in hawk-i, the proportion of children with a regular source of dental care (81% vs 88%) and a visit in the past year (54% vs 71%) increased, while the percent with unmet dental need (23% vs 8%) or delays for dental care (26% vs 9%) decreased significantly. Conclusions: Providing dental insurance to children significantly improved access to and use of dental services. These results parallel the positive trends found after the first year of the program, indicating that the program continues to improve access to dental care for new hawk-i enrollees.

14. W. David Bradford, PhD<sup>1</sup>, Paul J. Nietert, PhD<sup>1</sup>, Linda M. Kaste, DDS, PhD<sup>\*2</sup>, Raymond F. Lala, DDS<sup>1,3</sup>, <sup>1</sup>Medical University of South Carolina, Charleston, SC, <sup>2</sup>University of Illinois at Chicago, Chicago, IL, <sup>3</sup>SC Department of Health and Environmental Control, Columbia, SC

### INCREASED DENTAL MEDICAID REIMBURSEMENT RATES IN SOUTH CAROLINA

Objective: To evaluate the January 2000 South Carolina Medicaid reform, which set fees for dental Medicaid reimbursement at the level for 75 percent of SC dentists' private pay fees for dental procedures. Methods: HRSA funded a collaboration between MUSC and the SC Medicaid Quality Improvement Organization enabling the evaluation of the 2000 calendar year Medicaid data, assessing changes in enrollee and provider participation with contrasts to previous years. Analysis included descriptive statistics, as well as multivariate regressions. Results: The reform appears to have increased the number of Medicaid children receiving any service (25% relative increase in the rate of enrollees receiving services), the number of services to Medicaid children (percentage increases ranged from 40 percent for surgical services to 70 percent for restorative services), and the number of participating dentists (10% increased likelihood), but did not clearly increase the number of Medicaid patients treated per participating dentist. Conclusions: The results indicate the reform had the desired results, increasing Medicaid enrollee's access to dentists and dental services. Other states wishing to improve dental coverage for Medicaid recipients should consider emulating the SC experiment.

15. Ronald Venezie, DDS, MS<sup>\*1,2</sup>, R. Gary Rozier, DDS, MPH<sup>3</sup>, Sally Stearns, PhD<sup>3</sup>, <sup>1</sup>NC DHHS, Raleigh, NC, <sup>2</sup>Cecil G. Sheps Center for Health Services Research, <sup>3</sup>School of Public Health, University of North Carolina, Chapel Hill, NC

### EVALUATION OF A SCHOOL-BASED FLUORIDE MOUTHRINSE PROGRAM IN NORTH CAROLINA

Objective: To evaluate current effectiveness of fluoride mouthrinse (FMR) in preventing dental caries. Methods: School-level mean DMFT of 5th grade children in 335 elementary schools with FMR from 1996-2001 was compared to that of 267 nonparticipating schools. DMFT in 2001-02 was obtained by annual statewide caries surveillance for 5th grade children who began kindergarten in 1996--97. Effectiveness of FMR was assessed using a two-equation approach to control for FMR program selection bias. Three variables for school performance on statewide end-of-grade tests were used as instruments to model FMR assignment. The model for DMFT controlled for 4 school-level covariates (kindergarten dmft in 1996-97, estimated exposure to fluoridated drinking water, percent minority students, school size) and 4 countylevel variables (dentist-to-population ratio, geographic region, rural-urban status, economic development level). Robust standard errors accounted for clustering of schools within counties. Results: FMR was associated with a reduction of mean DMFT of 0.17 (35%) per school over 5 years (P=.016). For a cohort of 100 children participating in FMR for 5 years, we estimate saving 3.4 DMFT per year. Conclusion: Results support continued effectiveness of school-based FMR, but implementation decisions also should be based on program cost due to low caries levels in permanent teeth.

### 16. Charlotte W. Lewis, MD, MPH, Division of General Pediatrics Cranial Facial Center, University of Washington, Seattle, WA; Michele A. Vanderlinde PhD<sup>+</sup>, Spokane Regional Health District, Spokane, WA

### EVALUATION: THE ACCESS TO BABY AND CHILD DENTISTRY EXPANDED PROGRAM (ABCDE)

Objective: To assess the effectiveness of a program in the training and education of medical practitioners and staff and their provision of oral health screenings, client education, and fluoride varnish applications. Methods: Conducted qualitative interviews of pediatric practices that participated in early fluoride varnish trainings. The report addresses behavioral, environmental, and organizational factors that promote adoption of fluoride varnish application by medical practices, identify characteristics of training that were helpful or that need improvement, measure the degree of adoption, and identify potential barriers and enabling factors. Results: Although medical practices varied in their experiences, certain common themes emerged about the ABCDE program. Conclusions: Virtually, all the individuals interviewed believed ABCDE to be a worthwhile program. However, certain factors raised during the interviews could jeopardize the sustainability and ultimately influence the programs ability to succeed. Recommendations to address some of the issues of concern and to promote the ongoing success of the

### 17. Melody Scheer\*, BS, RDH, Clark County Health Department, Vancouver, WA; Kathy Phipps, DrPH, Consultant, Morro Bay, CA

### COMPLIANCE WITH CHLORHEXIDINE AND XYLITOL AMONG HIGH RISK MOTHERS

Reports suggest that maternal use of chlorhexidine (CHX) or xylitol may reduce levels of mutans streptococci and lower a child's risk of caries. These regimes, however, require patient compliance. Objective: To evaluate compliance with a CHX or xylitol caries prevention program among high-risk mothers. Methods: Mothers with active caries, or a previous child with ECC, were recruited at a public health clinic. Forty-seven mothers were asked to chew xylitol gum and 26 were asked to use CHX rinse (products were provided at no cost to participant). Focus groups were used to evaluate reasons for compliance or noncompliance. Results: Sixty-six percent of the xylitol group and 54 percent of the CHX group reported using the product for 6 months. Reasons for noncompliance included taste (both groups) and burning sensation (CHX). Compliance differed between racial/ethnic groups-Russian immigrants were the most compliant (88%) while 83 percent of the Hispanic participants were lost to follow-up. Conclusions: A CHX or xylitol caries prevention program may be appropriate for some highrisk mothers in public health settings, but compliance must be closely monitored.

18. Joshua Orlans MSW, MPH (expected 6/03), Center for the Health Professions, UCSF; Elizabeth Mertz, MPA\*, Center for the Health Professions, UCSF; Kevin Grumbach, MD, Department of Family and Community Medicine and Center for the Health Professions, UCSF

### DENTAL HEALTH PROFESSIONAL SHORTAGE AREAS: METHODS AND POLICY

Objective: To critique current dental health professional shortage area methodology and provide suggestions for revisions and public policy. Methods: An extensive literature review and interviews with 20 key stakeholders were the primary research methods. The report details the legislative history and institutional development of the current criteria, compares the performance of the policy against its expressed goal to identify areas of unmet need, provides a synthesis of alternative personnel planning methodologies, and examines data availability to support these methods. Results: The original criteria focused on defining manpower shortages, yet have evolved to be increasingly concerned with measuring underservice. The current methodology was found to be difficult to navigate, overly dependent on the provider-to-population ratio, and unable to identify unmet clinical need. A variety of alternative methodologies for measuring shortages exists; however, there are little data currently available upon which to base a new method. Conclusion: A great challenge exists in developing a methodology that is simple, feasible, accurate and consistent with the public health goal to designate underserved populations based on unmet clinical need. Choosing an alternative requires first clearly defining policy goals and then matching efforts to those ends. Support: NIH U54 DE 142501 and HRSA 1 U79 HP 00004-010.

## 19. Kathleen Heiden, RDH, MPH\*, Centers for Disease Control, Division of Oral Health, Project Officer; René Lavinghouze, MA Centers for Disease Control, Division of Oral Health, Evaluation Scientist

### DEVELOPMENT OF ORAL HEALTH INFRASTRUCTURE AND CAPACITY PERFORMANCE MEASURES

Objective: To facilitate evaluation and promote program effectiveness for oral health infrastructure and capacity development grantees. *Methods*: CDC, in collaboration with funded state dental directors, has developed infrastructure development performance measures along the continuum of program advancement. CDC provided technical assistance regarding the implementation of infrastructure development programs including workshops designed to promote collaboration and sharing of lessons learned. *Results:* Availability of collaboratively developed performance measures encourages buy-in across state oral health programs. Performance measures operationalize the concept of infrastructure and capacity development as well as guide program accountability. *Conclusions:* Performance measures are not designed to be punitive in nature. Rather, they are constructed to promote program success and allow for greater accountability, as well as gauge program accomplishments. Collaborative development of performance measures assures the flexibility of the evaluative nature of the measures across a variety of context and environments. Gradation of program advancement levels provides a framework for the provision of technical assistance. Methods employed to promote the advancement of infrastructure development are designed according to the nature and environment in which the grantee is working.

#### 20. Kristine Perkins, RDH, BS\*, Maine Oral Health Program, Augusta, ME EVALUATING, MAINTAINING, AND IMPROVING A SCHOOL ORAL HEALTH PROGRAM

Objective: To assess the overall effectiveness of the Maine School Oral Health Program's (SOHP) ability to improve the oral health of at-risk school-aged children. Methods: An evaluation plan was developed by a multidisciplinary steering committee. Information on the existing SOHP was collected from local directors using a survey and focus groups. A community risk profile was created to compare schools currently receiving SOHP services to those who do not. Delivery of oral health education and treatment services provided through the SOHP were assessed. Results: Revised eligibility guidelines for schools participating in the SOHP were developed to assure services are provided to children with the greatest need. Program components were prioritized, outlining a plan for future activities and revised areas of focus. A sustainability plan was established to identify alternative funding sources and procedures for Medicaid reimbursement of preventive services provided through the SOHP. A model for a Dental Referral Network was developed. At least one oral health question will be included on both the middle and high school YRBS. Conclusions: Strong support was shown for all components of the program. A major emphasis was on school-based sealants. Future SOHP activities will focus on individualizing participants programs to meet local needs and the expansion and institutionalization of the sealant component.

### 21. Kristine Perkins, RDH, BS, Maine Oral Health Program, Augusta, ME; Shawn B. Hoyle\* Computer Programmer, Division of Family Health, Maine Bureau of Health, Augusta, ME

### ESTABLISHING A DATABASE AND ELECTRONIC REPORTING SYSTEM FOR A SCHOOL-BASED SEALANT PROGRAM

Objective: To develop a database and electronic reporting system for monitoring the utilization of care and effectiveness of the Maine School Oral Health Program's (SOHP) sealant component. Methods: An Access Database was developed for use on lap top computers utilized at school-based sealant sites. Computers were programmed to collect student and guardian personal information, health conditions, insurance or Medicaid status, screening findings, and treatment information for both initial and follow-up visits. Three of the larger SOHP sealant components were chosen to pilot the program during the 2002-03 academic year. Results: An electronic database, export system and pilot project were established for laptop computers used on site at SOHP sealant component sites. The program proved to be a useful tool to assist in data management and program assessment. Conclusion: Use of the sealant component database demonstrated that the electronic collection of data and subsequent exporting of information directly to the SOHP administrator might aid provision of school-based services. The receipt of timely information on service provision via export to the SOHP administrator will assist us as the program begins to bill ME Medicaid for services provided to enrolled children.

### 22. Lynn A. Bethel, RDH, BSDH, MPH\*, Dental Hygiene Department-Mount Ida College, Newton, MA

#### AN INNER-CITY SCHOOL-BASED SEALANT PROGRAM IMPLEMENTED BY DENTAL HYGIENE STUDENTS

*Objective:* The goal of this school-based sealant program named SEAL (Seal, Educate, Advocate, Learning), is to improve the oral health of high-risk children in an inner-city school. *Methods:* The SEAL Program was developed in consultation with the Boston Public Health Commission Oral Health Program. The SEAL Program consists of multilingual, interactive oral health education in the classroom for all children in grades 2 and 3, and the provision of dental sealants using portable dental equipment in a public school. Second year dental hygiene stu-

dents provide all services and a dentist from a local health center does the screenings. *Results*: The SEAL Program targets 181 high-risk, lowincome, minority 2nd and 3rd graders at a public elementary school in Boston, MA. A preliminary dental screening showed these children have high unmet dental needs, with 90 percent of the 2nd graders needing dental sealants and 51 percent having at least one carious lesion. The 3rd graders had similar results, with 85 percent needing dental sealants and 59 percent having at least one carious lesion. Parental consent for SEAL was received for over 50 percent of the target population. *Conclusion*: Dental hygiene students implementing schoolbased sealant programs can help increase the number of high-risk children receiving sealants, while at the same time providing the students with a meaningful community oral health experience.

#### 23. Dolores Cottrell-Carson, DDS, MSHA\*, Jayanth V. Kumar, DDS, MPH, Donna Altshul, RDH, BS, Bureau of Dental Health, New York State Department of Health, Albany, NY

### THE ROLE OF SEALANT PROGRAMS IN ACHIEVING NATIONAL OBJECTIVES

Objective: This study assesses the role of school based dental sealant programs in achieving the Healthy People 2010 Objective regarding sealants. Methods: Data for this study came from the NY State Surveillance System, which was designed to assess the oral health status of 3rd grade children. Data from a stratified random sample of schools in 18 counties in upstate New York was analyzed to estimate the proportion of children with sealants on first permanent molars. Counties with and without school-based sealant programs were compared. Results: Of the 18 counties, 12 had school-based sealant programs. Seven counties (58%) reached the Healthy People 2010 objective of 50 percent sealed and 11 of the 12 counties (92%) had 44 percent or more children with sealants. In the 6 counties that did not have school-based programs, the percent of children with sealants varied from a low of 16 percent to a high of 42 percent. Conclusions: This data appears to show that schoolbased sealant programs have the potential to accomplish the Healthy People 2010 objective of providing sealants to at least 50 percent of children. Supported by a grant from the Centers for Disease Control and Prevention.

## 24. Patita Bhuridej, DDS, MS<sup>\*1</sup>, Peter C. Damiano, DDS, MPH<sup>1,2</sup>, Elizabeth T. Momany, PhD<sup>2</sup>, <sup>1</sup>University of Iowa, College of Dentistry, <sup>2</sup>Public Policy Center, Iowa City, IA

#### NATURAL HISTORY OF SEALED TEETH AMONG IOWA MEDICAID CHILDREN

Objective: To study the natural history of first permanent molars with and without sealants for children in the Iowa Medicaid program. Methods: Children aged 6 and 7 years old continuously eligible for the Iowa Medicaid program were followed for 5 years (fiscal 1996 to fiscal 2000) using claims data. First permanent molars, with and without sealants, were followed for the type of treatments received, if any. Results: Among 2,869 continuously enrolled children, 77 percent were white, 18 percent black, 2 percent Hispanic, and 3 percent other. Fifty percent were female. 60 percent of the children had an average percent poverty <40 percent of the federal poverty level. There were 9,080 dental procedures completed for these children (Ave. 3/enrolled child) during this time. The major categories of treatment in the claims for these children were oral examinations, preventive therapies, radiographs, and amalgam and composite restorations. In both the sealant and nonsealant groups, the treatment provided to those with a visit increased with age. The number of children receiving sealants, however, decreased with age. In fiscal 1996, 802 sealants were placed (239 children) as compared to 590, 592, 537, and 209 teeth sealed in fiscal 1997 to fiscal 2000. Treatments rendered to sealed and nonsealed first permanent molars varied. Conclusions: Variation in treatment patterns indicate further evaluation of the natural history of sealed and nonsealed teeth is warranted. Further analysis will determine the odds that sealed and nonsealed teeth received restorations, endodontic therapy and tooth extractions.

25. Adenike A. AdewakunDDS<sup>\*1</sup>, Bennett T. Amaechi, PhD<sup>2</sup>, Herold Gopaul<sup>3</sup>, Claudette Goddard<sup>4</sup>, Anne-Marie McMillan-Haynes<sup>4</sup>, <sup>1</sup>Oral Health Research Consulting Consortium, Trinidad, West Indies, <sup>2</sup>University of Texas

Health Sciences Center, San Antonio, TX, <sup>3</sup>Caribbean Environmental Health Institute, St. Lucia, West Indies, <sup>4</sup>Water and Sewerage Authority, Trinidad, West Indies

### FLUORIDE MAP OF THE ENGLISH-SPEAKING CARIBBEAN REGION

Objective: To present the distribution and spatial location of natural fluoride levels in water sources in 19 Caribbean countries using a map generated by GIS. Methods: 2,893 water samples were obtained from 14 intake points and distribution systems in 1,719 locations using a standard protocol. Samples were collected during the wet and dry seasons over a period of 27 months. Fluoride levels were analyzed using the ISE and classified in mg/l based on a five-point ordinal scale into low, suboptimal, optimal, high, and very high. Results: Detectable levels ranged from 0.001 to 3.54 mg/l. Low levels were found in 61.3 percent locations, while 16.2 percent and 9.64 percent contained optimal and high levels, respectively. Eleven countries had generally low fluoride levels while optimal levels were recorded in eight countries. Conclusions: Regional fluoride levels are generally below the optimal recommended for tropical environments. Further research on the availability and use of other fluoride sources is required before guidelines on optimal fluoride levels can be recommended for the respective countries and their constituent communities.

## 26. Steven M. Levy, DDS, MPH\*, John J. Warren, DDS, MS, Barbara Broffitt, MS, Michael J. Kanellis, DDS, MS, College of Dentistry, University of Iowa, Iowa City, IA

### COMPONENTS OF ESTHETIC PERCEPTIONS OF DENTAL FLUOROSIS

Objective: With concerns about increased prevalence of dental fluorosis, improved understanding about esthetic perceptions of dental fluorosis is warranted. Few studies have been conducted in North America; most have assessed only overall satisfaction and not components that might be important. Methods: This report presents results from questionnaire assessment by 143 parents from the Iowa Fluoride Study of their satisfaction with the appearance of their childrens teeth, as well as several components of dissatisfaction. Results: Among data thus far (n=143), 29 percent were very satisfied and 57 percent somewhat satisfied vs 13 percent somewhat dissatisfied and 1 percent very dissatisfied with the appearance. Among those 32 percent with definitive fluorosis (FRI-1=2 or 3), 39 percent with questionable (FRI-1=1) or 30 percent no dental fluorosis (all FRI-1=0), satisfaction was quite similar. Among the 100 not very satisfied, 39 percent overall were concerned about color (64% fluorosis vs 26-30% questionable/none), 49 percent about alignment (45, 52, 48%) and 39 percent about crowding (45, 33, 41%). Conclusion: Results support the need for additional research about the relative importance of different aspects of esthetic perceptions of dental fluorosis vs other conditions, emphasizing color vs other factors. Supported by NIDCR grant R01-DE09551.

27. John J. Warren, DDS, MS\*, Steven M. Levy, DDS, MPH, Barbara Broffitt, MS, Department of Preventive and Community Dentistry, University of Iowa, Iowa City, IA

#### MAXILLARY CENTRAL INCISOR FLUOROSIS: A LONGITUDINAL CASE SERIES

Objective: To begin to investigate risk factors and the critical period for developing dental fluorosis of the permanent maxillary central incisors using data from the Iowa Fluoride Study. Methods: As part of the Iowa Fluoride Study, fluoride intake data were collected periodically from birth through 4 years of age on a cohort of children currently aged 8-11. An attempt was made to assess all sources of fluoride intake including dietary supplements, dentifrice, water, other beverages and selected foods. Dental exams were completed for 698 children at age 4-7 years. We are in the process of conducting dental caries and fluorosis exams on children aged 8-10 years. This paper describes the longitudinal fluoride intakes of 30 children who presented with various patterns and severity levels of dental fluorosis in the permanent maxillary central incisors. Results: Selected cases depicted a wide range of fluorosis, from mild fluorosis limited to the incisal edges to severe fluorosis involving the entire buccal surface. Examination of the data thus far suggests that mild fluorosis involving the incisal third can occur with high fluoride intake at only 3-6 months of age. More pronounced fluorosis or fluorosis involving more of the surface appears to be associated with chronically high fluoride intakes from about 12 to 36 months. *Conclusion:* While clearly much more formal analyses are needed on the full cohort, results suggest that fluorosis can occur due to high fluoride intakes early in life. Supported by NIDCR grant R01-DE09551.

### 28. Teresa Marshall, PhD, RD\*, Steve Levy, DDS, MPH, John Warren, DDS, MS, Barbara Broffitt, MS, Julie Gilmore, PhD, RD, Judy Heilman, BS, Jim Wefel, PhD, Mike Kanellis, DDS, MS, Department of Preventive and Community Dentistry, University of Iowa, Iowa City, IA

### EARLY BEVERAGE INTAKES AND PRIMARY TOOTH FLUOROSIS

Objective: Our objective was to describe associations between fluorosis and intakes of beverages and fluoride (F) from these beverages for participants in the Iowa F Study. Methods: Beverages were reported by parents on 3-day diaries at 6 weeks, 3, 6, 9, 12, and 16 months and categorized by food type. F concentrations of purchased beverages and water used in home food and beverage preparation were assayed in our laboratory or obtained from public sources. Mean daily intakes of beverages (e.g., infant formula, milk, water) and F intakes from these were estimated at each time point and cumulatively. Dental examinations (n=654) were completed at 4.5–6.9 years of age. Results: Children with fluorosis consumed less milk at 6, 9, and 16 months and cumulatively, and more water at 16 months than children without fluorosis (P<.05). Children with fluorosis consumed more F from infant formulas at 3, 6, 9, and 12 months, and more F from all beverages at 3, 6, 9, 12 and 16 months and cumulatively than children without fluorosis (P<.05). Conclusions: F from beverages contributes to fluorosis of the primary teeth. Supported by the National Dairy Council and NIDCR (RO1-DE09551 and RO1-DE12101).

29. Marsha Cunningham\*, RDH, MS, Teresa Marshall, PhD, Steven Levy, DDS, MPH, John Warren, DDS, MS, Barb Broffitt, MS, Department of Preventive and Community Dentistry, University of Iowa, Iowa City, IA **BEVERAGE INTAKE IN IOWA CHILDREN AGED 1-5 YEARS** Objective: To assess children's longitudinal beverage intake patterns. Methods: Using a 3-day diet diary, data were collected from parents at regular intervals beginning at birth, concerning their children's beverage intake as a part of the Iowa Fluoride Study. This paper will report on beverage intake for children from aged 1 year (n=535) to 5 years (n=353). Results: At age 1, milk was the largest proportion of daily beverage intake (76%) and declined to 45-48 percent from age 2 to 5. The average proportion of daily beverage intake contributed by soda pop increased from <1 percent to 4, 6, 8, and 10 percent, respectively, from age 1 to 5 years. At age 5, 60 percent of the children in this study drank some pop (mean=4.7 oz/day). The children with the highest percentage of soda pop consumption at age 5 (n=88), drank proportionally less milk at age 3, 4, and 5 years (P<.01) and significantly less water at age 2 (P<.01) compared to children who did not drink soda pop. Conclusions: Soda pop consumption begins early and comprises 10 percent of beverage intake by age 5. This study suggests that children consuming soda pop tend to decrease consumption of either water or milk, which may have a negative impact on oral health. Supported by NIDCR (RO1-DE09551 and RO1-DE12101).

### 30. David F. Nelson, DDS, MS\*, Rudy F. Blea, BA, Ron W. Chapman, MD, MPH, California Department of Health Services, Medicine and Public Health Section, Office of Oral Health, Sacramento, CA

## THE POWER OF LOCAL COALITIONS: FLUORIDATION IN CALIFORNIA

*Objective:* To discuss the power of local coalitions in changing public policy by providing information to policy makers to counter anti-fluoride claims. *Methods:* Local oral health coalitions were organized from available resources in several California communities, namely local medical, dental, civic, business, educational, and public health advocates. Scientific information and expertise was provided to the local coalitions by the state fluoridation consultant and various agencies. Multiple meetings were held to provide definition of roles. *Results:* Fluoridation has been implemented in Los Angeles, Sacramento, Mountain View, Yuba City, and Pico Rivera, California, since 1995. The cities of San Diego, Redding, Watsonville, and Santa Maria have been offered

funding. The city of Escondido and the Helix Water District of San Diego County are in construction. Since 1998, the fluoridation collaboration has provided fluoridated drinking water to an additional 4 million Californians, increasing the percentage of residents drinking fluoridated water from 17 percent to almost 30 percent. *Conclusions:* The use of local coalitions to provide information for policy makers is a powerful tool for producing positive votes on controversial public health measures, such as community water fluoridation in California.

31. Patricia Evans, MD, MPH, Irene Hilton\*, DDS, MPH, Samantha Stephen, RDH, MS, San Francisco Department of Public Health, San Francisco, CA

### VIP—VERY IMPORTANT PARTNERS: USE OF COMMUNITY ADVISORY BOARDS IN ORAL HEALTH RESEARCH

Objective: To ascertain the various ways community advisory boards (CABs) can assist and make oral health research more relevant. Methods: Prior to conducting a qualitative research project in four different ethnic/racial communities-African-American, Latino, Chinese, and Filipino--CABs of 4-6 key informants in each community were convened. The initial CAB meeting was used to present the background and methodology of the research. A second meeting obtained input and feedback on research questions and logistical issues. Results: Each advisory group provided tremendous insight into and expertise about working in their respective communities; helped to identify possible pitfalls and solutions; provided guidance on research issues identified during the NIDCR scientific review process; assisted with recruitment strategies; and gave input on research questions, translations, and other materials. Conclusions: Representative community advisory boards are invaluable in assisting researchers to understand how communities define themselves, in supporting the research within the community, and in facilitating outreach activities and research participation. Supported by NIDCR/NIH/DHHS grant U54 DE14251.

32. Sharon J. Perlman, DDS, MPH,\* Director, Dental Health Services, Cook County Department of Public Health, Bureau of Health Services, Oak Park, IL; Elizabeth Lippitt, MHSA\*, Executive Director, Infant Welfare Clinic, Oak Park, IL; Catherine McNamara, MPH\*, Health Educator, Oak Park Health Department, Oak Park, IL

#### PUBLIC/PRIVATE COLLABORATION FOR ORAL HEALTH AWARENESS AND ACCESS TO CARE

Objective: To increase access and improve oral health for low-income adults and children. Methods: An oral health needs assessment indicated a critical lack of access to dental care. Strategies were developed to form a coalition of local and county health departments, private nonprofit agencies, Village Township, private dental practitioners, and community residents who developed an oral health referral program. The coalition developed the program's referral policies and procedures. The county public health dental clinic and a private, nonprofit dental clinic conducted oral health screenings. Patients were then referred to area volunteer dentists who provided services at a reduced cost. Results: A program video and print material were developed to recruit dentists for the program and increase client awareness of oral health prevention. Fundraising and grant opportunities resulted in \$45,000 to improve and increase dental capacity. In the first six months, the coalition recruited volunteer dentists, screened patients, and referred clients to the community dentists for restorative care. Conclusion: Developing a public/private coalition is challenging, but-if successful--will result in leveraging scarce resources to increase access to oral health care services for low-income clients.

### 33. Amos S. Deinard, MD, MPH\*, Srismitha Modem, BDS, Bernardita Prado, BA, Department of Pediatrics and School of Public Health, University of Minnesota, Minneapolis, MN

### THE ANDERSEN SCHOOL'S FAMILY DENTAL PROJECT

*Objective:* To describe an exercise in civic engagement, assisting families (poor, ethnic minorities) whose children attend an inner-city elementary school in getting dental care for all members of the family. *Methods:* University of Minnesota staff were invited by the community to assist it in improving the oral health status of all members of the family. Planning, involving 12–15 families, took a year. The program includes use of community health advocates, who identify families in need of care, do in-home dental health education, and arrange dental care for all. Also, medical providers are being trained to apply fluoride varnish and an atlas of common dental pathologic conditions has been created for them. *Results*: Successes of the program will be described, including participation rates, gain in parental knowledge base, ability to connect all family members to a dental home, quantification of pathology identified by dentists, interest of the pediatric medical community in learning to apply fluoride varnish and reception of the atlas by them. *Conclusions*: Civic engagement can be successful if approached and planned properly. The medical community is prepared to attend to primary prevention efforts aimed at reducing the occurrence of dental pathology seen in high-risk children.

34. Norma Wells, BS, RDH, MPH, Dental Public Health Sciences<sup>\*1</sup>, Pat Brown, BA, Washington State Department of Social and Health Services, Yakima, WA, Elise Tanner, RDH, BS, Oral Health Collaborative<sup>2</sup>, Janice Talkov, RDH, BS, <sup>2</sup>University of Washington, Seattle, WA WHITEWASHING THE FENCE: REPLICATING ORAL HEALTH MODELS IN LOCAL COMMUNITIES

*Objective:* To create timely, nontraditional oral health education models and replicate them in rural communities. *Methods:* UW Oral Health Collaborative formed the Tooth Fairy Academy and established its first campus in Yakima, WA, where its members trained students to demonstrate proper oral hygiene skills at health fairs and in classrooms. Members recruited UW Players, a group of Yakima County students, to dramatize oral health to student audiences countywide. They partnered with Heritage College to produce the first Family Health Fair. *Results:* The Tooth Fairy Academy receives requests for appearances. The UW Players perform throughout the county and their work is preserved on videotape. Recent health fairs at White Swan and Heritage College are modeled on the Family Health Fair. *Conclusion:* Replicating nontraditional models is a viable way to involve communities in oral health awareness. Funding supported by Washington State.

35. Pat Brown, BA, WA State Department of Social and Health Services, Yakima, WA\*; Norma Wells, BS, RDH, MPH<sup>1</sup>, Dental Public Health Sciences, Beverly Dale, PhD<sup>2</sup>, Oral Biology, <sup>1,2</sup>University of Washington, Seattle, WA

#### "PICTURE TALK" SETS STAGE FOR BETA-DEFENSIN RESEARCH 2002

Beta-defensins is a family of antimicrobial peptides found in saliva. To study the caries protective nature of this family, we need a homogeneous population willing to give cellular material for genetic analysis. *Objectives:* To create a visual theme and comic book to explain study protocols as a means of recruiting students for the study. *Methods:* We communicated project to local educators, health care providers, and parents by using grassroots media: word of mouth, flyers, community meetings, and comic book "Defensins, the Wildcat Warrior." We printed materials in English and Spanish. Local Tooth Fairies distributed 300 flyers. Staff followed up with parents and students. *Results:* We obtained a suitable homogeneous group for the B-defensins study. *Canclusion:* "Picture talk" is an important way to communicate when partnering research projects with local communities. Supported by NIDCR grant no P50 DE14254.

36. Kimberly Mathieu, RDH, BS<sup>+1</sup>, Oral Biology, Norma Wells, RDH, MPH<sup>2</sup>, Dental Public Health Sciences, Patricia S Brown, BA, WA State Department Social/Health Services, Nancy. Chino, AS, Heritage College; Marjorie Tsutsui, BS<sup>1</sup>, Richard Jurevic, DDS<sup>1</sup>, Beverly A. Dale, PhD<sup>1</sup>, <sup>1,2</sup>University of Washington, Seattle, WA

#### LINKING GENETIC STUDIES TO GRASSROOTS ORGANIZATION

*Objective:* To involve community partners in a small town to work with a university for enrollment of 150 Hispanic subjects into a study that requires biological material for analysis of genetic factors and salivary *Streptococcus mutans* as related to caries experience. *Methods:* We used a participatory protocol to recruit middle-school children in Toppenish, WA. Demographics, medical history, oral examination, buccal cells, and salivary specimens were collected from each participant. *Results:* We recruited 149 children (99%). Of the 149 children, 87 percent were Hispanic (female n=88, male n=61), aged 11–15 years. Caries experience as determined by number of decayed (D) and filled (F) surfaces, was 35 percent no decay, 32 percent low decay (<3 D+F), and 33 percent high decay (=3 D±F). Eight percent reported history of major illness, 10 children were referred for care, and 40 percent had either Class 2 or 3 occlusion. *Conclusion*: This population fulfills requirements needed to assess the role of genetic factors in caries experience. Supported by NIH/NIDCR.

### 37. Ronald M Marcsisin, MS, MBA, DDS\*, Gretchen Gibson, DDS, MPH, Paul R. Hoffman, MSSW, MBA, Veterans Administration North Texas Health Care System, Fort Worth, TX, Dental Health Inc., Dallas, TX

### PROGRAM ANALYSIS OF THE DALLAS HOMELESS VETERANS DENTAL PROGRAM

Objective: Several studies have shown that the Veterans' Homeless population numbers up to 500,000 individuals per year. This group has limited access to dental care and more dental pathology that the average population. The object of this study is to evaluate the Veterans Administration's Joint Program with the Dental Health Programs, Inc., in Dallas, which has been in existence for over 21/2 years. Methods: The data analyzed included pre- and posttreatment surveys on self-esteem and the impact of dental treatment on the daily lives of the homeless. Demographic and cost analysis was also done on each year of the program. Results: This study indicates that self-esteem and perception of dental health improved significantly after dental treatment in the Stewpot Homeless Veterans Program. The numbers of patients and procedures performed have shown a multifold increase and the value of the treatment has shown increasing cost benefits. Conclusions: Addressing the oral care of homeless veterans can have a significant impact on their personal and social lives. The growth of the program indicates the continuing needs of this population and the cost effectiveness and efficiency of the VA Stewpot Program.

38. René Lavinghouze, MA\*, Centers for Disease Control, Division of Oral Health, Evaluation Scientist, Katherine Bauer, MS, Centers for Disease Control, Division of Oral Health

### COLLABORATIVE EVALUATION OF STATE PLANS FOR IMPACT and SUCCESS

Objective: To facilitate collaboration for the development of State Oral Health plans through the identification and posting of current plans, the development of a logic model template, development of performance measures, crafting of suggestions for comprehensive plans, as well as designing an impact evaluation template to promote plan evaluation. Methods: CDC, in collaboration with state dental directors, has identified those states that currently have state oral health plans. Existing plans have been posted on the CDC/Oral Health Website to promote sharing of ideas across dental public health programs. In collaboration with currently funded grantees, CDC has developed state plan performance measures and crafted a summary of the content of existing plans with suggestions for the development of comprehensive oral health plans incorporating performance measures. Additionally, in collaboration with currently funded grantees and the ASTDD Best Practices Project committee, CDC has developed a state plan logic model template and a process/impact evaluation guide. Results: Availability of plan examples as well as suggestions for developing comprehensive plans incorporating performance measures should promote the development of quality plans. The evaluation template is designed to promote activities that can be tailored to the specific context of each state and used to assess strengths and weaknesses of a plan, promote revision and maximum implementation of the plan, as well as gauge the impact and reach of the plan. Collaboration with one state to implement the evaluation plan is currently underway. Conclusions: Evaluation designs are created to be cyclical in nature; ongoing use of evaluation results becomes part of the planning and implementation process. Collaboration with stakeholders, including other dental public health programs, through sharing of lessons learned is encouraged throughout the cycle of development, dissemination, and implementation for increased buyin, leveraging of resources, and impact.

39. Moncy Mathew, BDS, MPH\*, Buddhi M. Shrestha DDS, MS, PhD, Jayanth V. Kumar DDS, MPH, New York State Department of Health,

#### Albany, NY and Rochester Primary Care Network, Rochester, NY ASSESSMENT OF MOBILE DENTAL VAN PROGRAMS IN NEW YORK STATE

Objective: To assess the advantages and disadvantages of mobile dental van programs in New York State. Methods: We interviewed key dental personnel of selected programs via telephone. We focused on 5 questions: rationale, unique problems, barriers, advantages over a fixed clinic, and whether they would make the same decisions again. Results: The reported reason for selecting a mobile van was mainly to eliminate transportation barriers to dental care. Two problems common to all programs were the freezing of water pipes leading to time lost and the recruitment and retention of dental staff. Other reported problems included regulatory barriers with the part-time and full-time clinic status, lower enrollment, objections from local dentists, small waiting rooms, communication problems, inability to provide comprehensive treatment, and lack of adequate equipment. A common advantage was that no-shows were a minimum. Respondents also said that mobile programs were the only option for the population they served. Conclusion: Despite many disadvantages, mobile dental programs may be the only ideal approach for delivery of care in sparsely populated areas where transportation is a problem.

# 40. Kimberly McBroome, DDS<sup>\*1</sup>, Peter C. Damiano, DDS, MPH<sup>1,2</sup>, Jean Willard, MPH<sup>2</sup>, <sup>1</sup>University of Iowa, College of Dentistry, <sup>2</sup>Public Policy Center, Iowa City, IA

### IMPACT OF THE IOWA STATE CHILD INSURANCE PROGRAM ON ACCESS TO DENTAL CARE BY AGE OF THE CHILD

Objective: To evaluate if providing insurance through Iowa's State Children's Health Insurance Program (hawk-i) affected access to and utilization of dental services by age of the child. Methods: A longitudinal pretest posttest panel study design was used with a 60-item baseline survey mailed at enrollment and a similar 76 item follow-up survey one year later. Analyses are with data collected between July 2000 and September 2002 for 2005 children categorized by age (ages 2-6, 7-12, 13-18). Pre- and postsurveys were compared using McNemar's test and Wilcoxon test. Results: Although the proportion of children in all age categories with a regular source of dental care and a visit in the past year increased and the percent with unmet dental need or delays decreased significantly for all age categories, the effect differed by age. After one year in hawk-i, children ages 2-6 were less likely to have a visit in the past year (57%) than those aged 7-12 years (83%) or 13-18 years (73%). Children aged 7-12 and 13-18 had a significantly greater decline in unmet need and delays for care than children aged 2-6. Conclusions: While the hawk-i program improved access to dental care for all children, it had a greater impact on older children whose parents indicated greater need for dental services. Improving utilization of dental services for young children will require more education of parents, going beyond just providing them with insurance.

### **41**. Stephanie Burrell, DDS, MS\*, William Stempski, DDS, Oneida Community Health Center

## ONEIDA DENTAL CLINIC-PROVIDING CARE IN A RURAL SETTING

Objective: To initiate dental care earlier within a rural Native American pediatric population. Methods: The clinic has several innovative programs designed to target specific populations within the community and has formed agreements with Marquette's School of Dentistry, and Northeast Wisconsin Technical College's School of Hygiene and Dental Assisting. The Early Childhood Caries Prevention Clinic targets expectant mothers and their infants. Infants are transferred to the Well Child Clinic upon reaching their first birthday. The Well Child Clinic targets children 1 to 2 years old, and is designed to follow children for a two-year period. The first year of the program consists of patient education, oral examinations, and applications of fluoride varnish. The School-based Sealant Program extends throughout the school year. HeadStart through the 12th grade students are treated. Results: The clinic expects to have treated approximately 200 expectant mothers, 928 toddlers, and placed 2,000 sealants. Conclusion: Due to financial constraints and staff shortages, the entire pediatric population cannot be targeted for dental care. Also, data regarding sealant placement and caries incidence has been collected on the pediatric population since

1984; however, due to the lack of an epidemiologist and statistician, no statistical analysis has been conducted. Lastly, financial constraints prohibit the clinic from offering services such as interceptive orthodontics.

42. Mary Pat Burgess RDH, MBA\*, Aljernon J. Bolden, DMD, MPH, Flavia Lamberghini DDS, MPH, Sharita Webb, BA, Chicago Department of Public Health

#### UNIQUE CHALLENGES IN ADMINISTRATING CHICAGO PUBLIC SCHOOLS (CPS) ORAL HEALTH PROGRAM

Objective: This presentation will review the issues, challenges, and strategies in the program design and implementation of a School-based Oral Health Program (SBOH). Program Design: An Oral health care program for CPS students was developed as a direct result of an interagency contract agreement between Chicago Department of Public Health (CDPH) and CPS. CDPH oral health staff and contracted private oral health providers rendered a scope of services consisting of an oral health screening, an oral prophylaxis, a fluoride gel treatment, dental sealants and a referral for extended care. The program also included an oral health education / promotion and a quality assurance component. Results: During the pilot, March 2000 to June 2002, 2,374 students received 6,391 dental sealants and 974 (41%) students were referred for extended care. The dental sealant retention rate averaged 94 percent. The 2002-03 oral health contracted target population is 74,000 2nd and 6th graders. In the initial phase, it is anticipated that 19,000 students (24%) will be seen and 76,000 dental sealants will be placed. Conclusion: In these times of cost containment, unique partner models become paramount. This program explores one such model.

### 43. Kathleen Roth, DDS\*, Wisconsin Dental Association; Nancy McKenney, RDH, MS, Wisconsin Department of Health and Family Services; Amy Deering, Milwaukee Brewers Baseball Club; Jon Hisgen, MS, CHES, Wisconsin Department of Public Instruction; Mindy Marcus, PhD, Warren LeMay, DDS, MPH, Wisconsin Department of Health and Family Services SPIT TOBACCO PROGRAM: KNOWLEDGE AND ATTITUDE EVALUATION

Objective: To assess knowledge and attitude changes of 5th grade children and teacher participation toward a spit tobacco prevention program. Methods: A sample of 56 fifth grade student questionnaires measuring knowledge and attitude were randomly selected from 12 Cooperative Education Service Areas. A sample of 75 teacher evaluations were analyzed to obtain information regarding satisfaction with program curriculum elements: comic books, health, language, math, and dental visits. Results: 88 percent of students increased their knowledge, 52 percent showed an attitude change in the desired direction, 30 percent showed no change, and 18 percent felt more positive toward spit tobacco. Teacher ratings ranged from 5.41-7.00 (1=very unsatisfied/7=very satisfied) indicating a high and consistent satisfaction. Conclusions: The program effectively improves knowledge about spit tobacco and its use, and changes more economically disadvantaged students' attitudes about spit tobacco. Teachers expressed curriculum satisfaction. Most teachers used the curriculum elements while a small percentage used the dental visit.

44. Scott L. Tomar, DMD, DrPH\*, Henrietta L. Logan, PhD, Colleen K. Porter, R. Paul Duncan, PhD, University of Florida, Gainesville, FL; Kelli McCormack Brown, PhD, University of South Florida College of Public Health, Tampa, FL

### DO FLORIDA'S DENTISTS EXAMINE THEIR PATIENTS FOR ORAL CANCER?

*Objective:* This study explored Florida general dentists' self-reported provision of oral cancer exams for their patients aged 40+ years. *Methods:* A pretested survey instrument was mailed to a random sample of 2,000 general dentists in FL. A reminder postcard was sent 3 weeks later followed by a second questionnaire sent to nonrespondents. *Results:* 1,006 (58%) of the 1,725 dentists with valid addresses returned completed questionnaires. In 2002, 88 percent of Florida general dentists reported examining all patients aged 40+ years for oral cancer at their initial dental visit, 8.2 percent examined 80–99 percent, and 3.8 percent examined <80 percent. Most dentists reported providing oral cancer exams because it is a professional obligation (99.1%), their patients

expect optimal care (93.6%), and it reduces legal liability (83.5%). Few provided oral cancer exams because their patients are at high risk (18.5%) or request them (3.1%). The most common reason for not examining all patients age 40+ was that initial visits were sometimes for emergencies or acute problems. *Conclusions:* Dentists in Florida are reportedly examining the vast majority of their patients aged 40+ years for oral cancer at initial and recall visits. Target audiences besides dentists may be needed to enhance early detection of oral cancer. Supported by NIH DE14416-01.

45. Sangeeta Gajendra, BDS, MPH<sup>\*1</sup>, Gustavo D. Cruz, DMD, MPH,<sup>2</sup> Jayanth Kumar, DDS, MPH<sup>1</sup>, <sup>1</sup>Bureau of Dental Health, New York State Department of Health, Albany, NY, <sup>2</sup>New York University, College of Dentistry, New York, NY

### ARE HEALTH EDUCATORS OFFERING ORAL CANCER PREVENTION EDUCATION?

Objective: To assess the knowledge, opinions, and practices of health educators in New York State about prevention and early detection of oral cancer. Method: A structured questionnaire was administered to assess knowledge, opinions, and reported practices of selected health educators (n=362) in New York State. Descriptive statistics were calculated. Knowledge scores based on 21 items were computed and categorized into low, medium, and high groups. Results: The response rate was 49.3 percent. The majority (63%) of health educators were above 40 years of age and primarily Caucasian (76%), with 81 percent being CHES (Certified Health Education Specialist) certified. About 75 percent reported that they neither provided education nor had educational materials about oral cancer prevention. A majority (62%) admitted they did not intend to provide such education. However, 61 percent and 41 percent provided tobacco and alcohol education and cessation counseling, respectively. Almost 80 percent agreed their knowledge about oral cancer prevention was not current. Based on knowledge scores, only 8.5 percent had scores in the high category. Mean knowledge score was 9.5 (SD=4.2; range=0, 21) and median=10. More than 70 percent agreed they were not adequately trained to provide oral cancer prevention. Conclusion: This study shows that health educators are not actively engaged in educating the public about oral cancer, and that training is needed to reduce the oral cancer burden in New York State. Supported by a grant from the NIDCR (#5R21DE1442502).

#### 46. Barbara A. Simon\*, Patita Bhuridej, DDS, MS, Heather L. Pallister, RDH, Steven M Levy, DDS, MPH, Iowa Fluoride Study, College of Dentistry, University of Iowa, Iowa City, IA

### METHODOLOGY FOR COLLECTING WATER SAMPLES IN THE IOWA FLUORIDE STUDY

Objective: To review the methodology for collecting water samples to analyze for fluoride (F) levels from major water sources used by the participants in the Iowa Fluoride Study (IFS). Methods: Sources of water intake of 7-year-old participants from Iowa were reviewed. The water used in homes and child care centers included water from public water supplies and from wells, both with and without filtration. The methods of collecting the samples from different sources and their response rates were assessed. The F levels for public water supplies without filters are obtained from the Iowa Department of Public Health. Water samples are requested for filtered public water and all well water sources through a postage-paid mailer. Results: Seventy-four percent of 553 homes used public water supplies, compared to 97 percent and 94 percent of schools and child care centerss. In homes, 17 percent of public waters were filtered vs 24 percent of well waters. Letters requesting water samples for F testing due to filtration or wells were sent for 35 percent of home water sources vs 3 percent and 9 percent of water from schools and child care centers. The sample return rate from schools (71%) and child care centers (72%) were less than from the participants (84%). Conclusions: The methodology for collecting water F levels varies depending on water sources and filtration status. Approximately 84 percent of the Iowa Fluoride Study participants returned the requested samples via postage-paid mail. Supported by NIDCR (R01-DE09551andR01-DE12101).

47. Stuart A. Gansky, MS, DrPH\*, Division of Oral Epidemiology and Dental Public Health, University of California, San Francisco, CA; John Williamson, PhD, Centers for Disease Control and Prevention, Atlanta, GA; Doris Lin, DDS, Division of Pediatric Dentistry, University of California, San Francisco, CA; John D. B. Featherstone, PhD, Department of Preventive and Restorative Dental Sciences, University of California, San Francisco, CA

#### ASSESSING AGREEMENT IN ORAL HEALTH—ACCOUNTING FOR WITHIN-SUBJECT CLUSTERING

Objective: To extend methods of assessing intraexaminer agreement to account for two levels of within-person clustering agreement in oral health research. Methods: In a radiographic study (n=30) in the mixed dentition among seven dentists with tooth surfaces rated for caries extent on a five-point ordinal scale, ordinary kappa statistics were calculated for the 390 tooth surfaces. Using a generalized estimating equation (GEE) model (Williamson et al., 2000), kappas were calculated accounting for clustering and adjusting for covariates. Results: GEE kappa estimation was extended with a SAS macro. Ordinary kappas had standard errors of 0.01, while GEE kappas had SEs of 0.03, meaning ordinary kappa confidence intervals are three times too narrow. Moreover, GEE-based kappas adjust for important covariates such as surface type (occlusal/proximal) and dentition (primary/ permanent). Conclusions: Accounting for within-person clustering is important in assessing agreement in oral health studies. Partial support: Kavo and CSPD Foundation.

## 48. Joan T. Grabin, BS\*, Katherine M. Thomsen, BA, John J. Warren, DDS, MS, Steven M. Levy, DDS, MPH, Department of Preventive and Community Dentistry, University of Iowa, Iowa City, IA

#### INCENTIVES FOR RETENTION OF PEDIATRIC SUBJECTS: IOWA FLUORIDE STUDY

Objective: To present techniques used successfully to increase retention in a cohort of children in a longitudinal study. Methods: Subjects are members of the Iowa Fluoride Study, a longitudinal study designed to quantify fluoride exposures and relate to dental caries and fluorosis. The cohort has been followed from birth, with the current ages of the children ranging from 8-11 years. The parents are contacted twice annually by mail to fill out a detailed questionnaire and three-day dietary assessment. Incentive gifts are included in each mailing, meeting the following criteria: nongender specific, easily mailed, relatively inexpensive (\$2-\$8), age appropriate, and nothing further needs to be purchased to use the item. Results: A sample of each incentive is displayed with a cost of each item for the attendees including: fanny packs, calculators, gel pens, and more. Families have reported these to be valuable in their continued participation. Conclusions: Small incentive gifts are important in motivating participants to remain active in a long-term study. Supported by NIDCR (R01-DE09951 and R01-DE12101).

### 49. Richard J. Hastreiter DDS, MPH\*, Peilei Jiang PhD, MS, MS, Delta Dental Plan of Minnesota, Eagan, MN

#### TRENDS IN THE USE OF DIAGNOSTIC SERVICES OVER A SIX-YEAR PERIOD

Objective: To determine utilization trends in diagnostic services over a six-year period. Methods: Standard descriptive statistical methods were used to retrospectively analyze and compare diagnostic services use among commercially insured patients. Results: A major finding of "Oral Health in America: A Report of the Surgeon General" is a lack of oral health services research. This study assists in addressing this deficiency. From January 1996 through December 2001, 7.4 million diagnostic services were provided to 1.2 million persons: 54 percent female, 46 percent male. 55 percent of these services were provided to females, 45 percent to males. Mean patient age was 35 for females, 34 for males. Total provider reimbursement was \$159 million, \$136/patient. Of examination services, 6.5 percent (.5 million) were initial, 46.3 percent (3.4 million) periodic, and 3.3 percent (.2 million) emergency. Of radiographic services, 6.2 percent (.5 million) were FMXs/PANs, 24.6 percent (1.8 million) bitewings, and 13.1 percent (1.0 million) periapicals. Age was a significant factor in the trends seen in the use of diagnostic services. A significant increase in emergency examinations and a significant decrease in periapical radiographs were found. Conclusion: Significant changes were found in only a few diagnostic services among commercially insured individuals. These findings appear to be inconsistent with oral disease trends in this population.

50. Flavia Lamberghini, DDS, MPH<sup>+1,2</sup>, Linda M. Kaste, DDS, PhD<sup>2</sup>, <sup>1</sup>Chicago Department of Public Health, <sup>2</sup>University of Illinois at Chicago, Chicago, IL

### TRENDS IN DENTAL RESEARCH PUBLICATION

Objective: To assess trends in dental publication concerning the distributions of clinical research as a source for evidence-based practice. Methods: The study was conducted for the articles indexed in Medline using PubMed across 1966-2001. The searches used MeSH terms related to dentistry, publication source, and type of study. Results: The number of dental publications increased steadily since 1966. For 1966, 4,301 dental articles were found whereas 8,540 for 2001, a 98.6 percent increase. A marked increase of publications in English occurred: 54.8 percent in 1966 versus 92.8 percent in 2001. Dental journals were the source of 89.7 percent of the publications in 1966, while they were the source of 70.8 percent in 2001. In 1966, 0.7 percent and 0.6 percent of the dental publications were clinical trials and reviews, respectively, while in 2001 clinical trials and reviews rose to 5.8 percent and 9.1 percent. Randomized clinical trials and meta-analysis were also reviewed, but occurred sporadically until the last decade. Conclusions: Dental publications have increased in number and complexity since 1966. The publications appear to have gained some uniformity by increased frequency in English. However, relatively few papers in the dental literature are focused to contribute to evidence-based practice.

51. S. Peressini, PhD candidate\*, J. L. Leake, DDS, MSc, JT Mayhall, DDS, PhD, DOdont, Department of Community Dentistry; K. Sieciechowicz, PhD, Department of Anthropology, University of Toronto, Toronto, ON; M. Maar, PhD candidate, Noojmowin Teg Health Centre, Little Current, ON, and McMaster University, Hamilton, ON; R. Trudeau, RDH, Noojmowin Teg Health Centre, Little Current, ON, Canada

### EARLY CHILDHOOD TOOTH DECAY AMONG ABORIGINAL CHILDREN, MANITOULIN, ONTARIO

Objective: To determine both the prevalence of early childhood tooth decay (ECTD) in Aboriginal children and the factors influencing infant/child rearing practices among their caregivers related to ECTD development. Methods: Within a participatory action research framework, all 3- and 5-year-olds enrolled in elementary schools and day care centers in seven Aboriginal communities and all 3-year-olds at home in six communities in Manitoulin District were eligible for epidemiologic survey. Grounded theory research method guided sampling, data collection, and analysis with 12 primary caregivers. Results: 87 children (59% 5-year-olds, 54% females) were included in the study. Forty-five cases of ECTD were found, a prevalence of 52 percent. Mean deft score for cases was 7.5 (95% CI=6.51, 8.42) and 0.8 (95% CI=0.47, 1.11) for noncases (P<.001). Managing short-term family circumstances determined parenting choices more than correct knowledge. Factors influencing choices: (1) primary caregivers' experiences with alcohol abuse within the family, and (2) the educational/ employment activities of mothers with preschool-aged children. Conclusions: ECTD prevalence higher than in general population of children in Ontario. Oral health is determined by a complex web of both individual choices and larger social factors.

#### 52. Folakemi A. Oredugba, BDS, FWACS, MPH\*, Department of Child Dental Health, College of Medicine, University of Lagos, Nigeria ORAL HEALTH CARE KNOWLEDGE, ATTITUDE, AND PRACTICES OF SOME DEAF ADOLESCENTS

*Objective*: To determine the oral health care knowledge, attitude, and practices of a group of deaf and hard-of-hearing adolescents in Lagos. *Methods:* A pilot study involving 50 third year elementary school pupils of Wesley School 1 for the Deaf, Lagos, 26 males and 24 females, aged 10–19 years, mean=13.3 years ±2.8. Information about age, previous dental care, oral health education, dental problems, oral hygiene, and snacking habits and the willingness to have dental check-ups were obtained through self-administered questionnaire by the author and sign language by the teachers. *Results:* Only 12 percent had received dental care (extractions) previously. Bleeding gums during toothbrushing was reported in 36 percent, 8.3 percent of girls expressed displeasure about discoloration of their teeth, while 3.8 percent of boys reported having cavities in the teeth. None had any oral health education. Ninety-four percent brushed their teeth once daily, with no significant

difference between boys and girls (*P*>.05). The majority (60%) preferred biscuits and soft drinks as snacks. More than 90 percent were willing to have a dental check-up. *Conclusions:* This group of children had been neglected in terms of oral health care and they will benefit from oral health education through training of dental health personnel in sign language.

53. Nancy McKenney, RDH, MS\*, Wisconsin Department of Health and Family Services; Midge Pfeffer, RDH, BS, CDHC, Children's Health Alliance of Wisconsin; Warren LeMay, DDS, MPH, Wisconsin Department of Health and Family Services

### SURVEILLANCE SYSTEM DEVELOPMENT: YOUTH ORAL HEALTH DATA COLLECTION REPORT

Objectives: (1) To identify key oral health data elements and existing data and studies, (2) to disseminate information about the oral health of children and factors influencing their oral health, (3) to assist in policy development and program decisions, and (4) to monitor oral disease trends. Methods: Utilizing the ASTDD Seven-step Model, inventoried available primary and secondary data, identified resources, and organized the information for the baseline report. Results: The report describes oral health status, resources and programs for youth in Wisconsin including: demographics of the population, key findings of the Make Your Smile Count Survey of 3rd grade children, a survey of public school systems, community-based prevention programs, the oral health professional workforce, oral health delivery systems, financing of oral health including medical assistance information, dental health professional shortage areas, regional oral health programs, and community water fluoridation status. Conclusions: A baseline document is the first step in developing an ongoing surveillance system to monitor disease trends and evaluate factors influencing children's oral health and assist in policy and program development.

54. Warren LeMay, DDS, MPH\*, Nancy McKenney, RDH, MS, Wisconsin Department of Health and Family Services and Kathy Phipps, DrPH, Consultant, Morro Bay, CA

#### ORAL HEALTH SURVEY OF THIRD GRADE STUDENTS— WISCONSIN, 2002

Objective: To establish a baseline for monitoring oral disease trends in Wisconsin. Methods: This survey followed the methods outlined in the Association of State and Territorial Dental Directors' publication "Basic Screening Surveys: An Approach to Monitoring Community Oral Health." A self-weighting sample of elementary schools was obtained for each of the five regions of the state. All third grade children in the selected schools were eligible to participate. The screenings were completed by five dental hygienists who participated in both a training and calibration session. Results: A total of 3,307 third grade children participated in the survey (67% response rate). Among children screened, 60 percent had a history of dental caries, 31 percent had untreated decay, 47 percent had at least one permanent molar with a dental sealant, and 4 percent needed urgent dental care. Compared to white children, a significantly higher proportion (P<.05) of minority children had caries experience and untreated decay. Twenty-five percent of the white children had untreated decay compared to 50 percent of the African-American, 45 percent of the Asian, and 64 percent of the Native American children. White (52%) and Native American (66%) children were more likely to have dental sealants, compared to both African American (21%) and Asian (39%) children. Children who attended lower income schools had significantly more untreated decay (44%) compared to children in both middle (32%) and higher income schools (17%). Conclusions: Significant disparities exist in oral health status by race and economic status.

55. Sisko Honkala, RN, RSN, DDS, PhD\*, Eino Honkala, DDS, DDPH, MSc, PhD, Nameer Al-Sahli, BA, Jawad M Behbehani, DDS, DDSc, Faculty of Dentistry, Kuwait University, Kuwait

#### ORAL HEALTH HABITS AMONG A GROUP OF INTERMEDIATE SCHOOL CHILDREN IN HAWALLY GOVERNORATE IN KUWAIT

*Objective*: Only few studies have been conducted in the Middle East on oral health habits of children. The aim of this study was to describe those habits among Kuwaiti children for having information to plan oral

health promotion programs. Methods: A randomly selected sample of 260 children between 11- and 13-year-olds (4% of children of these age groups in one of the six governorates) filled a questionnaire anonymously in school classrooms during spring 2002. Samples of children at the five other governorates will participate in the study shortly. Questionnaire of the HBSC study (Health Behavior in School-aged Children, a WHO Collaborative Study) was used after modification to the region and translated to Arabic. Results: The majority of the children reported to brush their teeth daily (1/day, 24%; >1/day, 61%). Girls brushed more often than boys (P=.004). Dental floss was used rarely; 73 percent never used it or didn't know what flossing is. Use of sugar was very common among both genders. Sweets were used daily by 66 percent, soft drinks by 69 percent, and sugared tea by 47 percent. A large proportion of children (40%) had not visited a dentist during the last two years. Conclusions: Use of sugar products was very common among children and should be targeted in health education given by dentists, schoolteachers, and school nurses in Kuwait. In addition, regular dental check-ups should be encouraged.

56. Christopher Okunseri, BDS, MSc, David Born, PhD, Daniel Rose, DDS, James Hodges, PhD, Patricia Glasrud, MPH\* Benijala Salihbegovic, DMD, Department of Preventive Sciences, School of Dentistry, University of Minnesota, Minneapolis, MN

### SELF-REPORTED ORAL HEALTH STATUS AMONG SOMALI ADULTS IN MINNESOTA

Objective: Determine factors associated with self-reported oral health status among Somali adults in Minnesota. Methods: We surveyed all 53 persons aged 18-65 years attending the University of Minnesota Dental School's Somali outreach dental clinic. A closed-ended oral health questionnaire was administered to assess sociodemographic information and self-reported health perceptions. The questionnaires were self-administered; a trained interpreter was used for participants with poor English comprehension. Results: Of the 53 adults, 49 percent reported poor/fair dental health, and 38 percent reported poor/fair general health. 83 percent reported not having a regular source of dental care, 74 percent rated their access to dental care as poor/fair, and 43 percent had made a dental visit within the last 12 months. Perceived dental health was associated with marital status (P=05) and self-reported general health (P=.01), using Fisher's exact test. Conclusion: A substantial proportion of the Somali adults reported poor general/dental health and access to dental care. Further research is required to evaluate other factors associated with perceived oral health status, apart from general health.

#### 57. Susan Hyde, DDS, MPH\*, Jane A. Weintraub, DDS, MPH, Department of Preventive and Restorative Dental Sciences, University of California, San Francisco, CA

ORAL HEALTH AND ORAL HEALTH-RELATED QUALITY OF LIFE OF SAN FRANCISCO WELFARE REFORM PARTICIPANTS Objective: To assess the oral health and oral health-related quality of life (OHRQoL) of welfare reform recipients. Methods: A convenience sample of 377 participants in the novel San Francisco Personal Assisted Employment Services Dental Program received baseline oral examinations, Oral Health Impact Profile (OHIP-14) questionnaires, treatment plans, and restorative dental care. Oneway ANOVA, t-test, and stepwise linear regression were used to analyze the associations between demographic, clinical, treatment, and OHRQoL variables. Results: Twenty-six percent of the participants reported fair or poor general health, 85 percent had missing teeth, 84 percent had decayed teeth, and 63 percent had severe or emergency dental treatment urgency. Thirtytwo percent of OHIP-14 respondents reported frequent/constant problems with psychological discomfort. OHIP-14 scores were associated with general health (P=.03), number of missing teeth (P<.0001), treatment urgency (P<.0001), and treatment cost (P=.003) in the regression model. Conclusions: The oral health and OHRQoL of welfare reform participants have not been previously assessed. General health, missing teeth, and the severity and extent of treatment needs were associated with OHRQoL. Supported by NIDCR/NIH/DHHS K16 DE00386.

58. Alice M. Horowitz, PhD, National Institute of Dental and Craniofacial Research, National Institutes of Health, Department of Health and Human

#### Services.

### LITERACY AND ORAL HEALTH: IS THERE A CONNECTION?

Research has shown that higher levels of education are associated with better general health status. Health literacy is recognized as an essential skill not only for managing disease, but also for preventing it and for navigating the health care system to facilitate access. Objectives: to provide national data on levels of literacy of US adults from the 1992 National Adult Literacy Survey (NALS) and to describe its potential impact on oral health in view of answers to selected questions on four National Health Interview Surveys (NHIS). Methods: Review of the NALS study as well as findings from NHIS questions on oral health knowledge. Results: Nearly half the US population has low or limited literacy skills. Overall, the adult population is not very knowledgeable about many aspects of oral health. However, the higher the level of education, the more knowledgeable they are. Conclusions: Often people with the greatest oral health burdens have the least access to health information and the fewest skills to navigate the health care system. Lower levels of literacy likely have a negative impact on oral health. Research on the impact of literacy on oral health is needed.

59. Javier de la Fuente, MSc\*, Sergio Sanchez, MSc, Alejandra Mac Gregor, DDS, Alejandra Cabrera, DDS, Department of Health Education, UNAM, Mexico; Andrea C. Palmier, MSc, Department of Preventive Dentistry, UFMG, Brazil

### EVALUATION OF THE SOCIODENTAL IMPACTS IN RURAL COMMUNITIES, MEXICO

Objective: To assess the sociodental impacts in rural communities. Methods: The Oral Impact on Daily Performances (OIDP) index was used to measure the oral impacts. The total sample was 372 adults living in rural communities in the state of Morelos, Mexico. Each subject had an oral health interview and an oral examination. Results: The results showed that 187 (50, 27%) individuals had an OIDP >0. The range of the overall OIDP score was 0.44-64 (maximum value=225). The most prevalent OIDP impact was eating (81.3%) and the least frequent was emotional stability (2.7%). The activity with higher impact (severity x frequency) OIDP was working (mean=9.0) and the lower was speaking (mean=5.87). The range of the overall DMFT score was 2.0-28.0 and the mean score=13.09. Conclusion: The results showed a significant difference between the clinical findings and the sociodental impacts, probably due to the fact that rural communities share different concepts of pain and discomfort, and may rate oral health as a low priority. A sociodental approach should be considered in the planning and the provision of oral health care.

60. Monica A. Fisher, DDS, MS, MPH, PhD\*, Gregg H. Gilbert, DDS, MBA, Brent J. Shelton, MS, PhD, University of Alabama at Birmingham, Birmingham, AL

### RECOVERY FROM ORAL DISADVANTAGE ASSOCIATED WITH DENTAL SERVICES

To our knowledge, this is the first report of the association between dental services and Recovery from Oral Disadvantage due to Functional Limitation (RODF) for symptom-specific subgroups. Objective: To evaluate the effectiveness of dental services in facilitating RODF. Methods: Data from the prospective longitudinal Florida Dental Care Study of 873 individuals 45+ years old with at least one tooth at baseline. Univariable and multivariable logistic regression modeling quantified the associations between dental services and RODF. Results: Among those with signs/symptoms of diseased/broken teeth, corrective treatment [Odds Ratio (OR)=2.3; 95% CI=1.3, 4.2] and extractions (OR=2.1; 95% CI=1.1, 3.8) were more effective. Among those with symptoms of loose teeth, extractions were most effective (OR=2.8; 95% CI=1.04, 7.8). Among those with teeth sensitive to hot/cold, corrective treatment (OR=2.5; 95% CI=1.2, 5.1) was most effective. These ORs are simultaneously adjusted for age, race, gender, income, approach to dental care, and where appropriate, loose, diseased/broken or sensitive teeth. Conclusion: Judging from associations between RODF and dental service use, dental care was highly effective in facilitating improvement in quality of life.

61. Aida A. Chohayeb, DDS, MSD\*, Garnett L. Henley, MS, Howard University, Washington, DC

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### PERIODONTAL STATUS OF WOMEN FROM DIFFERENT ETH-NIC GROUPS

Objective: To compare the periodontal condition of women from different ethnic groups. Methods: Four hundred and fifteen adult women consented to participate in this study. Medical and oral health information and demographic profiles were recorded. The periodontal evaluation included assessing pocket depth, probing for gingival bleeding and swelling, the presence of calculus deposits, and tooth mobility. All procedures were performed by a single investigator. Data were analyzed using the SPSS Univariate General Linear Model and appropriate chi-square tests. Results: Participants were 42.09±.78 years of age, and were African Americans (n=281, 68%), Caucasians (n=65, 15.7%), Hispanics (n=37, 8.9%), Asians (n=27, 6.5%), and Native Americans (n=5, 1.2%). Half had no more than a high school education (n=187, 45.1%, P<.0005) and most (n=346, 83.4%) lived on fixed household incomes below \$35,000 per year (P=.084). All women brushed twice daily (P=.094) and visited the dentist annually (P=.978). Only Hispanics flossed daily (P<.05). All except Asians smoked cigarettes daily (P<.0005); Caucasians (4.30±1.51), African Americans (3.77±.49), Native Americans (2.40±1.94), and Hispanics (.76±.36). Calculus deposits, gingival bleeding, and swelling were more prominent in African Americans and least in Native Americans. Participants had pocket depths of 2.93±.068 mm (P=.793). Conclusions: Participants had good oral hygiene practices that were not influenced by socioeconomic status. Oral hygiene habits seemed to have compensated for the visible effects of smoking.

62. Justine L. Kolker, DDS, MS<sup>\*1</sup>, Peter C. Damiano, DDS, MPH<sup>1</sup>, Daniel J. Caplan, DDS, PhD<sup>2</sup>, <sup>1</sup>University of Iowa, Iowa City, IA, <sup>2</sup>University of North Carolina, Chapel Hill, NC

### SUBSEQUENT TREATMENT OF TEETH RESTORED WITH LARGE AMALGAMS AND CROWNS

Objective: The evidence base for determining the best treatment for a structurally challenged tooth is very limited; therefore, this study was done to evaluate the long-term outcome of posterior teeth treated with a large amalgam restoration (LA) vs teeth restored with LA+crowns (LAC). Methods: All teeth restored with a LA in 1987 and their subsequent treatment over the next 10 years were evaluated for patients continuously seen at the University of Iowa, College of Dentistry. Logistic regression analyses were conducted to describe the relationship between the independent variables (LA vs LAC, tooth type, tooth arch, age, gender, and type of provider) and the dependent variable: tooth outcome. Tooth outcome was defined in two ways: (1) whether or not the tooth had any subsequent treatment [extraction (TE), endodontic therapy (ET), replacement or supplemental restoration] and (2) whether or not the tooth had a severe event [TE or ET]. Results: The odds of teeth with LAs receiving subsequent treatment were 7.2 times [95% CI (4.8, 10.8)] the odds of teeth with LACs. The odds of teeth with LAs having a severe event were 2.5 times (95% CI=1.5, 4.1) the odds of teeth with LACs. Conclusions: Teeth with crowns received less subsequent treatment over a 10-year period. Cost benefit analysis is required to determine if the lower cost of placing LAs compensates for the increased future treatment costs.

### 63. Anne Koerber, DDS, PhD,\* John Crawford, BDS, PhD, and Kathleen O'Connell, MBA-MPH, Departments of Pediatric Dentistry and Periodontics, University of IL at Chicago

### TEACHING DENTAL STUDENTS BRIEF MOTIVATIONAL INTERVIEWING FOR SMOKING-CESSATION COUNSELING

*Objective:* to determine whether training in Brief Motivational Interviewing (BMI) would improve dental students' counseling techniques. BMI is method of counseling proposed by Miller and Rollnick, which emphasizes patient participation and readiness to change. *Methods:* 22 dental student subjects were randomly assigned to a training and no training group, using an untreated control group design with pretest and posttest. The measures were: student behavior, patient involvement, effectiveness to encourage patient change, doctor-patient rapport, and student confidence and interest in the task. *Results:* Repeated measures MANOVA found significant differences between the trained and the untrained groups (F=4.019, *P*=.018). Training resulted in students using more BMI techniques, and patients were more actively involved. No changes were seen in the other variables. *Conclusions:* BMI training improved some of the characteristics of the counseling sessions. Future studies must examine whether more experience will also improve the students' ability to use BMI to enhance patient rapport, to increase students' sense of competence and interest in doing counseling, and to improve the effectiveness of the counseling to encourage patient change. This project was supported in part through a grant from the IL Department of Public Health, Tobacco Prevention and Control Program.

#### 64. Keith E. Heller, DDS, DrPH\*, Raymond A. Kuthy, DDS, MPH, Department of Preventive and Community Dentistry, University of Iowa College of Dentistry, Iowa City, IA

#### EFFECTS OF EXTRAMURAL CLINIC PROGRAMS ON SENIOR DENTAL STUDENTS' ATTITUDES ABOUT TREATING SPECIAL PATIENT POPULATIONS

Objective: To assess the effects of extramural clinic programs on dental students' attitudes regarding treatment of special patient populations. Methods: 44 of 71 senior dental students of the 2002 graduating class completed questionnaires regarding treating special patient populations before and after participating in their required 10-week extramural clinic rotations. Students indicated on a 5-point scale (1=no problem to 5=will not treat) their comfort level of treating special patient populations. Results: Mean before and after scores for the different populations were: low income-1.2, 1.4; Title XIX recipients-1.2, 1.4; frail elderly-2.2, 2.0; homebound-2.4, 2.2; medically complex-2.4, 2.1; mentally compromised-2.4, 2.2; homeless-1.7, 1.6; drug users-1.9, 1.8; other ethnic groups-1.1, 1.4; HIV/AIDS persons-2.2, 2.1; jail inmates—1.8, 1.8; and non-English speaking persons—2.2, 2.3. Only the change for the medically complex population was significant (P<.05, paired t-test). Few students reported that they would not treat these patients. Conclusions: The extramural clinic programs had modest immediate effects on students' attitudes regarding treating special patient populations. In general, students reported having no problem or being "OK" with treating these patient populations.

#### 65. Curt Ayers, DDS, MPH\*, Richard Abrams, DDS, MPH, MEd, Program in Public Health, Marquette University School of Dentistry, Milwaukee, WI FACULTY AND STUDENT PARTICIPATION IN DEVELOPING A COMMUNITY-BASED CURRICULUM

Objective: This project was undertaken to obtain faculty and student input concerning community-based programming for dental students. Methods: A survey instrument was used to collect data from students and faculty at a private US dental school. The subjects were asked to rate the value of various community sites in helping make students become better dentists. The questionnaire asked how much time students should spend in the community and what percentage of the time spent in community programming should be allocated to various activities. Results: Students rated a private dental office as the most valuable location while faculty rated a hospital clinic as the most valuable. The amount of time in weeks each group thought students should spend in community programming in each year of dental school was as follows: D1 (faculty=2.4, students=2.9); D2 (faculty=3.2, students=3.7); D3 (faculty=5.1, students=5.7); D4 (faculty=8.9, students=7.0). Faculty and students preferred that most of the time in community programming be allocated to rendering basic and comprehensive clinical services (faculty=59.8%, students=61.0%) than any other activity. Conclusions: The data obtained in this study will be useful for planning a community-based curriculum.

### 66. G. Ferretti\*, J. Hardison, J. Skelton, T. Smith, W. Gonsalves, University of Kentucky

### PHYSICIANS' ORAL HEALTH EDUCATION IN KENTUCKY (POHEK)

Objective: Develop and implement a children's oral health training program for family practice medical residents at multiple sites in Kentucky. *Methods:* The curriculum development process involved national content experts to develop and prioritize focused content areas and help establish instructional format and methodology that is transportable and suitable for insertion in primary care medical training programs. Challenges included scheduling of multiple sites, utilization of distance technology, faculty development, and establishing a clinical evaluation experience. *Results:* preassessments of 15 medical residents revealed that 93 percent had no knowledge of dental fluorosis (P=.001, binomial test); 13 percent had confidence in dealing with dental trauma (P=.004); and 7 percent were familiar with caries risk assessment (P=.000). All residents wanted more information given to physicians concerning preventive dental care for children (P<=000). *Conclusion:* POHEK is one developing model for involving family practice medical practitioners in oral disease prevention, recognition, and treatment. Supported by HHS/HRSA 1 D30HP40013 01.

## 67. B. J. Ruth, MSW, MPH, K. A. Davis, MSW, MPH, S. M. Geron, PhD, K. Lituri, RDH, BS\*, R. Garcia, DMD, MMedSc, Boston University Schools of Social Work and Dental Medicine, Boston, MA

ROLE OF SOCIAL WORKERS IN ORAL HEALTH PROMOTION Objective: To identify barriers and opportunities for social workers to collaborate in oral health promotion. Methods: MSW students (165; 84.1% response) and faculty field instructors (97; 48.5% response) at Boston University School of Social Work were surveyed on their oral health knowledge, beliefs, attitudes, and experiences. Results: Over 80 percent of both the MSW students and field-based practicing faculty believed they should be involved in oral health promotion with their clients, with 45 percent of students and 47 percent of faculty rating oral health as "very relevant" to social work. However, over 90 percent reported that oral health had never been addressed in their professional education, while only 38 percent of faculty and 28 percent of students felt that it was easy to recognize signs of oral and dental pain in their clients. In regard to their own experiences in oral health promotion, 50 percent of students and 67 percent of the faculty field instructor group have been unable to easily locate oral health services for their clients. Conclusion: Social workers recognize the importance of oral health to general health and to their clients' needs. However, they do not appear to be knowledgeable enough to successfully engage in oral health promotion. As the social impacts of oral diseases are likely to be disproportionately greater in social workers clients, there exist opportunities for social workers and oral health professionals to effectively collaborate. Support by U54 DE14264.

68. David H. Lees, DDS, JD, MBA, Children's Dental Initiative Director, The Health Trust, Santa Clara County, CA

OPERATIONAL APPLICATION OF A COUNTY WIDE ORAL HEALTH NEEDS ASSESSMENT

Objective: To assess the practical application of an oral health needs

assessment in Santa Clara County, California. Methods: A randomly selected, statistically significant number of children in HeadStart, kindergarten, and third grades were screened for decayed, missing, and filled teeth. Protective sealants on molar teeth were also noted. Data on oral health status and access to care was obtained through a questionnaire that asked for information on socioeconomic and insurance status. Demographic data, such as race/ethnicity and the educational level of the primary care giver, was obtained. The families were also questioned about their child's dental history and barriers, if any, to receiving care. Results: The children at highest risk of are also the least likely to have access to care, with low-income and minority children suffering disproportionately. The demographics of Santa Clara County (25% Hispanic and 20% Asian), the 11th largest county in the United States, amplifies the problem. Conclusions: Dental disease is a significant public health problem and one that will take a collective, community wide effort to solve. An open, communitywide dialogue of all critical stakeholders, the convening of a collaborative of service providers, defined strategic planning, implementation of creative programs, and targeted fundraising have resulted. A needs assessment conducted within a defined community can translate into programs and funding that will have an immediate and direct impact on service delivery.

#### 69. Srismitha Modem, BDS\*, Amos Deinard, MD, MPH, Department of Environmental Health and Department of Pediatrics, University of Minnesota, Minneapolis, MN

#### HARTFORD PUBLIC SCHOOLS DENTAL PROJECT

Objective: To assess the effectiveness of the school dental health program in the Hartford public schools. Methods: The data was obtained from the schoolwide collection system, the school-based health clinics data collection system and their Web-based dental billings. We have used Stata software to analyze the secondary data to assess the relationship between the demographic variables (age, gender, race, etc.) and the service variables (first visit, procedure codes, or treatment, etc). Results: There is not much difference in the number of first visits made by the children to the school dental clinics by race and there is no disparity in number and type of procedures done by race. Statistical inference using chi-square showed that grade is related to treatment done. In determining the quality of services provided, about 40.9 percent of periodic oral exams, 3.05 percent of sealants and 1.34 percent of fluoride treatment were done on the whole. Conclusions: School dental clinics are effective in improving oral health of ethnically diverse school-aged children from low-income families. Better ways to improve the oral health of school-aged children through school-based clinics have been identified.

### **AAPHD Student Merit Award Program Abstracts**

70. Kenneth A. Bolin, DDS, MPH\*, Department of Public Health Sciences, Baylor College of Dentistry, Dallas, TX

### COMMUNITY HEALTH CENTER DENTIST SALARY/SATISFAC-TION SURVEY

*Objective:* To identify sources of dissatisfaction in Community Health Center (CHC) dentists that affect retention and determine current dentist salaries. *Methods:* CHC dentists nationwide were surveyed regarding salary and job satisfaction indicators. *Results:* 420/569 (73.8%) dentists responded; 126/404 (31.2%) do not intend to remain in CHC dental practices. Neither salary nor position were significantly associated with the intent to leave (P>.05). Years of experience (P<.0001), length of CHC service (P<.0001), freedom of professional judgment (P=.001), altruistic motivation (P=.003), value placed on loan repayment (P<.0001), and administrative time allowed for dentists (P=.002) were significantly associated with career change decisions. *Conclusions:* Periodic salary surveys can monitor factors associated with recruitment and retention of dentists in Community and Migrant Health Centers. Standardized exit surveys can identify factors associated with dissatisfied

dentists. Effective communication between dentists and administration is a key factor in retention of existing dentists, in the areas of exercising professional judgment and allowance of enough time for dentists to perform administrative duties. Salaries in CHCs need to be competitive with other career options in clinical dentistry and accurate compensation comparisons should be conveyed clearly to dentists.

71. Tegwyn L. Hughes, DDS, PhD\*, Department of Oral Medicine, Carolinas Medical Center, Charlotte, NC; Gary R. Rozier, DDS, MPH, Department of Health Policy and Administration, University of North Carolina, Chapel Hill, NC; Gary D. Slade, BDSc, DPH, PhD, Department of Oral Epidemiology, University of Adelaide, South Australia

### A COMPARISON OF PUBLICLY FUNDED INSURANCE PRO-GRAMS ON CHILDREN'S USE OF DENTAL SERVICES

*Objective:* The purpose of this study is to examine the differences in utilization of dental services for a population of preschool-aged children enrolled in North Carolina Medicaid and North Carolina Health Choice (NCHC), which is the states S-CHIP program structured simi-

larly to private insurance. Methods: Administrative and claims data were obtained for children aged 1-5 years (n=166,313) enrolled in Medicaid and NCHC and eligible for dental services at some point during a one-year outcome period (10/1/99-9/30/00). Utilization was measured as having at least one dental claim during the outcome period (10/1/99-9/30/00). Multivariable logistic regression models were developed to compare the effect of the two insurance programs on the use of dental services, controlling for a number of demographic, enrollment, and county-level characteristics. Results: Children enrolled solely in NCHC were 1.6 times more likely (95% CI=1.48, 1.76) to have a dental visit than those enrolled solely in Medicaid. Children enrolled sequentially in Medicaid and then NCHC were 1.24 times more likely (95% CI=1.16, 1.32) to have a dental visit than the Medicaid group. Conclusions: 1-to 5-year-old children enrolled in the NCHC program had significantly higher utilization of dental services than children enrolled in Medicaid. Public insurance programs structured similar to private insurance can improve access to dental services for young children.

## 72. Georgia G. dela Cruz, DMD, MPH\*, R. Gary Rozier, DDS, MPH, Gary D. Slade, BDSc, DDPH, PhD, UNC Chapel Hill, NC

### DENTAL REFERRAL BEHAVIOR OF PEDIATRIC PRIMARY CARE PROVIDERS

Objective: To determine characteristics of medical care providers that influence their decision to refer a child to the dentist. Methods: A self-administered questionnaire elicited providers' knowledge and attitudes toward oral health, their provision of preventive dental services, and their confidence in providing these services. Patient, medical practice, and referral environment characteristics also were assessed. Preliminary bivariate analysis (ANOVA, chi-square) identified characteristics associated with referral activity, which were confirmed in a multivariable analysis using logistic regression. Results: Nearly 78 percent of 169 providers involved reported referring children who had signs of decay or high risk for future disease. A regression model controlling for profession type (MD vs PA or NP) and years since graduation revealed that an increase in likelihood of referral was associated with high confidence in screening abilities (OR=3.4;95% CI=1.22, 9.42), group practice (OR=3.8; 95% CI=1.37, 10.77) and low referral difficulty (OR=6.2; 95% CI=1.08, 36.20). Practice busyness (80+ infants or toddlers per week) was associated with a decrease in referral (OR=0.2; 95% CI=.08, .67). Conclusions: Simultaneous efforts aimed at decreasing referral environment difficulty and increasing providers' confidence in their screening and referral abilities may improve oral health assessment and referral activities.

### 73. Margo R. Adesanya, DDS, MPH\*, Yechiam Ostchega, PhD, RN, Bruce Dye, DDS, MPH, Jeffrey Hyman, DDS, PhD, National Institutes of Health, and National Center for Health Statistics, Bethesda, Maryland and Hyattsville, MD

### ASSESSMENT OF CONTRIBUTORY FACTORS FOR TOOTH LOSS IN THE US ELDERLY POPULATION

Objective: To examine the association between tooth loss and potential risk indicators, including self-reported need for help with activities of daily living, mobility, sociodemographic and behavior characteristics, and oral health clinical indicators. Method: Data from 5,135 persons aged 60 years and older from the third National Health and Nutrition Examination Survey were used. The total number of missing teeth grouped into four ordered categories was the outcome measure. Bivariate analyses and cumulative logistic regression modeling was used to describe the association between the outcome variable and the potential explanatory variables. Results: Older age, lower educational attainment, poverty, smoking history, decreasingly poor perception of health, greater walking time, and need for personal care, were significantly associated with complete tooth loss in the bivariate analyses (P<.01). However, cumulative logistic modeling results indicate that only age, education, poverty, smoking history, a dental visit in the past 12 months, and lower health perception were associated with greater numbers of missing teeth. Having less than a very good perception of one's general health was a strong predictor of greater tooth loss [OR=1.74; 95% CI=1.14, 2.65 (poor perception); OR=1.36; 95% CI=1.05, 1.76 (fair perception); OR=1.62;95 percent CI=1.21, 2.17 (good perception)]. Conclusion: Tooth loss is a complex, multifactor phenomenon that should be viewed in a

psychosocial, behavioral, and general health context. Further studies are needed to understand the identified relationship between self-reported general health and tooth loss.

74. Yogita Butani, BDS, MS\*, Raymond Kuthy, DDS, MPH, Lewis Lampiris, DDS, MPH, Fang Qian, PhD, Department of Preventive and Community Dentistry, University of Iowa, Iowa City, IA, Division of Oral Health, Illinois Department of Public Health, Springfield, IL

#### ILLINOIS WIC PROVIDERS: USE OF AN ATTITUDINAL SURVEY IN THE DEVELOPMENT OF AN ORAL HEALTH EDUCATIONAL TOOL FOR CLIENTS

Objective: To assess the attitudes of the Illinois WIC providers concerning oral health counseling. This information would facilitate development of a formal educational tool for nondental healthcare providers (WIC) that interact with children from high-risk populations on a regular basis. Methods: A questionnaire was developed and mailed to all 166 Illinois WIC sites to assess attitudes toward oral health counseling. Results from the survey and discussions with WIC providers in the state were used to develop the educational tool titled, "Improving Children's Oral Health." Results: A response rate of 75.9 percentwas achieved after one mailing. 27 percent of the WIC providers had some form of oral health training. No statistically significant associations were found between the age of the provider, level of education, and special training and the comfort level of the WIC provider and actually discussing oral health issues with their clients. Statistically significant associations (P<.001) were found between the comfort level and actually discussing oral health issues with their clients. Discussion: The WIC providers, like dental public health practitioners realize that the population they interact with is a high-risk population and recognize that they could have an important role in the prevention of dental disease in these high-risk populations.

#### 75. Liang Hong\*, DDS, MS, Steven M. Levy, DDS, MPH, John J. Warren, DDS, MS, George R. Bergus, MD, MA, Deborah M. Dawson, PhD, James S. Wefel, PhD, Barbara A. Broffitt, MS, University of Iowa, Iowa City, IA PRIMARY TOOTH FLUOROSIS AND AMOXICILLIN USE DURING INFANCY

Objective: To assess the possible association between amoxicillin use during the first year of life and primary tooth fluorosis. Methods: 490 subjects recruited at birth were followed prospectively with questionnaires on fluoride intake and amoxicillin use at 1.5, 3, 6, 9, and 12 months. A modified Tooth Surface Index of Fluorosis (TSIF) was used by calibrated examiners at age 5 years. A case was fluorosis on 2+ primary second molars. Relationships between fluorosis and amoxicillin use were assessed. Results: Amoxicillin use was common in this cohort and 11 percent had fluorosis. In bivariate analyses, amoxicillin use for 1.5-3 months and 3-6 months significantly increased the risk for fluorosis of primary second molars. Other factors (sex, birth weight, breast feeding, family income, parents' education, episodes of otitis media, and other antibiotics) were not significant. Mantel-Haenszel stratified analysis showed no significant interaction between fluoride intake and amoxicillin use. After controlling for fluoride intake, the adjusted risks of fluorosis were not significant for amoxicillin use. In multivariable logistic regression, only fluoride intake was significantly related to fluorosis. Conclusions: Fluoride intake was the sole predictor of primary tooth fluorosis in the model, but bivariate results suggest that amoxicillin could play a contributing role. Investigation of the relationship between amoxicillin use and fluorosis of permanent teeth is warranted. Supported in part by NIH grants 2R01-DE09551, 2P30-DE10126, and CRC-RR00059

### 76. Barbara J. Smith, RDH, MPH\*, School of Public Health, University of Michigan, Ann Arbor, MI

### ORAL HEALTH STABILITY IN A LONG-TERM CARE POPULATION

*Objective:* To investigate dental service utilization over time among an institutionalized elderly population receiving regular dental care. *Methods:* Data was drawn from 868 dental records of dentate long-term care facility (LTCF) residents who had received comprehensive dental services over at least 24-months. The number, type, and cost of services were analyzed for each treatment period bounded by periodic examinations.

Characteristics of LTCFs and residents were explanatory variables. Stability status (stable=only diagnostic and preventive services needed) was established for each treatment period and at the person level. Repeated measures analysis was used to identify predictors of stability and dental utilization over time. *Results:* More services initially required were negatively associated with stability (*P*<.0001). Number of teeth at first visit was positively associated with prosthodontic services and costs (*P*<.0001). Number of services initially required was negatively associated with prosthodontic services and costs (*P*<.0001). Number of services initially required was negatively associated with prosthodontic services and costs (*P*<.0001). Number of services initially required was negatively associated with prosthodontic services and costs (*P*<.0001). Number of services initially required was negatively associated with prosthodontic services and costs (*P*<.0001). *Conclusion:* Presenting dental condition is an important predictor of utilization over time. High costs should be expected for residents receiving dental services for the first time in the LTCF. Once unmet need is addressed, maintenance costs are reduced substantially and remain relatively constant over time.

#### 77. Kimberly Randall\*, Senior Dental Student, Meharry Medical College School of Dentistry, Nashville, TN

### IMPROVING THE ORAL HEALTH OF UNDERSERVED POPULATIONS

*Objective:* To provide dental education and services for underserved populations, removing existing financial, time, and transportation barriers; to nurture children by contributing to their emotional and physical; to provide encouragement and information about career dentistry for students of disadvantaged backgrounds. *Methods:* Junior and senior dental students (under the guidance and supervision of faculty) provided no-cost dental education and services to children at schools and community centers. Dental students provided general mentoring to children in nondental related activities. Interested high school students were provided with general information about dentistry and were paired with dental students for additional activities encouraging those interests. *Results:* No-cost dental education and services were provided for people in disadvantaged areas. Interested high school students explored careers in dentistry and were given access to information and guidance by professionals, which will continue to be valuable resources for them. *Conclusions:* Progress was made with regard to removing existing barriers to underserved populations receiving dental care. High school students were provided with guidance, encouragement, and exposure to career dentistry, which may facilitate their becoming contributors to disadvantaged populations after graduation.

#### 78. Kecia Leary BA\*, Pete Damiano DDS, MPH, Jean Willard MPH, Elizabeth Momany PhD, University of Iowa College of Dentistry and Public Policy Center

### SELF-REPORTED BARRIERS TO DENTAL CARE FOR MEDICAID ENROLLED ADULTS AND CHILDREN

Objective: To evaluate if perceived barriers to dental care differed for Medicaid enrolled children and adults in Iowa. Methods: The 1997 Iowa Medicaid managed care enrollee survey was used. This mail-only survey contained 82 items, 25 specifically related to dental care. A modified Dillman survey method was used. Of the 5,675 sampled, 2,007 responded (35% response rate). Chi-square tests were used to evaluate the difference between responses for children and adults. Results: Adults rated their oral health lower (adults 39% excellent/very good, children 57%) and were more likely to be in need of restorative/emergency care (47% vs 26%) especially urgent care (34% vs 13%). Barriers: (1) not being able to fmd a dentist who accepts Medicaid, (2) co-payment too expensive, (3) fear of going to the dentist, and (4) travel distance to a dentist who accepts Medicaid patients (P<.05) were greater for adults. The ability to get needed dental care, satisfaction with dental care, and respect from dental office were rated higher for children than adults (P<.05). Conclusions: Although comprehensive dental care is required for children in Medicaid, Medicaid-enrolled adults report more treatment needs and experience greater barriers to receiving needed dental care. Pressure to eliminate dental coverage for Medicaid-enrolled adults could have serious implications for the oral health of enrollees.