Evidence Table Construction Q1 Actinomycetes

Actinomycetes
Question 1: Are subjects who have high levels of specific oral microorganisms at an increased or decreased risk for developing carious lesions compared to subjects who do not have high levels of those same microorganisms?
Primary, permanent coronal, permanent root, or mixed dentition
Initial lit. scan by JMT, AT, JL

| Code # | Public Yr. | Paper title | Authors | Design per AHRQ | Sample source/country/method/response rate | No subj, each grp/ No subj. lost | Micro methods | Lesion detection/Examiner training/Examiner reliability/Examiner blinding/Subject blinding | Other relevant data, questionnaires, confounders/demography/ <u>Quality of data</u> | Findings (stat measures: means, odds ratios, risk ratios, likelihood ratios, sensitivity, specificity, conf intervals). Inferences re topic of this evidence table |
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| Q1 a 5 & Q1 lacto | 99 | Mutans streptococci and other caries-associated acidogenic bacteria in five-year-old children in South Africa | Toi et al | obs | Johanesburg and Soweto, South, African blacks and coloreds, 5 yo. | 140; 44 European/Malay/Black termed colored. | Both saliva and plaque sampling from teeth 55 and 75, not pooled. Plaque quantified by protein anal. Selective agars for ms, lb, veillonella, actinos Confirmed biochemically | WHO, dmfs, ds. Examiner blinding--Not with regard to ethnicity | ? | Pearson correlations showed low yet statistically significant correlations between plaque mutans streptococci counts and the number of decayed surfaces (ds) and decayed, missing and filled surfaces (dmfs) of primary teeth in blacks and in coloreds (historical race classification).<br>Salivary mutans streptococci counts correlated with ds and dmfs in coloreds.<br>No relationship was found between ds, dmfs and Lactobacillus, Actinomyces or Veillonella numbers.<br>Significant associations were evident between plaque mutans streptococci and Veillonella and Lactobacillus in black children with caries and between plaque mutans streptococci and Actinomyces and Lactobacillus and Veillonella in colored children. |
| Q1 a 6 | 98 | The isolation of Actinomyces naeslundii from sound root surfaces and root carious lesions | Brailsford et al | obs | London, Engl. Hospital | N=56 subj; N=56 sound rs; N=26 soft rs; N=45 leathery rs | Root carious lesions were sampled after the removal of overlying plaque. Supragingival plaque or carious dentin was sampled using a sterile excavator, the samples were disaggregated and | Leathery or Soft vs hard | | Significantly greater numbers and proportions of A. naeslundii genospecies 2 than A. naeslundii genospecies 1 were isolated from all sites sampled. There was no significant difference between the numbers and proportions of the two genospecies isolated from leathery and soft lesions.<br>The microflora of soft root carious lesions was found to comprise primarily gram-positive pleomorphic rods which formed 70+/-7.8% of the flora, while in plaque from exposed root surfaces and in infected dentine from leathery lesions the gram-positive pleomorphic rods represented only |

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| | | | | | | | cultured on both selective and non-selective media. A. naeslundii isolates were identified to the genospecies using specific antisera. | | | 35% of the flora. |
| Q1 a 7 & Q1 m 39 | 97 | Variations in the predominant cultivable microflora of dental plaque at defined subsites on approximal tooth surfaces in children | Baba ahma dy et al | Obs, anal of site-specific lesion/bacteria l association<br><br>Is this same study as #117? Author name now Babaahmady instead of Ahmady. Appears to be further analysis of microbiologica l data from study #117. | London, UK, presumably, | Avg 12 yo schoolchild 12 subjects, 21 extracted premolars | Tiny plaque samples near, below and away from contact areas; TYC and TYCSB. Confirm tests.<br><br>Selective and nonselective agars for wide battery of implicated bacteria | Selection of most caries prone approximal site: below contact area | | Strep mutans, Strep. sobrinus, Strep. gordonii and Veillonella spp. were recovered most commonly from subsite B (85.7, 33.3, 38.1 and 76.2%, respectively).<br>The isolation frequencies of Strep. mutans and Strep. sobrinus were significantly higher at subsite B (A B $p < 0.01$ and $p < 0.05$, respectively).<br>Veillonella spp. were significantly higher at subsites B and S (A < B, $p > 0.01$; B > S, $p < 0.05$), while Neisseria spp. were most common at subsite A (A > B. $p > 0.03$).<br>No notable actinomyces differences. |
| Q1 a 8 & Q1 m 45 | 97 | Plaque pH and microflora of dental plaque on sound and carious root surfaces | Aamd al-Schei e et al | obs | Beijing, PRC; outpatients w -w/o root caries | 11 F, 6 M; age 52-81 | Plaque samples by curette from 2 sound and 2-3 carious sites, ea subject. VMGIIP, processed within 24 h. PSS also, to VMGIIS.<br>Brucella agar, MS, MSB, SL, CFAT, Sabdex.<br>Also, pH drop measurements on 10%sucrose challenge in situ. | Active= soft lesions n=25; Inactive = hard lesions n=9; Sound = no lesion n=32/ No examiner blinding | | There was no difference in microbial composition of dental plaque on sound and carious root surfaces. The pH response to sucrose was the same regardless of the presence or absence of mutans streptococci.<br><br>Results show sharper and more profound and longer pH drop induced by 10% sucrose exposure of plaques over active lesions and sound surfaces than over inactive lesions. |
| Q1 a 10 | 96 | Human root caries: microbiota of a | Schu pbach et al | obs | Switz, 14 root surface | 14 freshly extracted teeth from 32- | Extensive BA and selective agars after roots | Supragingi val RSC lesions. | Not clear what consequences of sequence of | The proportion of Actinomyces, and in particular A. naeslundii, was significantly higher ($p < 0.05$) in initial lesions than in advanced lesions. |

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| & Q1 m 62 | | limited number of root caries lesions | | | lesions | 72 yo subjs./xsec lost | varnished and sliced with saw. Then bacteria were recovered from ground sections | Severity scores according to Billings. 85. | sample preparation before microbiology | In contrast, the percentage of Streptococcus and especially S. mutans was higher ($p < 0.05$) in advanced than in initial lesions.<br>Surprisingly low (0.8% of the CFUt) was the percentage of lactobacilli in advanced lesions |
| Q1 a 14<br><br>& Q1 lact o 53 | 95 | Human root caries: microbiota in plaque covering sound, carious and arrested carious root surfaces | Schu pbach et al | obs | Swiss, 49-60 yo. Comparison of sound, carious, and presumed arrested carious root surfaces | Sound = 5<br>Active carious=5<br>Arrested carious =5 | Mowing technique, to RTF, transport on ice, comprehensive culture workup | Schupbach et al criteria (a histolog defn) | | The total CFU's on both caries-free and caries-active surfaces were significantly higher than on arrested lesions.<br>Suggest polymicrobial etiol of RSC. |
| Q1 a 17<br><br>& Q1 lact o 70 | 94 | A comparison of primary root caries lesions classified according to colour | Lynch and Beigh ton | Obs Stratified by color and texture and distance from gingival margin | London, England | 395 lesions from 117 patients | After removal of superficial plaque by brushing, standarized sampling with excavator. | | | Black soft and black leathery lesions had a significantly greater area and harbored more lactobacilli than all other types of lesions while black leathery lesions also harbored significantly more yeasts.<br>There were no significant differences in the number of bacteria or mutans streptococci isolated from soft or leathery lesions irrespective of lesion color.<br>Overall, these data indicate that the color of primary root caries lesions is not a reliable indicator of primary root caries activity. |
| Q1 a 21 | 94 | The predominant cultivable flora of sound and carious human root surfaces | Van Houte et al | Obs, comparison of sound vs initial and advanced root lesions | Boston, Ma | 8 in each groups category of root surfaces | Comprehensive; plaque from sound root surfs (SRF), incipient root surfs (IRS), and advanced root surfs (ARS) | Nyvad and Fejerskov criteria 82. IRS are soft and non-cavitated, ARS are cavitated | | Streptococci, actinomyces, and veillonellae constituted 84.2, 57.8, and 65.7% of the PCF (predominant cultivable flora) of SRS, IRL, and ARL samples, respectively;<br>a wide variety of other Gram-positive cocci and Gram-positive and -negative rods was also present; the PCF of many samples was often dominated by few organisms, the identity of which differed from sample to sample;<br>a negative and no association with root caries existed for the PCF levels of the non-mutans streptococci (non-MS) and the actinomyces; mutans streptococci (MS) and lactobacilli (L) were not always present among the PCF of IRL and ARL, respectively, and non-MS were isolated from the PCF of most lesions and actinomyces from all lesions. |
| Q1 | 93 | A | Beigh | Obs correl of | London, | 59 pts with | Rel | Categorizat | | The total numbers of bacteria, mutans streptococci, |

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| a 22 & Q1 lact o 93 & Q1 m | | microbiological study of primary root-caries lesions with different treatment needs | ton et al | rsc lesions judged to require restoration vs not to require restoration | s/Royal London Hosp; routine or emerg dental pt | 301 primary rsc lesions | comprehensive micro workup by sampling entire dimension of lesions with excavator | ion of lesions by color (4 shades) and hardness/leatheriness./ Experienced dentist | | lactobacilli, GPPR, and yeasts decreased significantly with decreasing treatment need. Lesions classified as soft yielded significantly more bacteria, mutans streptococci, lactobacilli, and GPPR than leathery lesions, which yielded more bacteria than hard lesions. The frequency of isolation of mutans streptococci, lactobacilli, and yeasts was significantly greater from lesions requiring restoration and from lesions situated within 1 mm of the gingival margin. |
| Q1 a 23 & Q1 lact o 88 | 93 | Effects of a 12-month prophylactic programme on selected oral bacterial populations on root surfaces with active and inactive carious lesions | Emilson et al | 12 mo Longi; intervention of intensive OH individually by hygienist, scaling done at first visit only. OH reinforced and reinstructed at subsequent visits. Root surfaces txd at all visits with F varnish and given F losenges.and F rinse. Also, 0.15% F /10%xylitol toothpaste. | Linkoping,Sweden; 15 caries active with 770 exposed root surfaces. Intervention | 15 caries active with mean age 57 yr. | PSS and plaque. 6 plaque samples from each subj., thus from 92 sites. Plaque samples to RTF. Saliva samples to VMGII. All processed within 24 h. – MSB, SL, CFAT, BA for ms, lb, actino, and total recov flora. | Hix and O'Leary, soft, color yellow or light brown | Underpowered and weak antimicrobial strategies may have obscured differences | Tendency for higher levels of Streptococcus mutans in plaque from active lesions compared with sound root surfaces, whereas an inverse relationship was noted for the Streptococcus oralis group. No significant differences in the Actinomyces naeslundii counts were detected. The 12-month prophylactic programme had an effect on the clinical surface characteristics of root caries, but no detectable change in oral flora resulted from the intervention. |
| Q1 a 28 & Q1 m | 91 | Effects of fluoride and chlorhexidine on the microflora of dental root surfaces and progression of root-surface caries | Schaeken et al | Interventional, randomized. Three groups. All received standardized preventive treatment. The dentition of the patients in the two experimental groups was treated, q3m, | Nijmegen, Netherlands | 44 pts already txd for adv PD. | Plaque samples from selected sound and carious root surfaces at baseline and at three, six, and nine months after the onset of the study | Scored at baseline and after one year. In addition, the texture, depth, and color of the root-surface lesions were monitored. | | Mutans streptococci on root surfaces were suppressed significantly (p less than 0.05) during the whole experimental period in the chlorhexidine varnish group, but not in the fluoride varnish group. A non-significant increase in the number of Actinomyces viscosus/naeslundii was noted after treatment with chlorhexidine and fluoride varnish. The increase in the number of decayed and filled root surfaces after one year was significantly lower in the experimental groups than in the control group. After treatment with chlorhexidine varnish, significantly more initial root-surface lesions had |

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| | | | | with chlorhexidine [or] fluoride varnish, respectively. | | | | | | hardened than in the other groups. |
| Q1 a 30<br><br>Q1 lact o 132 | 90 | Association of selected bacteria with the lesions of root surface caries | Bowd en et al | Obs, xsec, | Canada avg 65.5 yo, 22-26 teeth. Divided population into 5 groups according to DMFS and ± restored root surfaces. | All =165 | Plaque samples fr root surfs, either intact or carious. Samples taken from the entire surf with a scaler, to RTF, and plated on selective and nonselective agars. | | | The results confirm an association of S. mutans and Lactobacillus with root surface lesions and suggest a relationship between lesions and A. viscosus serovar 2. |
| Q1 a 32 & Q1 lact o 129 & Q1 m 175 | 90 | Root surface caries and associated factors | Fure and Zicker t | randomly chosen Xsec obs of 3 diff ages, 55, 65, and 75 yo | Sweden | Tot =208 | PSS ms and lb and MSB and SL agars respectively. Also, CFAT for Actinos. Also pooled plaque samples | 4 post BWs; mirror/expl orer. Coronal: Gustafsson criteria. Root: Banting criteria | Diet questionnaire by 24 hr recall | The frequency of root surface caries was positively correlated to the frequency of coronal decay and negatively correlated to the number of remaining teeth and exposed root surfaces<br>As for enamel caries, the variation in the frequency of root surface caries was best explained by the salivary levels of mutans streptococci and lactobacilli, the percentage of surfaces harboring plaque and the frequency of carbohydrate intake. |
| Q1 a 35<br><br>& Q1 m 185 & Q1 lact o 132 | 90 | Association of the microbial flora of dental plaque and saliva with human root-surface caries | Van Houte et al | Obs, 3 grps: n=43 with no RSC or restorations on roots, n=110 with ≥ 1 RSC lesion or RS restoration, n=120 with RS restorations only | US with RSC | 273 subjs, 46-64 yo, at least 10 teeth, | Plaque samples from sound, incip, and estab lesions on roots. Comprehensive workup for ms, lb, actinos, other strep species, and total flora | | | The data reinforce findings from other studies and indicate that, as for coronal caries, the plaque and saliva populations of mutans streptococci specifically are correlated positively with the presence of root-surface caries. |
| Q1 a 36 & Q1 | 89 | A microbiological study of early caries of approximal | Marsh et al | Xsec obs of approx dental plaque in teeth with very early decay, | Bath UK, | 60 sites in 42 premolars | Composition of approx plaque after wash with water. Extensive bacteriological | Orthodontic extraction teeth: Polarizing light and | | Both the isolation frequency and the mean percentage viable count of mutans streptococci and Actinomyces viscosus were higher at sites with early caries, although mutans streptococci could not be detected at 37% of sites with early caries. |

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| lact o 139 & Q1 m 98 | | surfaces in schoolchildren | | shch, mean age 13.5 y | | | workup, includes TYC and SL. | contact micro XR as evid of demin | | At these latter sites, the proportions of Veillonella were markedly reduced.<br>Lactobacilli were rarely isolated and were never recovered from caries-free surfaces. |
| Q1 a 37 & Q1 m 207 & Q1 lact o 153 | 88 | Microbial flora associated with presence of root surface caries in periodontally treated patients | Emils son et al | Obs, xsec of root caries in pts tx'd 3 yrs earlier for PD | Goteborg, Sweden, school perio clinic.<br>Adults | 35/ 4 lost | Plaque samples from sound and carious root surfs. Analyzed for ms, lb, actinos, sanguis | After prophy, FMX, photos, Gustafsson et al criteria re enamel and Hix and O'Leary re roots. Data expressed as DMFS% (ie as % of surfaces at risk for root decay) | All taught OH, topical 0.2 % NaF at each clinic visit, and bid F toothpaste. | There was a low prevalence of root surface caries and a low level of salivary mutans streptococci and lactobacilli.<br>From subjects with root caries there was no statistically significant tendency to higher proportional levels of mutans streptococci in plaque from carious root surfaces than from caries-free surfaces.<br>An inverse significant relationship between noncarious and carious root surfaces was noted for S. sanguis.<br>The population of A. viscosus and A. naeslundii was similar in plaque samples from sound and carious sites but was elevated in the subjects with five or more new root surface lesions. |
| Q1 a 38 & Q1 lact o 164 & Q1 m 218 | 87 | A bacteriological study of rampant caries in children | Boue et al | Obs rampant caries cohort | 1-5 yo, sweetened pacifiers and/or nursing bottle at bedtime beyond usual weaning period. Also freq cho-rich betw meal snacks in place of bottle. | 19 | Plaque samples from labial lesions, RTF, M1 broth for dilutions, enriched Tsoy, MS, MSB, CNAC-20, and Beighton and Colman medium, Veilonella mediumand media for bacteroids, yeast, staph, and Rogosa SL. Multiple culture standards run. | ? | | Aciduric flora, Streptococcus mutans, Veillonella, and Lactobacillus predominated in plaque over the lesions.<br>Extracellular polysaccharide-producing streptococci other than S. mutans, as well as Actinomyces, were more abundant in plaque from sound surfaces. |
| Q1 a 39 & Q1 | 87 | Proportions of Streptococcus mutans, lactobacilli and Actinomyces spp in root | Fure et al | Case-control All subjects have root exposure | Gothenburg, Sweden. Dental school pts | 24 subj with root caries vs 24 with no root caries but with severe | Plaque form lesions or surfaces of roots, RTF. MSB, SL, CFAT, and BA for ms, lb, actinos, | Soft roots | Possible covariate of root exposure resulting from severe PD | Higher proportions of S. mutans ($p<0.01$) and lactobacilli ($p<0.05$) in dental plaque samples taken from subjects suffering from root surface caries than in samples from subjects without root surface caries but with periodontitis.<br>The level of A. viscosus/naeslundii in the |

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| lacto 163<br><br>Q1 m | | surface plaque | | | | periodontitis | and total flora, respectively. | | | periodontitis group was higher than that found in the root surface caries group, but the difference was not statistically significant. |
| Q1 a 40 & Q1 m & Q1 lacto | 87 | Microflora of plaque from sound and carious root surfaces [published erratum appears in Caries Res 1987;21(6):561 ] | Keltjens et al | obs | Nijmegen, The Netherlands. Pts at periodontology clinic in dental school. | 47 plaque samples from 70 sound and 29 hard carious and 36 soft carious surfaces. | Plaque to RFT, suspended in diluent and plated on BA, TYCSB, CNAC-20, and SL, for total, capnocytophaga, and sanguis, and for ms, actino and lb. | Sound, carious but hard, carious but soft. RCI. | | Higher numbers of S. mutans on soft carious surfaces than sound ones (p<0.001).<br>Numbers of S. mutans on soft and hard carious surfaces about equal.<br>For S. sanguis and Actinomyces viscosus/naeslundii there was no signif difference among categories of surfaces.<br>Low freq isolation of Capnocytophaga.<br>Lactobacilli only occasionally found. |
| Q1 a 42<br><br>& Q1 m 231 & Q1 lacto 168 | 86 | Quantitative comparisons of potentially cariogenic microorganisms cultured from noncarious and carious root and coronal tooth surfaces | Brown et al | Obs, xsec, micro association with sound and carious crown and root surfs | Houston TX; 22 to 84 yo | 150 samples from 25 in situ teeth with initial RSC lesions and in 25 extracted teeth with advanced RSC lesions. There were 50 root and 10 enamel lesions and 47 sound root and 43 sound enamel samples. | Plaque; comprehensive workup | ? | No F info, drugs, xerostomia etc. | Proportions of microorganisms did not differ significantly between noncarious enamel and root sites, but the noncarious coronal and root sites had higher (p< 0.05) proportions of actinomyces than did the root lesions.<br>Enamel lesions had a greater (p< 0.05) percentage of Lactobacillus spp. than did root lesions.<br>The number of streptococci recovered from root lesions was greater (p< 0.01) than the number of Actinomyces at the same site.<br>S. mutans was recovered from initial root lesions in greater numbers (p< 0.001) than were actinomyces and lactobacilli.<br>The number of S. mutans recovered at the initial root lesions was greater (p< 0.01) than that recovered from the advanced root lesions. |
| Q1 a 43 & Q1 lacto 176 & Q1 | 85 | Longitudinal microbiological investigation of a hospitalized population of older adults with a high root surface caries risk | Ellen et al | Obs , 34 month longitudinal | London, Ontario, Canada, Elderly, hospitalized, root surfs at risk for caries. Thus, starts with intact root surfaces and | 44 subjects presenting 154 caries-free surfs. | Plaque, sharp instrument, tangentially drawn over depth of lesion. RTF and eval on dftl and selective and enrichment media for implicated bact | Discrete discoloration and soft. One examiner who also took plaque samples. Assessment at 12, 20, | Many variables including salivation rate, medications… | The microbial count data were highly variable, precluding the finding of significant differences in caries association for either subjects or sites.<br>Streptococci, especially S. mutans, correlated highly with lactobacilli in the samples. |

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| m 242 | | | | | follows longitudinally, a prospective study. | | | 24, 28,32, and 34 months | | |
| Q1 a 45 & Q1 m 246 & Q1 lact o 172 | 85 | The microflora associated with developing lesions of nursing caries | Milne s and Bowd en | One yr longi of micro of nursing caries | Canadian Indian chldrn | 9 | ? Post hoc Comprehensive plaque sample eval for implicated supraging bact | ? | underpowered | 5 developed lesions; 4 remained lesion free.<br>No bacteriological correlates clear. |
| Q1 a 47 & Q1 lact o 187 & Q1 m 259 | 82 | A microbiological analysis of human early carious and non-carious fissures | Meier s et al | Obs, xsec, case control (caries free and caries active) | US naval recruits | 68 teeth sampled: 48 carious and 20 noncarious | Occl fissures sample with sterile burs; Total bacterial counts, total streptococcal counts, and counts of Streptococcus mutans, Streptococcus sanguis, Streptococcus faecalis, Actinomyces viscosus, and lactobacilli | dentist | | There was a four-fold increase in the total number of microorganisms recovered from carious (N = 48) compared to non-carious (N = 20) fissures.<br>S. mutans was the only microorganism common to all carious fissures |
| Q1 a 52 & Q1 m 286 | 75 | Predominant cultivable flora isolated from human root surface caries plaque | Syed et al | Obs xsec | Ann Arbor, MI, dental school clinics, 23-70 yr olds | 15, All one grp | Plaque scraped with wire from bucco-cervical lesions, into RTF, with extensive aerobic and anaerobic workup, selective and enrichment media. Biochemical, Fab, and fatty acid analyses for identification vs | | | 2 groups of bacteriolog findings:<br>S. mutans comprised 30 percent of the total cultivable flora. S. sanguis was either not found or was present in very low number.<br>or<br>S. mutans was not detected, and S. sanguis formed 48 percent of the total plaque flora.<br><br>A. viscosus was the dominant organism in all plaque samples, accounting for 47 percent of the group I isolates and 41 percent of the group II isolates. |

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| | | | | | | | authentic controls. | | | |
| Q1 a 53 | 74 | Characterization of bacteria isolated from human root surface carious lesions | Sumney and Jordan | Obs | Facility for mentally retarded. Source of extracted teeth Root caries lesions | ? | Teeth into VMGII and culture on selective and non-selective media | Soft roots | Isolation of Arthrobacter raises question of possible soil contamination. | S. mutans was predominant organism from "this lesion".<br>Filamentous isolates typical of Actinomyces. Arthrobacter also isolated. |
| Q1 a 54 & Q1 lacto 197 | 73 | The predominant cultivable flora of carious plaque and carious dentine | Loesche and Syed | Obs<br>To quantify recovery of bacteria from localized approximal lesion sites in plaque and in carious dentin of them. | Ann Arbor, MI, dental school | 12 child donors. | Floss collection of plaque, to RTF. Plate on MM10, MS for total and differential for ms, and for streptococci. Aerobic and anaerobic conditions. | | | L. casei was prominent in dentin isolates (about 21% of all isolates. |
| Q1 a 55 | 72 | Filamentous bacteria isolated from human root surface caries | Jordan and Hammond | Obs.<br>Then experiment in gnotobiotic rats to assess cariogenicity. | Illinois facility for mentally retarded for extraction of teeth | ? | Plaque from lesions of teeth transported in VMGII. BA as primary isol plate. 20 isolates c/w Actinomyces spp. | Soft roots | | Strains of R. dentocariosa, A. viscosus, A. naeslundii, A. odontolyticus and A. eriksonii isolated.<br>One third of actinomycetes could not be speciated.<br>At least one strain of A. viscosus and one of A. naeslundii were highly cariogenic on roots, not crowns.<br>Not stipulated how many isolates were tested in gnotobiotes.<br>Hence, at least some human actinomycetes have the ability to induce root caries in monoinfected gnotobiotic rats.<br>No reported coronal caries induction. |
| | | Embase identified no additional cites on point | | | | | | | | |

Evidence Table Construction Enterococcus Q1

Enterococci

Question 1: Are subjects who have high levels of specific oral microorganisms at an increased or decreased risk for developing carious lesions compared to subjects who do not have high levels of those same microorganisms?

Designate teeth:

Primary, permanent coronal, permanent root, or mixed dentition

Initial lit. scan by JMT, AT, JL

| Code # | Public Yr. | Paper title | Authors | Design per AHRQ | Sample source/country/method/response rate | No subj, each grp/ No subj lost | Micro methods/Evaluator blinding | Lesion detection/Examiner training/Examiner reliability/Examiner blinding/Subject blinding | Other relevant data, questionnaires, confounders, demography. Quality of data/strategy | Findings (stat measures: means, odds ratios, risk ratios, likelihood ratios, sensitivity, specificity, conf intervals). Inferences re topic of this evidence table. |
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| Q1e2 & Q1s & Q1m | 00 | Relationship among mutans streptococci, "low-pH" bacteria, and lodophilic polysaccharide-producing bacteria in dental plaque and early enamel caries in humans | Van Ruyven et al | Obs, xsec, sound vs various numbers of white spot lesions | US | | Rel global eval of bact in supraging plaque. And "low pH" unident bact | | | Over half of the total plaque flora in subjects with 5, 6, or 7 white spots consisted of "low-pH"-type organisms (minimum pH < 4.4). Many of these were neither MS nor "low-pH" non-MS. |

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| Q1e3 & Q1m | 99 | Topical antimicrobial therapy in the prevention of early childhood caries [see comments] | Lopez et al | Interventional randomized single blind longi . Povidone I ± applied to teeth q2m of approx half of bottle nursing child already colonized by ms | US (Puerto Rico) | 31 12-19 mo child at WIC clinic/ 7 lost | MSB agar | No white spots at baseline. Time to white spot appearance defines failure (response variable measured). Examiners | | The mean duration of observation to treatment failure was 155 days; the mean duration of observation for treatment success was 217 days.<br>Five of the 16 control subjects and 0 of the 15 experimental subjects experienced treatment failure (Fisher's exact test: P = 0.04).<br>The Kaplan-Meier estimate for incidence of treatment failure in the placebo group was 48% over 357 days (P = 0.02). CONCLUSION: These observations suggest that topical antimicrobial therapy reduces risk for the development of ECC in high-risk children. |

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| Q1e 12<br><br>& Q1s<br><br>& Q1m | 90 | Comparison of the initial streptococcal microflora on dental enamel in caries-active and in caries-inactive individuals | Nyvad and Kilian | Obs caries active vs caries inactive adolescents | Denmark | N=7 in each grp. | 700 strep isolated from early plaque. Locations?<br><br>4 hr after teeth cleaned, hence, earliest colonizers after initial colonization mechanically cleaned | | | In both groups the microflora was dominated by streptococci which comprised 61 and 78% (median values) of the total viable counts in caries-active and caries-inactive individuals, respectively (p less than 0.01).<br>Identification of a total of 700 streptococcal isolates according to a recently revised classification showed that the predominant streptococci belonged to the species Streptococcus oralis, Streptococcus mitis biovar 1, and Streptococcus sanguis.<br>Early plaque from caries-inactive individuals differed from that of caries-active individuals by significantly higher proportions of S. sanguis (p less than 0.05) and IgA1 protease producing streptococci (p less than 0.05).<br>In caries-active individuals, there was a tendency to elevated levels of S. mitis biovar 1 (p less than 0.10).<br>In addition, caries-active individuals were colonized by significantly higher numbers of mutans streptococci on the enamel surfaces (p less than 0.01).<br>However, in both groups Streptococcus mutans (serotype c) comprised less than or equal to 2% of the early streptococcal flora.<br>Streptococcus gordonii, S. mitis biovar 2, and Streptococcus salivarius were present in low proportions and did not show differences in distribution that could be related to caries activity.<br>Authors examined for enterococci, but found nothing worthy of conclusions re them. |
| Q1s 27 | 75 | The prevalence of enterococci in the human mouth and their pathogenicity in animal models | Gold et al | Human isolates inoculated into experimental animals | | | Human enterococci used to inoc experimental animals | | | Missing? |

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| | | Embase search supplies no on point cites | | | | | | | | |
| Hand search | 55 | Experimental caries in germfree rats inoculated with enterococci. JADA 1955; 50:259-272, 1955. | Orland et al | Experimental Inoculated vs uninoculated. Standard diet with glucose in drinking water. | | | Inoculated enterococcus (and a proteolytic bacillus into historically first germfree rat colony | Rat caries | May have been another contaminant in isolators | Rats reared free of all bacteria and on a cariogenic diet develop no carious lesions over 5 months.<br>If inoculated, similar rats all developed carious lesions.<br>Photos suggest lesions are mostly/exclusively in fissures of teeth. |

Evidence Table Construction Lactobacilli Q1

Lactobacilli

Question 1: Are subjects who have high levels of specific oral microorganisms at an increased or decreased risk for developing carious lesions compared to subjects who do not have high levels of those same microorganisms?

Designate teeth:

Primary, permanent coronal, permanent root, or mixed dentition

Initial lit. scan by JMT, AT, JL

| Code # | Public Yr. | Paper title | Authors | Design per AHRQ | Sample source/country/method/response rate | No subj, each grp/No subj. lost | Micro methods/ Evaluator blinding | Lesion detection/ Examiner training/Examiner reliability/ Examiner blinding/Subject blinding | Other relevant data, questionnaires, confounders,demography<br><br>Quality of data/strategy | Findings (stat measures: means, odds ratios, risk ratios, likelihood ratios, sensitivity, specificity, conf intervals). Inferences re topic of this evidence table. |
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| Q1 lacto 1<br>& Q1 m | 00 | Cariogenic oral flora and its relation to dental caries | Llena-Puy et al | Obs, xsec, | N=167 child, 12-13. Presumably, Valencia, Spain | 167 | PSS then plastic slide with impregnation to dorsum of tongue and cheek, then put in culture medium. Sounds like Strip mutans, but not explicit. Dentocult SM and LB.<br>3 categorie | DMFT/S with probe, per WHO/ Cohen Kappa =0.99 | | Signif correl betw infec by MS and lactos and lesion status p<0.001.<br>No signif predictive values;<br>Methods more effective identifying health than patients requiring tx.<br>OR for DMFT was 6.2 for mutans; 6.3 for lactos. |

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| | | | | | | | s of semiquant scale: <10E5; 10E5-10E6; >10E6. | | | |
| Q1 lacto 14 & Q1 m | 99 | Oral microflora in subjects with reduced salivary secretion | Almstahl and Wikstrom | Obs, case (hyposalivation)-control (normal salivation FR). | Gothenburg Sweden, Oral medicine clinic vs Public health dental clinic. Hyposalivation. 53 ± 7 yo vs control (52 ± 7 yo). | 14 cases 14 controls | Oral rinse. Wide range of bacteria analyzed. | Clinical exam done and FS recorded | All are salivary gland bx negative for inflammatory lesions. Hence, presumably pharmacologically induced dry hyposalivation. Very well balanced as to numbers of teeth, filled surfaces, plaque amoutns, BOP, pocket depths. Case FR unstim--0.03±0.02 v control 0.331 ±0.15 ml/min; stim—0.84±0.65 v contol 1.76±0.58 ml/min | There was a significantly increased number of lactobacilli, and a tendency, not statistically significant and with large variations within the groups, toward a higher proportion of mutans streptococci and a lower proportion of alpha-hemolytic streptococci in the hyposalivation group. The presence of micro-organisms associated with gingival inflammation and mucosal infections was comparable with that in the healthy controls. |
| Q1 lacto 3 & Q1 m | 99 | Pre- and post-treatment levels of salivary mutans streptococci and | Twetman | Intervent, longitud effect of restoration on ms and lb. Intervention: | 108 preschool with severe caries; Sweden PH clinic. 2.5 – 6.0 | 108/16 lost | Saliv ms and lb q6m, by Dentocult Strip Mutans and Dentocult | WHO with explorer. Scored on primary teeth./ No effect on micro/no subject | 62 % not of Swedish birth. Questionnaire to parents re diet, habits re diet. Computer printout of paper does not display | The results demonstrate that the post-treatment levels of mutans streptococci and lactobacilli were significantly reduced (P < 0.001) compared to pretreatment levels. Lactobacilli levels were more dramatically reduced than mutans streptococci. The reduction of mutans streptococci was positively correlated to the number of |

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| | | lactobacilli in pre-school children | | restorative rehabilitation under general anesthesia involving extraction, filling, and grinding of teeth. All fillings with glass ionomer cement. If poss, anterior approx surfaces done by grinding rather than restoration. Compared pre with post-treatment microbiology. | yo, avg 4.4 yo. | | LB. Semiquant scale. | blinding | graphs and tables | extracted teeth (P < 0.01), but not to the number of restored or ground [sound?] surfaces.<br>Lactobacilli reduction was not significantly related to the type of treatment. |
| Q1 lacto 4 & Q1 m | 99 | Mutans streptococci and other caries-associated | Toi et al | obs | Johanesburg and Soweto, South, African blacks and | 140; 44 European /Malay/Black termed colored. | Both saliva and plaque sampling from teeth 55 and 75, not | WHO, dmfs, ds/ Not with regard to ethnicity (examiner blinding) | ? | Pearson correlations showed low yet statistically significant correlations between plaque mutans streptococci counts and the number of decayed surfaces (ds) and decayed, missing and filled surfaces (dmfs) of primary teeth in blacks and in coloreds (historical race classification). |

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| | | acidogenic bacteria in five-year-old children in South Africa | | | coloreds, 5 yo. | | pooled. Plaque quantified by protein anal. Selective agars for ms, lb, veillonella, actinos Confirmed biochemically | | | Salivary mutans streptococci counts correlated with ds and dmfs in coloreds.<br>No relationship was found between ds, dmfs and Lactobacillus, Actinomyces or Veillonella numbers.<br>Significant associations were evident between plaque mutans streptococci and Veillonella and Lactobacillus in black children with caries and between plaque mutans streptococci and Actinomyces and Lactobacillus and Veillonella in colored children. |
| Q1 lacto 7<br><br>& Q1 m | 99 | Saliva, salivary micro-organisms, and oral health in the home-dwelling old elderly--a five-year longitudinal study | Narhi et al | 5 yr longi to compare, at five-year intervals, stimulated salivary flow rates with the numbers of selected salivary micro-organisms (mutans streptococci, lactobacilli, and yeasts) in a group of home-dwelling elderly in | Helsinki, Finland/ Helsinki Aging Study | 270 at baseline and 110 5 yr later. | PSS. Dentocult SM, LB, and Oricult N, for ms, lb, and ye, respectively. | Explorer, regarding primary and secondary lesions as carious/2examiners with 89% agreement on subset of 19 subjs | Info and stratification on medications, sal FR, buffer capac | Apart from lower salivary lactobacilli counts at follow-up (paired t test, difference -0.44 CFUs/mL of saliva; $p < 0.001$), no changes were found in salivary microbial levels.<br>Salivary microbial counts were clearly associated with the subjects' dentition types: More denture-wearers had high microbial counts than persons with natural dentitions.<br>None of the salivary factors correlated with the root caries incidence or the number of teeth lost during the five-year follow-up. |

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| | | | | Helsinki. To study the influence of baseline microbial counts on five-year root caries increments and rates of tooth loss. | | | | | | |
| Q1 lacto 9 & Q1 m | 99 | Associations between microbiological and salivary caries activity tests and caries experience in Hungarian adolescents | Gabris et al | obs | Budapest and Debrecen ,Hungary, 14-16 yo | 349 | Paraffin stim saliva for ms, lb, ye; Dentocult SM, Dentocult LB, Dentobuff strip | 2 clinicians; DMFT DMFS/ calibrated examiner training | | Statistically significant correlations were found between DMFT, DMFS mean values, and salivary microbiological counts for ms, lb, and ye ($p<0.05$ –0.01) with correl coeffs of 0.169, 0.196, and 0.136, respectively. |
| Q1 lacto 10 & Q1 m | 99 | Salivary mutans streptococci and lactobacilli in 9- and | Brambilla et al | obs | Turin, Italy From child 9-13 yo/ Randomly | No grps N=473 | PSS, liquid N2, ms and lb on MSB and SL agars. | WHO criteria for DMFT. CPITN using the WHO | 0.1 ppm F, CPITN | Statistically positive relationship ($P < 0.01$) between the levels of MS and LB. Both were significantly correlated to caries ($P < 0.01$). |

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| | | 13-year-old Italian schoolchildren and the relation to oral health | | | chosen schools resulting in distrib of SES. Consent denied by 27 parents | | Fresh samples to lab for confirmation of freezing OK. | criteria/ Correlation coeff betw frozen and unfrozen counts is r=0.989. | | |
| Q1 lacto 13 & Q1 m | 99 | Dental caries and caries-associated microorganisms in Uruguayan preschool children | Angulo et al | Obs, Low vs. higher SES | Montevideao, Uruguayan children, preschool, kindergartens, 3-5 yr old/ Tongue loop, validated vs spit | 76: 22 Las Acacia; 54 Pocitos | Saliva and tongue loop. MSB and Rogosa agar, for ms and lb. Confirmatory biochemical/ physiological tests. Data expressed both as categorical (presence or absence) and as continuous variable. | WHO, no xrs | Gingivitis SES variables | More children from the low socioeconomic area of Las Acacias had caries (68%) than children from the middle- to high-class neighborhood of Pocitos (19%). They also had poorer oral hygiene and a significantly higher caries prevalence (P < 0.05) than those from Pocitos. |
| Q1 lacto 15 & Q1 m | 98 | Colonization with mutans streptoco | Straetemans et al | Longi Obs; stratified on basis | Nijmegen, Netherlands, Foundatio | Tot=196 in original cohort. 109 were | PSS kept cold, processed within | Mfs and MFS | Sugar eating | For children at 11 years of age who were MS-free until 5 years of age, the mfs and MFS values at 11 years of age were found to be 1.12+/-2.81 and 0.44+/-0.88, respectively. |

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| | | cci and lactobacilli and the caries experience of children after the age of five | | of those colonized by ms at age 5 vsthose not so colonized. That is, a case-control by the criterion of mutans infection by age 5. | n for Pediatric Dent<br><br>Previously in Roeters et al 95 study./ ? pts | traced: 58 ms either never detected or only once detected betw age 2 and 5; 51 ms always detected during followup cultures. For this study done at age 11: N=55 not infected at age 5 vs N=25 infected by age 5. Only analyzed data for individuals available for eval at both ages. | 12 h. Ms and lb, by TSY20B and SL agars | | | These values are much lower than those of a control group of 11-year-old children who had always been MS-positive since the age of 5, being 3.10+/-3.43 (p<0.0007) and 1.20+/-1.91 (p<0.04), respectively, Mann-Whitney.<br>Of the 30 children without detectable MS up to the age of 5 yr, 22 had acquired MS at 11 years of age, but their MS counts were significantly lower than those of the control group.<br>The acquisition of ms is still possible after the so-called "window of infectivity".<br>Delayed acquisition of ms may reduce the caries experience in the primary and permanent dentition at a later age.<br><br>No differences were found in the numbers of lactobacilli and sugar intakes per week between the children ms-free and the children ms-colonized at 5 years of age |
| Q1 lacto 16<br><br>& Q1 m | 99 | Factors associated with caries incidence in an | Powell et al | Obs, at least 4 teeth. | Seattle, WA. Low SES multiracial / Local public | Total of 258 <65 N=38, 66-70 N=65, 71-75 | PSS | NIDCR calibrated dentists and recalibrated q6m. | This study is apparently designed to reveal the problem and show its | The significant factors associated with high coronal caries incidence rates were high baseline root DMFS (P<0.001), high counts of mutans streptococci and lactobacilli (P=0.036), male gender (P=0.007), and Asian ethnicity (P=0.002). |

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| | | elderly populatio n | | | health depart, and from communit y programs for low-income elderly, multiracial /ethnic | N=67, 76-80 N=49, >80 N=39 | | | dimension, but it is not designed to elucidate bhe microbial correlates due, primarily to the diffusely variable subject population. Enormous variability in number of teeth is one of major variables which muddy the bacterial interpretations. | These factors had small to moderate effects on incidence rates, with relative risk values of approximately 1.2 to 2.<br>The significant factors associated with higher disease incidence on root surfaces were baseline coronal DMFS (marginally significant, P=0.078), high bacterial counts (P=0.002), and Asian ethnicity (P=0.009).<br>The predictive value of the models was low for both coronal and root caries.<br>This result may be because this population had a higher than usual caries incidence rate, making discrimination among these caries-active individuals difficult. |
| Q1 lacto 17 | 98 | Prolonge d pacifier-sucking and use of a nursing bottle at night: possible risk factors for dental caries in children | Ollila et al | 24 mo longi, obs To detn risk factors for colonizati on of oral lactobacill i and candida in a group of children (n = 166) whose mean age was 2.5 years. Follow up 24 mos later | Oulu, Finland/ Day care ctrs. | 166 at 2.5 yo baseline. | Saliv, not clear how collected. Monitored for yeast and lb, only. | Dentists or hygienists at local health ctr. Both initial and cavitated lesions (to dentin by probe.) No xrs. | Did not eval for ms. Questionnaire re bottle and pacifier use and breast feeding. SES data. No evid that asked how mother cleans the fallen pacifier or food prechewing. Many confounders and did not get data on an important microbiological factor, per the literature. | The results showed that pacifier-sucking and the use of a nursing bottle at night increase the occurrence of both salivary lactobacilli and candida.<br>logistic regression analysis showed prolonged pacifier-sucking (≥24 months) to be a significant risk factor for caries development in children, with a rather high relative risk (RR) of 3.5 (95% confidence interval (CI), 1.5-8.2; P= 0.003). Prolonged use of a nursing bottle at night (≥ 24 months) was also a risk factor, but less significant than pacifier-sucking (RR, 2.6; CI, 1.1-6.4; P= 0.03). |
| Q1 lacto 18 | 98 | Salivary findings, | Narhi et al | Obs, randomly | Helsinki, Finland/ | 196 | 9-11 am collection | 4 faculty examiners | Some subjects severely | Root caries occurred in 52% of men and in 35% of women (p < 0.05). |

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| & Q1 m | | daily medication and root caries in the old elderly | | selected, elderly (mean age 79.3) To detn root caries score in relation to salivary FR, buffering capacity and salivary microbial counts. | Oral health component of the Helsinki Aging Study in 1990-1991 | | of unstim (drooled) and PSS, kits for streptococci, lactobacilli and yeasts. | . 19 subjects for calibration of 2 of the examiners, at 89% agreement. Primary and secondary lesions regarded as lesions | handicapped motor/cognitively. Many other variables..diet, medications….. Number of natural teeth: 13.9±8.5 and 13.2±7.7 for males and females, respectively. Very hard to get anything here about causation, at this late stage of the disease | Number of decayed (DRS) and decayed or filled (DFRS) root surfaces correlated (r = 0.16 to 0.26) with salivary microbial counts. No correlation appeared between DRS and subjects' salivary flow rates. Basic estimates on the association between DRS and salivary findings showed that microbial counts only produced significant odds ratios, from 2.0 to 3.5. However, in a log-linear model high salivary mutans streptococci and yeast counts together with male gender were associated with greater occurrence of root caries. |
| Q1 lacto 19 & Q1 m | 98 | Root caries and some related factors in 88-year-old carriers and non-carriers of Streptococcus sobrinus in saliva | Lundgren et al | Obs. The root caries index (RCI) was calculated and related to salivary flow rate and buffer capacity, plaque score and salivary counts of Streptococcus mutans, S. sobrinus | Gothenburg, Sweden. 88 yo/ Gerontological study cohort | 92 | Collected in a.m. after 10 hr fast and before toothbrushing. Paraffin stim sal with dentures in situ. MSB and SL. Sobrinus by morphology. | One examiner. ± BWs as indicated. | Couldn't find answer to association of prosthesis with presence or absence of S. sobrinus. Highly variable probable medication Hx may serve to blunt the data. | The RCI was significantly higher in persons with than those without S. sobrinus ($p < 0.05$). Subjects with both S. sobrinus and S. mutans had higher counts of total mutans streptococci and lactobacilli than subjects with only S. mutans ($p < 0.05$). The RCI was significantly correlated to S. sobrinus and S. mutans ($p < 0.05$). The positive correlation between the RCI and S. sobrinus was still significant when the other tested variables were kept constant, whereas the correlation between the RCI and S. mutans was weaker when S. sobrinus and lactobacilli were kept constant. |

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| | | | | and lactobacilli. | | | | | | |
| Q1 lacto 20<br><br>& Q1 m | 98 | Longitudinal analysis of the association of human salivary antimicrobial agents with caries increment and cariogenic micro-organisms: a two-year cohort study | Kirstila et al | 2 yr longi To study the associations among selected salivary non-immune and immune antimicrobial variables, cariogenic bacteria, and caries increment. | Turku, Finland. Public dental clinic. 13 yr olds during first study year. | 63 | PSS at six-month intervals. Saliva samples were analyzed for flow rate, buffer effect, lysozyme, lactoferrin, total peroxidase activity, hypothiocyanite, thiocyanate, agglutination rate, and total and specific anti-S. mutans IgA and IgG, as well as for numbers of total and mutans streptococci, lactobacill | At baseline and 1 and 2 yrs; same dentist each time. | | During the two-year period, a statistically significant increase was observed in flow rate, thiocyanate, agglutination rate, anti-S. mutans IgA antibodies, lactobacilli, and total anaerobes, whereas lysozyme, lactoferrin, and total and anti-S. mutans IgG antibodies declined significantly.<br>Based on various analyses, it can be concluded that, at baseline, total IgG and hypothiocyanite had an inverse relationship with subsequent two-year caries increment, anti-S. mutans IgG antibodies increased with caries development, and mutans streptococci and lactobacilli correlated positively with both baseline caries and caries increment.<br>Total anaerobic microflora was consistently more abundant among caries-free individuals.<br>In spite of the above associations, we conclude that none of the single antimicrobial agents as such has sufficiently strong power to have diagnostic significance in vivo with respect to future caries. |

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| | | | | | | | i, and total anaerobic bacteria | | | |
| Q1 lacto 22 & Q1 m | 98 | Five-year incidence of caries, salivary and microbial conditions in 60-, 70- and 80-year-old Swedish individuals | Fure | 5 yr longi, 3 cohorts by age at baseline | Gothenburg, Sweden. Dept Cariology of dental sch. 60-,70 and 80 yr old | 208 at baseline./ 53 lost, various reasons | 1 hr post meal, drooled saliva. Dentures in place.MSB and LS for ms and lb. | WHO and Banting criteria | 22.4-14.7 remaining teeth, avg 19.4 for all subjects. OH, medications, dietary habits, brushing…by history. | The study revealed that 27% of the participants had not developed any carious lesions during the 5-year period and that the incidence of coronal and root caries increased with age.<br>In the 60-year-olds, 2.5% of the susceptible coronal and root surfaces, respectively, had decayed, while the corresponding figures for the 80-year-olds were 8.8% for coronal surfaces and 9.8% for root surfaces.<br>In all, 18% had an unstimulated saliva secretion rate of below 0.1 ml/min and 14% had a stimulated secretion rate of <0.7 ml/min, with a mean rate which decreased with increasing age from 2.0 to 1.6 and 1.3 ml/min (p = 0.02). The overall salivary counts of lactobacilli and mutans streptococci, particularly the subspecies of Streptococcus sobrinus, had increased during the period. In the respective age groups of 60, 70 and 80 years, 15, 39 and 39% had a mutans streptococci count of > or = 10(6) CFU/ml in saliva and the corresponding figures for > or = 10(5) lactobacilli counts were 22, 31 and 43%. In the stepwise regression analysis, it was found <u>that age,</u> salivary levels of mutans streptococci and lactobacilli and <u>number of teeth were the best predictors</u> of the incidence of root caries. (A tautology?) |
| Q1 lacto 24<br><br>& Q1 m | 98 | Ecological study of Streptococcus mutans, Streptococcus | Babaahmady et al | Obs, xsec Do ms, including S. sobrinus, and lb preferenti | London, Engl. Eastman Dental Hsop | 90 teeth from 60 children 12.5 ± 1.4 yo. 270 samples, | Small plaque samples A (away from), S (to the side of) | Considered high risk area for decay. | <u>Some antisera do not have good specificity.</u><br><br><u>Note, data only provide frequency of</u> | An overall positive association was found between S. mutans 'c' and S. sobrinus 'd' (p < 0.001).<br>Significant differences (p < 0.1) were found between the proportional counts at each sub-site for S. mutans 'c': A = 39%, S = 51% and B = 70%, and for S. sobrinus 'd' 21, 33 and 49%. |

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| | | sobrinus and Lactobacillus spp. at sub-sites from approximal dental plaque from children | | ally colonise specific sub-sites within approximal plaque?--. Follow up to previous study. | | therefore. | and B (below) contact area of approx surfaces. Polyclonal antisera to target bacteria, labelled with fluorescene and micros counts at optimal dilution | | presence, not relative abundance of presence | Mutans streptococci (MS) appeared to preferentially colonise the sub-site below the contact area (B = 81%), compared with sub-sites A and S (48 and 62%, respectively). S. mutans 'c' and S. sobrinus 'd' were detected together at subsites A = 12%, S = 22%, and B = 38%, with proportional counts at B sites being higher than those at A (B > A, p < 0.01, and B > S, p < 0.05).<br>Lactobacillus spp. were isolated rarely, and were usually found together with MS.<br>There was a positive relationship between the presence of lactobacilli or MS and caries (white spot lesions only), although these species could frequently be isolated from noncarious sites.<br>The presence of both S. mutans 'c' and S. sobrinus 'd' were strongly correlated with early caries lesions. |
| Q1 lacto 27<br>& Q1 m | 97 | Dental caries and related factors in 88- and 92-year-olds. Cross-sectional and longitudinal comparisons | Lundren et al | Obs for 14 92 yr olds, xsec. Longi obs for 24, betw ages 88 and 92. to compare two groups of 88- and 92-year-olds (n = 92 and n = 40), respectively, with regard to | Gothenburg, Sweden, geriatric study | 14, 92 yo. 24, 88 becoming 92 yo during study. | Paraffin stim sal. Dentures in situ. MSB and SL for ms and lb. | One examiner | functional capacity and use of cardiovascular agents and psychoactive drugs | Untreated root caries, plaque score, and counts of lactobacilli increased between the ages of 88 and 92 years (P < 0.01).<br>Nine of the 24 longitudinally followed up subjects had lost 1-5 teeth over 4 years, and 17 subjects had developed new caries (DFS). The mean caries increment over 4 years was 1.3 coronal and 3.6 root surfaces, and new DFS per 100 surfaces at risk was 4.3 coronal and 17.5 root surfaces. Plaque score and final pH of buffer capacity increased (P < 0.05 and 0.01, respectively), whereas saliva flow, independent of gender, was unchanged.<br>Use of cardiovascular agents and psychoactive drugs was associated with a deteriorated dental status.<br>Decayed root surfs and RCI correlate signif with lb at age 88 and with ms at 88 and 92. |

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| | | | | teeth, caries, and salivary and microbial conditions | | | | | | |
| Q1 lacto 31<br><br>& Q1 m | 97 | Caries risk assessment in adolescents | Bjarnason and Kohler | Retrospective anal of records and salivary microbiological tests were utilized to predict caries development in a group of 15-16-year-old Swedish adolescents. Three yrs later, a 30 % random sample of the baseline population studied for DFS, DSi, and DF. | Gothenburg, Sweden | 301 15-16 yo during 1987/8. For 155, got salivary micro data | Saliv ms and lb with stim saliva. MSB and SL. | DS, DFS and DSi (incipient) decay. Clinical and xrs. | | Both, caries experience and salivary microorganisms, correlated significantly with a subsequent 3-year increment of DFS.<br>The strongest associations were recorded between the prevalence of baseline incipient lesions and the development of manifest caries (r = 0.51).<br>Incipient lesions accounted for 27% of the 31% variability in the DFS increment explained by joined caries and salivary data. Using precavity lesions as a sole predictor, 79-81% of individuals were correctly classified with regard to their future caries levels. The addition of manifest caries increased the accuracy of classification to 86-89%, depending on the stringency of screening and validation criteria. |
| Q1 lacto | 96 | Dental | Zoitopoul | Obs, 2 | London, | 641 of | 10 | Dmft by | Ethnicity | The mean dmft scores of the 3- and 4-year-old |

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| 32 & Q1 m | | caries and caries-associated micro-organisms in the saliva and plaque of 3- and 4-year-old Afro-Caribbean and Caucasian children in south London | os et al | cohorts totaling 641 3 and 4 yo Caucasian and Afro-Carib children | daycare facils/ Random selec of centers, to ident sample of 900 children, ~9% of children in the borough. 97% of parents consented | 874 subjects examined. | microliter loop sample from dorsum tongue. Plaque by toothpick from UL decid molars and processed in 2 hrs. Transport method not stipulated. Sm and lb, method on MSB and SL; yeast on Sab dextrose. | British Assoc Study Commun Dent criteria. Not known whether white spots scored./ Asserted to have been trained and calibrated. | classified by physical appearance. At baseline, AfroCarib children had lower dt and dmft than Caucasian and signif more were caries free (both p<0.0001). | Afro-Caribbean children were 0.36 +/- 0.10 and 0.51 +/- 0.13, respectively, compared to 0.80 +/- 0.17 and 1.48 +/- 0.24 for the equivalent Caucasian children (p < 0.001). Mutans streptococci and lactobacilli were recovered less frequently from the Afro-Caribbean children than from the Caucasian, but in both groups there were significant correlations between the plaque and salivary levels of mutants streptococci and caries experience.<br>In both groups, children from whom both mutans streptococci and lactobacilli were isolated had the greatest mean dmft scores and these were not significantly different. Multiple regression analyses demonstrated that, after controlling for age and dmft, there were still significant associations between race and salivary levels of mutans streptococci and lactobacilli, p = 0.0013 and p = 0.0167, respectively. |
| Q1 lacto 33 & Q1 m | 96 | Evaluation of salivary tests and dental status in the prediction of caries increment in caries-susceptible teenagers | Vehkalahti et al | Retrospective 28 mo longi, observational | Helsinki, Finland, dental sch./ 3 bith cohorts born 73-75. | 66 adol, avg age 15.2 y defined as susceptible vs 230 controls of ? age | From health records at baseline — preumably stim salivary sm and lb, Dentocult SM and Dentocult LB. | | Susc grp is DMFT 5.7 at baseline. Controls are 4.3 DMFT at baseline. Buffering capac monitored. Hard to believe that such big diffs can be found/asserted from groups so similar at | Delta DFSs was correlated with LB (0.31) for both genders, for boys only with buffering capacity (-0.34), and for girls only with flow rate of stimulated saliva (-0.28) and DMFT (0.35).<br>The highest sensitivities of salivary tests for caries were shown by LB (0.82) and SM (0.64), their specificities being 0.63 and 0.59, respectively.<br>Positive predictive values of the five tests varied between 0.69 and 0.89.<br>Predictions based on DMFT showed a sensitivity of 0.87 for DMFT > 3, but only of 0.33 for DMFT > 7, the corresponding |

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| | | | | | | | | | baseline | specificities being 0.44 and 0.81. |
| Q1 lacto 35 & Q1 m | 96 | Number of mutans streptococci or lactobacilli in a total dental plaque sample does not explain the variation in caries better than the numbers in stimulated whole saliva | Sullivan et al | obs | Malmo, Sweden | 60, 14-15 yo | Pooled plaque scraped from all tooth surfs. VMGII then MSB and SL, ferm of mannitol to confirm ms ident. | ?/ Micro done by 2 examiners ; one clinical examiner. | Both are pooled plaque methods and pooled tongue surface methods. Also a possible problem with false + and false – of MSB | The results showed that the number of MS or LB in plaque did not explain the variation in caries to a greater degree than did the salivary counts.<br>For both bacteria the explanatory values increased, as expected, in subgroups with less favourable oral hygiene, but not even at this higher level of explanation was there any difference between plaque and saliva.<br>The LB count was a stronger explanatory variable than the MS count. |
| Q1 lacto 36 & Q1 m & Q1 a | 96 | Human root caries: microbiota of a limited number of root caries lesions | Schupbach et al | obs | Switz, 14 root surface lesions | 14 freshly extracted teeth from 32-72 yo subjs./ Xsec lost | Extensive BA and selective agars after roots varnished and sliced with saw. Then bacteria were recovered from ground sections | Supragingival RSC lesions. Severity scores according to Billings. 85. | Not clear what consequences of sequence of sample preparation before microbiology. | The proportion of Actinomyces, and in particular A. naeslundii, was significantly higher ($p < 0.05$) in initial lesions than in advanced lesions.<br>In contrast, the percentage of Streptococcus and especially S. mutans was higher ($p < 0.05$) in advanced than in initial lesions.<br>Surprisingly low (0.8% of the CFUt) was the percentage of lactobacilli in advanced lesions |
| Q1 lacto 38 | 96 | Multifactorial | Raitio et al | Prospective, 11 mo | Oulu, Finland, | 181 (all)/ 16 lost | Not clear if | WHO codes 2-4. | Multiple predictors tested | The multifactorial modeling included many risk indicators, age, and gender and resulted in |

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| L39<br><br>& Q1 m | | modeling for prediction of caries increment in adolescents<br><br>Assessment of single risk indicators in relation to caries increment in adolescents | same et al | duration<br><br>same | adolescents, 13 y 3months<br><br>same | | stimulated. Strip Mutans (Dentocult SM) and lb by Dentocult LB. Candida by Oricult-N. Sucrase by method of Hamalainen et al Caries Res 22:174,1988. | WHO 1 (white spots, recorded if 1 mm from ging margin)./ Single examiner | and modeled include salivary sec rate, buffer effect, ms, lb, Ca, salivary sucrase, plaque score, ws lesions, past caries experience Sucrase assay described by Hamalainen et al is use of a Dextrostix test strip for detection of blood or urinary glucose. As such, it could detect in saliva either glucose from diabetic host, or fructosyl transferase activity or amylase activity, or glucosidase activity | different models in boys and girls, indicating the difficulty of caries prediction in adolescents.<br>When boys and girls were combined, the final model included past caries experience, Candida, and salivary sucrase.<br><br>Significant associations between caries increment and past caries experience (p = 0.002), white spot lesions (p = 0.01), lactobacilli (p = 0.02), Candida (p = 0.006), and sucrase (p = 0.02) were observed.<br>The ensuing odds ratios were: past caries experience, 3.6; white spot lesions, 2.9; salivary sucrase activity, 2.9; lactobacilli, 2.5; and Candida, 2.8. |
| Q1 lacto 40 | 96 | Dental caries in relation to diet, saliva and cariogenic microorganisms in Tanzanians of | Mazengo et al | Random xsec, obs sample | Tanzian rural and urban pops | N=110 in each grp: 12, 35-44 and 65-74 yo groups/ Xsec lost | Described in Mazengo et al, Caries Res 28,468,1994. | WHO + initial lesions/2 examiners with very gook kappas both for within and between examiner | Urban, rural, energy intake daily | Decayed teeth (DT) increased significantly (P = 0.048) with the number of snacks per day and was also associated with dietary sucrose (P = 0.025), total carbohydrates (P = 0.002) and fiber (P = 0.002).<br>Among salivary variables lactobacilli (P = 0.000) correlated positively with DT.<br>No strong association between total energy intake and dental caries in rural or urban populations in Tanzania, but snacking and sucrose intake were significantly associated |

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| | | selected age groups | | | | | | agreement. | | with caries, in particular in the urban area. |
| Q1 lacto 42<br><br>& Q1 m | 96 | Caries prevalence and salivary and microbial conditions in 88-year-old Swedish dentate people | Lundgren et al | Obs xsec | 88 yo Swedish | 172; subsample of 40 males and 52 females, ambulatory/ Xsec lost | PSS with dentures in situ. VMGII. pH and buffer capac. Ms and lb on MSB and SL agars | One examiner, mirror explorer and occasional xr for approx. | AVG remaining teeth 14.1; DMFS 25.2; DFS 38.3; RCI 36.6 | High counts of lactobacilli (> 10(5)) and mutans streptococci (> 10(6)) were found in 49% and 55% of the subjects, respectively, of whom most were denture wearers. |
| | | Effect of chlorhexidine gel treatment on the prevalence of mutans streptococci and lactobacilli in patients with impaired salivary secretion rate | | | | | | | | |
| Q1 lacto 47<br>& Q1 m | 96 | Associations between dietary intake, | Beighton et al | Obs, xsec | 328 Northumberland, English schch, | 328/ Xsec lost | Saliva samples at least 1 hr after last food | DMFS per Rugg-Gunn criteria | Assessment of # eating event/d, sugary eating events/d;<br>GI | Data are in setting of patients with established cavitated lesions.<br>DMFS (excluding ws) =3.05 +/-3.85<br>DMFS (including ws) = 5.72+/-5.00<br>DMFS scores were significantly related to the |

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| | | dental caries experience and salivary bacterial levels in 12-year-old English schoolchildren | | | age 12 | | intake.. Chew paraffin and drool. Salivary sm, lb, ye by MSB, Rogosa agar and sab dex. | | | salivary levels of caries-associated micro-organisms;<br>to the total number of eating events at which sugar-containing foods or confectionery were consumed.<br>experience.<br>No significant correlations were found between intake of food types and salivary levels of caries-associated micro-organisms except that the mean number of confectionery-eating events was correlated with lactobacillus levels ($r = 0.136$, $p < 0.01$). |
| Q1 lacto 48 & Q1 m & Q1 a & Q1 s | 97 | Plaque pH and microflora of dental plaque on sound and carious root surfaces | Aamdal-Scheie et al | obs | Beijing, PRC; outpatients w -w/o root caries | 11 F, 6 M; age 52-81 | Plaque samples by curette from 2 sound and 2-3 carious sites, ea subject. VMGIIP, processed within 24 h. Paraffin stim saliva also, to VMGIIS. Brucella agar, MS, MSB, SL, CFAT, Sabdex. Also, pH drop measurements on 10%sucro | Active= soft lesions n=25; Inactive = hard lesions n=9; Sound = no lesion n=32/no examiner blinding | | There was no difference in microbial composition of dental plaque on sound and carious root surfaces.<br>The pH response to sucrose was the same regardless of the presence or absence of mutans streptococci.<br>Our results thus do not readily support the traditional concept of caries formation.<br>Results do show sharper and more profound and longer pH drop induced by 10% sucrose exposure of plaques over active lesions and sound surfaces than over inactive lesions. |

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| | | | | | | | se challenge in situ. | | | |
| Q1 lacto 55 & Q1 m | 95 | The effect of a low fluoride containing toothpaste on the development of dental caries and microbial composition using a caries generating model device in vivo | Petersson et al | Interventional --to evaluate the effect of daily use of a low F toothpaste (250 ppm F) on the uptake of fluoride and development of enamel lesions as well as the prevalence of lactobacilli and mutans streptococci in dental plaque compared to the use of placebo toothpaste.<br>Ill fitting ortho | | 16, 12-15 yo | Stim sal and MSB and SL | Demineralization under bands during 4 wks. | The intervention was ineffective with respect to changing either the lesion development or the flora | Although significant amounts of fluoride were taken up in the surface enamel from the fluoride toothpaste, the extent of the lesions was not influenced compared to teeth brushed with a non F-toothpaste.<br>Neither were microbiological differences in the dental plaque found between the groups. |

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| | | | | band model. | | | | | | |
| Q1 lacto 52<br><br>&<br>Q1 m | 95 | Cariogenic bacteria in a longitudinal study of approximal caries | Sigurjons et al | Obs, 3 yr longi | Dental practice in Reykjavik Iceland, 7-59 yo | 217 approx spaces initially caries free in 58 subjects | Samples of plaque by floss, to RFT. Ms and lb, by both MSB and TYCSB, and by SL and read by microscopic exam. | Single dentist, BWs + mirror and probe | Not clear how data expressed as cfu/ml if plaque was sampled and not saliva. Authors do not explain. Throws question on results. | During the study approximal caries developed in 16 subjects (27.6%) at 30 sites (13.8%), involving 42 teeth.<br>56 of 58 (96.7%) subjects harboured S. mutans at some time during the study, 62.1% lactobacilli, and 29.3% had S. sobrinus.<br>The counts of S. mutans were significantly higher in those subjects that also carried S. sobrinus than in the remaining subjects.<br>A persisting high count of S. mutans > 10(5) colony-forming units per millilitre (CFU/ml) or a count that rose by ≥ 1 x log10 CFU/ml during the study was seen in 25 of 30 sites that subsequently became carious ($p < 0.001$).<br>Similarly, counts of lactobacilli that were consistently > 10(3) CFU/ml or rising by > 1 x log10 CFU/ml were seen in 17 of 30 sites that became carious ($p < 0.001$).<br>Nonetheless, author concludes that:<br>Although there were strong statistical associations between approximal caries and high or rising counts of these cariogenic bacteria, the bacterial counts were not good predictors of future approximal caries at that particular site. |
| Q1 lacto 53 | 95 | Human root caries: microbiota in plaque covering sound, carious and arrested carious | Schupbach et al | obs | Swiss, 49-60 yo. Comparison of sound, carious, and presumed arrested carious root surfaces | Sound = 5<br>Active carious=5<br>Arrested carious =5 | Mowing technique, to RTF, transport on ice, comprehensive culture workup | Schupbach et al criteria (a histolog defn) | | The total CFU's on both caries-free and caries-active surfaces were significantly higher than on arrested lesions.<br>Suggest polymicrobial etiol of RSC. |

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| | | root surfaces | | | | | | | | |
| Q1 lacto 54 & Q1 m | 95 | Lactobacilli, mutans streptococci and dental caries: a longitudinal study in 2-year-old children up to the age of 5 years | Roeters et al | 3 yr longi | Nijmegen The Netherlands, child dental health ctr. | 252 preschool, 2-5 yo | Soaking up saliva in mouth with cotton pellets with care not to contact teeth. Transfer of several for each subj to bottle until approx 1 ml saliva could be extracted. Then a pooled plaque sample taken from approximals of anterior teeth with floss. At baseline, also a sample of saliva from | Single dentist examiner. Visual including white spots, after drying the teeth. No probing. | Mothers saliv mutans, number of sugar intakes/d | At baseline mutants streptococci were detected in 43% of the children while the detection frequency of lactobacilli was low (11.5%).<br>On an individual level, numbers of colony-forming units of mutans streptococci and lactobacilli in plaque and saliva varied largely [greatly?] during the study period.<br>Very low correlations (< r = 0.22) were also found between the numbers of mutans streptococci or lactobacilli and the diet in terms of the number of sugar intakes.<br>In children older than 2.5 years correlations between the clinical caries score and <u>lactobacilli in saliva</u> (range 0.31-0.62) and <u>mutans streptococci in plaque or saliva</u> (range 0.24-0.46) were highly significant (p < 0.01). |

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| | | | | | | | parent bringing child. Ms by TSY20B and lb by SL. | | | |
| Q1 lacto 56 & Q1 m | 95 | Mutans streptococci, lactobacilli and caries experience in 12-year-old Icelandic urban children, 1984 and 1991 | Kohler et al | Obs, randomized xsec with retrospective comparison of both decay status and salivary ms and lb with 1984 data. | 1991 Reykjavik, Iceland, 20% random sample of 12 yo Icelandic urban | 252 | Wax stim sal, VMGII; Strip Mutans, immunofluorescence confirmation of a 15% sample; lb by SL. | Single experienced examiner/ Previous study also a randomized sample of 12 yr olds | No info on differences between years re F exposure or diet | Frequency distribution at lower levels of mutans streptococci differed significantly between 1991 and 1984, e.g. in the present study 25.8% of the children had < 10(5) compared with 13.8% in the study 1984.<br>The mean caries prevalence in the permanent dentition (DFStot) was 11.0, which is significantly lower than in 1984 (mean DFStot 28.8).<br>A significant difference in caries prevalence was found at various levels of salivary mutans streptococci.<br>Strep. mutans (serotype c/e/f) was carried by all mutans streptococci-positive children, save one child, who carried only Strep. sobrinus.<br>As the case was in 1984 significantly more Strep. sobrinus carriers had a high level of salivary lactobacilli as well as higher caries prevalence than the children who did not carry this species. |
| Q1 lacto 58 & Q1 m | 95 | Longitudinal study of caries, cariogenic bacteria and diet in children just before and after starting | Holbrook | Obs, longi<br><br>Exams 15 mo later | 5 yo child from Akranes, Iceland, area of high caries preval | 50 at baseline; 43 (86%) reexamined 15 mos later/7 lost | Stdized Loop drawn across tongue to RTF. Ms and lb according to Holbrook & beighton | Visual, with probe used for only 5 of subjects. White spots and approx lesions half way to DEJ were | Routine use of F dentifrice, F varnish, twice monthly 0.2% NaF rinse. Drinking water very low in F. Dietary habits questionnaire. Classification of "misusing sugar". | Fifteen months after baseline, and after being in school for half a year, 43 of the 50 children were reexamined and investigated as before.<br>Mean dmfs scores rose from 7.1 to 9.0, but the scores including initial caries rose from 9.7 to 15.3.<br>Mutans streptococci were carried by 84% of children on both occasions with a mean count 2.1 and 3.6 x 10(5) cfu/ml.<br>Lactobacillus carriage increased from 29 to 38% and the mean count from 5.1 to 13 x 10(3) cfu/ml at 6 yr. |

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| | | school | | | | | SJDR 95,37,1987 and Holbrook et al CDOE 17,292,1989. | scored. | | The frequency of consumption of sugar-containing foods increased from 4.2 to 5.2 intakes per day and between-meal snacks rose from 3.0 to 3.7 per day.<br>Children classified as "misusing" sugar were 59% at 5 yr and 83% at 6 yr.<br>The mean caries score at 6 yr for children "misusing" sugar was 10.7 but only 2.0 for those not misusing sugar. |
| Q1 lacto 59 & Q1 m | 95 | Dental caries and prolonged breast-feeding in 18-month-old Swedish children | Hallonsten et al | Longi obs breast fed vs non-breast fed 18 mo | Three counties, Sweden, children from 46 day care centers, | ~3000; 200 children as a subsample for other analyses. Breast fed = 61; no longer breast fed = 2939 | Swab against smooth and occlusal surfaces to RTF, culture within 48 h. culture on BA, MSB, and SL for total, ms and lb, respectively. | dmfs | Subset studied for: dietary, toothbrushing, sucking habits, use of F, sal levels of ms and lb. | Children with caries and still being breast-fed had a mean defs of 5.3, and those with caries not being breast-fed 4.9; the difference was not statistically significant (n=.<br>Children with caries, irrespective of whether they were being breast-fed or not, had significantly higher numbers of cariogenic food intakes per day than caries-free children.<br>Mutans streptococci were detected in 67% of the children and lactobacilli in 13%.<br>Children with detectable mutans streptococci and lactobacilli had significantly more caries than those without. |
| Q1 lacto 60 & Q1 m | 95 | 60 Caries development in children from 2.5 to 3.5 years of age: a longitudinal study | Grindefjord et ak | Longi 1 yr, stratified for SES, | Suburbs of Stockholm, Sweden. 2.5-3.5 yo | 692 | Tongue spatula. For ms and lb on selective media. | 2 dentists, criteria of Koch | SES info, diet habits, educational level of mother, brushing behavior. | The majority of the new lesions were located on the occlusal surfaces of the second molar.<br>Ninety-two percent of the children with caries at baseline developed new carious lesions during the 1-year period, compared to 29% of the children who were caries-free at baseline ($p < 0.001$).<br>Of the lesions diagnosed at baseline as initial caries, 64% progressed to manifest lesions during the 1-year period.<br>The study indicates that children with early caries development exhibit high caries progression as well as a high risk for further development of an extensive number of new |

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| | | | | | | | | | | carious lesions.<br>The children with the earliest and most extensive caries development were more freq colonized by ms (p<0.001) or lb (p<0.001), and had more gingival inflam (p<0.01) compared with children without decay at baseline and those who remained caries free for the duration of study.<br>Also positive signif sugar-containing beverage at night and during day and candy effects on caries. |
| Q1 lacto 63 | 96<br><br>?95 | Caries incidence, effect of preventive measures, and caries prediction in Uruguayan children | Angulo et al | Obs xsec and interventional re 12 or 23 high risk individs. | Montevideo, Uruguay, 12- to 13-year-old children; two neighborhoods different SESs./ 23 children with large numbers of mutans streptococci, lactobacilli, or decayed surfaces or a combination of these factors were considere | Tot =100. 23 judged high risk; 12 selected for intervention. | Presumably, salivary methods and MSB and LB<br><br>NOTE THAT PAPER NOT AVAIL, ONLY ABSTR | | Underpowered | Preventive measures reduced the caries risk. The highest sensitivity was obtained with the clinical test, whereas the highest specificity was obtained with the combined clinical and microbiologic tests. |

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| | | | | | d to be at high risk of developing caries. Twelve of these 23 children were selected for special preventive measures. A second examination was made 18 months later, at which 81 of the originally 100 children were studied | | | | | |
| Q1 lacto 66 | 94 | Prediction of caries in 1 1/2-year-old children | Schroder et al | 1.5 yr Longi, obs. Using data for sensitivity and specificity the predictive values for | Helsingborg, Sweden child health center; 1.5 yr old, low caries prevalence | 208 from 2 different cities both with low F in water | Ca alginate swab rubbed against buccal, lingual and occlusal surfs of teeth; ms | ? | 0.2 ppm F in water<br>While authors disappointed with results, message may be important for low caries prevalence population. Viz that there is high | Mixed and ambig conclusions below:<br>Initially, 99% of the subjects were caries-free as against 72% at the age of 3 years, with a mean of 0.8 ds.<br>A dividing line between high and low caries risk that combined high sensitivity and high specificity could not be established for any variable or combination of variables.<br>High sensitivity was noted with diet as the predictor, high specificity with oral hygiene or occurrence of mutans streptococci. |

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| | | | | positive (PV+) and negative (PV-) tests were calculated for different levels and combinations of variables. | | | and lb by MSB and SL agars | | specificity for ms and diet as predictors of earliest lesion formation and that there is reason to think that any role of lactobacilli is secondary, at least sequentially, to that of ms. | Lactobacilli were excluded as they were found in only 6 children.<br>A two-step computation with mutans streptococci as second predictor improved the ability to single out children with caries at the age of 3 years.<br>To sum up, prediction at the age of 1 1/2 years, in a population with a low caries prevalence, was not successful with the variables used in this study. |
| Q1 lacto 67 | 94 | Multifactorial modeling for root caries prediction: 3-year follow-up results | Scheinin | Longi 3 yr | 44-79, avg 62 yo | 104/4 died | Stim sal. Ms and lb and yeast by Dentocult MS and SL and Oricult N, respecitivly. | WHO | Plaque and otherinfo expressed as % of surfaces with visible plaque. I did not see info on medications, or diet. | The association between prospective root caries increment and several tests was significant.<br>Multifactorial modeling resulted in the combination of Past Root Caries Experience (OR 12.8), Lactobacilli (OR 8.6) and Candida (OR 2.8).<br>At screening, the criterion "two or three positive tests" of these yielded acceptable accuracy (77.1) and a relative risk of 3.3.<br>NOTE THAT DATA DO NOT READ LIKE ABSTRACT. THE FORMER INDICAT FOLLOWING ODDS RATIOS FOR 3 YR ROOT CARIES INCREMENTS:<br>RDFS 12.0 P<0.0001<br>CANDIDA 4.4 P<0.001<br>LACTOBACILLI 11.9 P<0.0001<br>S MUTANS 6.3 P<0.0001<br>BUFFER EFFECT 3.8 P<0.005<br>VPT% 2.3 P<0.05 (VPT% MEANS PERCENT VISIBLE PLAQUE ON TEETH). |
| Q1 lacto 70 | 94 | A comparison of primary root | Lynch and Beighton | Obs Stratified by color and texture | London, England | 395 lesions from 117 patients | After removal of superficial plaque by | | | Black soft and black leathery lesions had a significantly greater area and harboured more lactobacilli than all other types of lesions while black leathery lesions also harboured significantly more yeasts. |

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| | | caries lesions classified according to colour | | and distance from gingival margin | | | brushing, standarized sampling with excavator. | | | There were no significant differences in the number of bacteria or mutans streptococci isolated from soft or leathery lesions irrespective of lesion colour.<br>Overall, these data indicate that the colour of primary root caries lesions is not a reliable indicator of primary root caries activity. |
| Q1 lacto 71 & Q1 m | 94 | Influence of caries-preventive measures in mothers on cariogenic bacteria and caries experience in their children | Kohler and Andreen | Longi with ± previous intervention on mothers when children were 3 yr old to reduce sm; Followup obs now 4 y later (children now 7yo). Previous intervention detailed by Kohler et al , Arch Oral Biol, 1983. | Oskarshamn, Sweden; | Cont: 33 of 40 previous mothers with their 33 of previous 40 children. Tx: 25 or 27 previous mothers with their 26 of previous 27 children./ Control: 7M, 7child Tx: 2M, 1child lost | Paraffin stim, VMGII transport and culture within 24 h. Salivary ms and lb by MSB and SL. | Exam by std conditions (Koch) | | Control mothers had significantly higher levels of salivary mutans streptococci and lactobacilli than the test mothers ($p < 0.05$).<br>The median level of salivary mutans streptococci was 0.6 x 10(6) c.f.u. (colony-forming units) per ml in the test mothers and 1.3 x 10(6) c.f.u. in the control mothers.<br>The median level of salivary lactobacilli was 10 times higher in control than test mothers (80 x 10(3) and 7 x 10(3) c.f.u. per ml, respectively).<br>Significantly more children of control than test mothers carried mutans streptococci (95 versus 46%) (z-test; $p < 0.01$).<br>Children of test mothers had lower salivary levels of mutans streptococci and lactobacilli ($p < 0.05$).<br>Twenty three % of the test children were caries-free, compared with 9% of the control children (z-test; $p < 0.01$).<br>The mean caries experience of the test children was also significantly lower than that of the control children (defstot 5.2 and 8.6, respectively; $p < 0.05$). |
| Q1 lacto 72 & Q1 m | 94 | Salivary lactobacilli explain dental caries better than | Granath et al | Obs, xsec | S. African 4-5yo, | Tot =2728; urban and rural black, urban Indian, | Dentocult for lb, ms on MSB plates for stimulated saliv, and | WHO with dmfs stratifications. | OH debris index of G&V, high values.<br>41.5 intakes of sweets/wk. Very strong correl betw lb and | Spearman's and Pearson's coefficients of correlation. Multivariate regression analyses were done on all intervals to correct for the confounding effects of regular intake of sweets, presence of salivary ms or lbc, and oral hygiene.<br>Of the children, 68% had detectable lbc in the |

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| | | salivary mutants streptococci in 4-5-year-old children | | | | urban white. | stratifications according to Dentocult scores. | | intake/wk (p<0.0001)./ Analysis of effect of confounders | saliva, and 74% had ms.<br>Except for children with more than 6 dmfs, the explanatory values, i.e., percentage of variation in dmfs explained, were higher for the lbc than for ms.<br>Before correction, the values for the total material were 15 vs 6%; for children with caries, 7 vs 5%; for those with 1-6 dmfs, 5 vs 0.4%; and for those with more than 6 dmfs, 0.3 vs 2%. |
| Q1 lacto 75<br>& Q1 m | 94 | Dental caries and microbial and salivary conditions in Uruguayan children from two different socioeconomic areas | Angulo et al | Obs, cohorts of 2 diff SES | Montevideo, Urugayan child, 12-13yo; / Every 5th child from class registers selected. | n=100 | Midmorning paraffin stim sal. Ms by MSB and lb by SL. | DMFT and DMFS, one examiner/ Dentist | | Lower SES/higher SES: DS, 4.7/2.5; and FS, 1.7 /4.7, respectively. The differences in DS and FS were statistically significant.<br>Children with highest ms and lb had highest Ds, while those with lowest ms and lb had lowest (p<0.005). |
| Q1 lacto 76<br><br>& Q1 m 21 | 94 | Association between mother-infant salivary contacts and caries resistance in children: a cohort study | Aaltonen and Tenovuo | Obs, 7 yr longi | Lohja district, Finland/ All who participated in earlier study invited to followup study in 1990 | 327 7-mo old and mothers at baseline. 7 yr later. Rare contact =34; Frequent contact=21/272 lost | For M and C, paraffin stim saliva for lb (Dentocult LB). From same samples, transport in Tsoy with | Single examiner. Only lesions into dentin scored. Data on caries scores at age 4 gotten from health center | Freq contacts detnd by questionnaire: common spoon for M and C; clean or wet pacifier in mouth of M; kiss directly on mouth. Breastfeeding, prechew food? Are there other covariants or | Children with frequent maternal close contacts (F group, N = 21) had significantly less ms in saliva than the children with rare close contacts (R group, N = 34, P = 0.02).<br>The F and R groups did not differ significantly with respect to other children's caries risk factors, or in age, sex, stage of dental development, dental treatment, or the social aspects studied.<br>Speculates that salivary immunological phenomena are of import.<br>No pattern or difference reported for lb.<br>Cannot rule out other covariants/confounders. |

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| | | | | | | | glycerol/frozen. The ms on MSB and total flora on BA | records./ Examiner had access to previous records. Not clear if used them before current exam | confounders in this comparison?/ breastfeeding, nurturing, diet habits | |
| Q1 lacto 76 & Q2 m | | 76 Association between mother-infant salivary contacts and caries resistance in children: a cohort study A. S. Aaltonen and J. Tenovuo *Pediatric Dentistry* 1994; 16 (2): 110-6 | | MAY BE IN Q2 EVID TALBE FOR MUTANS | | | | | | |
| Q1 lacto 78 & Q1 m | 93 | Intra- and inter-individual | Tukia-Kumala and | A longitudinal assay | Finland | 128 11 yr olds | Strip Mutans, MSB, | No caries scores | | Considerable variation over time.<br><br>Authors probably mis-state this as variance of |

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| | | variation in salivary flow rate, buffer effect, lactobacilli, and mutans streptococci among 11- to 12-year-old schoolchildren | Tenovuo | of the goodness of the microbiological and salivary monitoring assays. | | | Dentocult LB, Dentobuff, salivary FR | | | the assays rather than probable variance of the biology of the host plus variance of the assays as a function of time and/ or date of sampling. |
| Q1 lacto 79 & Q1 m | 93 | Caries risk assessment in a longitudinal discrimination study | Leverett et al | Obs, xsec, for model building and testing | 6 yo 286 from Rochester NY (fluoridated) and 186 from several towns in NH (0.3ppm) | 472 | Paraffin stim saliva, RTF. No further workup for 24 hr, during which frozen in RTF. Asserted that no significant loss of numbers of ms, lb or total viable flora over this interval. Then dispersed | Radicke/ Micro and salivary chem procedures done without knowledge of clinical findings. | F, phosphate, Ca, PII, fluorosis, fluoride ion product (FAP), | By means of linear discriminant analyses, it was possible to predict correctly which children would develop caries within six to 12 months (sensitivity) in 82.8% of cases and which children would not develop caries during that period (specificity) in 82.4% of cases.<br>At “key examination”, the following were statistically significantly different with regard to the discriminant analysis (Wilcoxon, comparing 2 caries status groups):<br>How does one interpret and describe this table???? Which is not described in abstract. Table 2 |

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| | | | | | | | and plated on selective and non-selective agars. This included Cariescreen SM and Bactotest LB. | | | |
| Q1 lacto 79 & Q1 m | 93 | 79 Caries risk assessment by a cross-sectional discrimination model | Leverett et al | Obs xsec Attempting to develop discriminatory predictive model | F vs non-F (water communities) | 313 F N=140; non-F N=173 | Salivary ms and lb | | Selected subjs on basis of either DMFs = 0 or DMFS ≥ 6 PII F supplements, slaivary F content, other variables | By means of discriminant analyses, with use of seven key clinical and laboratory variables, it was possible for zero-DMFS subjects to e classified correctly (specificity) in 77.6% of cases in the fluoridated community and in 86.1% of cases in the fluoride-deficient community. High-caries subjects were classified as such (sensitivity) in 79.3% and 88.1% of cases, respectively.<br>Again, using outcome variable as an independent variable. When included microbiological data in discriminant anal, they contributed no additional power. Unlikely to reveal anything about microbiology role, if model uses disease to predict the same disease. |
| Q1 lacto 84 & Q1 m | 93 | Dental caries and cariogenic factors in pre-school urban Icelandic children | Holbrook | Modeling with data of 126? | | | | | | Children with dmfs ≥ 5 at 4 years were significantly more likely to have caries in their permanent dentition at 6 years than those with a lower caries score at 4 years.<br>Almost all children carried Streptococcus mutans, but only 58% carried lactobacilli at 4 years.<br>Lactobacilli declined in numbers at 5 and 6 years as the number of open carious lesions decreased, but the mean count of S. mutans remained fairly static (> 10(5) cfu/ml). |

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| L85<br><br>also pertains to Q3 | 93 | Prediction of dental caries in pre-school children | Holbrook et al | Obs, 2 yr longi, modeling data from study #126 | Reykjavik Icelandic child, age 4 at baseline | 158, uneven distrib of dmfs at base. High baseline dmfs = 3.3 | ?sal ms and lb | dmfs | Re sugar use | There were strong associations between high counts of S. mutans or lactobacilli and caries. Other salivary parameters were not as strongly associated with caries although a low salivary pH and low salivary flow rate were significantly associated with high caries scores.<br>The misuse of sugar as determined by dietary questionnaire was strongly associated with a high caries score and low caries prevalence was found in those children that took fluoride tablets regularly.<br>Stepwise regression -- strongest variables were the baseline caries score and misuse of sugar. Counts of Streptococcus mutans entered into the analysis but only as a relatively minor component.<br><br>Caries incidence was significantly associated with bacterial, dietary and salivary variables; but when the data were examined by stepwise regression the strongest variables were the baseline caries score and misuse of sugar. Counts of Streptococcus mutans entered into the analysis but only as a relatively minor component.<br>Similar significant relationships were seen with the determination of odds ratios.<br>A caries activity test was formulated combining the following caries-associated variables: high counts of S. mutans, or lactobacilli, or the misuse of sugar, or frequent consumption of paediatric medicines.<br>Were it had been applied to the children at baseline, it would have had a positive predictive value of 0.76, a negative predictive value of 0.82, a sensitivity of 0.8 and a specificity of 0.78.<br>Combining tests made the prediction of caries more accurate and in the population for which |

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| | | | | | | | | | | it was intended gave a reliable means of detecting those children most in need of enhanced caries prevention. |
| Q1 lacto 81<br><br>&<br>Q1 mutans | 93 | Influence of salivary levels of mutans streptococci on colonization of crown margins: a longitudinal study | Kohler and Hager | Longi. Prospective study of p of crown margins being colonized by ms and lb as a f(salivary levels of ms and lb before cementation). | Gothenburg, Sweden,/ Pros clinic | 21 adults, 36 crowns | Paraffin stim sal. Ms and lb on MSB and SL. Samples of margins of cemented crowns taken by prob over time, up to 1 yr. | | | Before cementation, salivary concentrations of mutans streptococci and Lactobacillus sp, microorganisms associated with dental caries, were determined.<br>Within 1 week 25% of the selected crown margins in subjects with low salivary levels of mutans streptococci and 89% in subjects with high salivary levels were colonized.<br>High salivary counts of lactobacilli seemed to reflect conditions that enhanced the risk of colonization of mutans streptococci.<br>The results suggest that, before cementation of fixed prosthodontics, measures should be taken to control the salivary concentrations of these organisms to reduce the susceptibility to recurrent caries.<br>Note that secondary decay not studied, per se. |
| Q1 lacto 86<br>& Q1 m | 93 | Caries prevalence in 2.5-year-old children | Grindefjord et al | obs | Southern suburbs of Stockholm, Sweden/2.5 yo | 832 (462 of immigrant bkgd or ≥ 1 parent | Unstim sal from 634 of the cohort. Spatula method and MSB and SL. | Koch criteria defined manifest lesions (to dentin)/ Not with respect to clinical exam (examiner blinding) | Extensive SES, dietary and OH habits, F exposure. Gingival inflam assessed | 88.7% of cohort caries free.<br>11.7% had either initial and/or manifest lesions.<br>6.4% had manifest (ie cavitated) lesions.<br>72% of lesions localized to max incisors.<br>Statist signif associations of manifest lesions with sugar containing beverages at night, >2 sugar-containing beverages/day, > 7 meals/day, and candy, > 1/wk.<br>Caries prevalence in children with an immigrant background was significantly higher ($p < 0.001$) than in children without.<br>In the multivariate analysis, the variables significantly associated with caries were: colonization with mutans streptococci ($p < 0.001$), lactobacilli ($p < 0.01$) and children with immigrant background ($p < 0.01$). |
| Q1 lacto | 96 | Prevalenc | Granath L | obs | S African | 2700 | Paraffin | Dmfs and | Various intakes | The distribution of the children in the eight |

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| 84<br>& Q1 m | ?93 | e of dental caries in 4- to 5-year-old children partly explained by presence of salivary mutans streptococci | et al | | 4-5 yo Multiracial /multiethnic. Multiple stratifications by race/ethnic/level of ms | | stim saliva. VMGII, packed in ice for 2-3 days before workup. Ms and lb on MSB and Dentocult LB. | WHO. Sharp probe/# examiners not stipulated, but baseline calibration claimed at >90% with extracted teeth mounted in plaster blocks. | of sweets, lb infection state, OH. | caries classes was strongly associated with the ms class (P < 0.001), with those in the lower ms classes generally having low dmfs scores and those in the higher ms classes having dmfs scores distributed over the whole range.<br>Regression anal to correct for confounders. Ms classes with correction for confounders result in low r values.<br>Calls for reevaluation of ms as a risk factor in caries. THIS CONCLUSION SEEMS TO FLY IN THE FACE OF THE DATA OF FIG 1 AND FIG 2.<br><br>Model for study in highly diverse populations may bias for minimizing detection of role of any microorganism.<br><br>VMGII samples do not stay in same mixed microbial population proportions when packed in ice (for 2-3 days). Original Moller paper on VMGII makes clear that should be maintained at room temp, not refrigerated or frozen.<br><br>Were teeth cleaned before examination? |
| Q1 lacto 88<br>& Q1 m | 93 | Effects of a 12-month prophylactic programme on selected oral bacterial populations on root surfaces with active | Emilson et al | 12 mo Longi; intervention of intensive OH individually by hygienist, scaling done at first visit only. OH reinforced and | Linkoping ,Sweden; 15 caries active with 770 exposed root surfaces. Intervention | 15 caries active with mean age 57 yr. | Paraffin stim sal and plaque. 6 plaque samples from each subj., thus from 92 sites. Plaque samples to RTF. Saliva samples | Hix and O'Leary, soft, color yellow or light brown | Underpowered and weak antimicrobial strategies may have obscured differences | Tendency for higher levels of Streptococcus mutans in plaque from active lesions compared with sound root surfaces, whereas an inverse relationship was noted for the Streptococcus oralis group.<br>No significant differences in the Actinomyces naeslundii counts were detected.<br>The 12-month prophylactic programme had an effect on the clinical surface characteristics of root caries, but no detectable change in oral flora resulted from the intervention. |

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| | | and inactive carious lesions | | reinstructed at subsequent visits. Root surfaces txd at all visits with F varnish and given F losenges. and F rinse. Also, 0.15% F /10%xylitol toothpaste. | | | to VMGII. All processed within 24 h. – MSB, SL, CFAT, BA for ms, lb, actino, and total recov flora. | | | |
| Q1 lacto 92 & Q1 m | 93 | A longitudinal study of dental caries and cariogenic microflora in a group of young adults from Goteborg | Bjarnason et al | Obs, 3 yr longi; baseline at 15-16 yo | Goteborg, Sweden/30% random sample of pts attending child dental clinic at dental school | 101 18-19 yo at final eval. | Stim sal samples processed according to Kohler ad Bjarnason 1992. | WHO | Low F water; Excluded subj with ortho appliances and recent antimicrobial tx. | DFS prevalence and increment were 8.9 and 2, respectively.<br>Continuing polarization of the disease was observed, with mean DFS score reaching 19.9 in the upper 15% of the frequency distribution.<br>Highest caries activity was observed approximally where the increment of manifest [cavitated] and incipient lesions averaged 1.3 and 1.6 surfaces, respectively, as compared to 0.5/0.6 occlusally and 0.2/0.5 bucco-lingually.<br>While the occlusal component continued to dominate DF score with 5.7 surfaces, the prevalence of approximal lesions increased by 48%, averaging 2.7 surfaces.<br>Frequency distribution showed a shift to the right and increasing skewness.<br>Among the 88 subjects who were saliva sampled, salivary mutans streptococci were detected in 89.7% and lactobacilli in 83%. |

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| | | | | | | | | | | Forty-one percent of the 18-19-year-olds had high numbers of mutans streptococci (> 5 x 10(5) cfu per ml) as compared to 33% at the age of 15-16-years, while high numbers of lactobacilli (> 10(5) cfu per ml) were recovered in 21.8% as compared to 14.3%.<br>High numbers of either ms or lb were associated with increased prvalence of DS and Dsincip. |
| Q1 lacto 93 | 93 | A microbiological study of primary root-caries lesions with different treatment needs | Beighton et al | Obs correl of rsc lesions judged to require restoration vs not to require restoration | London,/ Royal London Hosp; routine or emerg dental pt | 59 pts with 301 primary rsc lesions | Rel comprehensive micro workup by sampling entire dimension of lesions with excavator | Categorization of lesions by color (4 shades) and hardness/leatherines s./ Experienced dentist | | The total numbers of bacteria, mutans streptococci, lactobacilli, GPPR, and yeasts decreased significantly with decreasing treatment need.<br>The frequency of isolation of mutans streptococci, lactobacilli, and yeasts was significantly greater from lesions requiring restoration and from lesions situated within 1 mm of the gingival margin. |
| Q1 lacto 94 & Q1 m | 93 | Salivary counts of mutans streptococci and lactobacilli and past caries experience in caries prediction | Alaluusua | Retrospective obs Clinical and salivary factors were compared for ability to predict 3-year caries increment (Based on data of Alaluusua et al 1990 | Finland | 122 teens | Moller criteria | | <u>A post hoc ergo propter hoc logical fallacy?</u> | Baseline caries experience was better or as powerful as the salivary tests in predicting future caries increment at comparable screening and validation levels. |
| Q1 lacto | 92 | Salivary | Wiktorsso | Obs. | Sweden | ~500, | Salivary | | <u>Not a good</u> | It is also shown that these differences can not |

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| 96 | | levels of lactobacilli, buffer capacity and salivary flow rate related to caries activity among adults in communities with optimal and low water fluoride | n et al | Hypoth that lower caries scores in optimally fluoridated area are due to lowere levels of lb in saliva. | 30-40 yo | divided almost equally among low and optimal F water drinkers | lb | | strategy. | be explained by differences in lactobacilli levels, buffer capacity and salivary flow, neither separately nor in combination. |
| Q1 lacto 97 | 92 | Sweets and other sugary products tend to be the primary etiologic factors in dental caries | Sundin and Granath | Obs; xsec Cohort clinically examined at ages 15 and 18 in 1984 and 87. Same subjects were interviewed about their dietary habvits during the previous 3 yrs in 1987. Hence, a retrospect | Sweden/ NOTE: details of interview methods, and other methods given in Sundin: Scand J Dent Res 1990;98: 96-101 and in Sundin et al Comm Dent Oral Epi 1992; 20: in press. Find these and | 69 at 15 and 18 yo; | Salivary ms and lb | Was interviewer about diet blinded as to caries experience? | OH, FR, oral sugar clearance, consumption of sweets and other sugar-containing products | Simple linear correlations and a stepwise multiple regression analysis were used to compare ranks and explanatory values.<br>The highest correlations were obtained for intake of sweets and intake of other sugary products, with r values increasing from 0.25 and 0.16, respectively, in the total material, to 0.70 and 0.67 in less favorable fractions of oral hygiene, salivary flow rate and other sugary products in the former case, sweets in the latter.<br>The stepwise multiple regression analysis revealed that sweets and other sugary products contributed 12 percentage points to the total explanatory value, which was as low as 19%. |

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| | | | | ive diet review and a xsec current clinical and microbiological eval. | read. Sounds like 1 study published in pieces | | | | | |
| Q1 lacto 98<br><br>& Q1 m | 92 | Variation of posterior approximal caries incidence with consumption of sweets with regard to other caries-related factors in 15-18-year-olds | Sundin et al | Obs of hypothesized risk factor and to assess their import in caries incidence, judged in a retrospective manner. | Malmo, Sweden, school dental clinics | 69 | Stim salivary with assays for ms and lb. | Recorded vs present data on approximal lesion scores. Progression since age 15, analysis, retrospectively at age 18. Xrs used. | Data on oral hygiene, salivary flow rate and oral sugar clearance time were collected when the individuals were 15 and 18 yr old. Dietary habits by interview. Defined sugar as sucrose, glucose, and fructose. Does not attemp;t to assess proportional contribution to foods or pattern of consumption. Asked about 44 products. | Simple linear correlations between caries incidence and the different variables showed that lactobacilli count ranked first (r = 0.26), sweets second (r = 0.25), and mutans streptococci count third (r = 0.24).<br>The r value for caries incidence and consumption of sweets increased in subgroups with combinations of poor oral hygiene, a high intake of other sugary products and a low salivary flow rate (r = 0.67-0.70). |
| Q1 lactp 99<br>& Q1 m | 92 | Dental caries and its determinants among recent | Sgan-Cohen et al | Obs, not clear if randomly chosen from approx 1000, but | Rural Ethiopean immigrants to Israel Adults 35-45; children 5 | 70 adults 68 children | Rinse with water, do not swallow, spit out saliva. | | What was diet of these immigrants after they arrived vs before they arrived in Israel? Mutans level | Low levels of caries in this population can be attributed to an almost sugar-free diet and high salivary flow, but not to the composition of oral microflora.<br>The mean total count of salivary bacteria, as determined on blood agar, was 3.4 x 10(8); mean count of Streptococcus viridans, on |

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| | | immigrants from rural Ethiopia | | all consented via interpreter. 20 dental school employees aged 35-45 served as controls | and 12 | | MSB for ms, MS for total streptococci, Rogosa fro lb, and BA for total flora. | | and lactobacillus level come up very fast after going onto a high sucrose diet. Hence, there is likely to be dissociation between mutans levels and caries experience<br>Is there a log calculation error in the data? This is suggested by the values for the 20 hospital worker controls. Most unusual values unless workers have unusually high freq sucrose intake. | mitis salivarius, was 6.7 x 10(7); and mean count of S. mutans, as determined on mitis salivarius with bacitracin, was 1.7 x 10(7). These levels were all high and were not significantly different from a control group of 20 Israelis.<br>High levels of bacteria may just be reflection of very poor OH. |
| Q1 lacto 101 & Q1 m | 92 | Mutans streptococci and lactobacilli in breast-fed children with rampant caries | Matee et al | obs | Morogoro district of Tanzania. Breast fed children betw 1 and 2.5 yr old. | 34, 17 with rampant caries and 17 matched caries free controls. | Plaque samples from anterior dentition by toothpick, into saline, plated within 2 h onto TYCSB agar and | | No OH practices.<br>No nursing bottle practice. Only breast feeding on demand.<br>No information on prechewed mother's food shared with child.<br>Asserts (in Discussion) but | Mutans streptococci and lactobacilli were isolated from dental plaque of all children with rampant caries and from most caries-free children.<br>None of the colonies of mutans streptococci resembled those of Streptococcus sobrinus.<br>The mean counts of the mutans streptococci and lactobacilli were 100-fold higher in plaque samples from children with rampant caries as compared with caries-free children.<br>No difference could be found between the numbers of mutans streptococci in plaque overlaying cavities and that from adjacent sound enamel. |

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| | | | | | | | Rogosa agar. Also saliva by spatula method | | doesn't document that supplementary foods containing some sugars (mono and disaccharides were consumed twice a day. <u>Is TYCSB insufficiently selective?</u> | In contrast, the counts of lactobacilli in plaque were approximately 100-fold higher from cavities than from sound surfaces.<br>The levels of mutans streptococci in saliva were directly related to the presence of rampant caries.<br>Rampant caries in these children can occur in the absence of nursing bottles or any other [detected] feeding abuse during weaning and in the presence of an aciduric plaque microflora, as has been reported for children with nursing bottle caries. |
| Q1 lacto 102 & Q1 m | 92 | Mutans streptococci, lactobacilli and caries prevalence in 15 to 16-year olds in Goteborg. Part II | Kohler and Bjarnason | Obs, xsec | Gothenberg, Sweden; / Those attending an annual dental exam at the childrens dental clinic at dental school | 155 15-16 yo | Paraffin stim sal, VMGII , MSB and SL for ms and lb | | From Bjarnason et al Scand Dent J 16,143-149,1992: Almost all subjs had been receiving regular dental care since age 3 at dental school clinic, including preventive care: prof F applics, OH instruc, dietary advice, and use of F supplements and toothpaste strongly advised. Those with apparent higher risk / caries active were in a q2w F rinse program from 7-12 yo. | Increased numbers of mutans streptococci and lactobacilli were associated with increasing caries prevalence.<br>Subjects with high numbers of both microorganisms had about 4 times higher mean caries prevalence than those with low numbers.<br>Streptococcus sobrinus carriers (15%) had both higher mean caries prevalence and constituted higher proportion of subjects with > 10(6) cfu mutans streptococci per ml saliva than was found in the whole group.<br>Correlation statistical anals. |
| Q1 lacto | 92 | Streptoco | Hunt et al | Obs xsec | North | B=448 | Paraffin | Radicke | Many had low | In general, people with higher levels of S. |

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| 104 & Q1 m | | ccus mutans, lactobacilli, and caries experience in older adults | | | Carolina, US; 448 black (B) and 362 white (W), seniors. Piedmont 65+ Dental Study/66 % resp rate from parent study cohort. Blacks oversampled to permits B-W comparisons | W=362<br><br>All are dentatate | stim saliv ms and lb by Cariesscreen SM and Bactotest LB, respectively. Used comparator chart only. | for coronal; Root lesions according to Graves et al (AJPH 92) --softness only (color change discounted)/ Interexaminer agreement reported for different types/locations of lesions | sal flow rate and low buffer capacity, both of which were deemed to increase risk of lesions. Numbers of teeth, identities (not all at same risk) and number of surfaces at risk not clear. | mutans or lactobacilli had more untreated coronal and root caries, but not greater total caries experience.<br>Among both black and white cohorts, stratification betw ≤5x10E4 and ≥10E5 give signif difference in coronal DS of p<0.008 and 0.01 for B and W, respectively; root DS of p<0.002 and 0.01, respectively, and root DFS for B of 0.003. Values for Coronal DFS were ns, as they were for W root DFS.<br><br>Data not normalized to surfaces at risk, a potentially big problem in a senior population.<br><br>No evidence that Bentley (paper Q1 m204) data on salivary sampling were considered |
| Q1 lacto 107 & Q1 m | 92 | The University of North Carolina Caries Risk Assessment study: further developments in caries risk prediction | Disney et al | 4 yr longi, 2 locations, 2 initial grade levels. | Aiken, SC and Portland ME | N =5233 at base-line. 4158 at end./ 1075 lost | Stim sal ms by Cariescreen SM and lb by Bactotest dipslide methods, without control as to time of sampling | Radicke/ Four examiners. Extensive training for study of the examiners. As permitted, assignment of children to same examiner./ Probably very good. | A "predicted caries index" was used by examiners which reflected "the examiner's subjective personal judgment or 'gut feeling' about whether a child's 3-yr caries incremenet would be none, low., moderate or high." No attempt was made to | For the four risk assessment models (two grade cohorts at two sites) specificity values averaged 0.83 and sensitivity values averaged 0.60.<br>Clinical predictors such as prior DMFS, pit and fissure morphology, and predicted caries risk status were the major contributors to the models.<br><br>No evidence that Bentley (paper #204) data on salivary sampling were considered.<br><br>Predicted caries risk status assessment, a major contributor to the models, is suggestive of the logical fallacy of post hoc ergo propter hoc. |

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| | | | | | | | | Not clear that there was random assignment of children to the examiners. | standardize examiners as to this subjective index, [but they were likely to have been influenced in their ideas by detnal educational/practice/sociological experience].<br><br>Data on many other parameters gathered. | |
| Q1 lacto 108 & Q1 m | 92 | A multivariate model to predict caries increment in Montreal children aged 5 years | Demers et al | Prospective | Montrael, Canada | 302, age 5 yr 8 mos ± 4 mos | Stim sal. Bactotest dip slide, read from chart, for ms and lb | WHO 79 with explorer and without xrs./ 2 precalibrated dentists | Debris index. Parental education and other SES info. | The following predicted caries increment at p<0.001: prior caries experience, ms, lb, parents' education; at p<0.02 debris index and F supplements.<br>143 children developed new caries over the study period; the mean increment for the whole group was 2.1 dmfs.<br>Sensitivity (Sn) and specificity (Sp) were calculated for each predictor and for the final model. The best model comprised only two factors, caries experience and lactobacillus. This could identify 81.8 per cent of children who would develop new caries during the next 12 months (Sn) and 77.4 per cent of those who would not (Sp). |
| Q1 lacto 110 & Q1 m | 92 | Relationship of microbial and salivary paramete | Bretz et al | obs | Brazilian, 3-6 yo preschool, living in Vidigal slum of | 37 | Paraffin stim. Dipslide methods. Caries screen | WHO | Defined patient based prevalence of caries (PB-CPR) as the percentage of | Surface-based and patient-based caries prevalence rates (SBCPR and PBCPR) recorded.<br>31 of the 37 children were caries active.<br>Ms salivary levels were significantly associated with the SBCPR (P = 0.0001). |

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| | | rs with dental caries in Brazilian pre-school children | | | Rio de Janeiro | | and Dentocult for ms and lb, respectively | | patients exhibiting at least one lesion, and Surface based caries prevalence rate (SB-CPR) as the percentage of all surfaces at risk which in fact evidence a lesion. | Similarly, lactobacilli salivary levels were significantly associated with the SBCPR (P = 0.0001).<br>When regression analysis was used to model dependence of the SBCPR on both organisms, the mutans streptococci and lactobacilli salivary levels were significantly associated with the SBCPRs (P = 0.0021 and 0.0118, respectively), and salivary levels of these organisms accounted for 57% of the SBCPR variability.<br>These findings indicate that the levels of mutans streptococci and lactobacilli in saliva are significantly related to the SBCPRs on the primary dentition of these children. |
| Q1 lacto 111 & Q1 m | 92 | University of North Carolina Caries Risk Assessment Study: comparisons of high risk prediction, any risk prediction, and any risk etiologic models | Beck et al | Comparison of 3 statist models for predicting risk among children over a 3 yr period. | Aiken SC and Portland ME/ Univ NC Caries Risk Assessment Study | | | | | Paper appears to be a detailed discussion of models per se, rather than a new data paper. The discussion is a fine tuning of reasoning of the data paper of Disney et al CDOE 1992; 20:64-75.<br><br>It does not cast particular light on the topic of the role of lb per se in caries. For further comment, see evid table on Q1 mutans. |
| Q1 lacto 112 & Q1 m | 91 | Prediction of caries increment in Scottish adolesce | Russell et al | 2 yr longi obs | Scotland; adolescents | All = 355 | Paraff stim sal ms (Dentocult SM), lb (Dentocul | DMFS and categorization for increment | F exposure info, Stepwise discriminant analysis<br>A useful cross-study | The caries increment was significantly correlated with previous caries experience, salivary buffering capacity and counts of lactobacilli, mutans streptococci and candida. The caries increment group (low, medium, or high) was identified correctly in 49% of all |

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| | | nts | | | | | t Lb), Candida, Veillonella on selective agars and in colorimentric broth of Walter and Shklair | | comparison of sensitivity and specificity and predictive value data with similar data of Crossner (81) and Stecksen =Blicks(85, and Pienihakkinen et al (87) and Wilson and Ashley (89) | subjects, but this was reduced to 45% if previous caries experience was excluded from the analysis |
| Q1 lacto 113 & Q1 m | 91 | Factors associated with active and inactive root caries in patients with periodontal disease | Ravald and Birkhed | Xsec, obs, randomly selected from periodontal clinic patients who were assigned to Ravald at clinic, randomly | Linkoping, Sweden | N=144, 30-78 yo | Paraffin stim sal ms and lb, by Dentocult dip slides and Lb. Alos, after VMGII transport to lab and culture on MSB. | One examiner blinded to micro results. Hix and O'Leary criteria of decay status—based on softness, color yellow or light brown. Also, FMX./ Periodontist | Definitions of activity or inactivity in doubt in view of Beighton and Lynch data, see elsewhere in this review. | 645 decayed and 539 filled root surfaces were found.<br>Of the carious lesions, 372 (58%) were recorded as clinically active and 273 (42%) as inactive.<br>30 patients showed no lesions (group 1), 46 had only fillings or inactive lesions (group 2), and 35 showed 1-2 (group 3) and 36 greater than or equal to 3 active lesions (group 4).<br>The lactobacillus count differed significantly between all groups, except group 1 vs. 2, and the mutans streptococcus count between groups 1 vs. 4 and 2 vs. 3 and 4.<br>Group 4 differed in plaque score from the other groups, and the salivary buffer effect differed between the inactive groups 1 and 2 and the active group 4.<br>By stepwise multiple regression analysis, it was shown that lactobacillus count, plaque index, salivary buffer effect, dietary habit index, and number of exposed root surfaces contributed significantly to the coefficient of determination. |
| Q1 lacto Revealed by | 88 | Effect of preventive | Rask et al | 5 yr longi with 1 yr interventi | Study at Sweden; Pub Dent | Tot =124 ; 50-60 yo. | Sl ms and lb | Single examining dentist, | | The risk patients in the control group developed 1.67 new DF as compared to 0.19 in the test group (at end of 1 yr). ($p < 0.05$). |

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| mutans but not by lacto search.<br><br>There is further data presentation and workup in Q1 lacto 114 | | measures in 50-60-year-olds with a high risk of dental caries | | on of preventive measures to half. Intervention, 2 cohorts of "risk" patients with low salivary secretion rate and buffer capacity and high numbers of mutans streptococci and lactobacilli. Randomized to test group that received diet counseling, professional topical F applic in clinic and F mouththrisne or F get at home, and | Health Svc./ Patients of private dentists. | 58 control; 66 exptl. Risk with tx=16; Risk with control protocol= 12. Non-risk with tx=40; non-risk with control protocol= 41./ 26 in 5 yr Risk with tx=1 Risk with control=2 Non-risk with tx=1 Non-risk with control=6. / 26 in 5 yr Risk with tx=1 Risk with control=2 Non-risk with tx=1 Non-risk with control=6.<br><br>No | | DMFT and DMFS include BW xrs. | | Also the numbers of mutans streptococci and lactobacilli were significantly lower in the risk patients in the test group after 1 yr compared with baseline values.<br>After the experimental year all patients were treated according to routine procedures.<br>Non-risk groups on the two protocols had same caries increment DF 0.39 and 0.40.<br>Five years after the start of the study a new examination showed increased caries activity in the risk patients in the test group and the gain which had been made during the experimental year was almost lost, statistically.<br>No signif bacteriolog differences at beginning or end of 1 yr or at 5 yr for either risk or non-risk groups; however, differences between risk and non-risk at baseline asserted, but stats not shown. Means given but not variances so calc cannot be done. |

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| | | | | 1%CH gel in applicators during 1 y. Controls got preventive tx deemed needed by private dentists, include OH instruc, 2% topical F applic professionally, F varnish and dietary information, and routine other dental care. After yr 1, all extl grp given routine procedures of controls. | | dropouts at end of yr 1.26 in 5 yr<br>Risk with tx=1<br>Risk with control=2<br>Non-risk with tx=1<br>Non-risk with control=6.<br><br>No dropouts at end of yr 1. | | | | |
| Q1 lacto 114 & Q1 m | 91 | Dental caries and | Rask et al | Obs. Baseline xsec data | Gothenburg, Sweden; | Tot =124 ; 50-60 yo. | Two paraffin stim sal | DMFT and DMFS | | Flow rate <1 ml/min found in 20%.<br>Buffer capac below end pH 5.5 in 64%.<br>ms not detected in 5%. |

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| | | salivary and microbial conditions in 50-60-year old persons | | for 5 yr longi interventional study described in #213 Q1 mutans | Pub Dent Health Svc. | | samples, midmorning, 1 –3 wks interval. Ms and lb and buffer capacity using MSB, SL, and Dentobuff.. | according to Gustafsson | | 17% had ms at ≥10E6/ml.<br>Lb not found in 10%.<br>21% had lb ≥10E5/ml.<br>S sobrinus found in 35-37% of subjects at 2 examinations.<br>Persons with both S. mutans and S. sobrinus had more ms than if had S. mutans alone.<br>Caries score increments are not discussed as they relate to the independent variables evaluated over the 5 year study |
| Q1 lacto 116 & Q1 m | 91 | Salivary levels of mutans streptococci and lactobacilli in dentate 80- and 85-year-old Swedish men and women | Kohler and Persson | obs | Gothenberg, Sweden | 130 dentate 80 and 85 yo | Stim salivar. VMGII. ms and lb by MSB and SL, respectively. | | Complex other issues not evaluated.<br>Could be considerable numbers of covariates or confounders.<br>Subjects classified by Eichner intermaxillary realtionship classification.<br>RPD presence recorded. | 88.5% were positive for mutans streptococci and 29% carried greater than 10(6) cfu per ml saliva.<br>S. mutans was most frequently isolated and was found in 114 persons (88%) alone or in combination with S. sobrinus.<br>S. sobrinus was detected in 33 persons (25%), who also showed significantly higher salivary numbers of both mutans streptococci and lactobacilli than persons from whom S. sobrinus was not isolated.<br>Subjects who carried a removable denture(s) had significantly higher salivary numbers of both mutans streptococci and lactobacilli than subjects without removable dentures.<br>Implies that having an RPD is a risk factor for more decay. |

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| Q1 lacto 117<br><br>& Q1 m | 91 | University of North Carolina caries risk assessment study. III. Multiple factors in caries prevalence | Graves et al | Obs xsec | Aiken, So Carolina and Portland, Maine; grades 1 and 5. | Tot 5012, representing 85% of eligible participants | Paraffin stim sal and ms by commercial kit (Cariescreen SM) and lb by Bactotest LB others?. Naked eye reading by calibrated dentists using density template. | Radicke criteria, 4 calibrated examiners.<br>No xrs/ The future caries increment predicted by the examiner as a variable. Does this inflict bias? | Multiple potential variables recorded.<br>The future caries increment predicted by the examiner was included as a variable. Does this reflect bias? Post hoc ergo propter hoc.<br><br>Not clear if applied info from Bentley et al re time of day sampling. | Four factors--number of dental visits by the child in the past year, presence of white spot lesions, and both the urgency of need for restorative care and the future caries increment predicted by the examiner--associated significantly and consistently with caries prevalence in primary and permanent teeth of first and fifth graders at both study sites.<br>In these analyses, sensitivity ranged from .60 to .72 and specificity varied from .86 to .91 in the four grade-site groups.<br>Lack of consistent association of many variables, including microbiologic factors, with baseline caries prevalence was unexpected.<br>It is expected that some of these variables will contribute predictive power in the prospective study. |
| Q1 lacto 118<br>& Q1 m | 91 | Correlations between caries prevalence and potential etiologic factors in large samples of 4-5-yr-old children | Granath et al | Obs. Simple linear correlations between all the factors including caries; stepwise multiple regression analyses between caries prevalence and the | Database gathered in 1984 on 2800 4-5-yr-old South African children/ Massaging the database | 671 rural black; 758 urban black; 588 urban Indian; 711 urban white | Salivary ms and lb by kits and MSB. DO THESE DATA COME FROM FROZEN OR ICEPACKED TRANSPORT VMGII MEDIUM, AS IN ONE OF | WHO | | The highest r value obtained in the single correlations was 0.56 for dmfs/lactobacillus count in the white group.<br>The overall pattern of the groups did not vary much.<br>In the stepwise multiple regression analyses, lactobacilli entered first in all groups.<br>S. mutans and oral hygiene interchanged as Nos. 2 and 3, and gingival state or buffer capacity came out as No. 4.<br>The highest percentage of caries variability explained by these regressions was 25%, in the urban black group, while the lowest was 12%, in the Indian group. |

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| | | | | independent factors in each of the four groups. | | | THE EARLIER OR LATER PAPERS OF THIS GRP? | | | |
| Q1 lacto 119 & Q1 m | 91 | The efficacy of chlorhexidine gel in reduction of Streptococcus mutans and Lactobacillus species in patients treated with radiation therapy | Epstein et al | Interventional. No control group, which would argueably be unethical. Instead, longitudinal control to eval micrbiol parameters, before and after intervention. Intervention: CH rinse and F gel in trays | Salivary gland region radiation patients, with nasopharygeal/nasal tongue Cas. | 9 | Sal ms and lb not clear how saliva was collected, but refers to Zickert et al AOB 1982;27:861-8. | | Antibiotics? Other meds altering salivary flow, ex. Antidepressants ? Not enough statist power. Also, probably some or most subjs on antibiotics | Quantitative counts of these organisms demonstrated high caries risk due to streptococci in 66% and due to lactobacilli in 100% of patients studied<br>Use of chlorhexidine rinse was shown to reduce S. mutans counts 1.1 logs and lactobacilli 1.1 logs.<br>The use of chlorhexidine gel resulted in a reduction of S. mutans 1.2 logs and lactobacilli 2.2 logs.<br><br>Question to self: What is the ligitimacy of arguing that a 1.1 log reduction in parameter X is equivalent to a 1.1 log reduction in parameter Y if X and Y are one to two to three logs different at baseline? Is reduction of ms from 10E6 to 9.9x10E4 comparable <u>cariologically</u> to reduction of lb from 10E4 to 9.9x10E2? |
| Q1 lacto 120 & Q1 m | 91 | Associations of microbiological factors and plaque index with caries | Eisenberg et al | Obs; F and non F cohorts | US; 12-15 | 140; 173 | Sal ms and lb and PII; also pooled plaque | | | In each community, pooled dental plaque and saliva harbored fewer mutans streptococci and lactobacilli in the zero-caries than the high-caries group.<br>Greater numbers of mutans streptococci were found in the dental plaque and saliva of the zero-caries subjects in the fluoridated community than in the fluoride-deficient community, suggesting that a greater caries |

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| | | prevalence and water fluoridation status | | | | | | | | challenge can coexist with zero-caries status in the fluoridated community. |
| Q1 lacto 121 & Q1 m | 91 | Salivary levels of mutans streptococci, lactobacilli, yeasts, and root caries prevalence in non-institutionalized elderly dental patients | Beighton et al | Obs, consecutive sample of patients attending routine dental examination during a 3 month interval. | Huntington Heath, UK/ RC prevalence in consecutive >55yo independently living pts with min 12 teeth | N= 146. Avg ~20 test and ~30 exposed root surfaces | Paraffin stim sal collected in bottle and stored on ice until processed within 4 h of collection. Dilutions made in thio medium. ms, lb, ye by MSB, Lacto Selective, and Sab dex, respectively. | Coronal DFS by WHO criteria. RSC defined as exposed root where color and/or surface texture is abnormal. Hence abrasion or erosion not recorded. | | The mean root DFS score of the males (n = 49) was 6.34 +/- 4.55 and for the females (n = 97) 3.76 +/- 3.31 (P < 0.001).<br>Subjects with greater than 1 root DFS had significantly higher salivary levels of mutans streptococci, lactobacilli, and yeasts.<br>They also had fewer teeth and more exposed root surfaces.<br>Partial denture (none, one or two) also positively correlates with levels of both lactobacilli and yeasts among females.<br>In the multivariate analyses salivary levels of mutans streptococci were not significantly related to any clinical measurement of root caries experience due to the greater strength of association between the root DFS score and salivary levels of yeasts. |
| Q1 lacto 123 & Q1 m | 90 | Association of the microbial flora of dental plaque and saliva with human root-surface | Van Houte et al | Obs, 3 grps: n=43 with no RSC or restorations on roots, n=110 with ≥ 1 RSC | US with RSC | 273 subjs, 46-64 yo, at least 10 teeth, | Plaque samples from sound, incip, and estab lesions on roots. Comprehensive workup | | | The data reinforce findings from other studies and indicate that, as for coronal caries, the plaque and saliva populations of mutans streptococci specifically are correlated positively with the presence of root-surface caries. |

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| | | caries | | lesion or RS restoration, n=120 with RS restorations only | | | for ms, lb, actinos, other strep species, and total flora | | | |
| Q1 lacto & Q1 m<br><br>Handsearch | 90 | Root surface caries and associated factors | Fure and Zickert | randomly chosen Xsec obs of 3 diff ages, 55, 65, and 75 yo | Sweden | Tot =208 | Paraffin stim sal ms and lb and MSB and SL agars respectively. Also, CFAT for Actinos. Also pooled plaque samples | 4 post BWs; mirror/explorer. Coronal: Gustafsson criteria. Root: Banting criteria | Diet questionnaire by 24 hr recall | The frequency of root surface caries was positively correlated to the frequency of coronal decay and negatively correlated to the number of remaining teeth and exposed root surfaces<br>As for enamel caries, the variation in the frequency of root surface caries was best explained by the salivary levels of mutans streptococci and lactobacilli, the percentage of surfaces harboring plaque and the frequency of carbohydrate intake. |
| Q1 lacto & Q1 m<br><br>Handsearch | 90 | Dental caries, mutans streptococci, lactobacilli, and saliva secretion rate in adults | Klock et al | Obs, 4 age grps (20-25,26-45, 46-60, >60) | Sweden | All = 718 | Sal ms and lb, dipslide methods (Dentocult) | DMFS in enamel-dentin according to WHO, and root scores/ Calibration? | No info on medications/ Lots of variability among and within grps | Both mutans streptococci and lactobacilli significantly correlated to the caries prevalence but the r-value never exceeded 0.34. |
| Q1 lacto & Q1 m<br><br>handsearch | 90 | Caries prevalence and microbiological and salivary | Russell et al | Obs on 4 occasions | Scotland, adolescents | 372 | Paraff stim sal ms (Dentocult SM), lb (Dentocult Lb), | DMFS | Children used 6 dentifrices: 1000, 1500, or 2500 ppm F either with or without ).5% zinc citrate | Counts of lactobacilli, mutans streptococci, and candida were consistently and significantly associated with caries prevalence, as either DS or DMFS score, and buffering capacity was consistently inversely related to DMFS score.<br>No significant difference among toothpastes re |

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| | | caries activity tests in Scottish adolescents | | | | | Candida, Veillonella on selective agars and in colorimentric broth of Walter and Shklair | | trihydrate. Stepwise regression strategy | DMFS or DS. |
| Q1 lacto 127 & Q1 m | 90 | Longitudinal study of caries and cariogenic bacteria in an elderly disabled population | MacEntee et al | 2 yr longi | Vancouver, Canada/ Longterm care facility | 50 with severe root decay and avg. 14 teeth | Proxabrush samples from teeth to VMGII, then refrigerated. MSB and SL for ms and lb. | Soft tooth structure, by explorer./ Dentists, hygienists / Y (examiner blinding) | Very poor OH Medication status and sal FR unknown or unstated. Prob with standardization of size of plaque samples, yet data expressed/ml. Hence, assumes equal sample sizes, even though OH stated as bad and variable. | There was a significant (P less than 0.05) association between large (greater than 10(5) CFU/ml) numbers of mutans streptococci and the development of new lesions, but there was no association between the dental status of the subjects and the dental treatment they received. |
| Q1 lacto 128 & Q1 m | 90 | Dental caries, mutans streptococci, lactobacilli, and saliva secretion rate in adults | Klock et al | Obs, 4 age grps (20-25,26-45, 46-60, >60) | Sweden | All = 718 | Sal ms and lb, dipslide methods (Dentocult) | DMFS in enamel-dentin according to WHO, and root scores/ Calibration? | No info on medications/ Lots of variability among and within grps | Both mutans streptococci and lactobacilli significantly correlated to the caries prevalence but the r-value never exceeded 0.34. |

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| Q1 lacto 135 & Q1 m | 90 | Salivary caries-related tests as predictors of future caries increment in teenagers. A three-year longitudinal study | Alaluusua et al | 3 yr longi obs to assess proposed predictive indices | Finland, n=122, 12-17 yo | All =122 | Afternoon or evening samples. Paraffin stim saliv ms, lb, at q1y on Dentocult SM, and LB. Buffer capacity by Dentobuff | | Baseline caries indices | The 3-year caries increment was positively correlated to the baseline DFS ($r = 0.46$, $p < 0.001$), salivary level of mutans streptococci ($r = 0.30$, $p < 0.001$) and lactobacilli ($r = 0.30$, $p < 0.001$), and combined level of mutans streptococci and lactobacilli ($r = 0.39$, $p < 0.001$) and negatively correlated to the buffering capacity of saliva ($r = -0.22$, $p < 0.05$).<br>Tests based on either past caries experience or mutans streptococci or lactobacilli levels alone were not efficient in selecting persons at high risk for caries.<br>Among the tests, DFS was the most sensitive and specific.<br>A combination of either microbial test and DFS was more efficient to select persons at risk than various alternatives alone.<br>The sensitivity was 84% and the specificity 62% for the combination of lactobacilli test and DFS and 71% and 79% respectively for the combination of mutans streptococci and DFS. In the former combination the positive prediction value was 43% and in the latter 56%. |
| Q1 lacto 136 & Q1 m | 90 | Maternal caries incidence and salivary close-contacts with children affect antibody levels to Streptococcus | Aaltonen et al | obs | 5-8 yr old | 67 (14 with close-contacts, see Aaltonen et al in Q1 mutans and Q2 mutans for defn) | For M and C, paraffin stim saliva for lb (Dentocult LB). From same samples, transport in Tsoy with | | Freq contacts detnd by questionnaire: common spoon for M and C; clean or wet pacifier in mouth of M; kiss directly on mouth. Breastfeeding, prechew food? Important insight, and at | However, the high maternal caries incidence did not increase the risk of caries in those children whose mothers' saliva contained high amounts of lactobacilli during the first nursing year, when compared with matched children with a low maternal level of lactobacilli. |

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| | | mutans in children | | | | | glycerol/frozen. The ms on MSB and total flora on BA | | variance with ms data from several studies | |
| Q1 lacto 129 & Q1 m & Q1 a | 90 | Root surface caries and associated factors | Fure and Zickert | randomly chosen Xsec obs of 3 diff ages, 55, 65, and 75 yo | Sweden | Tot =208 | Paraffin stim sal ms and lb and MSB and SL agars respectively. Also, CFAT for Actinos. Also pooled plaque samples | 4 post BWs; mirror/explorer. Coronal: Gustafsson criteria. Root: Banting criteria | Diet questionnaire by 24 hr recall | The frequency of root surface caries was positively correlated to the frequency of coronal decay and negatively correlated to the number of remaining teeth and exposed root surfaces<br>As for enamel caries, the variation in the frequency of root surface caries was best explained by the salivary levels of mutans streptococci and lactobacilli, the percentage of surfaces harboring plaque and the frequency of carbohydrate intake. |
| Q1 lacto 132 & Q1 m &Q1 a | 90 | Association of selected bacteria with the lesions of root surface caries | Bowden et al | Obs, xsec, | Canada avg 65.5 yo, 22-26 teeth. Divided population into 5 groups according to DMFS and ± restored root surfaces. | All =165 | Plaque samples fr root surfs, either intact or carious. Samples taken from the <u>entire</u> surf with a scaler, to RTF, and plated on selective and nonselective agars. | | | The results confirm an association of S. mutans and Lactobacillus with root surface lesions and suggest a relationship between lesions and A. viscosus serovar 2. |
| Q1 lacto | 89 | Correlatio | Sullivan | Obs | From | 87 in one | Salivary | | confounded | The best value for S. mutans was found for |

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| 138<br>& Q1 m | | n between child caries incidence and S. mutans/lactobacilli in saliva after correction for confounding factors | et al | 5-7 and 12-14 age groups. | previous database of Sullivan and Schroder and Widenheim et al (called grps A and B, here) | and 118 in other | ms and lb | | | the total material in the younger age group (r = 0.24).<br>For lactobacilli the best value was found for the total materials and in the subgroup with less favorable oral hygiene and S. mutans count in the older age group (r = 0.18).<br>(Ambiguous). The connection between caries incidence and these bacteria was shown to be weak at the individual level, particularly after correction for confounding by oral hygiene.<br>(OF COURSE, THAT IS MY QUALM ABOUT USING SALIVA SAMPLING!).<br><br>Comment re this and some other papers:<br>USING THE DEPENDENT VARIABLE TO PREDICT THE VALUE OF THE DEPENDENT VARIABLE. EX. LESIONS AS A PREDICTOR OF LESIONS, EITHER CAVITATED OR WHITE SPOT. IT IS A TAUTOLOGY, TRUE ON ITS FACE. ITS USE DIMINISHES THE CONTRIBUTION OF ANOTHER VARIABLE, PER SE MS OR LB OR DIETS HABITS, TO THE VARIANCE, IE TO THE EQUATION :<br>CARIES = FACTOR 1 X (REGRESSION COEF 1) + FACTOR 2 X (REGRESSION COEF 2)….FACTOR N |
| Q1 lacto<br>139<br>& Q1 m | 89 | A microbiological study of early caries of approximal surfaces in schoolchildren | Marsh et al | Xsec obs of approx dental plaque in teeth with very early decay, shch mean age 13.5 y | Bath UK, | 60 sites in 42 premolars | Composition of approx plaque after wash with water. Extensive bacteriological workup, includes TYC and | Orthodontic extraction teeth: Polarizing light and contact micro XR as evid of demin | | Both the isolation frequency and the mean percentage viable count of mutans streptococci and Actinomyces viscosus were higher at sites with early caries, although mutans streptococci could not be detected at 37% of sites with early caries.<br>At these latter sites, the proportions of Veillonella were markedly reduced.<br>Lactobacilli were rarely isolated and were never recovered from caries-free surfaces. |

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| Q1 lacto 141<br><br>Q1 m | 89 | Prediction of caries activity in children with today's low caries incidence | Klock et al | Longi obs of 14 yo with low incidence of caries (4.9±1.8 DMFT) at baseline. Seeks to evaluate progression of existing lesions on approx surfs. | Uddevalla and Hindos, Sweden. | 100 In Uddevalla, 50 subj randomly selected. In Hindas, all 50 children are included. All subjects got rountine care before onset and during project. | Stim sal by paraffin chewing, ms and lb by MSB and SL after transport in VMGII. Plating withing 24 hr. | 3 examiners, one common to both locations. Radiographs read by 3 three dentists—may be different ones? | | A weak but statistically significant correlation was demonstrated between caries incidence and caries prevalence. No other significant correlations were shown. It was concluded that caries activity could not be predicted in this population. |
| Q1 lacto 142<br>& Q1 m<br><br>also Q3 | 89 | Caries prevalence, Streptococcus mutans and sugar intake among 4-year-old urban children in Iceland | Holbrook et al | Obs | Urban Iceland, 4 yo;/ all were offered inclusion, about a 10% sample of all Reykjavik children of this age. | 158 presch | Sal ms and lb | | Sugar intake questionnaire | Threshold value of 30 instances of sugar intake per week above which caries prevalence increased markedly<br>High bacterial counts were strongly associated with caries.<br>Only 5% of children with more than 5 x 10(5 S. mutans cfu per ml were caries free.<br>27% of subjects had 67% of the total amount of caries for the group and all of these would have been detected by the bacterial test. |
| Q1 lacto 143<br>& Q1 m | 89 | Presence of mutans streptococci and various types of | Crossner et al | 2 yr longi, obs. | ? Umea, Sweden and Riyadh, Saudi Arabia. | 23 7yr olds who had more than 10E3 lactobacill | Saliva, tongue and plaque from 276 interdenta | BWs | Marginally powered | Results showed an increased number of interdental samples containing lactobacilli with an increasing number of salivary lactobacilli. Furthermore, lactobacilli were never found interdentally without the presence of mutans streptococci. |

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| | | lactobacilli in interdental spaces related to development of proximal carious lesions | | | Not clear where patients originated. | i in saliva | l spaces in yr 1 and yr 2. | | | Lactobacilli proved to be the more suitable microorganism for prediction of proximal carious lesions.<br>The presence of lactobacilli probably reflects a caries-inducing environment (etiologic microflora + fermentable carbohydrates), thus explaining their high predictive ability compared to their rather limited etiologic importance in the initiation of decay. |
| Q1 lacto 144<br><br>& Q1 m | 89 | Distribution of mutans streptococci in populations with different levels of sugar consumption | Carlsson P | Obs, xsec. Study of caries as func of sugar consump and ms and lb | Sweden; age?/ THIS IS A RETROSPECTIVE PAPER ATTEMPTING TO RECONCILE DATA AFTER VIPEHOLM STUDY. DO NOT CONSIDER IN THIS REVIEW. | ? | ? | ? | Need to scutinize N, bias, microbiol, how diet evaluated | . As expected, differences were found in the caries prevalence between the different populations.<br>An association between bacterial count and dental caries status could be demonstrated at the low level of sugar consumption and caries prevalence.<br>the difference in diet between the populations or groups were not sufficient to affect the counts of lactobacilli or mutans streptococci, but may have been sufficient to create the differences in caries prevalence. |
| Q1 lacto 146<br>& Q1 m | 89 | The microflora associated with the development of initial enamel decalcification | Boyar et al | Longi intervention: banding of noncarious teeth destined for ortho extn. | Canadian children in fluoridated area | 11 | Comprehensive plaque culture from extracted teeth with bands and sampled | Histological eval below ortho bands | | Dissolution was detected in areas where S. mutans was not isolated (8/34), but S. mutans was also present in samples showing dissolution (12/34).<br>There was no relationship between dissolution and the numbers of S. mutans; however, the isolation frequency of S. mutans was associated with dissolution ($p < 0.05$). |

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| | | below orthodontic bands in vivo in children living in a fluoridated-water area | | Then extn at timed intervals up to 14 days post-banding. Used oversized bands | | | from below the bands. Sample to RTF, diluted and plated on nonselective and selective agars | | | |
| Q1 lacto 147 & Q1 m | 89 | Associations between salivary levels of Streptococcus mutans, Streptococcus sobrinus, lactobacilli, and caries experience in Kenyan adolescents | Beighton et al | Obs | Randomized rural Kenyan adolescents (15 and 19). Low caries experinece? | N= 149 | Spit into sterile bottle. Sal ms est by biochemical tests and lb by G+ calalase – criterion. Also, MS, MSB, TYCSB, in the field. Picked cfu's for further ID after transport I TH with glycerol to UK. | 3 examiners, D1…D4 criteria. DMFS | | Caries experience of the group was significantly ($p < 0.001$) correlated with both the total salivary level of mutans streptococci and the salivary S. mutans levels, but not with the salivary S. sobrinus level. |
| Q1 lacto 148 & Q1 m | 89 | Caries-related microbiological findings in | Alaluusua et al | Xsec, obs | Finland, 113 teens, and 163 of their | 82 M/C pairs and 73 F/C pairs | Paraffin stim sal. Ms by Dentocult SM, lb by | DMFS include xrs | Correlation statistics | DMFS was eightfold higher in adults than in teenagers (56.4 +/- 22.8 vs. 7.3 +/- 6.7). The percentage distribution of the level of salivary S. mutans and lactobacilli was approximately the same in both groups. |

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| | | a group of teenagers and their parents | | | parents. Teens were previous participants of studies of these investigators. | | Dentocult Lb | | | The mean number of DMFS increased with increasing levels of salivary S. mutans and lactobacilli, the correlation being highly significant both in teenagers and adults. There was a significant correlation of the DMFS indices in the mother-child pairs (r = 0.364), but the correlation was not significant in the father-child pairs (r = 0.138). The salivary level of S. mutans was higher in the children of mothers with high DMFS values compared to the children of mothers with low DMFS values. |
| Q1 lacto & Q1 m<br><br>handsearch | 89 | Dental health status in Latin-American preschool children in Malmo | Vidal and Schroder | Obs | Latin Amer chld living in Malmo Sweden 3-6 yo | 73 | Sal ms and lb | | 30 % use nursing bottle at night with sucrose/ Swedish not native lang | The mean dmfs values differed significantly between children with and without S. mutans and with different levels of S. mutans in saliva ($p<0.05$). In some ages, there was signif difference in dmfs for children with and without detectable lb in saliva ($p<0.05$). |
| Q1 lacto 151 & Q1 m | 88 | Salivary levels of Streptococcus mutans and lactobacilli and dental caries experiences in a US adolescent population | Kingman et al | 3 yr longi | Coldwater MI, 10-15 yo | 541 = all | Initially and at 17 months, unstimulated sal ms and lb after dry ice transport and thaw at 50C.. Then dilution and plating on MSB and SL. | DMFS | All pts except 6 used F in one way or another. Dubious validity of use of unstimulated saliva. Very dangerous micro methods re quantitative losses of flora. No assessment of this | Subjects with low levels of S. mutans and lactobacilli had significantly lower initial DMFS scores and developed significantly fewer new DMFS than subjects with high counts. The predictive values of a positive result for S. mutans or lactobacilli assays were low (31% and 39%), but those for a negative result were high (81% and 84%). |

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| Q1 lacto 152 & Q1 m | 88 | Epidemiology of root surface caries in patients treated for periodontal diseases | Keltjens et al | obs | Netherlands, pts in dental sch dept periodontology | 83 pts tx'd for PD 2 yr previously. 22-72 yo, avg 41. | Paraffin stim saliva. TYCSB and SL agars | DFS with probe | | Salivary S. mutans counts and a combination of higher salivary S. mutans and lactobacilli counts were good indicators for the presence of root surface caries ($p<0.01$). Pts with high RCI had higher ms levels than those with lower <2.5x10E6 ($p<0.02$). |
| Q1 lacto 153 & Q1 m & Q1 s & Q1 a | 88 | Microbial flora associated with presence of root surface caries in periodontally treated patients | Emilsson et al | Obs, xsec of root caries in pts tx'd 3 yrs earlier for PD | Goteborg, Sweden, school perio clinic. Adults | 35/4 lost | Plaque samples from sound and carious root surfs. Analyzed for ms, lb, actinos, sanguis | After prophy, FMX, photos, Gustafsson et al criteria re enamel and Hix and O'Leary re roots. Data expressed as DMFS% (ie as % of surfaces at risk for root decay) | All taught OH, topical 0.2 % NaF at each clinic visit, and bid F toothpaste. | There was a low prevalence of root surface caries and a low level of salivary mutans streptococci and lactobacilli. From subjects with root caries there was a no statistically significant tendency to higher proportional levels of mutans streptococci in plaque from carious root surfaces than from caries-free surfaces. An inverse significant relationship between noncarious and carious root surfaces was noted for S. sanguis. The population of A. viscosus and A. naeslundii was similar in plaque samples from sound and carious sites but was elevated levels in the subjects with five or more new root surface lesions. |
| Q1 lacto 154 & Q1 m | 88 | Analytical and physiological variability of salivary | Bentley et al | Obs. Method validation and ident of sources | North Carolina | ? | Sal ms and lb. MSB and SL agars. Sample stability | As microbiologist (examiner training) | Important methods paper explaining some sources of variability. Were North Carolina | Sample collection, rather than sample processing, was found to be the major factor determining the imprecision of salivary microbial analysis in the majority of cases. However, individual subjects varied considerably in the consistency with which |

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| | | microbial counts | | of variability . Issue of time of day and before/after eating or brushing | | | was investigated over storage periods of up to 72 hr at 5 degrees C, room temperature, and 37 degrees C. Physiological variability was investigated by performance of serial analyses on ten individuals, who collected six samples at intervals on a single day, and rising and noon samples on ten subsequent days. | | group studies done according to Bentley's criteria as to sampling conditions or controlled at one or another condition? | they provided saliva samples.<br>Imprecision due to sample processing was relatively small, with coefficients of variations of 2.3% for MS counts and 2.1% for Lactobacillus counts.<br>Rising samples yielded higher counts than samples collected after breakfast and toothbrushing.<br>Day-to-day variability was considerable, with 95% confidence limits exceeding 1 log in 28% of data sets for MS count and 39% of data sets for Lactobacillus. |

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| Q1 lacto 155 & Q1 m | 87 | 155 Microbial conditions and caries increment 2 years after discontinuation of controlled antimicrobial measures in Swedish teenagers | Zickert et al | Longi, 2 yr. Follow up from interventional trial (Zickert et al AOB 1982; 27:861-8.) | Molndal, Sweden. Follow up of cohort in controlled antimicrobial tx using ms salivary titer as indicator/threshold to further antimicrob Tx. | 83 of 101 subjects avail for reeval. | As described in Q1 mutans #261 | As described in Q1 mutans #261 | As described in Q1 mutans #261 | The number of S. mutans and lactobacilli per ml of saliva within and between control and test groups was with few exceptions practically the same as 5 yr earlier.<br>During the post-treatment 3 yr period, the caries activity was similar in the control and test groups, and lower than during the experimental years especially in the control group. Subjects with initial S. mutans level of greater than 10(6) CFU per ml of saliva continued to show incremental caries scores higher than those subjects with lower S. mutans levels.<br>These differences did not now meet p< 0.05. Numbers in each stratum of control and test groups, stratified by mutans levels now to small to show signif differences, 2 yr after tx had been discontinued. Trends are seen for highest ms groups within both control and test groups.<br>Thus, either can interpret as underpowered study or as biological effect not lasting for 2 yrs in a statist signif way. |
| Q1 lacto 156 & Q1 m | 87 | Lactobacilli and Streptococcus mutans in saliva, diet and caries increment in 8- and 13-year-old children | Stecksen-Blicks | Obs, 2 cohorts by age | Umea, Sweden. Larger ongoing health study with random selection of subjs. | 88 8 yo; 97 13 yo/ 7 8 yr old and 4 13 yr old dropped out of diet study | Paraffin stim sal, Dentocult dip slide for ms and lb. | dmfs or DMFS , requiring penetration of probe for scoring, and BWs as required/ Single (examiner training) | If restorations needed, they were done before entrance to study, and sal sample taken 1 wk subsequently. Diet questionnaires with focus of analysis on sugars, sucrose and habits—by dietitians remote from this study and from | In the 8 yr olds, total sugar and sucrose consumption and number of meals per day were correlated with salivary ms (p<0.05 and p<0.01).<br>In the 13 yr olds, total meals per day were correl with lb (p<0.01).<br>Dietary parameters correlations with caries increment were generally low.<br>In the 13 yo group, however, sucrose consumption and number of meals per day were corrl with caries increment (p<0.05). |

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| | | | | | | | | | dentistry. Done in g/day. Measure of meal effects and specific substance consumption (g/day) probably not most critical for detecting possible effects. | |
| Q1 lacto 157<br>Q1 m | 87 | Dietary habits, gingival status and occurrence of Streptococcus mutans and lactobacilli as predictors of caries in 3-year-olds in Sweden | Schroder and Edwardsson | Obs; with stepwise pooling strategy based on caries status and retrospective eval of hypoth risk factors/correlates | Sweden; 3 yo/1st visit to dentist | All= 133 | Sal ms and lb | Dentist (examiner training) | Three levels of gingival status and dietary habits | Two groups in respect of dietary habits and oral hygiene were formed by stepwise pooling of the caries data for the nine possible combinations of oral hygiene and dietary habits, setting the most discriminating border (screening level) where sensitivity (0.86) and specificity (0.69) simultaneously reached their highest value. PV + was 0.58 and PV- 0.91. Higher predictive values were obtained when presence/absence of lactobacilli and of S. mutans were combined.<br>Combinations of defined levels of dietary habits, gingival status and presence/absence of lactobacilli showed sensitivity 0.87, specificity 0.95, PV + 0.87 and PV- 0.95, presence/absence of S. mutans sensitivity 0.94, specificity 0.76, PV + 0.74 and PV- 0.95. |
| Q1 lacto 158 | 87 | Caries prediction through combined use of incipient caries lesions, salivary buffering | Pienihakkinen | Volume missing. logistic regression models. | Hungary. Part of a cohort of collaborative WHO studies on xylitol. | 7-12 yo, stratified in analysis to those <9 and those >10 | Dentocult (DC), Oricult (OC) and Dentobuff chair-side methods. Hence DCOC acronym. | WHO | | Incipient lesions (INC) has OR of 7.1. DCOC gives OR of 2.8. Odds for being a caries active subject were about 20-fold in one group and 33.5-fold in greater than or equal to 10 yr in the other, when a child had positive values for INC and DCOC.<br><br>Another paper where the outcome variable is used as the predictor. A tautological argument. IT IS LIKE SAYING THAT A |

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| | | capacity, lactobacilli and yeasts in Hungary | | | | | Thus, no assay for ms. | | | PATIENT WITH A POSITIVE RENAL BIOPSY FOR LUPUS AT BASELINE CAN BE PREDICTED TO HAVE A CLINICAL DIAGNOSIS OF LUPUS SUBSEQUENTLY. OF WHAT USE IS THIS? |
| Q1 lacto 160 & Q1 m | 87 | Mutans streptococci, lactobacilli and caries prevalence in 11- and 12-year-old Icelandic children | Kohler and Bjarnason | Obs, xsec | Iceland | 217 Icelandic 11 and 12 yo | Parafffin stim sal S mutans, S sobrinus, and lb; VMGII and MSB and SL. | Dentist (examiner training) | | In 2% of the children mutans streptococci were not found whereas 31% and 35% of the 11-yr-olds and 12-yr-olds respectively carried more than 10(6) CFU per ml saliva.<br>The mean caries prevalence (DFS), initial caries included, for 11-yr-olds was 21.6 and for 12-yr-olds 28.8.<br>Both mutans streptococci and lactobacilli were significantly correlated to each other as well as to caries prevalence.<br>An increased number of these microorganisms, especially the mutans streptococci, were associated with an increased DFS.<br>Children with high salivary counts of mutans streptococci and lactobacilli had four times higher DFS than children with low numbers.<br>Children with both S. mutans and S. sobrinus had significantly higher salivary counts of mutans streptococci and lactobacilli as well as caries prevalence than children with only S. mutans.<br><br>Disc: The magnitude of salivary cariogenic bacteria as well as caries prevalence was found to resemble the situation in Sweden 10 yr ago. S. mutans (serotype c/e/f) was carried by all mutans streptococci positive children. S. sobrinus (serotype d/g) was found in 60 children (30.2%). |
| Q1 lacto 161 | 87 | Caries status | Klock and Krasse | Xsec randomiz | Bohuslan, Sweden, | 1973N=?; randomly | 8 am to 2 pm stim | WHO/ Four | Lower baseline decay | Both the number of cariogenic microorganisms and the caries prevalence |

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| & Q1 m | | and microbial conditions in children in 1973 and 1984 | | ed comparison of current with 11 yr-previous data set for comparable subjects | 9-12 yo | chosen =250 in 1984 | saliva collections, paraffin, VMGII, workup within 24 hr. MSB and Rogosa agars for ms and lb. Microscopic confirmation. | dentists, one from 11-yr-previous study. | prevalence and extimates of ms. / Widespread present use of F, more common antibiotic use. Estimated that sucrose and other diet factors not changed (but no data). | were significantly lower in 1984 than in 1973 (P less than 0.001). |
| Q1 lacto 163 & Q1 m & Q1 a | 87 | Proportions of Streptococcus mutans, lactobacilli and Actinomyces spp in root surface plaque | Fure et al | Case-control All subjects have root exposure | Gothenburg, Sweden. Dental school pts | 24 subj with root caries vs 24 with no root caries but with severe periodontitis | Plaque form lesions or surfaces of roots, RTF. MSB, SL, CFAT, and BA for ms, lb, actinos, and total flora, respectively. | Soft roots | | Higher proportions of S. mutans ($p<0.01$) and lactobacilli ($p<0.05$) in dental plaque samples taken from subjects suffering from root surface caries than in samples from subjects without root surface caries but with periodontitis (. The level of the group A. viscosus/naeslundii in the periodontitis group was higher than that found in the root surface caries group, but the difference was not statistically significant. |
| Q1 lacto 164 & Q1 m | 87 | A bacteriological study of rampant caries in children | Boue et al | Obs rampant caries cohort | 1-5 yo, sweetened pacifiers and/or nursing bottle at bedtime | 19 | Plaque samples from labial lesions, RTF, M1 broth for dilutions, | ? | | Aciduric flora, Streptococcus mutans, Veillonella, and Lactobacillus predominated in plaque over the lesions. Extracellular polysaccharide-producing streptococci other than S. mutans, as well as Actinomyces, were more abundant in plaque from sound surfaces. |

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| | | | | | beyond usual weaning period. Also freq cho-rich betw meal snacks in place of bottle. | | enriched Tsoy, MS, MSB, CNAC-20, and Beighton and Colman medium, Veilonella mediumand media for bacteroids, yeast, staph, and Rogosa SL. Multiple culture standards run. | | | |
| Q1 lacto 165 Also Q1 m215 | 87 | Caries in the primary teeth and salivary Streptococcus mutans and lactobacillus levels as indicators of caries in permanent teeth | Alaluusua et al | Obs, follow up to previous data collection | Helsinki, Finland | 129 teenagers with low caries activity | Paraf stim sal, dip slide MSB, | Visible decalcifications and xrs | | Results suggest that caries experience of primary dentition was associated with caries experience of subsequent permanent dentition. This assoc is stronger in subjs who were caries inactive and weaker in those who were caries active in the primary dentition. The caries activity in the now teenage cohort was low. |

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| Q1 lacto 166 & Q1 m | 86 | Long-term evaluation of root surface caries in periodontally treated patients | Ravald et al | 8 yr longi, | Linkoping, Sweden/ Pts following tx for advanced PD. | 35 | Paraffin stim saliva, poured over dip slides onto SL for lb; or into VMGII for MSB within 24 hr | Hix and O'leary method (76) – softening + FMX. | Perio parameters, plaque score, sal FR, oral sugar clearance rate," dietary habit index", age | Support previous findings from an initial 4-year period -- root surface caries occurs, though to a minor extent, in this patient category demonstrating good or excellent periodontal conditions after periodontal treatment.<br>A positive correlation between the baseline and final root surface caries scores.<br>After the second 4-year period, the salivary counts of S. mutans and lactobacilli, the plaque score and the dietary habits differed significantly between groups of subjects who had developed 0 or greater than 5 new DFS %. |
| Q1 lacto 167 | 86 | Salivary lactobacillus counts as a diagnostic and didactic tool in caries prevention | Crossner et al | 2.5 yr longi<br>12.5 yo<br><br>JOURNAL MISSING: CDOE VOL 14 NOT CLEAR WHETHER THIS IS A DATA PAPER OR AN ESSAY, FROM THE ABSTRACT | Sweden | 236 | | | | |
| Q1 lacto 168 & Q1 m | 86 | Quantitative comparisons of potentially | Brown et al | Obs, xsec, micro association with | Houston TX; 22 to 84 yo | 150 samples from 25 in situ teeth with initial | Plaque; comprehensive workup | ? | No F info, drugs, xerostomia etc. | Proportions of microorganisms did not differ significantly between noncarious enamel and root sites, but the noncarious coronal and root sites had higher ($p < 0.05$) proportions of actinomyces than did the root lesion. |

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| | | cariogenic microorganisms cultured from noncarious and carious root and coronal tooth surfaces | | sound and carious crown and root surfs | | RSC lesions and in 25 extracted teeth with advanced RSC lesions. There were 50 root and 10 enamel lesions and 47 sound root and 43 sound enamel samples. | | | | Enamel lesions had a greater (p< 0.05) percentage of Lactobacillus spp. than did root lesions.<br>The number of streptococci recovered from root lesions was greater (p< 0.01) than the number of actinomyces at the same site.<br>S. mutans was recovered from initial root lesions in greater numbers (p< 0.001) than were actinomyces and lactobacilli.<br>The number of S. mutans recovered at the initial root lesions was greater (p< 0.01) than that recovered from the advanced root lesions. |
| Q1 lacto 169 & Q1 m | 86 | Identifying children who will experience high caries increments | Bader et al | Discriminant anal on 18 month longi data with multiple hypothesized predictors recorded. Prediction performance assessed by comparisons with the actual high | Not identified/ Volunteers from another study. Prescreened to proved even distrib of caries prevalence among/across children in ages covered, then | 197 5-18 yo | Sal ms and lb by spatula tech and MSB and LBS agars, no stated confirmation | Explorer penetration and depth. DMFS/Examiner training and reliability not identified/ stated | Race, DMFS,defs, nujmber perm teeth present, fissure retentiveness, occlusal morphol, sex. | Prediction performance was assessed by comparisons with the actual high increment group, defined as those children with increments in the upper quartiles of the DMFS distributions within age groups.<br>The analyses predicted between 56% and 91% of actual high increment children depending on age group. The children identified in the analyses experienced between 59% and 91% of the disease experienced by the actual high increment groups. |

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| | | | | increment group, those with increments in the upper quartiles of DMFS within age groups. | divided by age group. | | | | | |
| Q1 lacto & Q1 m & Q1 a & Q1 s<br><br>handsearch | 85 | The microflora associated with the progression of incipient carious lesions of children living in a water-fluoridated area | Boyar and Bowden | Obs, 1 yr longi. Radiographic assessment of progressivity of lesions approximally, and correlated to microbiology. Compared incipient lesions with control sites which were initially lesion free. | Winnepeg, CA. Childrens Hosp dental clinic. | 22, age 4-9. | Plaque from approx by stripping, to RTF, to nonselective and selective agars for ms, lb, total flora, others. | Incipient lesions – by concurrence of 3 examiners of BW xrs. By 3 blinded examiners of xrs. Xrs done q6m for 1 yr./ Yes examiner blinding | | Lb present at 85% progressive lesions before clinical dx of progression made.<br>Lb was never isolated from non-progressive lesions.<br>Stat signif correls betw ms, lb, Veillonella and A. odontolyticus and p;rogressive lesions.<br>Stat signif negative correls betw progressivity and S. mitior, A naeslundii and A viscosus. |
| Q1 lacto 170 & Q1m | 85 | Salivary counts of lactobacilli and | Stecksen-Blicks | Obs. To observe value of adding | Sweden | 179 8-13 yo | Sal ms and lb | | | these tests or a combination of them are not specific in selecting caries risk patients. combination of the two tests, however, was more efficient in selecting these patients than |

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| | | Streptococcus mutans in caries prediction | | lactobacillus est to mutans in predicton of disease | | | | | | each test used by itself |
| Q1 lacto 171 | 85 | Collaborative WHO xylitol field studies in Hungary. III. Longitudinal counts of lactobacilli and yeasts in saliva | Pienihakkinen | An interventional trial on xylitol use vs F use, during which Dentocult (for lb) and Oricult N (for ye) was used for saliva eval. | Hungary | | | No caries scores reported here. Caries incidence data reported as component of this collaborative WHO trial by Scheinin et al . Acta Odon Scand 1985;43:327-47. | | No regular changes noted in salivary lb and/or ye in the two groups.<br>Data suggests that any caries increments are not detectably attributable to effects of regimens on either lb or ye.<br><br>Note that: Caries incidence data reported as component of this collaborative WHO trial by Scheinin et al . Acta Odon Scand 1985;43:327-47. Those data in abstract are that the 3 yr caries increments were 4.2 for the xylitol grp, 6.5 for the F supplement grp, and 7.7 for the control group.<br>Presumable others in this CDC will review that report. |
| Q1 lacto 172 | 85 | The microflora associated with developing lesions of nursing caries | Milnes and Bowden | One yr longi of micro of nursing caries | Canadian Indian chldrn | 9 | ? Post hoc Comprehensive plaque sample eval for implicated supraging bact | ? | | 5 developed lesions; 4 remained lesion free. No bacteriological correlates clear. |
| Q1 lacto 175 & Q1 m | 85 | Streptococcus mutans | Ellen et al | Obs, longitudinal for at | Canada; Described by | 45 | 7 plaque samples taken | Most, 6 monthly root | Many variables including salivation rate, | The presence or absence of S. mutans and lactobacilli in samples taken at baseline could discriminate between subjects who were to be |

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| | | and Lactobacillus detection in the assessment of dental root surface caries risk | | least 1 yr. | Banting et al in press at time of this pub./ Hospitalized pts avg 68.6 yr | | q6m over a period of 32 months for most subjs. Plaque from 150 root surfs, RTF, with eval on MS, SL, and enrichment media. | surface assessments during a 32 month period. | medications… | root-caries-active and those who were to remain root-caries-inactive during the subsequent observation period.<br>Moreover, if both bacteria were detected or only S. mutans was detected on a root surface at its entry into the study, that surface had a greater risk for developing a root lesion.<br>However, the tests <u>could not predict which root surfaces within the mouths of caries-active subjects</u> were to become carious. |
| Q1 lacto 176 & Q1 m | 85 | Longitudinal microbiological investigation of a hospitalized population of older adults with a high root surface caries risk | Ellen et al | Obs , 34 month longitudinal | London, Ontario, Canada, Elderly, hospitalized, root surfs at risk for caries. Thus, starts with intact root surfaces and follows longitudinally, a prospective study. | 44 subjects presenting 154 caries-free surfs. | Plaque, sharp instrument, tangentially drawn over depth of lesion. RTF and eval on dftl and selective and enrichment media for implicated bact | Discrete discoloration and soft. One examiner who also took plaque samples. Assessment at 12, 20, 24, 28,32, and 34 months | Many variables including salivation rate, medications… | The microbial count data were highly variable, precluding the finding of significant differences in caries association for either subjects or sites.<br>Streptococci, especially S. mutans, correlated highly with lactobacilli in the samples. |
| Q1 lacto 177 & Q1 m & Q1 a & Q1 s | 85 | The microflora associated with the progression of | Boyar and Bowden | Obs, 1 yr longi. Radiographic assessment of | Winnepeg , CA. Childrens Hosp dental clinic. | 22, age 4-9. | Plaque from approx by stripping, to RTF, to nonselecti | Incipient lesions – by concurrence of 3 examiners | | Lb present at 85% progressive lesions before clinical dx of progression made.<br>Lb was never isolated from non-progressive lesions.<br>Stat signif correls betw ms, lb, Veillonella and A. odontolyticus and p;rogressive lesions. |

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| | | incipient carious lesions of children living in a water-fluoridated area | | progressivity of lesions approximally, and correlated to microbiology. Compared incipient lesions with control sites which were initially lesion free. | | | ve and selective agars for ms, lb, total flora, others. | of BW xrs. By 3 blinded examiners of xrs. Xrs done q6m for 1 yr./ Yes examiner blinding | | Stat signif negative correls betw progressivity and S. mitior, A naeslundii and A viscosus. |
| Q1 lacto 178 & Q1 m | 84 | Longitudinal investigation of bacteriology of human fissure decay: epidemiological studies in molars shortly after eruption | Loesche et al | 3 yr longi, repeat obs of bacteria in occl fissures of first molars. Subjects stratified into 5 grps according to prior caries experience. | US 1st and 2nd graders, Coldwater, MI | 368. About 700 fissures studied | Plaque from occl fissures and workup for implicated orgs. MS, MM10, MSB, LBS. | | Non-fluoridated water<br><u>Strong, with parametric stats</u> | Teeth destined to become decayed exhibited a significant increase in the proportions of S. mutans from 6 to 24 months before the diagnosis of dental decay.<br>Lactobacilli were sporadically detected but when present were associated with dental decay.<br>Children whose teeth exhibited the greatest number of decayed surfaces had, at all time periods, significantly higher proportions of S. mutans than did children who were caries free.<br>Many teeth had high proportions of S. mutans at their entry into the study.<br>About 10% of the monitored teeth erupted during the period of observation, and in these teeth both S. mutans and lactobacilli could be significantly associated with decay.<br>In these newly erupted teeth S. mutans outnumbered lactobacilli by ca. 20 to 1. |

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| | | | | | | | | | | S. sanguis, veillonellae, and the unidentified actinomyces-like organism could not be associated with the development of decay. |
| Q1 lacto 180 & Q1 m | 84 | The effect of caries-preventive measures in mothers on dental caries and the oral presence of the bacteria Streptococcus mutans and lactobacilli in their children | Kohler et al | 3 yr longi, interventional (sucrose avoidance instruction, alternately assigned to Tx or control. Intervention delivered to mothers (or not) consisted of airm at reduction of S mutans, repeated q2-4m, till children 3 yo. Entry depended on sal ms of ≥1E6 ms and child of 3-8 mo. | Sweden, primiparous mothers | 40 control mothers; 37 test mothers/ 4 lost | Mothers: Sal ms. VMGII and MSB and SL. Children: If able to cooperate, paraf stim sal with RTF and MSB and SL. AB confirmation of identities of serotypes and species. | 2 dentists independently, criteria of Koch (stick with explorer/ No subject blinding | Breastfeeding? | The test mothers as a group showed approx. 10-fold fewer Strep. mutans during the test period.<br>At the age of 3 years, 70 per cent of the children in the control group carried Strep. mutans, compared with 41 per cent in the test group (p less than 0.01).<br>Fifty-two per cent of the children who carried Strep. mutans had caries at this age, compared to 3 per cent of the children without this organism.<br>The time when Strep. mutans was first detected in the children seemed to influence subsequent development of caries because 77 per cent of the children who carried Strep. mutans at the age of 15 months had caries at the age of 3 years.<br>Approximately 40 per cent of the children in both the control and the test group had detectable lactobacilli in their saliva at 3 years. In general, the children in the control group had more lactobacilli.<br>No signif diff in self reported frequency of sucrose intake. |
| Q1 lacto 181 | 84 | Factors predicting | Honkala et al | Prediction of caries | Kuopio, Finland, | 153 | Data by mail | Data by mail | Data by mail survey | In the multiple regression analyses, the final model (P less than 0.001) for girls included: |

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| | | caries risk in children | | risk using | 13 yo/ Data by mail survey | | survey | survey | Low. Mutans streptococci not analyzed. Can't be sure of quality of data collection discipline and uniformity of standards by the mail-in strategy. | DMF-index of the previous year (beta = 0.64) and lactobacillus count (beta = 0.31). The corresponding model for boys (P less than 0.001) included: DMF-index of the previous year (beta = 0.55) and frequency of consumption of sweets (beta = 0.24). (once again, disease existance predicts disease, an arguable tautology) |
| Q1 lacto 182 & Q1 m | 84 | Microbial characteristics of the human dental caries associated with prolonged bottle-feeding | Berkowitz et al | obs | Cleveland OH | 7 nursing bottle caries | Plaque from lesions and white spot margins and lesion-free smooth surfaces. 4-6 samples from ea subject. | dentist | Bottle contents detnd by hx. All with fruit juice and either milk or formula | All plaques contained unusually high proportions of Streptococcus mutans. The proportion of lactobacilli present in plaque from caries lesions was statistically greater (p< 0.01) than the proportion present in plaque obtained from white spot margins of these lesions or caries-free smooth enamel surfaces. |
| Q1 lacto 184 & Q1 m | 82 | Effect of caries preventive measures in children highly infected with the bacterium Streptococcus mutans | Zickert et al | 3 yr longi, interventional. Interv was 1 % CH gel qd x14 d which greatly reducted ms. Retreated those who | Sweden, 13-14 yo, schch. | N=101: 53 control; 48 test | Salivary ms ?lb q6m. All test had ≥ 2.5xE5 for inclusion. Data stratified according to ms level in saliva. MSB and | Mirror explorer. Gustafsson criteria.(1954). | For all subj, all carious lesions restored at baseline, defective fillings fixed, OH instructions, dietary advice, tooth cleaning and topic fluoride varnish. Also education re role of ms and lb in caries. | After 3 years, the mean number of new carious lesions was 9.6 in the control group and 4.2 in the test group. In the children with 10(6) Strep. mutans at the start of the study, the corresponding figures were 20.8 compared with 3.9. |

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| | | | | exceeded baseline inclusionary criterion when tested on 4 month basis. | | | Rogosa SL. | | strong | |
| Q1 lacto 185 & Q1 m | 82 | Streptococcus mutans, lactobacilli and dental health in 13-14-year-old Swedish children | Zickert et al | Obs, xsec. At baseline all subjs brought to good restorative status by restoration of all cavitated lesions, got diet advice, prof tooth cleaning, and F varnish | Molndal, Sweden, 13-14 yo/ All children in 4 classes | 101 | 2-5 weeks after tx completed—paraffin stim saliva, VMGII, MSB, SL for ms and lb. Biochem confirmation | BWs and white spots, ie. Incipient lesions then detected. | Plaque and gingivitis assess | DFS at baseline was 10.1 and 12.8 for girls and boys, ns.<br>Ms not detected in 11% while 21% had more than 10E6.<br>Lb not detected in 21% while 11% had more than 10E5..<br>There was statist signif correl betw ms and lb, betw ms and DFS, lb and DFS, and ms+lb and DFS.<br>Increasing numbers of ms and lb, alone and in combination were assoc with increased lesions. |
| Q1 lacto 186<br><br>& Q1 m | 82 | Oral flora of children with "nursing bottle caries" | Van Houte et al | Obs Nursing bottle caries micro correlates | Boston, MA Childrens's Hosp. Nursing bottle users. | 6 | Small samples of plaque from and near lesions and from sound surfaces. MS, SL and BA | Probe supplemented by xrs | Content of nursing bottles reveal both/or either milk or formula with sugar added and/or fruit juice. 2 children recently got penicillin, but not stated when or | S. mutans averaged about 60% of the total cultivable flora of dental plaque obtained from caries lesions, white spot margins of these lesions, or clinically-sound areas of upper anterior teeth, and averaged about 27% in plaque from mostly clinically-sound areas of posterior teeth of six children with nursing bottle caries; its concentrations in saliva averaged about 10% of the total cultivable flora.<br>The proportion of S. sanguis, in contrast to |

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| | | | | | | | for ms, lb and total flora, respectively. | | for how long. Important data set, despite small sample of subjects. Contributes to knowledge of biology of lesion initiation and its flora. | those of S. mutans, were very low in plaque from upper anterior teeth and higher in plaque from posterior teeth.<br>Lactobacilli -- in nearly all plaque samples; but plaque and carious material from cavities contained higher levels than plaque associated with white spots or clinically-sound tooth surfaces.<br>Support for the role of S. mutans in the initiation of human dental caries. In the case of lactobacilli, they support other evidence suggesting only the limited involvement of these organisms in the initiation of caries lesions, but a more extensive role in their progression.<br>In addition, they clearly illustrate the marked effect of diet on the dental plaque flora.<br>Highly signif diffs, statistically, in plaque samples over lesions, and white spots vs sound, despite the low N. |
| Q1 lacto 187 & Q1 m | 82 | A microbiological analysis of human early carious and non-carious fissures | Meiers et al | Obs, xsec, case control (caries free and caries active) | US naval recruits | 68 teeth sampled: 48 carious and 20 noncarious | Occl fissures sample with sterile burs; Total bacterial counts, total streptococcal counts, and counts of Streptococcus mutans, Streptococcus | dentist | | There was a four-fold increase in the total number of microorganisms recovered from carious (N = 48) compared to non-carious (N = 20) fissures.<br>S. mutans was the only microorganism common to all carious fissures |

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| | | | | | | | sanguis, Streptococcus faecalis, Actinomyces viscosus, and lactobacilli | | | |
| Q1 lacto 189 & Q1 m & Q2 m44 Q3 | 82 | Effect of caries preventive measures on Streptococcus mutans and lactobacilli in selected mothers | Kohler et al | Interventional, alternative assignment, longi study of primiparous mothers. Inclusion criterion included sal ms of ≥ 10E6/ml. Intervention: diet counseling (esp re sucrose avoidance, prof toothcleaning with F pumice, and OH instruc, topical F tx, | Oskarshamn, Sweden | All primip mothers= 249. Control=42; Tx=45 | Paraffin stim sal. VMGII, plated on next day on MSB and SL for ms and lb. | | 3-day diet diary and motivation to mother by information about increased caries risk for child if mother has high ms and risk behaviors. | A statistically significant reduction in both S. mutans and lactobacilli was found to result from Tx regimen p<0.001 for ms and <0.02 for lb.<br>The basic preventive program was effective in reducing the number of S. mutans below a selected threshold value of 3x10E5 cfu/ml saliva in 60% of the mothers.<br>In the remaining treated subjects chlorhexidine treatment was required to suppress the salivary levels of S. mutans below this value by about 1 log, but lactobacilli were unaffected..<br><br>Study established a complex, microbial recovery-guided strategy for reduction of ms. |

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| | | | | excavation of larger cavities and temp fillings, then F varnish. If at followup, pt has ≥3 x 10E5 ms, 1% CH gel daily for 2 wks. Controls: std care. | | | | | | |
| Q1 lacto 190 & Q1 m | 81 | Lactobacilli in human dental plaque and saliva | Van Houte et al | Obs Compared no-F (N=9) with F-supplemented (N=21) subjects | Boston, MA | 238 plaque samples from fissures and approximals. | Plaque samples from fissures and approximals. Salivary samples. Total flora and lb on BA and SL plates. Data expressed as frequency of isolation re plaque and in absolute counts in | | | Lactobacilli were isolated from about 50% of plaques from sound tooth surfaces of human subjects who had ingested fluoride (F) supplements since their births or subjects with negligible systemic fluoride exposure.<br>In about 10% of these plaques, the proportions were 1% or higher of the total flora.<br>Lactobacilli were not always isolated from caries-associated plaques.<br><br>Too small a sample of carious lesions to ascribe great signif; however, consistent with important Duchin and van Houte AOB 23:779-786,1978. This is Q1 mutans #275. |

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| | | | | | | | saliva. | | | |
| Q1 lacto 192 | 81 | Cariogenicity of human plaque lactobacilli in gnotobiotic rats | Fitzgerald R | Obs. To test cariogenicity of human lactobacilli in gnoto rat model | 32 strain of human lactobacilli, of 8 species | | Std gnoto rat technique | | High sucrose diet<br>Important to confirm cariogenic potential of lactobacilli and expression of virulence in sheltered areas, such as fissures/existing cavitation | 17 of 32 moderately to highly cariogenic, and only one, a strain of Lactobacillus lactis, was scored as non-cariogenic.<br>The molar fissures were the predominant site of caries attack. Primary lesions of the smooth surfaces were infrequently seen.<br>Preferential location of caries in the sheltered fissure sites was attributed to their inability to form adherent plaque deposits on the smooth surfaces of the teeth. |
| Q1 lacto 193 | 81 | Salivary lactobacillus counts in the prediction of caries activity | Crossner | Longi<br><br>14 yo | Orebro, Sweden | 115 | Over 64 weeks, 7 saliva samples. Paraffin stim sal, during school early am time.Dipslide method for lb. | Over 64 weeks, 3 clinical recordings.<br>One observer, not stipulation of criterion for calling a lesion./ Question arises due to frequency of reexam of same subjects. | Saliva secretion rate.<br>Did not analyze for ms, so that hard to discern how much lesion increment may have been associated with another implicated bacterium in the prediction model. | Statistically significant correlations between caries activity on the one hand, and lesion frequency and lactobacillus counts on the other. ALTHOUGH THIS IS CLAIMED, REVIEWER CANNOT SPOT THE SIGNIFICANCE VALUES IN THE PAPER.<br>It is important that there are no areas of microbial retention on the teeth such as open carious lesions, poorly executed restorations, dentures or orthodontic bands. In such situations, the lactobacillus count seems to reflect the frequency of ingested fermentable carbohydrates and thus, indirectly, the risk of initiating carious lesions. |
| Q1 lacto 195<br>& Q1 m | 80 | Microflora and chemical composition of dental plaque | Hoover et al | Cases of HFI who restrict sugar intake vs controls who do | US and Switzerland.<br>Age of cases is 6-54 yo, avg 29 | 17 HFI and 14 controls. (equal propostions of cases | Supragingival plaque from smooth surfs, fissures and | Refers to other paper of Newbrunre caries scores (submitted | Est that controls ate 20x the amount of sucrose as the HFI/ Inevitable confounder is that HFI | Of 271 samples from HFI and 220 samples from controls, no difference in freq of isolation of sanguis (233/271 vs 185/220) but large diffs in freq of isolation of mutans (71/271 vs 159/220) and of lactobacilli 28/271 vs 88/220.<br><br>Total cfu/microg plaque is the same for cases |

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| | | from subjects with hereditary fructose intolerance | | not have HFI nor restrict sugar intake. | yo. Control age 9-55, avg 26.5 yo | and controls from US and Switz.) | approx (i.e. extensive sampling). Workup for sanguis, mutans, lactobacilli. Data in terms of both isolation freq from samples and bacterial cfu/unit protein of plaque. | ) | subjects don't have lesions or much restorative experience vs controls. Important biological principle re impact of sugar. | and controls.<br>Ms cfu/microg plaque is 7 x 10E1 for cases and 3 x 10E4 for controls. There was one exception HFI subject whose cfu ms was like that of controls. Authors didn't supply statists, but likely highly signif.<br>Comparable total cfu/microg plaque for lactobacilli not provided, perhaps because of lower freq of isolation in cases. |
| Q1 lacto 196 | 80 | Cariogenicity of human oral lactobacilli in hamsters | Fitzgerald R et al | Obs. To test cariogenicity of human lactobacilli in conventional hamster model, free of ms | 50 lb isolates from Puerto Rican children | | Confirmed that isolates are lb. Confirmed that hamsters free of ms, unless inoculated by them. | | Caries test diet made with either sucrose, glucose, or starch (56% w/w)<br>Important insight to biol of lactobacilli and need for fissure anatomy for colonization | Only 3 of 50 strains of lactobacilli isolated from dental plaque of school children induced significant caries activity in conventional hamsters.<br>Sucrose was a required dietary cariogenic substrate and could not be replaced with glucose or starch.<br>This contrasts to cariogenic strains of Streptococcus mutans (by literature comparison and by running one control group inoculated by S mutans). |
| Q1 lacto 197 & Q1 m | 79 | Longitudinal investigation of the role of Streptococcus | Loesche and Straffon | Longi study of fissure microbiol | Michigan, patients at dental school clinic; | 52 5-12 yo ; 195 teeth; 42 with carious fissures; 153 | Plaque sampling and comprehensive workup including | Explorer catch. All detected lesions were confirmed as such | All teeth restored before entry to study<br>Very good micro and stats (para and non para) | Longitudinal analysis, which showed the the proportions of S. mutans to increase significantly at the time of caries diagnosis, Cross-sectional comparisons, which showed that the proportions of S. mutans in the carious fissures were significantly higher than in caries-free fissures. |

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| | | mutans in human fissure decay | | | | noncarious fissures/ Couldn't spot it. There must have been some. (lost) | ms, lb and sanguis. MS, MSB, MM10, BA, etc | by staff pedodontist and thereafter restored, as ethically demanded./ Dentist, single examiner. | | Three subjects who had a low caries expereince developed five new carious lesions.<br>Lactobacilli were prominent members of the caries-associated flora in these subjects greatly outnumbering S. mutans.<br>The levels and proportions of S. sanguis tended to be higher in the caries-free fissures. |
| Q1 lacto 199 & Q1 m | 78 | Relationship of Streptococcus mutans and lactobacilli to incipient smooth surface dental caries in man | Duchin and van Houte | Obs, | Boston, MA | 2 grps of 5 6-12 yo child with multiple carious teeth | Minute sharp explorer tip samples of plaque across white spot lesions. Adjacent and distant sound surfaces similarly sampled. Workup on MS, MSB and MS without tellurite, and Rogosa for lb. | Visual, after removal of small area adjacent plaque | Plaque score 3 by Silness and Loe and debris score 3 by Greene and Vermillion | Proportions of ms much higher over ws lesions than adjacent or distant sites.<br>Lactos not recovered from ws sites but were recovered from adjacent sound tooth sites.<br>Topographical assoc of far higher % ms with incipient lesions (ms).<br>Extensive statist support. |
| Q1 lacto 200 & Q1 m | 77 | Microbial and salivary | Klock and Krasse | Obs, xsec | Tjorn, Sweden | 655, 9-12 yo | Paraffin stim sal, VMGII, | 2 dentists, clin + xrs. Gustafsso | | Positive correlations were observed between S. mutans and lactobacilli.<br>Between S. mutans and incipient smooth |

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| | | conditions in 9- to 12-year-old children | | | | | MSB and SL for ms and lb. | n criteria. | | surface caries.<br>Between lactobacilli and open carious lesions.<br>Nonpara stats (p<0.01) for all of above. |
| Q1 lacto 201<br>& Q1 m | 77 | A longitudinal epidemiological study on dental plaque and the development of dental caries--interim results after two years | Hardie et al | 2 yr longi, | UK | 50 child (avg age 12.5) recruited from 700 in a longi epi study. 19 of these studied. | Premolar plaque sites sampled tiy, bilaterally by abrasive strip method. Total of 224 samples. Comprehensvie workup for facultative bact and categorization by gram stain | Bws at alternate exams, 2 evaluators / Trained examiner | Pooling of approx plaque inevitable by abrasive stip meth. | During the two-year period, caries developed at 20% of the target premolar sites.<br>The microbial composition of plaque samples from caries-free sites and from carious sites before and after radiographic detection of lesions was broadly similar.<br>Numerical domination of particular sites by S mutans before detection of caries can occur, but has only been observed so far in 2 of 15 sites.<br>Pooled data from sites which have developed lesions indicate a rise in the isolation frequency and mean numbers of S. mutans after detection of caries.<br>In two of 15 instances no isolations of S mutans were made from sites which developed caries.<br>To date, no single species appears to be uniquely associated with the onset of dental caries. |
| Q1 lacto 203<br>& Q1 s<br>& Q1 m<br><br>& Q2 m hand search | 75 | Lactobacilli and streptococci in the mouth of children | Carlsson J et al Caries Res 9:333-9,1975 | 5 yr longi, randomized, observational | Umea, Sweden | 30 /9 (moved) | Cotton swabs of mouth; VMGII. culture on MS agar and MC (Carlsson's selective medium | | Selective medium for ms (MC) later shown to miss large proportion of ms.<br><br>Conceptually important paper re life history of oral flora | Oral establishment of diverse species of strep and lactobacilli followed for 5 yr in 25 children, from birth.<br>S salivarius established in mouth within day 1 ex-utero.<br>S sanguis not noted until after eruption of teeth.<br>S mutans not noted until after eruption of teeth, except appearance is more gradual among cohort (by 5 yo, 15/25 colonized).<br>Lactobacilli recovered in low numbers and at |

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| | | | | | | | for S mutans) and SL for lb. | | colonization and ecological niches. | less than 2 yo appeared most likely to be transient oral inhabitants.<br>While there was association between development of carious lesions and colonization prevalence of S mutans, this was not statist signif.<br>Data suggest that initiation of carious lesions cannot be attributed to lactos and that colonization of mouth by S salivarius cannot be dependent on non-shedding surfaces. |
| Q1 lacto 197<br>& Q1 m | 73 | The predominant cultivable flora of carious plaque and carious dentine | Loesche and Syed | Obs<br>To quantify recovery of bacteria from localized approximal lesion sites in plaque and in carious dentin of them. | Ann Arbor, MI, dental school | 12 child donors. | Floss collection of plaque, to RTF. Plate on MM10, MS for total and differential for ms, and for streptococci. Aerobic and anaerobic conditions. | | | L. casei was prominent in dentin isolates (about 21% of all isolates. |
| Q1 lacto 208<br><br>&<br>Q1 m280 | 73 | Changes in Streptococcus mutans and lactobacilli in plaque in relation to the initiation | Ikeda et al | 18 mo longi study Black chld. | Birmingham AL, | 12 selected from 25. With lesion free lower 1st molar contacting a lesion free lower decid molar/0 | Sampled same tooth sites at baseline, 3, 6 and 12 mos. MS and Rogosa SL. | At baseline, 3, 6, 12 and 18 mos, teeth examined for appearance of lesions visually and by xr. | 7-9 yr old at baseline | Mean number of S mutans increased with time on each of the 3 surfaces, it remained much higher in pits and fissures than on buccal and approx surfs.<br>Initiation of lesions tended to be preceded by elevated numbers of both sm and lb.<br>However, lb became sizeable proportion of plaque biota only after appearance of lesions<br>Lesions often occurred in absence of lb, but not in absence of Sm. |

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| | | of dental caries in Negro children | | | | lost | | 3 sites sampled each time/ dentist | | |
| Q1 lacto<br><br>Handsearch | 72 | Ecology of human oral lactobacilli. Infect Immun 6:723-729, 1972. | Van Houte J, Gibbons RJ, and Pulkkinen AJ. | obs | Boston, MA 11 13 yo children and presumably 5 adults for distributional studies. 5 donors and subjects of 22-38 yo for adherence studies | | Plaque and saliva samples SL agar and BA. Tagged cells for adherence studies so can be dftlly counted. | | Powerful insight to the operation of the oral ecology | Proportions of lactobacilli in saliva as a percent of total flora are 10-100 fold higher than found on the tooth surface, but are comparable to those found on eptithelial surfaces.<br>Adherence of 2 speciaes of lactobacilli to epith cells experimentally demonstrated to be high, esp to the tongue dorsum.<br>Adherence to teeth is very poor.<br>Can deduce that lactos on teeth at least initially are salivary contaminants of the teeth and that they are present in saliva as result of epithelial sloughing of soft tissues, esp the tongue dorsum's. |
| Q1 lacto<br><br>& Q1 m<br><br>handsearch | 67 | Studies of oral health in persons nourished by stomach tube – II. Acidogenic properties and selected bacterial components of plaque | Littleton NW et al Arch Oral Biol 12:601-609, 1967 | Case-control. | Hospitalized pts in Orlando, FL | 7 subj nourished by intragastric tube exclusively for ≥32 months and 9 subj fed p.o. | Plaque. MS, SL and BA with beef ext and starch for streps and ms, lb, and total and filamentous bacteria, respectively | | No mention made of why pts tube fed. No mention of antibiotic tx, but would have been said, likely, if it was done, in a bacteriological study.<br>To have streptoccci and lactobacilli as prominent in plaque and acidogenic inn plaque, one | Higher baseline pH and less acidogenicity of plaques from gavaged than normally fed.<br>Less acidogenicity of streptococci in gavaged patients than normals.<br>Lower lb and streptococci /mg plaque from tube fed than orally fed. |

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| | | material | | | | | | | needs to feed sugars. Powerful insight to the operation of the oral ecology | |
| Q1 lacto<br><br>handsearch | 46 | The microbic flora of the dental plaque in relation to the beginning of caries | Hemmens ES et al. J. Dent Res 1946; 25:195-205. | Obs, longi | Chicago | 85 children with 269 tooth areas, cultured repeatedly so that 939 cultures taken | Plaque form erupting premolar, approximal surfs. Lb on tomato juice agar | Explorer and BWs, done q3m. | Powerful insight to the operation of the oral ecology | Unlike streptococci and diphtheroids, lactobacilli are not frequently (freq = 0.5) recovered until about 6+ years after eruption of bicuspid approximal cultured and until 18 mos after lesion detected.<br>Implies that lactobacilli are late colonizers of teeth and that they may do so with frequency only after lesions are clinically/radiographically detectable. |
| Q1 lacto<br><br>handsearch | 38 | A comparison of the bacterial flora of different mouths. J Dent Res 1938; 17:432-429. | Bibby | obs | Rochester, NY | 20 | Plaque from teeth | | Powerful insight to the operation of the oral ecology | Bacilli (and thus lactobacilli) are in very low numbers on the teeth as a proportion of total flora.<br>Implies that lactobacilli are not a prime colonizer in the plaque. |
| | | There were no further references retrieved by Embase search which met inclusiona | | | | | | | | |

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| | | ry criteria. | | | | | | | | |

**Evidence Table Mutans Streptococci Question 1**

Question 1: Are subjects who have high levels of specific oral microorganisms at an increased or decreased risk for developing carious lesions compared to subjects who do not have high levels of those same microorganisms?
Primary coronal, permanent coronal, permanent root, mixed dentition. Primary lesions only.

| # | Y. | Paper title | Authors | Design per AHRQ | Sample source/country/method/response rate | No subj, each grp/No subj lost | Micro methods/Evaluator blinding | Lesion detection/ Exam training/Exam reliability/Exam blinding/subj blinding | Other relevant data, questionnaires, confounders, demography<br><br>Methods issues. | Findings (stat measures: means, odds ratios, risk ratios, likelihood ratios, sensitivity, specificity, conf intervals<br><br>Data issues |
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| Q1 m3 | 00 | The fidelity of mutans streptococci transmission and caries status correlate with breast-feeding experience among Chinese families | Li et al | Obs cohort as f(breast feeding) | Beijing, China; families with 2-3 yo children | 48 fams | Assesses prevalence of ms only. Pooled plaque from prox surfs of upper and lower teeth, to VMGII to MSB. Then, DNA fingerprinting of random cfus. | WHO criteria 1987./ NA re infection | Breast feeding, nurture/? diet other food, prechewing of food by mothers? | 66% of children colonized by ms assoc with 46 % of decay.<br>Among the children whose chromosomal DNA fingerprint genotypes of ms matched that of their mothers, 88% were breast-fed compared with only 12% who were not breast-fed (p = 0.03).<br>Children who were breast-fed for more than 9 months were likely to harbor strains of ms common to their mothers (p = 0.04) and experience more dental caries (dmft = 4.4) at 3 years of age compared with children who were breast-fed less than 9 months (dmft = 1.4, p = 0.04).<br>Data suggest that breast-feeding, especially prolonged breast-feeding, may correlate with the fidelity of transmission and that prolonged breast-feeding may contribute to a higher caries rate. |
| Q1 m4 & Q1 lacto | 00 | Cariogenic oral flora and its relation to dental caries | Llena-Puy et al | Obs, xsec, | 12-13 yo. Presumably, Valencia, Spain | 167 | PSS, then plastic slide with impregnation to dorsum of tongue and cheek, then put in culture medium. Sounds like Strip Mutans, but not explicit. Dentocult SM and LB.<br>3 categories of | DMFT/S with probe, per WHO/ Cohen Kappa =0.99 | | Signif correl betw infec by ms and lb and lesion status p<0.001.<br>No signif predictive values;<br>Methods more effective identifying health than patients requiring tx.<br>OR for DMFT was 6.2 for ms; 6.3 for lb. |

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| | | | | | | | semiquant scale: <10E5; 10E5-10E6; >10E6. | | | |
| Q1 m5 & Q1 lact o | 00 | Caries-associated micro-organisms in infants from different socio-economic backgrounds in Scotland | Radford et | Obs, xsec | 1 yo; 73% of all children born in one yr in Dundee, Scotland, diverse SES | 1393/xsec | Tongue loop to anaerobic medium, kept cool, processed according to Beighton with MSB and Rogosa SL and Sabdex. | One examiner, visual only, per WHO/ Calib exam training | SES analysis of deprivation/ No detected SES effect | 95% CI with nonparametric stats:<br>S. m, lb and y were isolated more frequently from those infants with caries /those who were caries-free (S. m: 29.7 vs 9.8%, P=0.0008; lb: 15.4 vs 4.3%, P=0.0073; y: 23.7 vs 10.4%, P=0.0016-Fisher's exact test.<br>No signif diffs in % of various types of bacteria in tongue flora as a f(SES). |
| Q1 m6<br><br>& Q2 | 2000 | Influence of maternal xylitol consumption on acquisition of mutans streptococci by infants | Soderling et al | Intervent; randomized assign | 169 M/C pairs Finland | 106 Xyl gum mothers<br>30 CH varnish mothers<br>33 F varnish mothers/ | Mother—saliva Child. – saliva MSB | this was transmission study. Blinding: children, yes; mothers, no. Experienced examiner training/ Experienced, single examin pre/post calib | Time of institution of interventions/<br><u>Also q2</u><br><br>Completed by caries scores longitudinally. See 2000 Isokangas study which supplies caries data. | The salivary ms levels of the mothers remained high and not significantly different among the three study groups throughout 2 yr study. At two years of age, 9.7% of the children in the xylitol, 28.6% in the CH, and 48.5% in the F varnish group showed a detectable level of MS. p<0.??? |
| Q1 m7 | 99 | Subsidized dental care associated with lower mutans streptococci count in male industrial workers | Ahlberg J | Obs, subsidized vs non-subsidized male indust workers, | Helsinki, Finland, male industrial workers, 38-65 yo | 315 subsidized dental care vs 168 nonsubsidized | Npo 2 h before PSS, Strip Mutans and semiquantitated. | compares DT among subjects/ Experienced dentist clin res/ | oil refinery (subsidized); nonsubsidized from 3 other companies and pay out of pocket, without reimbursement source./ Filling or nonfilling of lesions<br><br>Small but signif diff betw groups in p visits to dentist in a yr | The study groups had similar dental status. A total of 92% subsidized employees had visited a dentist within the past 2 years, while 82% in the control group had done so (P< 0.01).<br>Note that on avg, 20.5 and 21.9 teeth in subsidized and control subjs, respectively.<br>Filled teeth 12.1 vs 12.3, respecitively.<br>No of sound teeth is 7.3 vs 7.3 in these same two groups.<br>Mean number D teeth signif lower in the subsidized group (0.4, SD 1.2) than in the control group (1.7, SD 3.2) (P< 0.001). [this is a big difference considering how many teeth were at risk for new lesions].<br><br>According to the trend test, men in the subsidized |

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| | | | | | | | | | | group tended to have a lower ms count than the control employees (P< 0.01). Results suggest decayed teeth and "resevoirs" for ms. |
| Q1 m8 & Q1 lact o | 99 | Dental caries and caries-associated microorganisms in Uruguayan preschool children | Angulo et al | Obs, Low vs higher SES | Montevideao, Uruguayan children, preschool, kindergartens, 3-5 yr old/Tongue loop, validated vs spit | 76: 22 Las Acacia; 54 Pocitos | Saliva and tongue loop. MSB and Rogosa agar, for ms and lb. Confirmatory biochemical/ physiological tests. Data both as categorical (presence or absence) and as continuous variable. | WHO, no xrs | Gingivitis SES variables | More children from the low socioeconomic area of Las Acacias had caries (68%) than children from the middle- to upper-class neighborhood of Pocitos (19%). They also had poorer oral hygiene and signif higher caries prevalence (P < 0.05) than those from Pocitos. |
| Q1 m1 0 | 99 | Caries-preventive effect of topical amine fluoride in children with high and low salivary levels of mutans streptococci | Brambilla et al | Prospective, intervent, randomized by student, double blind. Amine F (1%) q6m profess applied q6m for 5 yr to 1st permanent molars only vs placebo. Threshold ID of high set at 10E5. After examination of micro data, split into four subgroups: A high (Ah), A low (Al), Bh and Bl. A is for amine F, B is control. | Milan, Italy, 6 yr old schchild. Random assign by student | 284/36 lost | PSS, immediate transfer to lab with workup within 6 h.MSB. | WHO-DMFT. No xrs. Eval q6m./ Interexaminer variabil evaluated | 0.2 ppm F; basic preventive program, all stuents: OH instruction, biannual, brushing instruct and diet info; 1 mg F/day, ie 2.3 mg NaF by talbets dispensed daily (all used it). Brush and toothpaste supplied to everyone. Not clear in F in paste. | The mean DMFT in the experimental and control groups were 0.56 and 0.22, respectively, at the beginning, and 1.14 and 2.06 after 5 years. Survival analysis, performed on the first molar data split by salivary ms group, showed a significantly higher caries reduction in low-SMS experimental group subjects compared to low-SMS control group subjects after 5 years. No significant differences were found between the two high-SMS experimental and control groups. Findings indicate that the preventive effects of the treatment were significantly lower in subjects who had high SMS. Note that they demonstrate good tx effect re caries, but not attributable to antimutans effects, just as one might hypothesize from the nature of the intervention. |
| Q1 m1 1 | 99 | Salivary mutans streptococci | Brambilla et al | obs | Turin, Italy From child 9-13 | No grps N=473 | PSS, liquid N2 tspt, ms and lb on MSB and SL | WHO criteria for DMFT. | 0.1 ppm F, CPITN | Statistically positive relationship (P < 0.01) between the levels of ms and lb. Both were significantly correlated to caries (P < |

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| & Q1 lact o | | and lactobacilli in 9- and 13-year-old Italian schoolchildren and the relation to oral health | | | yo/randomly chosen schools resulting in distrib of SES. Consent denied by 27 parents. | | agars. Fresh samples to lab to confirm freezing OK. | CPITN using the WHO criteria/ Correlation coeff betw frozen and unfrozen counts is r=0.989. | | 0.01). |
| Q1 m12 & Q1 lact o | 99 | Associations between microbiological and salivary caries activity tests and caries experience in Hungarian adolescents | Gabris et al | obs | Budapest,Hungary, 14-16 yo | 349 | PSS for ms, lb, ye; Dentocult SM, Dentocult LB, Orocult N; Dentobuff strip | 2 examin; DMFT DMFS/ calib, examin training | | Statistically significant correlations were found between DMFT, DMFS mean values, and salivary microbiological counts. |
| Q1 m16 & Q1 lact o | 99 | Saliva, salivary micro-organisms, and oral health in the home-dwelling of old elderly--a five-year longitudinal study | Narhi et al | 5 yr longi, obs | Tot=900; 600 invited to dental exam of 651 who had medical exam. Elderly, Finland, root caries<br>Living in grp home. Part of Helsinki Aging Study. | Saliva from 271, final cohort 209./ 62 lost | Saliva betw 8 –11 am, npo 1 hr, PSS, Dentocult SM strip; Dentocult LB; Orocult N for ye. Range scores. | 4 faculty examiners, dePaola 89 criteria for decayed root surfaces. Computed RCI. Reexams on subset of 19 subjs by 2 examiners gave 93% and 89% agreement for root surfs at risk and status of | Variable # teeth, prostheses. Classified as to no medications; 1-3 meds, ≥4 meds/ Randomized confounders/ Highly variable status at baseline (# teeth, salivation status, medications, OH, RPDs increase counts, variable RPDs). | Salivary microbial counts were clearly associated with the subjects' dentition types: More denture-wearers had high microbial counts than persons with natural dentitions.<br>None of the salivary factors correlated with the root caries incidence or the number of teeth lost during the five-year follow-up. |

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| | | | | | | | | root, respectively | | |
| Q1 m17 | 99 | First permanent molar: first indicator of dental caries activity in initial mixed dentition | Noronha et al | obs | Belo Horizont, Minas Gerais, Brazil | 81, 7-8 yo schchild | Saliva ms, method ambig. | After cleaning and drying, dmfs and DMFS | | Whereas dmfs did not present a positive correlation, DMFS was significantly correlated with salivary ms levels.<br>The first permanent molars of the schoolchildren studied comprised 87.3% of the affected surfaces recorded in the DMFS, suggesting that the development of new lesions was preferentially located on the surfaces of the first permanent molars. |
| Q1 m20 | 99 | Prevalence of caries in urban Australian aborigines aged 1-3.5 years | Seow et al | Obs, xsec | Brisbane, Australia, Aborigines1-3.5 yo, random selection | 147 | Spatula, Strip Mutans | WHO | Mothers questioned re brushing, F supplements, Sleeptime sugared milk as variable | Increased caries experience of the infants was strongly associated with high dental plaque scores, high levels of S mutans infection, and sleep-time consumption of milk containing added sugar. Signif level set at p<0.05. |
| Q1 m21 | 99 | Salivary mutans streptococci and caries development in the primary and mixed dentitions of children | Thibodeau and O'Sullivan | Obs, longi (6th yr) | CT, headstart, minority low SES<br>Mean baseline age 3.8 y.<br>This evaluation at mean age 9.8 yr | 85 studied; 377 lost. | Saliva by tongue blade, Kimmel-Tinanof medium, categorized as low, med, high ms | Radicke/ Same examiner as earlier years? | Fluoridated community/ Deciduous teeth being shed, effect noted on dmfs decline . DMFS not changing between age 8 and 9./ High attrition rate | Children classified as high caries risk at baseline had significantly greater (P<0.05) dmfs scores for all teeth, and in the primary molars, than children classified as moderate or low caries risk at every age but 9 (P<0.10).<br>Children classified as high risk at age 3 had the greatest DMFS increment through age 8.<br>Based on annual examinations, there was a trend towards increasing mean dmfs/DMFS scores among children classified as high risk in every year. |
| Q1 m22 & Q1 lacto & Q1 a | 99 | Mutans streptococci and other caries-associated acidogenic bacteria in five-year-old children in South Africa | Toi et al | obs | Johanesburg and Soweto, South, African blacks and coloreds,<br>5 yo. | 140; 44 European/Malay/Black termed colored. | Both saliva and plaque sampling from teeth 55 and 75, not pooled.<br>Plaque quantified by protein anal.<br>Selective agars for ms, lb, veillonella, actinos<br>Confirmed biochemically | WHO, dmfs, ds/ Not examiner blinded with regard to ethnicity | | Pearson correlations showed low yet statistically significant correlations between plaque mutans streptococci counts and the number of decayed surfaces (ds) and decayed, missing and filled surfaces (dmfs) of primary teeth in blacks and in coloreds (historical race classification).<br>Salivary mutans streptococci counts correlated with ds and dmfs in coloreds.<br>No relationship was found between ds, dmfs and Lactobacillus, Actinomyces or Veillonella numbers.<br>Significant associations were evident between plaque mutans streptococci and Veillonella and Lactobacillus in black children with caries and between plaque mutans streptococci and Actinomyces and Lactobacillus and Veillonella in colored children. |

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| Q1 m23 & Q1 lacto | 99 | Pre- and post-treatment levels of salivary mutans streptococci and lactobacilli in pre-school children | Twetman | Intervent, longitud effect of restoration on ms and lb. Intervent: restorative rehabilitation under general anesthesia involving extraction, filling, and grinding of teeth. All fillings with glass ionomer cement. If poss, anterior approx surfaces done by grinding rather than restoration. Compared pre with post-treatment microbiology. | 108 preschool with severe caries; Sweden, PH clinic. 2.5 – 6.0 yo, avg 4.4 yo. | 108/ no blinding/16 lost | Saliv ms and lb q6m, by Dentocult Strip Mutans and Dentocult LB. Semiquant scale. | WHO with explorer. Scored on primary teeth./ No effect on micro (examiner blinding)/ no subject blinding | 62 % not of Swedish birth. Questionnaire to parents re diet, habits re diet. (Computer printout of paper does not display graphs and tables.) | Post-treatment levels of ms and lb were significantly reduced (P < 0.001) compared to pretreatment levels.<br>Lb levels were more dramatically reduced than ms.<br>The reduction of ms was positively correlated to the number of extracted teeth (P < 0.01), but not to the number of restored or ground [sound?] surfaces.<br>Lb reduction was not significantly related to the type of treatment. |
| Q1 m27 | 98 | Effect on caries experience of a long-term preventive program for mothers and children starting during pregnancy | Gunay et al | Intervent longi. 2 cohorts. No stip made re randomization.<br>Intervention – <u>In phase 1</u>: Individualized OH instruct, prof cleaning, topical F varnish, CH rinse, diet counsel.<br>Also, to selected high risk mothers, | Hannover, Germany 86 pregnant females, diverse SES, 3 phase longi study of children | Intervent with individ prophylatic care: 86 M/C pairs at baseline; 54 M/C pairs at age 3; 47 M/C pairs at age 4.<br>Control 65 M/C pairs at age 3; 45 M/C pairs at age 4.<br>Interv: baseline to 3 yr –32; 3 yr to 4 yr –7. | Salivary ms Dentocult SM | dmfs, DMFT | Approximal plaque index (API), community periodonal index of treatment need (CPITN)/ Mothers oral health improved among intervention group | All children in the second phase of the study group revealed a naturally healthy dentition with an API of 0-25% and a salivary S. m score of 0 (0-10(3) cfu/ml).<br>In the third phase, only four of the 47 children of the study group had lesions, with a mean dmfs of 1.5.<br>No S. m could be detected in 20 (42.6%) children.<br>Ten (21.3%) children of the study group had S. m score of > or = 2 (> 10(5) cfu/ml).<br>In contrast, only 53 of the 65 children of the control group (second phase) and 26 of the 45 control children (third phase) revealed a naturally healthy dentition.<br>The remaining 19 children of the control group revealed a mean dmf-s of 7.0 at 4 years of age.<br>In the control group, no S. m could be detected in 25 (38.5%) children at 3 yo whereas 21 (32.3%) children had S. mutans score of ≥2. |

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| | | | | "need-related" instrucs to prevent transmission and bad diet habit to babies. If required, preventive and restorative Tx. Also, education re etiol of caries and PD and import of less cariogenic diet.<br>In phase 2: recall @ q6m, ms monitoring, individ prophylactic care till baby 3 yo. Taught to clean baby's teeth with low F paste, education re healthy diet habits for baby.<br>In phase 3: more of same instuction, prof tooth cleaning, topical F, CH varnish, diet counselling for adults and children.<br>Controls are 3 yr old children | | Controls: 3 yr to 4 yr - 20 | | | | In the third phase, a salivary S. m score of ≥ 2 was found in 27 (60%) children of the control group. The statistical comparison between the study and the control groups revealed significant differences for all results determined (P < 0.001). |

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| | | | | with no intervention to either M/C. | | | | | | |
| Q1 m30 | 98 | Association between caries prevalence and clinical, microbiological and dietary variables in 1.0 to 2.5-year-old Brazilian children | Matto s-Grane r | Obs, xsec | Sao Paulo Brazian child; 1.0-2.5 yo/9 Pub school nurseries randomly selected from 21 nurseries | 142 total/ xsec | Spatula with Rodac plate of MSB and semiquant . Read with microscope. | 1 examin., no disclosing soln for plaque estimate, teeth brushed and dried, and decay scored. Kappa =0.77 for 10% sample done within a week. | Bottle or breast feeding, w and w/o sucrose/ obs | A significant difference in caries prevalence was observed between those children with and without visible plaque (chi2 = 12.08, p < 0.001).<br>Mutans streptococci were detected in 114 (80.3%) of the children.<br>A significantly higher caries prevalence was observed in children with high levels of mutans streptococci compared to children with low levels (chi2 = 28.67, p < 0.001).<br>The mean ds was significantly higher in children with levels of mutans streptococci greater than 50 CFU when compared to children with 0 CFU or 1-50 CFU of mutans streptococci (p < 0.05).<br>Children who were either never breast-fed or only until 3 months exhibited a significantly higher caries prevalence than those breast-fed for a longer time (chi2 = 4.11, p < 0.05).<br>A significantly higher caries prevalence was also observed between children that used bottle containing milk with sucrose and cereal than children using bottle with milk with or without sucrose (chi2 = 6.24, p < 0.05).<br>Children who started to eat salty meals at or after 7 months of age showed a significant higher caries prevalence than children who started earlier (chi2 = 10.30, p < 0.01). |
| Q1 m34 | 98 | Association of salivary mutans streptococci with discoloured pits and fissures | Stein er et al | obs | Zurich, Switzerland, 6.5-12.5 yo | 1035 / xsec | Strip Mutans onto tongue dorsum | Brown discolored pits and fissures/ (don't understan d how they did kappa values on color and dichotomi zation) | | The salivary level (low/high) of ms significantly associated with the presence of slightly brown discoloured (C1), clearly brown discoloured (C2) and cavitated (C3) pits and fissures.<br>The odds ratios were 1.5 (P<0.01) for C1, 2.5 (P<0.001) for C2 and 5.0 (P<0.001) for C3 pits and fissures |
| Q1 m35 | 98 | Colonization with mutans streptococci | Straet eman s et al | Longi obs; stratified on basis of those | Nijmegen,Net herlands, Foundation for | Tot=196 in original cohort. 109 | PSS kept cold, processed within 12 h. Ms and lb, | Mfs and MFS | Sugar eating | For children at 11 years of age who had been MS-free until 5 years of age, the mfs and MFS values at 11 years of age were found to be 1.12+/-2.81 and |

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| & Q1 lact o | | and lactobacilli and the caries experience of children after the age of five | | colonized by ms at age 5 vs those not colonized . That is, a case-control by the criterion of mutans infection by age 5. | Pediatric Dent pts.<br><br>Previously in Roeters et al 95 study. | were traced: 58 ms either never detected or only once detected betw age 2 and 5; 51 ms always detected during followup cultures. For this study done at age 11: N=55 not infected at age 5 vs N=25 infected by age 5 / Only analyzed data for individuals available for eval at both ages. | by TSY20B and SL agars | | | 0.44+/-0.88, respectively.<br>These values are much lower than those of a control group of 11-year-old children who had always been MS-positive since the age of 5, being 3.10+/-3.43 (p<0.0007) and 1.20+/-1.91 (p<0.04), respectively, Mann-Whitney.<br>Of the 30 children without detectable MS up to the age of 5 yr, 22 had acquired MS at 11 years of age, but their MS counts were significantly lower than those of the control group.<br>The acquisition of MS is still possible after the so-called "window of infectivity".<br>Delayed acquisition of MS may reduce the caries experience in the primary and permanent dentition at a later age.<br><br>No differences were found in the numbers of lactobacilli and sugar intakes per week between the children MS-free and the children MS-colonized at 5 years of age |
| Q1 m39 & Q1 s | 97 | Variations in the predominant cultivable microflora of dental plaque at defined subsites on approximal tooth surfaces in children | Baba ahma dy et al | Obs, anal of site-specific lesion/bacteria l association<br><br>(Is this same study as #117? Author name now Babaahmady instead of Ahmady. Appears to be further analysis of microbiologica l data from study q1m117.) | London, UK, presumably, | Avg 12 yo schoolchild 12 subjects, 21 extracted premolars | Tiny plaque samples near, below and away from contact areas; TYC and TYCSB. Confirm tests.<br><br>Selective and nonselective agars for wide battery of implicated bacteria | Sel of most approxim al caries prone site: below contact area | | Strep mutans, Strep. sobrinus, Strep. gordonii and Veillonella spp. were recovered most commonly from subsite B (85.7, 33.3, 38.1 and 76.2%, respectively).<br>The isolation frequencies of Strep. mutans and Strep. sobrinus were significantly higher at subsite B (A B p < 0.01 and p < 0.05, respectively).<br>Veillonella spp. were significantly higher at subsites B and S (A < B, p > 0.01; B > S, p < 0.05), while Neisseria spp. were most common at subsite A (A > B. p > 0.03) |

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| Q1 m4 1 | 97 | A cross-sectional study of dental caries, intake of confectionery and foods rich in starch and sugars, and salivary counts of Streptococcus mutans in children in Spain | Garcia-Closas | Obs, xsec<br><br>Stratified by tertiles on sweenented foods and by below and above 10E7 ms. in saliva/LITER | Manresa, Spain | 236 schch, 6-15 yr old xsec | PSS, Dentocult SM strip. Also, loop scraped over tongue dorsum to MS. Stratified as < 10E6/L, 10E6-<10E7/L, 10E7-<10E8/L, ≥10E8/L. | | Low caries prevalence 1.3 DMFT at 10.6 y. Sex, age, F, brushing freq, freq dental visits, SES, other foods of potential signif.<br><br>(care: data expressed per liter. hence, highest level is ≥10e5/ml) | In this population, the association between consumption of sweetened baked goods and caries appeared to be modified by the numbers of S. m [OR = 6.1 (95% CI: 1.6, 23.0) for low compared with high intake in children with moderate-to-high S. m counts and OR = 0.3 (95% CI: 0.1, 1.6) for low compared with high intake in children with low S. m counts].<br>These results suggest that a high intake of sweetened baked goods may be a determinant of caries prevalence in children with moderate-to-high salivary counts of S. m. |
| Q1 m4 5 & Q1 s & Q1 lacto & Q1 a | 97 | Plaque pH and microflora of dental plaque on sound and carious root surfaces | Aamdal-Scheie et al | obs | Beijing, PRC; outpatients w-w/o root caries | 11 F, 6 M; age 52-81 | Plaque samples by curette from 2 sound and 2-3 carious sites, ea subject. VMGIIP, processed within 24 h. PSS also, to VMGIIS.<br>Brucella agar, MS, MSB, SL, CFAT, Sabdex.<br>Also, pH drop measurements upon 10% sucrose challenge in situ. | Active= soft lesions n=25; Inactive = hard lesions n=9; Sound = no lesion n=32 | | There was no difference in microbial composition of dental plaque on sound and carious root surfaces. The pH response to sucrose was the same regardless of the presence or absence of mutans streptococci.<br><br>Results do show sharper and more profound and longer pH drop induced by 10% sucrose exposure of plaques over active lesions and sound surfaces than over inactive lesions. |
| Q1 m4 6<br><br>& Q2 m | 96 | Oral colonization by more than one clonal type of mutans streptococcus in children with nursing-bottle dental caries | Alaluusua et al | Case-control | M/Infants, 1.5 –3 yo; Finland | Nursing bottle caries. Case (n=6) vs control (n=6)/ xsec | Plaque with ribotyping | ? | Powerful micro method.<br><br>Small n. | Children with nursing-bottle caries exposed to frequent consumption of sucrose had a high proportion of mutans streptococci in plaque and four of them were colonized with more than one ribotype of ms,<br>whereas caries-free children had a low proportion of mutans streptococci in plaque and only one of them harbored more than one ribotype.<br>In both child groups, mothers were probably the main source of infection with mutans streptococci. Thus, children with nursing-bottle caries were not only heavily infected with mutans streptococci but also often colonized with more than one clonal type.<br>Strong evidence of maternal-child transmission, |

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| Q1 m48 & Q1 lacto | 96 | Associations between dietary intake, dental caries experience and salivary bacterial levels in 12-year-old English schchild | Beighton et al | Obs, xsec | Northumberland, English schch, age 12 | 328, xsec | Saliva samples at least 1 hr after last food intake.. PSS. Salivary sm, lb, ye by MSB, Rogosa agar and sab dex. | DMFS per Rugg-Gunn criteria | Assessment of # eating events/d, sugary eating events/d;<br>GI | Data are in setting of patients with established cavitated lesions.<br>DMFS (excluding ws) =3.05 +/-3.85<br>DMFS (including ws) = 5.72+/-5.00<br>DMFS scores were significantly related to the salivary levels of caries-associated micro-organisms;<br>to the total number of eating events at which sugar-containing foods or confectionery were consumed. experience.<br>No significant correlations were found between intake of food types and salivary levels of caries-associated micro-organisms except that the mean number of confectionery-eating events was correlated with lactobacillus levels ($r = 0.136$, $p < 0.01$). |
| Q1 m52 | 96 | Temporal changes in dental caries levels and patterns in a Native American preschool population | Douglass et al | Obs, longi chart review for retrospective comparison | Whiteriver AZ; 4 yo Apache Indian Head Start 1993 vs same group and age in 1978-9 evaluated by chart review/how were records for retrospective review selected? | N=127 (1993) vs 113 (1978-79) | Tongue blade impressed on MSKB (Kimmel-Tinanoff medium) for ms | Dmfs and dmft per Radicke/ Pediatric dentists (examin training) | Info on nursing caries.<br><br>No data on prechewing of food. | Neither the caries prevalence (95%) nor the prevalence of caries patterns differed between the 1978-79 and 1993 cohorts.<br>However, the level of treatment received in 1993 was greater than that in 1978-79.<br>Children with nursing caries (64%) had a greater severity of fissure caries and a greater prevalence of posterior approximal caries compared with caries-positive children without nursing caries.<br>The mean dmfs and dmft of the children categorized in the high mutans streptococci range were greater than those of children categorized in the moderate range. |
| Q1 m53 | 96 | Stepwise prediction of dental caries in children up to 3.5 years of age | Grindefjord et al | Prospectiv longi, 3rd examin, | Southern suburbs of Stockholm Sweden; children 2.5 and 3.5 yo | 692 of a previous group of 1095 who were intitailly studied for ms colonization at age 1. Group reduced to 832 and now by further dropouts to 692. (of those | Tongue sample per Grindfjord et al OMI 6;280,1991, cotton applicator sample. | 2 Pediatric dentists, each 50% of children Calibrated before the study using 16 children (r=0.91) and another | Immigrant/ nonimmigrant; candy consump, soft drink consump | The predictors for caries development in children before 2.5 years of age were mutans streptococci ($p < 0.01$), immigrant background ($p < 0.01$), and consumption of candy ($p < 0.01$).<br>The predictors for developing manifest caries between 2.5 and 3.5 years of age were mutans streptococci ($p < 0.001$), mother's education ($p < 0.001$), immigrant background ($p < 0.01$), and consumption of candy ($p < 0.05$) and sugar-containing beverages ($p < 0.05$).<br>The caries incidence at 2.5 years of age as well as the caries increment between 2.5 and 3.5 years of age were significantly higher in children with |

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| | | | | | | not examined, 42% had moved, 47% no show, 11% declined to partic. | | group correl at 0.93. Regular recalibration during study. | | immigrant background compared to non-immigrants. |
| q1 m56 & Q1 lacto | 96 | Caries prevalence and salivary and microbial conditions in 88-year-old Swedish dentate people | Lundgren et al | Obs xsec | 88 yo Swedish | 172; subsample of 40 males and 52 females, ambulatory | PSS with dentures in situ. VMGII. pH and buffer capac. Ms and lb on MSB and SL agars | One examiner, mirror explorer and occasional xr for approx. | Avg remaining teeth 14.1; DMFS 25.2; DFS 38.3; RCI 36.6 | High counts of lactobacilli (> 10(5)) and mutans streptococci (> 10(6)) were found in 49% and 55% of the subjects, respectively, of whom most were denture wearers. |
| Q1 m58 & Q1 lacto | 96 | Dental caries in relation to diet, saliva and cariogenic microorganisms in Tanzanians of selected age groups | Mazengo et al | Random xsec, obs sample | Tanzian rural and urban pops | N=110 in each grp:<br><br>35-44 and 65-74 yo groups | Described in Mazengo et al, Caries Res 28,468,1994. | WHO + initial lesions/2 examiners with very good kappas both for within and between examiner agreement. | Urban, rural, energy intake daily | Decayed teeth (DT) increased significantly (P = 0.048) with the number of snacks per day and was also associated with dietary sucrose (P = 0.025), total carbohydrates (P = 0.002) and fiber (P = 0.002).<br>Among salivary variables lactobacilli (P = 0.000) correlated positively with DT.<br>No strong association between total energy intake and dental caries in rural or urban populations in Tanzania, but snacking and sucrose intake were significantly associated with caries, in particular in the urban area. |
| Q1 m59 | 96 | Caries experience and mutans streptococci as indicators of caries incidence<br><br>Same study as # | O'Sullivan and Thibodeau | Longi, obs | Hartford, CT, preschool mean age 3.8 y, low SES ident at baseline as caries free or caries positive | 148, 314 lost | Salivary sm with semiquant scale | Delta dmfs | Is addition legitimate statistically? Consequences to propagation of error? It IS in a sense an integration of the hypothesized microbiological challenge. | Both the caries-free and caries-positive groups had high SMS levels associated with the greatest delta dmfs.<br>When SMS ranges were added for the three examination years (minimum = 3, maximum = 9), the mean second-year dmfs scores varied directly as the sum of the ranges. |
| Q1 m60 | 96 | Multifactorial modeling for prediction of caries increment in adolescents | Raitio et al | Prospective, 11 mo duration | Oulu, Finland, adolescents, 13 y 3months | 181 (all)<br>16 lost | Not clear if stimulated. Strip Mutans (Dentocult SM) and lb by Dentocult LB. Candida by | WHO codes 2-4. WHO 1 (white spots, recorded | Multiple predictors tested and modeled include salivary sec rate, buffer effect, ms, lb, Ca, salivary sucrase, plaque | The multifactorial modeling included many risk indicators, age, and gender and resulted in different models in boys and girls, indicating the difficulty of caries prediction in adolescents.<br>When boys and girls were combined, the final model included past caries experience, Candida, |

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| Q1 m6 1 & Q1 lact o | | Assessment of single risk indicators in relation to caries increment in adolescents | same et al | same | same | | Oricult-N. Sucrase by method of Hamalainen et al Caries Res 22:174,1988. | if 1 mm from ging margin). Single examiner | score, ws lesions, past caries experience. Sucrase assay described by Hamalainen et al is use of a Dextrostix test strip for blood or urinary glucose. Thus, it could detect in saliva either glucose from diabetic host, fructosyl transferase, amylase, or glucosidase activity. | and salivary sucrase. Significant associations between caries increment and past caries experience (p = 0.002), white spot lesions (p = 0.01), lactobacilli (p = 0.02), Candida (p = 0.006), and sucrase (p = 0.02) were observed. The ensuing odds ratios were: past caries experience, 3.6; white spot lesions, 2.9; salivary sucrase activity, 2.9; lactobacilli, 2.5; and Candida, 2.8. |
| Q1 m6 2 & Q1 a | 96 | Human root caries: microbiota of a limited number of root caries lesions | Schu pbach et al | obs | Switz, 14 root surface lesions | 14 freshly extracted teeth from 32-72 yo subjs./ xsec | Extensive BA and selective agars after roots varnished and sliced with saw. Then bacteria were recovered from ground sections | Supraging ival RSC lesions. Severity scores according to Billings. 85. | Effects of sequence of sample preparation before microbiology unclear | The proportion of Actinomyces, and in particular A. naeslundii, was significantly higher (p < 0.05) in initial lesions than in advanced lesions. In contrast, the percentage of Streptococcus and especially S. mutans was higher (p < 0.05) in advanced than in initial lesions. Surprisingly low (0.8% of the cfu) was the percentage of lactobacilli in advanced lesions |
| Q1 m6 4 & Q1 lact o | 96 | Number of mutans streptococci or lactobacilli in a total dental plaque sample does not explain the variation in caries better than the numbers in stimulated whole saliva | Sulliv an et al | obs | Malmo, Sweden | 60, 14-15 yo | Pooled plaque scraped from all tooth surfs. VMGII then MSB and SL, fermentation of mannitol to confirm ms ident. | ? | *Pooled plaque and salivary methods for ms are similar source, so should correlate, as should pooled tongue surface methods scraping for lb and saliva lb. Also a possible problem with false + and false – of MSB. | The results showed that the number of ms or lb in plaque did not explain the variation in caries to a greater degree than did the salivary counts*. For both bacteria the explanatory values increased, as expected, in subgroups with less favorable oral hygiene, but not even at this higher level of explanation was there any difference between plaque and saliva. The lb count was a stronger explanatory variable than the ms count. |
| Q1 m6 5 | 96 | Salivary mutans streptococci and dental | Thibo deau and O'Sull | Longi, obs, case-control | 148 preschool mean age 3.8 y, low SES ident at | 148, 316 lost | Spatula method, sampled annually, Salivary sm with semiquant scale | Delta dmfs, sharp explorers. | Focus on rate of disease | Both the caries-free and caries-positive groups had high SMS levels associated with the greatest delta dmfs. When SMS ranges were added for the three |

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| Same as Q1m59 & Q1m95 | | caries patterns in pre-school children | ivan | | baseline as caries free or caries positive | | Kimmel-Tinanoff agar. | 2 calibrated dentists. Kappa 0.91 | | examination years (minimum = 3, maximum = 9), the mean second-year dmfs scores varied directly as the sum of the ranges.<br>At year 2, children with high baseline SMS had the 1) highest prevalence of caries (87%) and the highest dmfs (9.15); 2) highest prevalence of each pattern, and 3) greatest number of patterns.<br>Among children with the pit/fissure pattern, those with high baseline SMS had the greatest pit/fissure dmfs after 2 yr.<br>Results show that baseline SMS levels were associated with both cross-sectional and longitudinal caries experience, numbers of caries patterns, and the prevalence and severity of those patterns. |
| Q1m66 | 96 | Prediction of caries in pre-school children in relation to fluoride exposure | Twetman and Petersson | 2 yr longi.<br>see Q1m67<br>Obs comparison of 3 co-existing cohorts different amounts and vehicles of F exposure, | Halland, Sweden; presch 4-5 yo at baseln/ 3 diff public health clinics, but near to one another. | Total 1022: 448 on 0.1ppmF+ semiannual F varnish; 374 on 0.1ppm F only; 206 on 1.2ppm F + semiann F varnish | Salivary samples (not stipulated how done) and Dentocult SM Strip Mutans (Vivicare) | WHO, no xrs | ? | The caries predictive ability decreased with increasing fluoride exposure.<br>The sum of sensitivity and specificity decreased from 151% (65% + 86%) in the low fluoride group to 131% (40% + 91%) in the optimal fluoride group.<br>The positive predictive value was highest (62%) in the low fluoride group. |
| Q1m67 | 96 | Caries incidence in relation to salivary mutans streptococci and fluoride varnish applications in preschool children from low- and optimal-fluoride areas | Twetman et al | Obs, longi; comparison of 3 co-existing cohorts, different amounts and vehicles of F exposure | Halland, Sweden; presch 4-5 yo at baseln/ 3 diff public health clinics, but near to one another. | Total 1022: 448 on 0.1ppmF+ semiannual F varnish; 374 on 0.1ppm F only; 206 on 1.2ppm F + semiann F varnish | Salivary samples (not stipulated how done) and Dentocult SM Strip Mutans (Vivicare) | WHO, no xrs/ Possibly some, not knowing how much F in water (subject blinding) | ?Fluor Protector Vivicare. | Higher levels ($p < 0.05$) of salivary mutans streptococci were found in the low-fluoride areas compared to the optimal fluoride area at baseline and after 2 years.<br>A positive relationship ($p < 0.05$-$0.001$) between salivary ms scores at baseline and caries incidence was found in all three groups. |
| Q1m6 | 96 | Evaluation of salivary tests | Vehkalahti | Retrospective 28 mo longi, | Helsinki, Finland, | 66 adol, avg age 15.2 y | From health records at | | Susc grp is DMFT 5.7 at baseline. | Delta DFSs was correlated with lb (0.31) for both genders, for boys only with buffering capacity (- |

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| 9 & Q1 lact o | | and dental status in the prediction of caries increment in caries-susceptible teenagers | et al | observational | dental sch. 3 birth cohorts born 73-75. | defined as susceptible vs 230 controls of similar age | baseline—preumably PSS sm and lb, Dentocult SM and Dentocult LB. | | Controls are 4.3 DMFT at baseline. Buffering capac monitored. Surprising that such big diffs can be found/asserted from groups so similar at baseline | 0.34), and for girls only with flow rate of stimulated saliva (-0.28) and DMFT (0.35).<br>The highest sensitivities of salivary tests for caries were shown by lb (0.82) and ms (0.64), their specificities being 0.63 and 0.59, respectively. Positive predictive values of the five tests varied between 0.69 and 0.89.<br>Predictions based on DMFT showed a sensitivity of 0.87 for DMFT > 3, but only of 0.33 for DMFT > 7, the corresponding specificities being 0.44 and 0.81. |
| Q1 m7 0 & Q1 lact o | 96 | Dental caries and caries-associated micro-organisms in the saliva and plaque of 3- and 4-year-old Afro-Caribbean and Caucasian children in south London | Zoitop oulos et al | Obs, 2 cohorts totaling 641 3 and 4 yo Caucasian and Afro-Carib children | London, daycare facils. Random selec of centers, to ident sample of 900 children, ~9% of children in the borough. 97% of parents consented | 641 of 874 subjects examined. | 10 microliter loop sample from dorsum tongue. Plaque by toothpick from UL decid molars and processed in 2 hrs. Transport method not stipulated. Sm and lb, method on MSB and SL; ye on Sab dextrose. | Dmft by British Assoc Study Commun Dent criteria. Not clear whether white spots scored. Trained and calibrated | Ethnicity classified by physical appearance. At baseline, AfroCarib children had lower dt and dmft than Caucasian and signif more were caries free (both p<0.0001). | The mean dmft scores of the 3- and 4-year-old Afro-Caribbean children were 0.36 +/- 0.10 and 0.51 +/- 0.13, respectively, compared to 0.80 +/- 0.17 and 1.48 +/- 0.24 for otherwise comparable Caucasian children (p < 0.001).<br>Mutans streptococci and lactobacilli were recovered less frequently from the Afro-Caribbean children than from the Caucasian, but in both groups there were significant correlations between the plaque and salivary levels of mutants streptococci and caries experience.<br>In both groups, children from whom both mutans streptococci and lactobacilli were isolated had the greatest mean dmft scores and these were not significantly different.<br>Multiple regression analyses demonstrated that, after controlling for age and dmft, there were still significant associations between race and salivary levels of mutans streptococci and lactobacilli, p = 0.0013 and p = 0.0167, respectively. |
| Q1 m7 1 & Q1 lact o | 96<br>?9 5 | Caries incidence, effect of preventive measures, and caries prediction in Uruguayan children | Angul o et al | Obs xsec and longi interventional re 12 of 23 high risk individs. | Montevideo, Uruguay, 12- to 13-year-old children; two neighborhood s different SESs. 23 children with large numbers of ms, lb, or decayed surfaces or combinations of these were | Tot =100. 23 judged high risk; 12 selected for intervent. | Presumably, salivary methods and MSB and LB<br><br>NOTE THAT PAPER NOT AVAIL, ONLY ABSTR | | underpowered | Preventive measures reduced the caries risk. The highest sensitivity was obtained with the clinical test, whereas the highest specificity was obtained with the combined clinical and microbiologic tests. |

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| | | | | | considered to be at high risk of developing caries. Twelve of these 23 children were selected for special preventive measures. A second examination was made 18 months later, at which 81 of the originally 100 children were studied. | | | | | |
| Q1 m7 3 & Q1 lact o & Q1 a | 95 | Comparison of selected microflora of plaque and underlying carious dentine associated with primary root caries lesions | Beigh ton and Lynch | Obs | Royal London Hosp pts, England, 81 root caries lesions | | Compared superficial plaque bact composition over RS lesions vs bacterial composition in the excavated dentin. 2 phased sampling. (Did not drill from pulp a la Edwardsson) | By color, texture, surface contour | | These data indicate that the microflora overlying primary root caries lesions is significantly different from that associated with the infected root dentine. Notable component of gram positive pleomorphic rods, mainly Actinomyces sp in root caries dentin was twice that in overlying plaque (p<0.001). |
| Q1 m7 5 | 95 | Distribution and determinants of mutans streptococci among African-American children and association with selected variables | Dasa nayak e et al | Obs, prior antibiotic use as variable | Inner city elementary school, Birmingham, AL. Afro-American child, 5-12 yo, | n=353 | Pooled plaque and tongue surf; directly onto MSB (Rodac type plate). Also stim saliva and spatula sample to same type plate and medium | Kappa stat for detection of ms. | SES within the groups. Implying that antibiotic use opens wider the "window of infectivity" by suppressing competitive flora | MS prevalence (92%, 95% CI = 89-95%) was associated with dental caries (Odds Ratio [OR] = 2.5, 95% CI = 1.3-6.2), age (Chi for trend = 4.3, P = 0.04), increased frequency of sweet consumption (Chi for trend = 5.1, P = 0.02), and increased number of teeth in the mouth (unit OR = 1.3, 95% CI = 1.1-1.6).<br>Higher MS levels were associated with higher number of decayed teeth (P < 0.0001), and also, with having the mother as the primary caregiver during the second year of life (P = 0.02).<br>Children who took antibiotics during early childhood and those who lived in the same household with many others during the second year of life had a higher MS prevalence than those who did not (OR = 8.3, 95% CI = 2.0-35.0; unit OR = 1.5, 95% CI = |

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| | | | | | | | | | | 1.03-2.2, respectively). |
| Q1 m77 | 95 | Prediction of dental caries development in 1-year-old children | Grindefjord et al | Prospective longi, 1 yo at baseline, eval at 3.5 yo | 8 Suburbs of Stockholm, Sweden | 786 of a previous group of 1095 who were studied for ms colonization at age 1. (of those not examined, 49% had moved, 32% no show, 19% declined to partic. | Tongue samples per Grindfjord et al OMI 6;280,1991, and cotton applicator samples. | 2 dentists at 4 clinics, ea 50% of subjects. Manifest caries according to Koch (by probing into lesion and catch in fissures./ Calibrated before the study using 16 children (r=0.91) and another group correl at 0.93. Regular recalibration during study. | Questionnaire: Ethnic/racial, breast feeding, candy and other sweeets, meal freq, toothbrush freq, F tablests, medications, etc | Multivariate logistic regression analysis, the variables significantly associated with caries at 3.5 years of age were immigrant background ($p < 0.001$), mother's education ($p < 0.001$), consumption of sugar-containing beverages ($p < 0.001$), mutans streptococci ($p < 0.05$) and candy ($p < 0.05$).<br>The probability of caries development was 87% when all the variables associated with caries were present at 1 year of age.<br>The relative risk (odds ratio) of those children to develop manifest caries at 3.5 years of age was estimated to be 32 times higher than in the children where corresponding risk factors were not present. |
| Q1 m78<br><br>& Q1 lacto | 95 | Dental caries and prolonged breast-feeding in 18-month-old Swedish children | Hallonsten et al | Longi obs breast fed vs non-breast fed 18 mo | Three counties, Sweden, children from 46 day care centers, | ~3000; 200 children as a subsample for other analyses. Breast fed = 61; no longer breast fed = 2939 | Swab against smooth and occlusal surfaces to RTF, culture within 48 h. culture on BA, MSB, and SL for total, ms and lb, respectively. | dmfs | Subset studied for: dietary, toothbrushing, sucking habits, use of F, sal levels of ms and lb. | Children with caries and still being breast-fed had a mean defs of 5.3, and those with caries not being breast-fed 4.9; the difference was not statistically significant.<br>Children with caries, irrespective of whether they were being breast-fed or not, had significantly higher numbers of cariogenic food intakes per day than caries-free children.<br>Mutans streptococci were detected in 67% of the children and lactobacilli in 13%.<br>Children with detectable mutans streptococci and lactobacilli had significantly more caries than those without. |

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| Q1 m79 & Q1 lacto | 95 | Longitudinal study of caries, cariogenic bacteria and diet in children just before and after starting school | Holbrook | Obs, longi<br><br>Exams 15 mo later | 5 yo child from Akranes, Iceland, area of high caries preval | 50 at baseline; 43 (86%) reexamined 15 mos later/7 lost | Stdized loop drawn across tongue to RTF. Ms and lb according to Holbrook & Beighton SJDR 95,37,1987 and Holbrook et al CDOE 17,292,1989. | Visual, with probe used for only 5 of subjects (probed). White spots and approx lesions half way to DEJ were scored. | Routine use of F dentifrice, F varnish, twice monthly 0.2% NaF rinse. Drinking water very low in F. Dietary habits questionnaire. Classification of "misusing sugar". | Fifteen months after baseline, and after being in school for half a year, 43 of the 50 children were reexamined and investigated as before.<br>Mean dmfs scores rose from 7.1 to 9.0, but the scores including initial caries rose from 9.7 to 15.3.<br>Mutans streptococci were carried by 84% of children on both occasions with a mean count 2.1 and 3.6 x 10(5) cfu/ml.<br>Lactobacillus carriage increased from 29 to 38% and the mean count from 5.1 to 13 x 10(3) cfu/ml at 6 yr.<br>The frequency of consumption of sugar-containing foods increased from 4.2 to 5.2 intakes per day and between-meal snacks rose from 3.0 to 3.7 per day.<br>Children classified as "misusing" sugar were 59% at 5 yr and 83% at 6 yr.<br>The mean caries score at 6 yr for children "misusing" sugar was 10.7 but 2.0 for those not misusing sugar. |
| Q1 m82 | 95 | Mutans streptococci and dental caries prevalence in a group of Latvian preschool children | Kohler et al | Obs xsec | Riga, Latvia, and two rural community 3-4 yo attending 9 nursery schs. | 140 | Paraffin stim sal, Strip Mutans | Per Bjarnason et al CDOE in press at time of this paper. | | Of the children, 29.3% were rated at zero (approximately < 10(4) cfu per ml saliva). This group of children demonstrated the lowest mean caries prevalence dmfstot = 1.5 (SD 1.9). The highest dmfstot was found among children in class 2 (38.6%; approximately > 10(5)-10(6) cfu/ml) and class 3 (12.1%; approximately > 10(6) cfu/ml) with a mean caries prevalence of 6.5 (SD 5.8) and 6.4 (SD 6.0), respectively. |
| Q1 m83<br><br>& Q1 lacto | 95 | Mutans streptococci, lactobacilli and caries experience in 12-year-old Icelandic urban children, 1984 and 1991 | Kohler et al | Obs, randomized xsec with retrospective comparison of both decay status and salivary ms and lb with 1984 data. | 1991 Reykjavik, Iceland, 20% random sample of 12 yo Icelandic urban | 252 | PSS, VMGII; Strip Mutans, immunofluorescence confirmation of a 15% sample; lb by SL. | Single experienced examiner. Previous study also a randomized sample of 12 yr olds | No info on differences between years re F exposure or diet | Frequency distribution at lower levels of mutans streptococci differed significantly between 1991 and 1984, e.g. in the present study 25.8% of the children had < 10(5) compared with 13.8% in the study 1984.<br>The mean caries prevalence in the permanent dentition (DFStot) was 11.0, which is significantly lower than in 1984 (mean DFStot 28.8).<br>A significant difference in caries prevalence was found at various levels of salivary mutans streptococci.<br>S. mutans (serotype c/e/f) was carried by all mutans streptococci-positive children, save one child, who carried only S. sobrinus.<br>As in 1984 significantly more S. sobrinus carriers had a high level of salivary lactobacilli as well as |

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| | | | | | | | | | | higher caries prevalence than the children who did not carry this species. |
| Q1 m84 | 95 | Preliminary observations on the relationship between mutans streptococci and dental caries experience within black, white, and Hispanic families living in Houston, Texas | Korenstein et al | Obs xsec | Houston TX, black, white, Hispanic children<br><br>Ages?, | 62 children and 39 accompanying adults (32 of them mothers) | Spatula method, MSB | | Not clear that data adjusted by age, ms, caries score groups | Significant correlations between MS levels and most measures of caries experience (P < 0.05) were observed in children and adults. Although mother-child correlations for caries experience were highly significant (P < 0.01), the mother-child correlation for MS infection levels was low and not statistically significant (P > 0.05). |
| Q1 m85 | 95 | The effect of caries scoring systems on the association between dental caries and Streptococcus mutans | Koroluk et al | Obs xsec<br><br>FROM ABSTRACT; JOURNAL NOT AVAIL. | Saskatoon, Canada | 98 3-5 yo | Stim salivary ms | Multiple caries scoring criteria. Goal is to examine correlation of salivary ms with these diverse criteria | | Both dft(MC) = 1.03 and dfs(MC) = 1.53 were significantly different (p < .0001) from dft(WHO) = 0.69 and dfs(WHO) = 1.17, respectively.<br>The S. mutans count was found to be significantly (p < .001) correlated with dft(MC), dfs(MC), dft(WHO) and dfs(WHO). |
| Q1 m86 | 95 | The fidelity of initial acquisition of mutans streptococci by infants from their mothers | Li and Caufield | obs | M/C pairs and F/C pairs and M/F pairs, Alabama | 34 M/C pairs | Unstim saliva from mother; either stim saliva or plaque from child.<br>Culture on MS.<br>Genotyping of isolated mutans strep | | | Genotypes of ms in infants appeared identical to those present in mothers in approximately 71% of 34 mother-infant pairs studied.<br>Female infants acquired ms genotypes identical to their mothers' with significantly greater fidelity than male infants (88% vs. 53%).<br>Homology of genotypes between mothers and their infants at initial acquisition strongly suggests that ms strains were transmitted from mother to infant and that this transfer exhibited gender specificity.<br>In no instance was homology of genotypes between fathers and infants or fathers and mothers |

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| | | | | | | | | | | observed -- acquisition of MS in humans follows maternal lines.<br>Although the prevalence of dental caries was low in this young child population (11/34; 32%), male children who harbored the same genotype as their mothers had a 13 times greater likelihood of having caries than female children who acquired their mothers' strain (p < 0.01). |
| Q1 m87 & Q1 lacto | 95 | Factors which influence levels of selected organisms in saliva of older individuals | Loesche et al | obs | VA hosp elderly (70±8 yo) | 560 | Sour taste induced saliva; if hospitalized, by suction; if dry, rinse with 10ml water and collect. Variety of selective and non-selective media | Same clinician/assistant team throughout. | Kappa stats on questionnaire data re interview vs clinical forms. Re xerostomia, 0.65-0.74. Medications, xerostomia,/ Stratified for them | There was a significant positive relationship between the salivary levels of Streptococcus mutans and increased numbers of teeth.<br>There was a positive association between the salivary levels of S. mutans and decay when the data were stratified for the presence of a complaint of xerostomia and the presence of dentures.<br>However, a similar analysis indicated that lactobacilli and yeasts were more likely to be associated with decay.<br>In that analysis the number of decayed teeth was significantly associated with the presence of lactobacilli (P = 0.0001) and yeasts (P = 0.025) but not with the presence of S. mutans.( |
| Q1 m90 & Q1 lacto | 95 | Lactobacilli, mutans streptococci and dental caries: a longitudinal study in 2-year-old children up to the age of 5 years | Roeters et al | 3 yr longi | Nijmegen The Netherlands, child dental health ctr. | 252 preschool, 2-5 yo | Soak up saliva in mouth with cotton pellets with care not to contact teeth. Transfer of several for each subj to bottle until approx 1 ml saliva could be extracted. Then a pooled plaque sample taken from approximals of anterior teeth with floss.<br>At baseline, also a sample of saliva from parent bringing child.<br>Ms by TSY20B and lb by SL. | Single dentist examiner. Visual including white spots, after drying the teeth. No probing. | Mothers saliv mutans, number of sugar intakes/d.<br><br>Saliva collection without disruption of plaque seems of little relevance of anal of ms in view of their colonization site. | At baseline ms were detected in 43% of the children while the detection frequency of lactobacilli was low (11.5%).<br>On an individual level, numbers of colony-forming units of mutans streptococci and lactobacilli in plaque and saliva varied largely [greatly?] during the study period.<br>Very low correlations (< r = 0.22) were also found between the numbers of mutans streptococci or lactobacilli and the diet in terms of the number of sugar intakes.<br>In children older than 2.5 years correlations between the clinical caries score and <u>lactobacilli in saliva</u> (range 0.31-0.62) and <u>mutans streptococci in plaque or saliva</u> (range 0.24-0.46) were highly significant (p < 0.01). |
| Q1 m9 | 95 | Human root caries: | Schupbach | obs | Swiss, 49-60 yo. | Sound = 5 Active | Mowing technique, to RTF, | Schupbach et al | | The total CFU's on both caries-free and caries-active surfaces were significantly higher than on |

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| 2 | | microbiota in plaque covering sound, carious and arrested carious root surfaces | et al | | Comparison of sound, carious, and presumed arrested carious root surfaces | carious=5 Arrested carious =5 | transport on ice, comprehensive culture workup | criteria (a histolog defn) | | arrested lesions.<br>Suggest polymicrobial etiol of RSC.<br><br>Power to detect differences even if exist? |
| Q1 m93 & Q1 lacto | 95 | Cariogenic bacteria in a longitudinal study of approximal caries | Sigurjons et al | 3 yr longi | Dental practice in Reykjavik Iceland, 7-59 yo | 217 approx spaces initially caries free in 58 subjects | Samples of plaque by floss, to RFT. Ms and lb, by both MSB and TYCSB, and by SL and read by microscopic exam. | Single dentist, BWs + mirror and probe | Not clear how data expressed as cfu/ml if plaque was sampled and not saliva. Authors do not explain.<br>Throws question on results | During the study approximal caries developed in 16 subjects (27.6%) at 30 sites (13.8%), involving 42 teeth.<br>56 of 58 (96.7%) subjects harbored S. mutans at some time during the study, 62.1% lactobacilli, and 29.3% had S. sobrinus.<br>The counts of S. mutans were significantly higher in those subjects that also carried S. sobrinus than in the remaining subjects.<br>A persisting high count of S. mutans > 10(5) colony-forming units/ml (CFU/ml) or a count that rose by ≥ 1 x log10 CFU/ml during the study was seen in 25 of 30 sites that subsequently became carious ($p < 0.001$).<br>Similarly, counts of lactobacilli that were consistently > 10(3) CFU/ml or rising by > 1 x log10 CFU/ml were seen in 17 of 30 sites that became carious ($p < 0.001$).<br>Nonetheless, author concludes that:<br>Although there were strong statistical associations between approximal caries and high or rising counts of these cariogenic bacteria, the bacterial counts were not good <u>predictors</u> of future approximal caries at that particular site. |
| Q1 m95 | 95 | Salivary mutans streptococci and incidence of caries in preschool children | Thibodeau and O'Sullivan | Longi, obs; classified during each of the 3 years as low; moderate or high caries risk based on total sal ms counts. | Hartford, CT, Low SES, 3.8 yo at baseline | 148 at base. None claimed lost | Ms by semiquant Kimmel-Tinanoff agar, saliva from tongue surf | Radicke, dmfs | | Prevalence of dental caries increased with SMS levels at baseline and generally in both assessment years.<br>At baseline the mean dmfs of the children classified as low, moderate, or high caries risk was 0.15, 1.44, and 3.36, respectively, while the mean dmfs of the same children at year 2 was 1.18, 3.10, and 7.87, respectively.<br>The mean dmfs of the high-caries-risk group increased by 79% between baseline and year 1 and by 30% between year 1 and year 2. |
| Q1 | 94 | Early plaque | Alaluu | 1.5 yr longi . | Orimattila,Finl | 92 =all | Plaque | WHO | Nursing bottle, | Visible plaque and the use of a nursing bottle were |

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| m98 | | accumulation--a sign for caries risk in young children | sua and Malmi virta | 19 mo at baseline | and, 92 | | quantitation incisors of child; ms in saliva of mothers. Dentocult SM. Usual semiquant scale. | criteria, exams by dentists of community dental health clinic. | toothbrush/fluoride paste | strongly associated with the caries development, while the other two variables had weak or no statistically significant associations.<br>The best indicator of risk was visible plaque.<br>Its sensitivity was 83%, specificity 92%, positive prognostic value 63% and negative prognostic value 97%.<br>Overall, 91% of the children were correctly classified with this variable, while the corresponding percentage of the other variables ranged from 72 to 77. |
| Q1 m99 & Q1 lacto | 94 | Dental caries and microbial and salivary conditions in Uruguayan children from two different socioeconomic areas | Angulo et al | Obs, cohorts of 2 diff SES | Montevideo, Urugayan child, 12-13yo;/ Every 5th child from class registers selected | n=100 | Midmorning PSS. Ms by MSB and lb by SL. | DMFT and DMFS, one examiner. | | Lower SES/higher SES: DS, 4.7/2.5; and FS, 1.7 /4.7, respectively. The differences in DS and FS were statistically significant.<br>Children with highest ms and lb had highest DS, while those with lowest ms and lb had lowest ($p<0.005$). |
| Q1 m101 | 94 | Associations of dental caries with salivary mutans streptococci and acid producing bacteria in 5-year-old children from KwaZulu and Namibia | Boardman et al | Obs; rural and urban; two countries | Childrne Kwazulu and Namibia | Total of 285, 5 yo | Chewed sugar free gum and spat out. Saliv to RTF and ms by TYCSB and confirmed, and total acid producing cfu on indicator agar. | WHO criteria | | Statistically significant correlations (mostly $p<0.01$-0.001) between salivary mutans streptococci counts and ds and dmfs scores in all groups of children.<br>Salivary acid forming bacteria had low correlations with few statistically significant groups.<br>While salivary mutans streptococci counts may be a useful caries screening method in children of this age, salivary acid forming bacterial counts appear unsuitable. |
| Q1 m104 | 94 | Eighteen-month coronal caries incidence in North Carolina older adults | Drake et al | 18 mo longi | North Carolina | All > 65; 325 blacks, 280 whites, all home dwellers | Omission?<br><br>Is there no micro reported. If so, omit. | | | OMISSION, where is it? |
| Q1 m106 & | 94 | Salivary lactobacilli explain dental caries better | Granath et al | Obs, xsec | S. African 4-5yo, | Tot =2728; urban and rural black, urban Indian, | Dentocult for lb, ms on MSB plates for PSS, and stratifications | WHO with dmfs stratifications. | OH debris index of G&V, high values. 41.5 intakes of sweets/wk. Very | Spearman's and Pearson's coefficients of correlation. Multivariate regression analyses were done on all intervals to correct for the confounding effects of regular intake of sweets, presence of |

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| Q1 lact o | | than salivary mutants streptococci in 4-5-year-old children | | | | and urban white. | according to Dentocult scores. | | strong correl betw lb and intake/wk (p<0.0001).<br>Analysis of effect of confounders<br>Does not regression including, as indep variable,evidence of lesions bias outcomes? | salivary ms or lbc, and oral hygiene.<br>Of the children, 68% had detectable lb in the saliva, and 74% had ms.<br>Except for children with more than 6 dmfs, the explanatory values, i.e., percentage of variation in dmfs explained, were higher for the lbc than for ms.<br>Before correction, the values for the total material were 15 vs 6%; for children with caries, 7 vs 5%; for those with 1-6 dmfs, 5 vs 0.4%; and for those with more than 6 dmfs, 0.3 vs 2%. |
| Q1 m1 07 & Q1 lact o | 94 | Influence of caries-preventive measures in mothers on cariogenic bacteria and caries experience in their children | Kohler and Andreen | Longi with ± previous intervention on mothers when children were 3 yr old to reduce sm; Followup obs now 4 y later (children now 7yo). Previous intervention detailed by Kohler et al , Arch Oral Biol, 1983. | Oskarshamn, Sweden; | Cont: 33 of 40 previous mothers with their children.<br>Tx: 25 of 27 previous mothers with their 26 of previous 27 children. Loss: Control: 7M, 7child<br>Tx: 2M, 1child lost | PSS, VMGII transport and culture within 24 h.<br>Salivary ms and lb by MSB and SL. | Exam by std conditions (Koch) | | Control mothers had significantly higher levels of salivary mutans streptococci and lactobacilli than the test mothers ($p < 0.05$).<br>The median level of salivary mutans streptococci was 0.6 x 10(6) c.f.u. per ml in the test mothers and 1.3 x 10(6) c.f.u. in the control mothers.<br>The median level of salivary lactobacilli was 10 times higher in control than test mothers (80 x 10(3) and 7 x 10(3) c.f.u. per ml, respectively).<br>Significantly more children of control than test mothers carried mutans streptococci (95 versus 46%) (z-test; $p < 0.01$).<br>Children of test mothers had lower salivary levels of mutans streptococci and lactobacilli ($p < 0.05$).<br>Twenty three % of the test children were caries-free, compared with 9% of the control children (z-test; $p < 0.01$).<br>The mean caries experience of the test children was also significantly lower than that of the control children (defstot 5.2 and 8.6, respectively; $p < 0.05$). |
| Q1 m1 12 & Q1 lact o | 94 | Prediction of caries in 1 1/2-year-old children | Schroder et al | 1.5 yr Longi, obs. Using data for sensitivity and specificity the predictive values for positive (PV+) and negative (PV-) tests were calculated for different levels | Helsingborg, Sweden child health center; 1.5 yr old, low caries prevalence | 208 from 2 different cities both with low F in water | Ca alginate swab rubbed against buccal, lingual and occlusal surfs of teeth; ms and lb by MSB and SL agars | | 0.2 ppm F in water | Mixed and ambig conclusions below:<br>Initially, 99% of the subjects were caries-free as against 72% at the age of 3 years, with a mean of 0.8 ds.<br>A division between high and low caries risk that combined high sensitivity and high specificity could not be established for any variable or combination of variables.<br>High sensitivity was noted with diet as the predictor, high specificity with oral hygiene or occurrence of mutans streptococci.<br>Lactobacilli were excluded as they were found in only 6 children. |

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| | | | | and combinations of variables. | | | | | | A two-step computation with mutans streptococci as second predictor improved the ability to identtify children with caries at the age of 3 years.<br>Authors feel that prediction at the age of 1 1/2 years, in a population with a low caries prevalence, was not successful with the variables used in this study.<br>While authors disappointed with results, message may be important for low caries prevalence population. Viz that there is high specificity for ms and diet as predictors of earliest lesion formation and that there is reason to think that any role of lactobacilli is secondary, at least sequentially, to that of ms. |
| Q1 m1 14 | 94 | Mutans streptococci in a Thai population: relation to caries and changes in prevalence after application of fissure sealants | Song paisa n et al | Longi interventional study of caries prevalence and incidence over 2 yrs in 7-8 and of 12-13 yo children, thus, 2 cohorts by age.<br>Intervent: assignment to one of 5 groups -- Delton, glassionomer, HF topical after H2O2 tx. These 3 txs were done either by professionals or by teachers. | Bangkok, Thailand/ 4 schools; low to very low SES from 3 of them and low to mod SES from the 4th | Baseline tot n=1114; longi obs done with 752 12-13 yo and with 512 7-8 yos; baseline minimal caries score req for inclusion; 5 groups within each age cohort representing differnent sealants | PSS, Strip Mutans | WHO | Was there difference betw sealed and unsealed subj? Questions of randomization and interpretation. | Precis: strong correl at both ages between salivary ms semi-quant categorization and either DFT (12-13 yo at baseline) or df (7-8 yo at baseline).<br>No comment about differential effects of sealants.<br>Highest occl DFS increment in children in highest Strip Mutans category who were treated with HF regimen, but stats not provided.<br>Lowest occl DFS increment with Delton tx, independent of ms category. |
| Q1 m1 15 | 94 | Use of the Strip mutans test in the assessment of caries risk in a | Twet man et al | Obs, prospective, randomized and stratified by ms saliva, | Halmstad, Sweden Preschool | 528 4 yr olds at baseline, 264 in each group./ ?15 lost | 1.5 hr after breakfast and toothbrushing, PSS, Strip Mutans, micro | WHO | All children on F toothpaste.<br><br>After 2 yr, 257 from study group and | There was no difference in caries experience between the study group and the control group at baseline.<br>Within the study group, caries increment was positively correlated ($p < 0.01$) with the number of |

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| | | group of preschool children | | Intercession: for those assumed to be at high risk (Strip Mutans score ≥2 and/or dmfs ≥ 1) intercession -- referral to Pub Dent Svc restorative tx, profess cleaning and OH instruct, F varnish applics, dietary counselling x2. Prediction of disease assessed 2 yrs later | | | counts, 4 strata of counts. | | 256 controls could be re-evaluated. Data thus based on these 513. | mutans streptococci in saliva at baseline.<br>Children assessed 'at risk' at baseline (Strip mutans score ≥ 2 and/or ≥ 1 dmfs) developed more new lesions than those considered as 'low risk' (mean dmfs 2.6 v 0.9; P < 0.05).<br>The sensitivity and specificity of this combined clinical and microbial caries risk selection were 67% and 75%, respectively.<br>In both groups, 50% of the children remained caries inactive during the study.<br>The mean caries increment was, however, lower in the study group than in the control group (mean dmfs 1.7 v 2.1) but the difference was not statistically significant. |
| Q1 m117<br><br>See Q1 m39 | 93 | Distribution of Streptococcus mutans and Streptococcus sobrinus at sub-sites in human approximal dental plaque | Ahmady et al | Obs<br>Investigates topographical localization of bacteria of interest with respect to A (away from), S (to the side of) and B (below) approximal contact areas | London, UK | 21 schch ; 21 teeth | Tiny plaque samples near, below and away from contact areas; TYC and TYCSB. Confirm tests. | Sound teeth extracted for ortho reasons | | S. mutans was detected in highest proportions from the B site compared to the A site (p = 0.025).<br>There were no significant differences in the isolation frequency or prevalence of S. sobrinus from any of the sub-sites.<br>S. mutans and S. sobrinus were never isolated together from the A sub-sites.<br>They were recovered together most commonly from the B sub-sites (p < 0.01).<br>It is concluded that S. mutans and S. sobrinus preferentially colonize the most caries-prone site apical to the contact area. |
| Q1, 118 | 93 | Salivary counts of mutans streptococci and lactobacilli and past caries experience in caries prediction | Alaluusua | Retrospective obs<br>Clinical and salivary factors were compared for ability to predict 3-year caries | Finland | 122 teens | Moller criteria | | A post hoc ergo propter hoc logical problem? | Baseline caries experience was better or as powerful as the salivary tests in predicting future caries increment at comparable screening and validation levels.<br><br>Legitimacy of using outcome variable as both independent and dependent variable? |

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| | | | | increment (Based on data of Alaluusua et al 1990 | | | | | | |
| Q1 m1 19 & Q1 lact o | 93 | A microbiological study of primary root-caries lesions with different treatment needs | Beighton et al | Obs, correl of rsc lesions judged to require restoration vs not to require restoration | London, Royal London Hosp; routine or emerg dental pt | 59 pts with 301 primary rsc lesions | comprehensive micro workup by sampling entire dimension of lesions with excavator | Categorization of lesions by color (4 shades) and hardness/leatherness. | | The total numbers of bacteria, mutans streptococci, lactobacilli, GPPR, and yeasts decreased significantly with decreasing treatment need.<br>The frequency of isolation of mutans streptococci, lactobacilli, and yeasts was significantly greater from lesions requiring restoration and from lesions situated within 1 mm of the gingival margin. |
| Q1 m1 20 & Q1 lact o | 93 | A longitudinal study of dental caries and cariogenic microflora in a group of young adults from Goteborg | Bjarnason et al | 3 yr longi; baseline at 15-16 yo | Goteborg,Sweden/ 30% random sample of pts attending child dental clinic at dental school | 101 18-19 yo at final eval. | PSS processed according to Kohler ad Bjarnason 1992. | WHO | Low F water; Excluded subj with ortho appliances and recent antimicrobial tx. | DFS prevalence and increment were 8.9 and 2, respectively.<br>Continuing polarization of the disease was observed, with mean DFS score reaching 19.9 in the upper 15% of the frequency distribution.<br>Highest caries activity was observed approximally where the increment of manifest [cavitated] and incipient lesions averaged 1.3 and 1.6 surfaces, respectively, as compared to 0.5/0.6 occlusally and 0.2/0.5 bucco-lingually.<br>While the occlusal component continued to dominate DF score with 5.7 surfaces, the prevalence of approximal lesions increased by 48%, averaging 2.7 surfaces.<br>Frequency distribution showed a shift to the right and increasing skewness.<br>Among the 88 subjects who were saliva sampled, salivary mutans streptococci were detected in 89.7% and lactobacilli in 83%.<br>Forty-one percent of the 18-19-year-olds had high numbers of mutans streptococci (> 5 x 10(5) cfu per ml) as compared to 33% at the age of 15-16-years, while high numbers of lactobacilli (> 10(5) cfu per ml) were recovered in 21.8% as compared to 14.3%.<br>High numbers of either ms or lb were associated with increased pervalence of DS and DSincip. |
| Q1 m1 21 | 93 | Dental caries and prevalence of mutans streptococci in | Bratthall et al | Obs, randomized selection of schoolchildren | Phnom Penh, Cambodia children | 100 12 yr old | PSS, Strip Mutans | WHO | | DMFS = 1.64 is low according to WHO criteria.<br>Association of DMFS with Strip Mutans class is p=0.0036, using contingency coef of 0.444. |

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| | | a group of Cambodian children | | | | | | | | |
| Q1 m1 24 & Q1 lact o & Q1 a | 93 | Effects of a 12-month prophylactic programme on selected oral bacterial populations on root surfaces with active and inactive carious lesions | Emilson et al | 12 mo Longi; intervention of intensive individ OH by hygienist, scaling done at first visit only. OH reinforced and reinstructed subsequently. Root surfaces txd at all visits with F varnish and given F losenges, F rinse. Also, 0.15% F /10%xylitol tpaste. | Linkoping,Sweden; 15 caries active with 770 exposed root surfaces. | 15 caries active with mean age 57 yr. | PSS and plaque. 6 plaque samples from each subj., thus from 92 sites. Plaque samples to RTF. Saliva samples to VMGII. All processed within 24 h. – MSB, SL, CFAT, BA for ms, lb, actino, and total recov flora, respectively. | Hix and O'Leary, soft, color yellow or light brown | Underpowered and weak antimicrobial strategies may have obscured differences | Tendency for higher levels of Streptococcus mutans in plaque from active lesions compared with sound root surfaces, whereas an inverse relationship was noted for the Streptococcus oralis group.<br>No significant differences in the Actinomyces naeslundii counts were detected.<br>The 12-month prophylactic programme had an effect on the clinical surface characteristics of root caries, but no detectable change in oral flora resulted from the intervention. |
| Q1 m1 25 | 93 | Close association between Streptococcus sobrinus in the saliva of young children and smooth-surface caries increment | Hirose et al | Obs; stratif according to S m and S sobr in saliva; 6 mo follow-up on caries increments as a func of surface type | 388 suburban Japanese 3.5 yo | All = 388 | Stim sal 2 hr after breakfast. Transported in anaerobic conditions and handled in anO2 glovebox. TYCSB for ms. 1/6 cfus further identified by biochemical and immuno reactions. | WHO | | The subjects in the S. sobrinus group had both higher caries and higher ds increments than the S. mutans group.<br>The mean decayed smooth-surface increment (delta d-surface) for the S. sobrinus group was 2.6 and was significantly higher than 0.8 for the S. mutans group.<br>For the subjects with delta d-surface ≥ 4, the mean number of S. sobrinus in the saliva was 4.29 x 10(5) CFU/ml and was significantly higher than 0.32 x 10(5) CFU/ml for the subjects without delta d-surface.<br>There was no significant difference in the mean number of S. mutans in saliva between the subjects with and without delta d-surface.<br>The prevalence of S. sobrinus in saliva was more closely associated with future caries activity, especially with smooth-surface caries increment, than the prevalence of S. mutans. |
| Q1 m1 | 93 | Dental caries and cariogenic | Holbrook | Modeling with data of 126? | | | | | Prob of using | Caries incidence was significantly associated with bacterial, dietary and salivary variables; but when |

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| 26<br><br>&<br>Q1<br>m1<br>27<br>&<br>Q1<br>lact<br>o | | factors in pre-school urban Icelandic children<br><br>Prediction of dental caries in pre-school children | Holbrook et al | Obs, 2 yr longi, modeling data from study #126 | Reykjavik Icelandic child, age 4 at baseline/ 158, uneven distrib of dmfs at base.<br>High baseline dmfs = 3.3 | 158 | ?sal ms and lb | dmfs | baseline decay score both as independent and dependent variable. Tautology.<br><br>Re sugar use | the data were examined by stepwise regression the strongest variables were the baseline caries score and misuse of sugar.<br>Counts of Streptococcus mutans entered into the analysis but only as a relatively minor component.<br>Similar significant relationships were seen with the determination of odds ratios.<br>A caries activity test was formulated combining the following caries-associated variables: high counts of S. mutans, or lactobacilli, or the misuse of sugar, or frequent consumption of paediatric medicines.<br>Were it had been applied to the children at baseline, it would have had a positive predictive value of 0.76, a negative predictive value of 0.82, a sensitivity of 0.8 and a specificity of 0.78.<br>Combining tests made the prediction of caries more accurate and in the population for which it was intended gave a reliable means of detecting those children most in need of enhanced caries prevention. |
| Q1<br>m1<br>29<br>&<br>Q1<br>lact<br>o | 93 | Caries risk assessment in a longitudinal discrimination study | Leverett et al | Obs, xsec, for model building and testing | 6 yo<br>286 from Rochester NY (fluoridated) and 186 from several towns in NH (0.3ppm) | 472 | PSS, RTF. No further workup for 24 hr, during which frozen in RTF. Asserted that no significant loss of numbers of ms, lb or total viable flora over this interval. Then dispersed and plated on selective and non-selective agars. This included Cariescreen SM and Bactotest LB. | Radicke | F, phosphate, Ca, PII, fluorosis, fluoride ion product (FAP), | By means of linear discriminant analyses, it was possible to predict correctly which children would develop caries within six to 12 months (sensitivity) in 82.8% of cases and which children would not develop caries during that period (specificity) in 82.4% of cases.<br>At “key examination”, the following were statistically significantly different with regard to the discriminant analysis (Wilcoxon, comparing 2 caries status groups):<br>How does one Table 2?<br><br>Microbiological reliability assertions seem tenuous. |
| Q1<br>m1 | 93 | Effect of sucrose | Margolis et | Obs of rsc lesion free | Boston MA | N’s range from 2 to 4 for | Plaque, eval by microbiolog | | underpowered | RCP samples contained consistently higher levels of mutans streptococci than RCF samples. |

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| 32 | | concentration on the cariogenic potential of pooled plaque fluid from caries-free and caries-positive individuals | al | (RSF) vs RSPos plaque and plaque fluid after sucrose exposure. Monitored variety of organic and inorganic chemical shifts after exposure to various amounts of sucrose exposure, acutely. | | each grp | procedures of van Houte 1991. | | | |
| Q1 m1 33 | 93 | Mutans streptococci in caries-active and caries-free infants in Tanzania | Matee et al | Obs xsec<br><br>Note that paper may contain quantitative assoc of ms with caries. | Tanzanian 1 to 3.5 yo with no lesions or rampant lesions. Attendees of maternal child health clinics, 2 communities. | 100 | Pooled plaque samples from labial surf of max ant teeth TCY agar. Also, samples stored in frozen skimmed milk and shipped to Nijmegen Netherlands for workup by non-selective (includes TCYS) and selective cultivation. | | | These infants came from Turiani and Singida, where the caries prevalence for this age group was 12.8% and 1.6% respectively. Streptococcus mutans was found to be the only mutans streptococcal species. No S rattus isolated, contrary to previous report. |
| Q1 m1 34 | 93 | Social and biological factors contributing to caries of the maxillary anterior teeth | O'Sullivan and Tinanoff | obs | Head start. Norwich/ New London and surrounding rural communities 3-4 yr old | 369 | Spatula saliv mutans, Kimmel-Tinanoff agar | Radicke, dmfs/ Dentist | Bottle to bed | Significant differences were found in mutans streptococci levels between children with and without the anterior caries pattern (p<0.01 by chi sq) |
| Q1 m1 35 | 93 | Root caries susceptibility in periodontally treated | Raval d et al | Obs, intervent, longi 12 yr s/p perio Tx | Sweden; 27 pts | | | | Several probable confounders: CH, F, OH, or else otherwise, ethically | Annual mean number of new DFS was rather low. 13 patients with > 5 new DFS% during the 3rd 4-year period (years 9-12) differed significantly from 14 patients with < or = 5 new DFS% in salivary |

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| | | patients. Results after 12 years | | assessing RSC incid | | | | | problemmatic | mutans streptococcus counts ($p < 0.01$), plaque scores ($p < 0.001$) and new DFS% during the 2nd 4-year period (years 5-8) ($p < 0.001$). |
| Q1 m136 &Q1 lacto | 93 | The association of mutans streptococci and non-mutans streptococci capable of acidogenesis at a low pH with dental caries on enamel and root surfaces | Sansone et al | Obs xsec | Boston MA | 12 lesion +; 18 lesion free; 10 root lesions | Pooled plaque over ws lesions vs sound surfs of enamel and root; comprehensive workup including, SL for lb, MSB and TYCSB for ms, MS for total streptococci. Also, a plaque pH profile after centrifugation of pooled plaque sample. | White spots and frank cavitations of roots | | The levels of the MS were generally positively associated with caries.<br>A weaker positive association was found for the levels of those non-MS capable of acidogenesis at low pH (final pH < 4.4) |
| Q1 m139 & Q1 lacto | 92 | Relationship of microbial and salivary parameters with dental caries in Brazilian pre-school children | Bretz et al | obs | Brazilian, 3-6 yo preschool, living in Vidigal slum of Rio de Janeiro | 37 | PSS. Dipslide methods. Caries screen and Dentocult for ms and lb, respectively | WHO | Defined patient based prevalence of caries (PB-CPR) as the percentage of patients exhibiting at least one lesion, and Surface based caries prevalence rate (SB-CPR) as the percentage of all surfaces at risk which in fact evidence a lesion. | Surface-based and patient-based caries prevalence rates (SBCPR and PBCPR) recorded.<br>31 of the 37 children were caries active.<br>Ms salivary levels were significantly associated with the SBCPR ($P = 0.0001$).<br>Similarly, lb salivary levels were significantly associated with the SBCPR ($P = 0.0001$).<br>When regression analysis was used to model dependence of the SBCPR on both organisms, the mutans streptococci and lactobacilli salivary levels were significantly associated with the SBCPRs ($P = 0.0021$ and $0.0118$, respectively), and salivary levels of these organisms accounted for 57% of the SBCPR variability. |
| Q1 m142 & Q1 lacto | 92 | The University of North Carolina Caries Risk Assessment study: further developments in caries risk prediction | Disney et al | 4 yr longi, 2 locations, 2 initial grade levels. | Aiken, SC and Portland, ME | N =5233 at base-line. 4158 at end. /1075 lost | PSS by Cariescreen SM and lb by Bactotest dipslide methods, without control as to time of sampling | Radicke. Four examiners. Extensive training for study of the examiners. As permitted | A “predicted caries index” was used by examiners which reflected “the examiner’s subjective personal judgment or ‘gut feeling’ about whether a child’s 3-yr caries incremenet would | For the four risk assessment models (two grade cohorts at two sites) specificity values averaged 0.83 and sensitivity values averaged 0.60.<br>Clinical predictors such as prior DMFS, pit and fissure morphology, and “predicted caries index” risk status were the major contributors to the models.<br><br>Data on many other parameters gathered. No evidence that Bentley (paper #204) data on salivary sampling were considered. |

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| | | | | | | | | assignment of children to same examiner.<br><br>Not clear that there was random assignment of children to the examiners. | be none, low, moderate or high." No attempt was made to standardize examiners as to this subjective index, [but they were likely to have been influenced in their ideas by dental educational, practice, sociological experience]. | Predicted caries risk status assessment, a major contributor to the models, is suggestive of the risk of logical fallacy of post hoc ergo propter hoc. |
| Q1 m143<br><br>& Q1 lacto | 92 | Dietary and salivary factors associated with root caries | Faine et al | Obs, 40 seniors | Seattle WA; convenience sample at dental school periodontal and prosthodontic clinic.of subjects with/without RSC | 20 with RSC, 20 without prior knowledge. Equal numbers of males and females. | PSS ms on MSB with conventional agar plate culture technique; lb on Dentocult LB kit | | Extensive dietary data._Experiment probably underpowered in terms of microbiological data. Seen with very small n with high ms | Within the root caries group, significant correlations were found with Root Caries Index and lactobacilli (r = 0.56) and S. mutans counts (r = 0.50).<br>Dietary correlates of RCI were:<br>Increased eating freq/day p<0.05<br>Increased CHO intakes times/day p<0.01<br>Increased total sugars (g) p<0.05.<br>Other correlates of RCI were:<br>Decreased buffering capacity p<0.001.<br>Decreased lactobacilli in the <10E5 group p<0.001. |
| Q1 m144 & Q1 lacto | 92 | Streptococcus mutans, lactobacilli, and caries experience in older adults | Hunt et al | Obs xsec | North Carolina, US; 448 black (B) and 362 white (W), seniors. Piedmont 65+ Dental Study. 66% resp rate from parent study cohort. Blacks oversampled to permit B-W comparisons. | B=448<br>W=362<br><br>All are dentate | PSS ms and lb by Cariesscreen SM and Bactotest LB, respectively. Used comparator chart only. | Radicke for coronal; Root lesions according to Graves et al (AJPH 92) --softness only (color change discounted). Interexaminer agreement reported | Many had low sal flow rate and low buffer capacity, both of which were deemed to increase risk of lesions. Numbers of teeth, identities (not all at same risk) and number of surfaces at risk not clear. | In general, people with higher levels of S. mutans or lactobacilli had more untreated coronal and root caries, but not greater total caries experience. Among both black and white cohorts, stratification betw ≤5x10E4 and ≥10E5 give signif difference in coronal DS of p<0.008 and 0.01 for B and W, respectively; root DS of p<0.002 and 0.01, respectively, and root DFS for B of 0.003. Values for coronal DFS were ns, as they were for W root DFS.<br><br>Data not normalized to surfaces at risk, and which teeth, potentially big problems in a senior population.<br><br>No evidence that Bentley (paper #204) data on salivary sampling were considered |

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| Q1 m145 & Q1 lacto | 92 | Mutans streptococci, lactobacilli and caries prevalence in 15 to 16-year olds in Goteborg. Part II | Kohler and Bjarnason | Obs, xsec | Gothenberg, Sweden; Those attending an annual dental exam at the childrens dental clinic at dental school | 155 15-16 yo | PSS, VMGII , MSB and SL for ms and lb | | From Bjarnason et al Scand Dent J 16,143-149,1992: Almost all subjs had been receiving regular dental care since age 3 at dental school clinic, including preventive care: prof F applics, OH instruc, dietary advice, and use of F supplements and F toothpaste strongly advised. Those with apparent higher risk / caries active were in a q2w F rinse program from 7-12 yo. | Increased numbers of mutans streptococci and lactobacilli were associated with increasing caries prevalence.<br>Subjects with high numbers of both microorganisms had about 4 times higher mean caries prevalence than those with low numbers.<br>Streptococcus sobrinus carriers (15%) had both higher mean caries prevalence and constituted higher proportion of subjects with > 10(6) cfu mutans streptococci per ml saliva than was found in the whole group.<br>Correlation stats. |
| Q1 m147 & Q1 lacto | 92 | Mutans streptococci and lactobacilli in breast-fed children with rampant caries | Matee et al | obs | Morogoro district of Tanzania. Breast fed children betw 1 and 2.5 yr old. | 34, 17 with rampant caries and 17 matched caries free controls. | Plaque samples from anterior dentition by toothpick, into saline, plated within 2 h onto TYCSB agar and Rogosa agar. Also saliva by spatula method | | No OH practices.<br>No nursing bottle practice.<br>Only breast feeding on demand.<br>No information on prechewed mother's food sharing with child.<br>Asserts (in Discussion) but doesn't document that supplementary foods containing some sugars (mono and disaccharides) were consumed twice a day. Is TYCSB | Mutans streptococci and lactobacilli were isolated from dental plaque of all children with rampant caries and from most caries-free children.<br>None of the colonies of mutans streptococci resembled those of Streptococcus sobrinus.<br>The mean counts of the mutans streptococci and lactobacilli were 100-fold higher in plaque samples from children with rampant caries as compared with caries-free children.<br>No difference could be found between the numbers of mutans streptococci in plaque overlaying cavities and that from adjacent sound enamel.<br>In contrast, the counts of lactobacilli in plaque were approximately 100-fold higher from cavities than from sound surfaces.<br>The levels of mutans streptococci in saliva were directly related to the presence of rampant caries.<br>Rampant caries in these children can occur in the absence of nursing bottles or any other [detected] |

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| | | | | | | | | | insufficiently selective? | feeding abuse during weaning and in the presence of an aciduric plaque microflora, as has been reported for children with nursing bottle caries. |
| Q1 m149 & Q1 lacto | 92 | Dental caries and its determinants among recent immigrants from rural Ethiopia | Sgan-Cohen et al | Obs, not clear if randomly chosen from approx 1000, all consented via interpreter. 20 dental school employees aged 35-45 served as controls | Rural Ethiopean immigrants to Israel Adults 35-45; children 5 and 12 | 70 adults 68 children | Rinse with water, do not swallow, spit out saliva. MSB for ms, MS for total streptococci, Rogosa for lb, and BA for total flora. | | What was diet of these immigrants after they arrived vs before they arrived in Israel? Mutans level and lactobacillus level come up very fast after going onto a high sucrose diet. Hence, there is likely to be dissociation between mutans levels and caries experience. | Low levels of caries in this population can be attributed to an almost sugar-free diet and high salivary flow, but not to the composition of oral microflora.<br>The mean total count of salivary bacteria, as determined on blood agar, was 3.4 x 10(8); mean count of Streptococcus viridans, on mitis salivarius, was 6.7 x 10(7); and mean count of S. mutans, as determined on mitis salivarius with bacitracin, was 1.7 x 10(7).<br><br>High levels of bacteria may just be reflection of very poor OH.<br><br>These levels were all high and were not significantly different from a control group of 20 Israelis. Is there a log calculation error in the data? This is suggested by the values for the 20 hospital worker controls. Most unusual values unless workers have unusually high freq sucrose intake. |
| Q1 m150 | 92 | WHO pathfinder caries survey in Beijing extended with data for prevalence of mutans streptococci | Shi et al | Obs; random selection from schools of 5 districts of Beijing for study | Beijing PRC; 12 yo | 178 examined for caries; 176 of them randomly selectedfor micro | Strip Mutans; Strips examined without knowl of results of caries scores | WHO, two calibrated experienced examiners | | Fourteen per cent had mutans class 0, 28 per cent class 1, 35 per cent class 2 and 23 per cent class 3.<br>The mean DFT, for each mutans class was 0.82, 1.48, 2.09 and 2.69, respectively.<br>The differences were statistically significant (P = 0.0015).<br>In the lowest mutans class, 50 per cent had caries and the mean number of teeth requiring conservative care was 0.68.<br>For the high mutans group, the corresponding values were 72 per cent and 2.11 teeth. |
| Q1 m151<br><br>Also Q3 | 92 | Sweets and other sugary products tend to be the primary etiologic factors in dental caries | Sundin and Granath | Obs; xsec Cohort clinically examined at ages 15 and 18 in 1984 and 87. Same subjects were interviewed | Sweden. NOTE: details of interview methods, ond other methods given in Sundin: Scand J Dent Res 1990;98: 96-101 and in | 69 at 15 and 18 yo; | Salivary ms and lb | Was interviewer about diet blinded as to caries experience? | OH, FR, oral sugar clearance, consumption of sweets and other sugar-containing products | Simple linear correlations and a stepwise multiple regression analysis were used to compare ranks and explanatory values.<br>The highest correlations were obtained for intake of sweets and intake of other sugary products, with r values increasing from 0.25 and 0.16, respectively, in the total material, to 0.70 and 0.67 in less favorable fractions of oral hygiene, salivary flow rate and other sugary products in the former case, sweets in the latter. |

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| | | | | about their dietary habits during the previous 3 yrs in 1987. Hence, a retrospective diet review and a xsec current clinical and microbiological eval. | Sundin et al Comm Dent Oral Epi 1992; 20: in press. Find these and read. Sounds like 1 study published in pieces. | | | | | The stepwise multiple regression analysis revealed that sweets and other sugary products contributed 12 percentage points to the total explanatory value, which was as low as 19%. |
| Q1 m1 52 | 92 | Latex agglutination test for detection of mutans streptococci in relation to dental caries in children | Takei et al | Obs, xsec | Osaka Dental Hosp, Japan | N=1192-12 yo; also 87 3-5 yo from eight nursery schools locally | Plaque samples and latex agglut assay, correl with plaque assay for cfu | Dfs, DMFS per Moller. Dentists | | In clinical trials, the outcome of the LA test correlated significantly with the number of mutans streptococci found in plaque (p less than 0.0001), which was quantified by the selective cultivation of mutans streptococci.<br>The sensitivity and the specificity of the LA test for detection of mutans streptococci were 78.9 and 100%.<br>The degree of reactivity in the LA test correlated significantly with the number of decayed tooth surfaces ($p < 0.0001$) and decayed and filled tooth surfaces ($p < 0.0001$). |
| Q1 m1 53 | 92 | Effects of chlorhexidine-fluoride gel treatments in mothers on the establishment of mutans streptococci in primary teeth and the development of dental caries in children | Tenovuo et al | Longi; intervent; 3 grps according to mother's ms level in saliva. Randomized mothers (and consequently their infants) to:<br>Grp 1--If >10E5, got gel biy or Grp 2--no gel. Grp 3 had < 10E5 and got no gel.<br>Mothers txd 1% CH – | Turku, Finland 151 1 yo M/C pairs.<br>Low caries prevalence.<br>Essent all Finish parents (usually mother) bring infant to 1st visit to dentist at 6 mo and then again at 12 mo. 252 invited to participate and 250 consented at 12 mo visit. | Grp 1=56; Grp 2 = 50; Grp 3 = 45. Actual N at tx outset was 59, 53, 46, respectively./ 250 consenting mothers at 6 mos age of child.<br>Before treatments began, 34 mothers excluded (reason not | Sal samples at about 6, 12, 24 and 48 mos, Dentocult SM for ms. Plaque at 2, 3 and 4 yo. | 2 dentists, recording only cavities extending to dentin. Dentists (ex. training)/ Children blinded, not mothers | Contrast method of use of CH gel -- See contrast with Kohler's 1984 study AOB 29,879,1984 | In the total study population, 16, 42, and 54% of the children were colonized by MS by the age of 2, 3, and 4 years, respectively.<br>Most children harbored only Streptococcus mutans, but 2 had both S. mutans and Streptococcus sobrinus, and 2 had only S. sobrinus.<br>Twenty-eight percent of the ms-positive children developed caries by the age of 4 years, whereas 4 out of 27 children with dental caries did not have any detectable ms in their plaque samples.<br>Both the colonization by ms and the caries incidence were highest in grp 2 and lower in the experimental group and grp 3.<br>These observations suggest that the reduction of maternal salivary ms at the time of tooth emergence may delay, or perhaps even prevent, the colonization of ms in the children's primary dentition with a concomitant decline in caries incidence, even in a population with an already low prevalence of dental caries. |

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| | | | | 0.2% NaF gel in standard trays with 10 ml gel /tray for 5 min applic. Then gel rinsed out with water. This procedure repeated 2 more times on treatment day. The three applications were repeated on the following day. Most mothers got 5-6 such treatment cycles, but some less, due to their childrens' colonization with ms. Children 1 yo at baseline. Followed children for 3 yrs. | | stated) and lost 48 at 12 mos – 40 moved, 1 death, 1 pregnancy, 1 declined participation (that's 44) lost | | | | No statist signif CH-F gel effect noted with this regimen. |
| Q1 m1 54 | 92 | Antimicrobial factors of saliva in relation to dental caries and salivary levels of mutans streptococci abstract available for review, only—*J de Biologie Buccale* | Tenovuo et al | Obs, xsec | ? | 59 young adults | Sal ms | | | The amount of ms correlated significantly (+0.31, $p < 0.05$) with the number of initial caries lesions (Di) but not with other caries indices (DMFT, DMFS, DS). |

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| Q1 m156 & Q1 lacto | 91 | Salivary levels of mutans streptococci, lactobacilli, yeasts, and root caries prevalence in non-institutionalized elderly dental patients | Beighton et al | Obs, consecutive sample of patients attending routine dental examination during a 3 month interval. | Huntington Heath, UK/ RC prevalence in consecutive >55yo independently living pts with min 12 teeth | N= 146. Avg ~20 test and ~30 exposed root surfaces | PSS collected in bottle and stored on ice until processed within 4 h of collection. Dilutions made in thio medium. ms, lb, ye by MSB, Lacto Selective, and Sab dex, respectively. | Coronal DFS by WHO criteria. RSC defined as exposed root where color and/or surface texture is abnormal. Hence abrasion or erosion not recorded. | | The mean root DFS score of the males (n = 49) was 6.34 +/- 4.55 and for the females (n = 97) 3.76 +/- 3.31 (P < 0.001).<br>Subjects with greater than 1 root DFS had significantly higher salivary levels of mutans streptococci, lactobacilli, and yeasts.<br>They also had fewer teeth and more exposed root surfaces.<br>Partial denture (none, one or two) also positively correlates with levels of both lactobacilli and yeasts among females.<br>In the multivariate analyses salivary levels of mutans streptococci were not significantly related to any clinical measurement of root caries experience due to the greater strength of association between the root DFS score and salivary levels of yeasts. |
| Q1 m157 | 91 | Dental caries and mutans streptococci in selected groups of urban and native Indian schoolchildren in Mexico I | Del Rio Gomez | Obs, 2 grps, urban and rural | Mexico, native Indian schch; 12-14 | 100 in each grooup | PSS, Strip Mutans. Subculture in immunofluorescence confirmation. | WHO recs. | | Mean DMFT was 5.98 in Mexico City and 3.57 in Mazahua Indian population, respectively.<br>Mutans streptococci were found in 95% of the urban children and 75% of the Indians.<br>There was a statistically significant difference in the prevalence of mutans streptococci between the city and the rural samples (chi sq <.05). This appeared greatest among children with highest ms values, but statistical comparison not stipulated. |
| Q1 m158 & Q1 lacto | 91 | Associations of microbiological factors and plaque index with caries prevalence and water fluoridation status | Eisenberg et al | Obs; F and non F cohorts | US; 12-15 | 140; 173 | Sal ms and lb and PII; also pooled plaque | | | In each community, pooled dental plaque and saliva harbored fewer mutans streptococci and lactobacilli in the zero-caries than the high-caries group.<br>Greater numbers of mutans streptococci were found in the dental plaque and saliva of the zero-caries subjects in the fluoridated community than in the fluoride-deficient community, suggesting that a greater caries challenge can coexist with zero-caries status in the fluoridated community. |
| Q1 m160 | 91 | Caries prevalence and salivary mutans streptococci in | Fujiwara et al | Longi; obs | Japanese predentate at baseline chldn; 0-2 yr old | 356 | Cotton roll to absorb sal, squeezed by sterile syringe. MSB for ms. | Def according to WHO guidelines | Low F exposure. Nice study, prudent and rational analysis. Probable | The detection rate of mutans streptococci and the prevalence of caries increased with age.<br>Mutans streptococci were isolated from 39.9% of the subjects.<br>The concentration of mutans streptococci |

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| | | 0-2-year-old children of Japan | | | | | microscopic and biochem confirmation. | | underestimate of ms because teeth not dislodged from teeth. | correlated with the number of erupted teeth (r = 0.339).<br>Concentration of mutans streptococci was closely correlated to the caries prevalence that year (r=0.368, p<0.0001).<br>Concentration of mutans streptococci was more closely correlated to the caries prevalence of the next year (r = 0.465, p<0.0001).<br>The children who had no caries but harbored mutans streptococci in the first year showed significantly higher caries prevalence in the next year than did the children with neither caries nor mutans streptococci.<br>These results indicate that the establishment of mutans streptococci is associated with caries initiation in early childhood. |
| Q1 m1 61 & Q1 lact o | 91 | University of North Carolina caries risk assessment study. III. Multiple factors in caries prevalence | Graves et al | Obs xsec | Aiken, So Carolina and Portland,Maine; grades 1 and 5. | Tot 5012, representing 85% of eligible participants | PSS and ms by commercial kit (Cariesscreen SM) and lb by Bactotest LB others?.<br>Naked eye reading by calibrated dentists using density template. | Radicke criteria, 4 calib examins. No xrs. The future caries increment predicted by the examiner as a variable. Does this inflict bias? | Multiple potential variables recorded. The future caries increment predicted by the examiner was included as a variable. Does this reflect or inflict bias? Post hoc ergo propter hoc.<br><br>Not clear if applied info from Bentley et al re time of day sampling | Four factors--number of dental visits by the child in the past year, presence of white spot lesions, and both the urgency of need for restorative care and the future caries increment predicted by the examiner--associated significantly and consistently with caries prevalence in primary and permanent teeth of first and fifth graders at both study sites.<br>In these analyses, sensitivity ranged from .60 to .72 and specificity varied from .86 to .91 in the four grade-site groups.<br>Lack of consistent association of many variables, including microbiologic factors, with baseline caries prevalence was unexpected.<br>It is expected that some of these variables will contribute predictive power in the prospective study. |
| Q1 m1 63 | 91 | Dental caries and mutans streptococci in the proximal areas of molars affected by the habitual use of xylitol chewing gum | Isokangas et al | Xsec then intervent; two phase; xylitol ± gum children participated in 3 yr prospective 1982-4 study. After its end, by questionnaire, some of the | Ylivieska, Finland | Part 1: 324 11-12 yo started in 1982.<br>Part 2: 324 starting in 1982, half using X gum and half no gum assigned. Assignment basis to X or | Interdental plaque by floss, betw 46/47 and 26/27 frozen with glycerol and cultivated on MSB for ms | Blinded examiner (HM). WHO, with noncavitated lesions ignored. BWs used. | Non parametric stats.<br>Previous publications on dental health status, use of X, published previously by Isokangas et al 88, 89 and Soderling et al 91. | The presence of MS (expressed in log10 colony-forming units) in the proximal areas studied was significantly lower in habitual xylitol consumers.<br>Carious interproximal areas of all subjects had significantly higher total levels of MS than clinically and radiographically sound interproximal areas.<br>Those children who had used xylitol chewing gum regularly since 1982 had significantly lower caries indices in 1988, including proximal caries scores. |

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| | | | | previous participants who had regularly used X gum in postexperimental yrs were recruited to the present study while the previous control subjects were randomly selected, and all were examined again cross-sectionally, while ± still or no longer using X gum ≥ bid, in 1988. Thus, an interventional study in first phase and a self-voluntary interventional and partial crossover study in second phase. | | C not stipulated.<br><br>Following 1984 to 88 phase, there were n=15 former X cohort. Of these, XX = 10 and XC=5. Of the n=31 Controls, there were CC=17 and CX=14. Thus 4 subgrps in 1988.<br><br>Difficult to understand statist consequences to phase 2 study | | | | |
| Q1 m1 66 & Q1 lacto | 91 | Factors associated with active and inactive root caries in patients with periodontal disease | Ravald and Birkhed | Xsec, obs, randomly selected from periodontal clinic patients who were assigned to Ravald at clinic, randomly | Linkoping, Sweden | N=144, 30-78 yo | PSS, ms and lb, by Dentocult dip slides and Lb. Also, after VMGII transport to lab and culture on MSB. | One examiner blinded to micro results. Hix and O'Leary criteria of decay status—based on | Definitions of activity or inactivity unclear in view of Beighton and Lynch data, see elsewhere in this review. | 645 decayed and 539 filled root surfaces were found.<br>Of the carious lesions, 372 (58%) were recorded as clinically active and 273 (42%) as inactive.<br>30 patients showed no lesions (group 1), 46 had only fillings or inactive lesions (group 2), and 35 showed 1-2 (group 3) and 36 greater than or equal to 3 active lesions (group 4).<br>The lactobacillus count differed significantly between all groups, except group 1 vs. 2, and the mutans streptococcus count between groups 1 vs. |

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| | | | | | | | | softness, color yellow or light brown. Also, FMX. Periodontist. | | 4 and 2 vs. 3 and 4.<br>Group 4 differed in plaque score from the other groups, and the salivary buffer effect differed between the inactive groups 1 and 2 and the active group 4.<br>By stepwise multiple regression analysis, it was shown that lactobacillus count, plaque index, salivary buffer effect, dietary habit index, and number of exposed root surfaces contributed significantly to the coefficient of determination. |
| Q1 m167 & Q1 lacto | 91 | Prediction of caries increment in Scottish adolescents | Russell et al | 2 yr longi obs | Scotland; adolescents | All = 355 | PSS. (Dentocult SM), lb (Dentocult Lb), Candida, Veillonella on selective agars and in colorimentric broth of Walter and Shklair | DMFS and categorization for increment | F exposure info, Stepwise discriminant analysis. A useful cross-study comparison of sensitivity and specificity and predictive value data with similar data of crossner (81) and stecksen =blicks(85, and pienihakkinen et al (87) and wilson and ashley (89 | The caries increment was significantly correlated with previous caries experience, salivary buffering capacity and counts of lactobacilli, mutans streptococci and candida.<br>The caries increment group (low, medium, or high) was identified correctly in 49% of all subjects, but this was reduced to 45% if previous caries experience was excluded from the analysis |
| Q1 m168 | 91 | Salivary mutans streptococci and caries prevalence in 8-year-old Swedish schoolchildren | Twetman and Frostner | Xsec, obs; longi caries scores | Varberg, Sweden, 8 yr old | All = 372<br><br>Text leads one to thinking that not same study as #167/<br>Lost 14 due to illness; 3 due to refusal to participate | Para stim saliva. Strip Mutans (Dentocult SM). | By record review, DMFS and dmfs. | Public water F 0.1 ppm . All also got 0.2% NaF rinse q1w since age 6. Est 90% use F toothpaste. | Strong positive correlations ($p < 0.001$) were found between different levels of mutans streptococci infection and the caries experience in both the primary (dmfs) and the permanent (DMFS) dentition. |
| Q1 m169 &Q1 lacto | 90 | Salivary caries-related tests as predictors of future caries increment in teenagers. A three-year | Alaluusua et al | 3 yr longi obs to assess proposed predictive indices | Finland, n=122, 12-17 yo | All =122 | Afternoon or evening samples. PSS, ms, lb, at q1y on Dentocult SM, and LB. Buffer capacity by Dentobuff | | Baseline caries indices | The 3-year caries increment was positively correlated to the baseline DFS ($r = 0.46$, $p < 0.001$), salivary level of mutans streptococci ($r = 0.30$, $p < 0.001$) and lactobacilli ($r = 0.30$, $p < 0.001$), and combined level of mutans streptococci and lactobacilli ($r = 0.39$, $p < 0.001$) and negatively correlated to the buffering capacity of saliva (r = - |

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| | | longitudinal study | | | | | | | | 0.22, p < 0.05).<br>Tests based on either past caries experience or mutans streptococci or lactobacilli levels alone were not efficient in selecting persons at high risk for caries.<br>Among the tests, DFS was the most sensitive and specific.<br>A combination of either microbial test and DFS was more efficient to select persons at risk than various alternatives alone.<br>The sensitivity was 84% and the specificity 62% for the combination of lactobacilli test and DFS and 71% and 79% respectively for the combination of mutans streptococci and DFS.<br>In the former combination the positive prediction value was 43% and in the latter 56%. |
| Q1 m1 70 | 90 | Prevalence of caries and salivary levels of mutans streptococci in 5-year-old children in relation to duration of breast feeding | Alaluusua et al | Retrosp eval at age 5 of children with known breast feeding hx. 19% exclusively breast fed for > 9 mo; 38% weaned at ≥ 12 mo.. | Helsinki, Finland | 144 = all | At age 5--PSS ms (Dentocult SM) | WHO criteria for caries into dentin | Control for mother's mutans?? | Equal caries prevalence at the age of 5 among children with a longer or shorter period of exclusive breast-feeding (chi 2 = 3.68, 9 df, NS).<br>Exclusive breast-feeding also did not affect the levels of salivary mutans streptococci (chi 2 = 4.87, 9 df, NS).<br>Children who were weaned late did not differ from those who were weaned early with respect to caries experience (chi 2 = 6.12, 9 df, NS), level of salivary mutans streptococci (chi 2 = 5.49, 9 df, NS) or presence of mutans streptococci (chi 2 = 1.53, 4 df, NS).<br>On the basis of our sample we concluded that breast feeding alone cannot be connected with an increased or lowered caries prevalence. |
| Q1 m 173 | 90 | Association of selected bacteria with the lesions of root surface caries | Bowden et al | Obs, xsec, | Canada avg 65.5 yo, 22-26 teeth. Divided population into 5 groups according to DMFS and ± restored root surfaces. | All =165 | Plaque samples fr root surfs, either intact or carious. Samples taken from the entire surf with a scaler, to RTF, and plated on selective and nonselective agars. | | | The results confirm an association of S. mutans and Lactobacillus with root surface lesions and suggest a relationship between lesions and A. viscosus serovar 2. |
| Q1 m1 | 90 | Prevalence of Streptococcus | De Leo et | obs | Genoa Italy, | 105 schch age 5.5-11.5 | GSTB agar in unstim sal, pooled | | | All three samples showed association between S. mutans presence and caries prevalence. |

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| 74 | | mutans and dental decay in schoolchildren living in Genoa (Italy) | al | | | | occlusal and pooled buccal plaqe fr posterior teeth | | | The presence of S. mutans was significantly associated with both caries prevalence and extent of caries experience.<br>Both S. mutans prevalence and S. mutans proportion in plaque increased with the number of decayed teeth present among those sampled.<br>Sucrose consumption between meals appeared to be more correlated with the degree of caries experience rather than with caries or S. mutans prevalence. |
| Q1 m175 & Q1 lacto & Q1 a | 90 | Root surface caries and associated factors | Fure and Zicker t | randomly chosen Xsec obs of 3 diff ages, 55, 65, and 75 yo | Sweden | Tot =208 | Paraffin stim sal ms and lb and MSB and SL agars respectively.<br>Also, CFAT for Actinos.<br>Also pooled plaque samples | 4 post BWs; mirror/explorer.<br>Coronal: Gustafsson criteria.<br>Root: Banting criteria | Diet questionnaire by 24 hr recall | The frequency of root surface caries was positively correlated to the frequency of coronal decay and negatively correlated to the number of remaining teeth and exposed root surfaces<br>As for enamel caries, the variation in the frequency of root surface caries was best explained by the salivary levels of mutans streptococci and lactobacilli, the percentage of surfaces harboring plaque and the frequency of carbohydrate intake. |
| Q1 m176 | 90 | Primary reservoirs of Streptococcus mutans and their relationship to caries experience in adults with good oral hygiene | Keene et al | Obs | Houston TX, US | N=21 adults | Multiple sites sampled on dentition for plaque: tape for approx, sharp instr for "harvest" of all plaque at all other sites | DMFT and DMFS by Radicke criteria | Pooling of plaque samples may have led to underestimations and blunting of differences topographically | An anterior to posterior gradient of increasing S. mutans scores was observed for interproximal sites.<br>Oral hygiene scores correlated poorly with DMFT, DMFS and with the S. mutans scores obtained for different anatomic locations. |
| Q1 m177 & Q1 lacto | 90 | Dental caries, mutans streptococci, lactobacilli, and saliva secretion rate in adults | Klock et al | Obs, 4 age grps (20-25,26-45, 46-60, >60) | Sweden | All = 718 | Sal ms and lb, dipslide methods (Dentocult) | DMFS in enamel-dentin according to WHO, and root scores/ Calibration? | No info on medications/ Lots of variability among and within grps | Both mutans streptococci and lactobacilli significantly correlated to the caries prevalence but the r-value never exceeded 0.34. |
| Q1 m182 & | 90 | Caries prevalence and microbiological and salivary | Russell et al | Obs on 4 occasions | Scotland, adolescents | 372 | Paraff stim sal ms (Dentocult SM), lb (Dentocult Lb), Candida, | DMFS | Children used 6 dentifrices: 1000, 1500, or 2500 ppm F either with or | Counts of lactobacilli, mutans streptococci, and candida were consistently and significantly associated with caries prevalence, as either DS or DMFS score, and buffering capacity was |

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| Q1 lact o | | caries activity tests in Scottish adolescents | | | | | Veillonella on selective agars and in colorimentric broth of Walter and Shklair | | without ).5% zinc citrate trihydrate./ Stepwise regression strategy | consistently inversely related to DMFS score. No significant difference among toothpastes re DMFS or DS. |
| Q1 m1 83 | 90 | Mutans streptococci, oral hygiene, and caries in an adult Swedish population | Salon en et al | Obs, randomly selected adult pop | Alvsborgs County, Sweden/ 914 subj who represented 95% of an age and gender stratified random pop sample of 967 subjs. 751 were dentate | | Spatula after PSS, ms by MSB | | OH as prime variable | The results showed that the distribution of mutans streptococci among dentate adults not wearing any kind of removable denture(s) was similar to that previously reported from studies on Swedish schoolchildren.<br>A comparably higher proportion of subjects with high levels of mutans streptococci was found among the dentate individuals wearing some kind of removable denture(s).<br>Even higher proportions were found among edentulous individuals with complete denture(s).<br>There was a correlation between mutans streptococci concentration in saliva and caries.<br>The subjects with lower concentrations showed a significantly lower mean number of decayed surfaces, compared<br>For individuals without mutans streptococci, no relation between OH standard and caries could be found and, regardless of OH standard, higher numbers of decayed surfaces were found with an increasing concentration of mutans streptococci in saliva.<br>ANOVA with Scheffe to isolate differences. |
| Q1 m1 85 & Q1 lact o & Q1 a & Q1 s | 90 | Association of the microbial flora of dental plaque and saliva with human root-surface caries | Van Houte et al | Obs, 3 grps: n=43 with no RSC or restorations on roots, n=110 with ≥ 1 RSC lesion or RS restoration, n=120 with RS restorations only | US with RSC | 273 subjs, 46-64 yo, at least 10 teeth, | Plaque samples from sound, incip, and estab lesions on roots. Comprehensive workup for ms, lb, actinos, other strep species, and total flora | | | The data reinforce findings from other studies and indicate that, as for coronal caries, the plaque and saliva populations of mutans streptococci specifically are correlated positively with the presence of root-surface caries. |
| Q1 m1 87 | 89 | Streptococcus mutans infection level | Alaluu sua et al | Obs xsec | Helsinki, Finland, 5 yo participants in | All = 149 | PSS ms by Dentocult SM; plaque ms (on | 2 dentist examiners using | | In general, salivary S. mutans levels were low, and it was detected only in 46% of saliva samples. There was, however, a clear association between |

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| | | and caries in a group of 5-year-old children | | | longi study of nutrition and health. Not stated if a random sample or all of the children | | TSYbacitracin) of fissure and prox plaque samples taken from subset of 47.<br>Confirm tests. | WHO criteria. | | salivary levels of S. mutans and caries experience (chi 2 = 53.65, p < 0.001). |
| Q1 m 188 & Q1 lact o | 89 | Caries-related microbiological findings in a group of teenagers and their parents | Alaluusua et al | Xsec, obs | Finland, 113 teens, and 163 of their parents.<br>Teens were previous participants of studies of these investigators. | 82 M/C pairs and 73 F/C pairs | Paraffin stim sal. Ms by Dentocult SM, lb by Dentocult Lb | DMFS include xrs | Correlation statistics | DMFS was eightfold higher in adults than in teenagers (56.4 +/- 22.8 vs. 7.3 +/- 6.7).<br>The percentage distribution of the level of salivary S. mutans and lactobacilli was approximately the same in both groups.<br>The mean number of DMFS increased with increasing levels of salivary S. mutans and lactobacilli, the correlation being highly significant both in teenagers and adults.<br>There was a significant correlation of the DMFS indices in the mother-child pairs (r = 0.364), but the correlation was not significant in the father-child pairs (r = 0.138).<br>The salivary level of S. mutans was higher in the children of mothers with high DMFS values compared to the children of mothers with low DMFS values. |
| Q1 m1 89 & Q1 lact o | 89 | Associations between salivary levels of Streptococcus mutans, Streptococcus sobrinus, lactobacilli, and caries experience in Kenyan adolescents | Beighton et al | Obs | Randomized rural Kenyan adolescents (15 and 19).<br>Low caries experinece? | N= 149 | Spit into sterile bottle. Sal ms est by biochemical tests and lb by G+ calalase – criterion. Also, MS, MSB, TYCSB, in the field. Picked cfu's for further ID after transport I TH with glycerol to UK. | 3 examiners, D1…D4 criteria. DMFS | | Caries experience of the group was significantly (p < 0.001) correlated with both the total salivary level of mutans streptococci and the salivary S. mutans levels, but not with the salivary S. sobrinus level. |
| Q1 m1 90 | 89 | The microflora associated with the development of initial enamel decalcification | Boyar et al | Longi intervention: banding of noncarious teeth destined for ortho extn. | Canadian children in fluoridated area | 11 | Comprehensive plaque culture from extracted teeth with bands and sampled from below the bands. | Histological eval below ortho bands | | Dissolution was detected in areas where S. mutans was not isolated (8/34), but S. mutans was also present in samples showing dissolution (12/34).<br>There was no relationship between dissolution and the numbers of S. mutans; however, the isolation frequency of S. mutans was associated with |

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| | | below orthodontic bands in vivo in children living in a fluoridated-water area | | Then extn at timed intervals up to 14 days post- banding. Used oversized bands | | | Sample to RTF, diluted and plated on nonselective and selective agars | | | dissolution ($p < 0.05$). |
| Q1 m1 92 | 89 | Distribution of mutans streptococci in populations with different levels of sugar consumption | Carlsson P | Obs, xsec. Study of caries as func of sugar consump and ms and lb | Sweden; age? THIS IS A RETROSPECTIVE PAPER ATTEMPTING TO RECONCILE DATA AFTER VIPEHOLM STUDY. DO NOT CONSIDER IN THIS REVIEW. | ? | ? | ? | Need to scutinize N, bias, microbiol, how diet evaluated | As expected, differences were found in the caries prevalence between the different populations.<br>An association between bacterial count and dental caries status could be demonstrated at the low level of sugar consumption and caries prevalence.<br>the difference in diet between the populations or groups were not sufficient to affect the counts of lactobacilli or mutans streptococci, but may have been sufficient to create the differences in caries prevalence. |
| Q1 mH and search | 89 | Effect of different caries preventive measures in children highly infected with mutans streptococci | Linquist et al. Scand J Dent. Res 97:330-7, 1989. | 2 yr randomized, interventional on 13 yo children with >10E6/ml ms in saliva. Interventions: N=40 got 1% CH gel, in applicators for 5 min, repeated 3X on 2 consecutive days. If in 3 months, ms was >2.5 x 10E5, repeated. Avg # txs/child was 5.<br>N=42 got F | Goteborg, Sweden, public dental service./ Of 1122 children screened, 256 found to meet inclusion criterion. | 189 remained for final eval clinically./ 67 lost, mostly due to moving from area. | Paraffin stim sal; VMGII, MSB for ms. | Single examiner. DF recorded. yes, examiner blinded | All got std anticaries program including bim F rinse in school, dietary info, OH instruction. F in water is 0.1 ppm. | Mean number of new DFS was CH (3.06), F varnish (5.88), FeAlF (5.33), Control (6.34).<br>CH results different from controls at different surfaces by $p<0.05$ to 0.001.<br>Supervised antimicrobial tx can significnatly reduce incidence of caries in children with high numbers of ms. |

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| | | | | varnish in q3m after prophy. N=47 got FeAlF solution painted onto teeth, q3m (contains 0.2% F). N=50 controls. | | | | | | |
| Q1 m1 94 & Q1 lact o | 89 | Presence of mutans streptococci and various types of lactobacilli in interdental spaces related to development of proximal carious lesions | Cross ner et al | 2 yr longi, obs. | ? Umea, Sweden and Riyadh, Saudi Arabia.<br><br>Not clear where patients originated. | 23 7yr olds who had more than 10E3 lactobacilli in saliva | Saliva, tongue and plaque from 276 interdental spaces in yr 1 and yr 2. | BWs | Marginally powered | Results showed an increased number of interdental samples containing lactobacilli with an increasing number of salivary lactobacilli.<br>Furthermore, lactobacilli were never found interdentally without the presence of mutans streptococci.<br>Lactobacilli proved to be the more suitable microorganism for prediction of proximal carious lesions.<br>The presence of lactobacilli probably reflects a caries-inducing environment (etiologic microflora + fermentable carbohydrates), thus explaining their high predictive ability compared to their rather limited etiologic importance in the initiation of decay. |
| Q1 m1 96<br><br>& Q1 lact o | 89 | Caries prevalence, Streptococcus mutans and sugar intake among 4-year-old urban children in Iceland | Holbr ook et al | Obs | Urban Iceland, 4 yo; /all were offered inclusion, about a 10% sample of all Reykjavik children of this age. | 158 presch | Sal ms and lb | | Sugar intake questionnaire | Threshold value of 30 instances of sugar intake per week above which caries prevalence increased markedly<br>High bacterial counts were strongly associated with caries.<br>Only 5% of children with more than 5 x 10(5 S. mutans cfu per ml were caries free.<br>27% of subjects had 67% of the total amount of caries for the group and all of these would have been detected by the bacterial test. |
| Q1 m1 97 & Q1 lact o | 89 | Prediction of caries activity in children with today's low caries incidence | Klock et al | Longi obs of 14 yo with low incidence of caries (4.9±1.8 DMFT) at baseline. Seeks to | Uddevalla and Hindos, Sweden. | 100 In Uddevalla, 50 subj randomly selected.<br>In Hindas, all 50 children are included. All subjects | Stim sal by paraffin chewing, ms and lb by MSB and SL after transport in VMGII. Plating withing 24 hr. | 3 examiners, one common to both locations. Radiographs read | | A weak but statistically significant correlation was demonstrated between caries incidence and caries prevalence. No other significant correlations were shown. It was concluded that caries activity could not be predicted in this population. |

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| | | | | evaluate progression of existing lesions on approx surfs. | | got rountine care before onset and during project. | | by 3 three dentists—may be different ones? | | |
| Q1 m198 & Q1 lacto | 89 | A microbiological study of early caries of approximal surfaces in schoolchildren | Marsh et al | Xsec obs of approx dental plaque in teeth with very early decay, shch mean age 13.5 y | Bath UK, | 60 sites in 42 premolars | Composition of approx plaque after wash with water. Extensive bacteriological workup, includes TYC and SL. | Orthodontic extraction teeth: Polarizing light and contact micro XR as evid of demin | | Both the isolation frequency and the mean percentage viable count of mutans streptococci and Actinomyces viscosus were higher at sites with early caries, although mutans streptococci could not be detected at 37% of sites with early caries. At these latter sites, the proportions of Veillonella were markedly reduced.<br>Lactobacilli were rarely isolated and were never recovered from caries-free surfaces. |
| Q1 m200 & Q1 lacto | 89 | Systematic analysis of gingival state and salivary variables as predictors of caries from 5 to 7 years of age | Sullivan and Schroeder | 2 yr Longi, observational | Malmo, Sweden; 5-7 yo | 105 | Spatula for sal ms and lb on MSB and Dentocult LB.. Read by comparison with visual standard (semiquant). | WHO stds and surface demin. BWs used when teeth approximating. Recorded only lesions in primary teeth. | gingival state as index of OH, salivary secretion rate and buffer capacity of the saliva/ Tx during year by others. Concern with changing diet habits during study | The S. mutans count turned out to have the best combination of sensitivity (0.41) and specificity (0.83).<br>The observed low predictive ability might be explained by the fact that 1) many children changed their habits during the period of investigation and 2) they were examined and treated once a year according to their individual needs, which meant variations in conservative as well as in preventive treatment. |
| Q1 m201 & Q1 lacto | 89 | Dental health status in Latin-American preschool children in Malmo | Vidal and Schroder | Obs | Latin Amer chld living in Malmo Sweden 3-6 yo | 73 | Sal ms and lb | | 30 % use nursing bottle at night with sucrose/ Swedish not native lang | The mean dmfs values differed significantly between children with and without S. mutans and with different levels of S. mutans in saliva ($p<0.05$). In some ages, there was signif difference in dmfs for children with and without detectable lb in saliva ($p<0.05$). |
| Q1 m202 | 89 | Correlating Streptococcus mutans with dental caries in young children using a clinically applicable microbiological | Weinberger and Wright | Obs, done as clinical method validation | Pediatric dental practice in Canada; 16-60 mo, avg. 38 mos, 33 with complete primary | 37 | Spatula Sal ms onto MSB | Pediat dentist, mirror and explorer | | chi 2 and multiple regression analyses gave highly significant relationships ($p < 0.01$) between dental caries prevalence and the number of S. mutans colonies. |

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| | | method | | | dentition | | | | | |
| Q1 m203 & Q1 lacto | 89 | Identification of caries risk in schoolchildren: salivary buffering capacity and bacterial counts, sugar intake and caries experience as predictors of 2-year and 3-year caries increment | Wilson and Ashley | Obs, 2 or 3 yr longi | UK; 84 urban schch, 11-12 yo | 84 | Q6m paraffin stim sal ms and lb by TYCSB and Dentocult. | FOTI approx, visual-tactile methods | | All the predictor variables showed statistically significant correlations with either 2-year or 3-year caries increment.<br>Approximately 25% of subjects were identified as high risk individuals on the basis of a 2-year DFS increment of 5 and above, or a 3-year increment of 8 and above.<br>None of the predictor variables achieved the target predictive value of 80%, either individually or in combination. |
| Q1 m204 & Q1 lacto | 88 | Analytical and physiological variability of salivary microbial counts | Bentley et al | Obs. Method validation and ident of sources of variability . Issue of time of day and before/after eating or brushing | North Carolina | ? | Sal ms and lb. MSB and SL agars.<br>Sample stability was investigated over storage periods of up to 72 hr at 5 degrees C, room temperature, and 37 degrees C.<br>Physiological variability was investigated by performance of serial analyses on ten individuals, who collected six samples at intervals on a single day, and rising and noon samples on ten subsequent days. | As microbiologist (ex training) | Important methods paper explaining some sources of variability. Were North Carolina group studies done according to Bentley's criteria as to sampling conditions or controlled at one or another condition? | Sample collection, rather than sample processing, was found to be the major factor determining the imprecision of salivary microbial analysis in the majority of cases.<br>However, individual subjects varied considerably in the consistency with which they provided saliva samples.<br>Imprecision due to sample processing was relatively small, with coefficients of variations of 2.3% for MS counts and 2.1% for Lactobacillus counts.<br>Rising samples yielded higher counts than samples collected after breakfast and toothbrushing.<br>Day-to-day variability was considerable, with 95% confidence limits exceeding 1 log in 28% of data sets for MS count and 39% of data sets for Lactobacillus. |
| Q1 m205 | 88 | Effect of a preventive program on dental caries | Carlsson et al | 3 yr longi , obs. Divided by class with ± educational | Poland, schch, suburban | 10-12 yo 168 examined, 158 enrolled | Spatula sal ms by MSB | By probing and exploratio | | The mean 3-yr DFS increment was 1.7 in the test and 10.9 in the control group.<br>The salivary counts of mutans streptococci were similar in test and control group at baseline and |

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| | | and mutans streptococci in Polish schoolchildren | | and temp restorations and then preventive program begun for tx grp. This was eduction re sugar avoidance and use of F toothpaste, F varnish, supervised toothbrushing, by trained assistant. | | and completed 1st yr, 133 completed 3 yr. | | n after teeth polished/2 dentist examiners | | after 1 and 2 yr.<br>At the examination after 3 yr, a difference of ms was established between the two groups. |
| Q1 m2 06 | 88 | Caries prevalence and severity in the primary dentition and Streptococcus mutans levels in the saliva of preschoolchildren in South Africa | Chosak et al | Obs, xsec, 3 age cohorts: 3, 4, and 5 yo | So Afrrica, urban Indian, Colored, Black and rural Black children | Tot of 228 of 654 screened for willingness ot participate or child/parents. | Ms by spatula method | Dmft and severity score (css). WHO criteria. | | In all three age groups a statistically higher dmft and css was found with a S. mutans level of greater than 10(6) CFU/ml in saliva than at lower concentrations.<br>At age 5 ANOVA showed significant differences between dmft and css at all S. mutans levels. |
| Q1 m2 07 & Q1 lacto & Q1 a & Q1 s | 88 | Microbial flora associated with presence of root surface caries in periodontally treated patients | Emilsson et al | Obs, xsec of root caries in pts tx'd 3 yrs earlier for PD | Goteborg, Sweden, school perio clinic.<br>Adults | 35/4 lost | Plaque samples from sound and carious root surfs. Analyzed for ms, lb, actinos, sanguis | After prophy, FMX, photos, Gustafsson et al criteria re enamel and Hix and O'Leary re roots. Data expressed as DMFS% | All taught OH, topical 0.2 % NaF at each clinic visit, and bid F toothpaste. | There was a low prevalence of root surface caries and a low level of salivary mutans streptococci and lactobacilli.<br>From subjects with root caries there was a no statistically significant tendency to higher proportional levels of mutans streptococci in plaque from carious root surfaces than from caries-free surfaces.<br>An inverse significant relationship between noncarious and carious root surfaces was noted for S. sanguis.<br>The population of A. viscosus and A. naeslundii was similar in plaque samples from sound and carious sites but was elevated levels in the subjects with five or more new root surface lesions. |

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| | | | | | | | | (ie as % of surfaces at risk for root decay) | | |
| Q1 m2 08 | 88 | Effect of professional flossing with chlorhexidine gel on approximal caries in 12- to 15-year-old schoolchildren | Gissel sson et al | Intervent, 3 y longi. | Sweden | 243 children, of which 220 12 yo. Grps: CH gel on floss n=72; placebo gel on floss n=77; no floss n=71 finished study | Saliva sampling for ms | | Saliva sampling for ms , thus distant from presumptive site of effect, dulling ability to detect effect. | After 3 years, the mean approximal caries increment, expressed as new DFS, was 2.50 in the chlorhexidine gel group and 4.30 in the placebo gel group ($p < 0.05$). The corresponding figure in the control group was 5.25 ($p < 0.001$ when compared to group 1).<br>There was no statistically significant difference between the groups with respect to numbers of S. mutans in saliva. |
| Q1 m2 09 & Q1 lact o | 88 | Antimicrobial systems of human whole saliva in relation to dental caries, cariogenic bacteria, and gingival inflammation in young adults | Grahn et al | Obs, xsec | Finland, naval recruits, all male, 19-21 yo | All =50 | Saliv ms, lb, total using MSB, SL, and nutrient agars; immunoglob; and sal FR and buffer capacity | Single dentist DFS and 4 BWs/ Dentist | Gingival bleeding index, calculus and probing depth. Some habitual smokers. | DS correlated large amounts of S. mutans ($p<0.01$), lactobacilli ($p<0.01$), GI (0.05), and total salivary immunoglobulins ($p<0.05$) and with low salivary flow rate and buffer capacity. |
| Q1 m 210 & Q1 lact o | 88 | Epidemiology of root surface caries in patients treated for periodontal diseases | Keltje ns et al | obs | Netherlands, pts in dental sch dept periodontolog y | 83 pts tx'd for PD 2 yr previously. 22-72 yo, avg 41. | PSS. TYCSB and SL agars | DFS with probe | | Salivary S. mutans counts and a combination of higher salivary S. mutans and lactobacilli counts were good indicators for the presence of root surface caries ($p<0.01$).<br>Pts with high RCI had higher ms levels than those with lower <2.5x10E6 ($p<0.02$). |
| Q1 m2 11 & Q1 lact o | 88 | Salivary levels of Streptococcus mutans and lactobacilli and dental caries experiences in a US adolescent | King man et al | 3 yr longi | Coldwater MI, 10-15 yo | 541 = all | Initially and at 17 months, unstimulated sal ms and lb after dry ice transport and thaw at 50C.. Then dilution and plating on MSB and SL. | DMFS | All pts except 6 used F in one way or another./ Dubious validity of use of unstimulated saliva.<br>Very dangerous micro methods re quantitative losses | Subjects with low levels of S. mutans and lactobacilli had significantly lower initial DMFS scores and developed significantly fewer new DMFS than subjects with high counts.<br>The predictive values of a positive result for S. mutans or lactobacilli assays were low (31% and 39%), but those for a negative result were high (81% and 84%). |

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| | | population | | | | | | | of flora. No assessment of this | |
| Q1 m2 12 & Q1 lact o | 88 | The earlier the colonization by mutans streptococci, the higher the caries prevalence at 4 years of age | Kohler et al | 33 month longi study of children monitored at 15 mo baseline for ms. Then q4m assessment of salivary ms, caries assessment and ms repeat. | Oskarshamn Sweden | 78-4 yo | PSS to RTF to MSB and SL agars. Confirmation immunologically. Levels of microorgs categorized by log differences <10E4, 10E4-10E5, 10E5-10E6, >10E6. | 2 dentists working independently and reconciling disagreements. Visual tactile BWs. Lesion criteria of Koch: probe entry to smooth surfs and stick in fissures. | All but 7 chldn on low F water. & on >1ppm. | The earlier the mutans colonization, the higher the caries experience.<br>89% of those colonized by 2 yo had caries with mean dfs=5.0 compared to 25% of the non-colonized 4 yr olds who had become colonized at 4 yo, with mean dfs=0.3 (p<0.001).<br>When detected at 3 yo, dfs at age 4 was 2.5 vs 4 yr olds who had become colonized at 4 yo, with mean dfs=0.3 (p<0.001).<br>More children with multiple species (S.mutans and S. sobrinus) had higher caries scores than those with only S. mutans |
| Q1 m & Q1 lact o by handsearch | 91 | Dental caries and salivary and microbial conditions in 50-60-year old persons<br><br>Commun Dent Oral Epidemiol. 1991; 19:93-7. | Rask et al | Obs. Baseline xsec data for 5 yr longi interventional study described in #213 | Study at Sweden; Pub Dent Health Svc. | Tot =124 ; 50-60 yo. | Two PSS samples, midmorning, 1 –3 wks interval. Ms and lb and buffer capacity using MSB, SL, and Dentobuff.. | DMFT and DMFS according to Gustafsson | | Flow rate <1 ml/min found in 20%.<br>Buffer capac below end pH 5.5 in 64%.<br>ms not detected in 5%.<br>17% had ms at ≥10E6/ml.<br>Lb not found in 10%.<br>21% had lb ≥10E5/ml.<br>S sobrinus found in 35-37% of subjects at 2 examinations.<br>Persons with both S. mutans and S. sobrinus had more ms than if had S. mutans alone. |
| Q1 m2 13 | 88 | Effect of preventive measures in 50-60-year-olds with a high risk of dental caries | Rask et al | 5 yr longi with 1 yr intervention of preventive measures to half. Intervention, 2 cohorts of "risk" patients with low salivary secretion rate | Study at Sweden; Pub Dent Health Svc./ Patients of private dentists. | Tot =124 ; 50-60 yo.<br>58 control; 66 exptl.<br>Risk with tx=16; Risk with control protocol= 12.<br>Non-risk with tx=40; non-risk with control | Sl ms and lb | Single examining dentist, DMFT and DMFS include BW xrs. | | The risk patients in the control group developed 1.67 new DF as compared to 0.19 in the test group (at end of 1 yr). (p< 0.05).<br>Also the numbers of mutans streptococci and lactobacilli were significantly lower in the risk patients in the test group after 1 yr compared with baseline values.<br>After the experimental year all patients were treated according to routine procedures.<br>Non-risk groups on the two protocols had same caries increment DF 0.39 and 0.40.<br>Five years after the start of the study a new |

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| | | | | and buffer capacity and high numbers of mutans streptococci and lactobacilli. Randomized to test group that received diet counseling, professional topical F applic in clinic and F mouththrisne or F get at home, and 1%CH gel in applicators during 1 y. Controls got preventive tx deemed needed by private dentists, include OH instruc, 2% topical F applic professionally, F varnish and dietary information, and routine other dental care. After yr 1, all extl grp given routine procedures of controls. | | protocol= 41./ 26 in 5 yr Risk with tx=1 Risk with control=2 Non-risk with tx=1 Non-risk with control=6.<br><br>No dropouts at end of yr 1. | | | | examination showed increased caries activity in the risk patients in the test group and the gain which had been made during the experimental year was almost lost, statistically. No signif bacteriolog differences at beginning or end of 1 yr or at 5 yr for either risk or non-risk groups; however, differences between risk and non-risk at baseline asserted, but stats not shown. Means given but not variances so calc cannot be done. |
| Q1 | 88 | Streptococcus | Sepp | obs | Kuopio, | 841 13 yo | Paraffin stim sal, | Caries | Public water is | As S. mutans counts increased, there was a |

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| m2 14 | | mutans counts obtained by a dip-slide method in relation to caries frequency, sucrose intake and flow rate of saliva | a et al | | Finland | | ms by dipslide (Dentocult SM) | scores were obtained from Public Dental Health records. / dentist | 1ppm F.<br>A sucrose intake score was calculated based on self-reported frequency of intake of six types of diverse form sugary products. | significant trend of increased DMFS and DS scores.<br>No linear correlation was observed between reported intake of sucrose and S. mutans counts, but the children with the highest counts (class 3) tended to have significantly higher sucrose intake than the rest of the children.<br>The flow rate of saliva decreased significantly as S. mutans increased. |
| Q1 m2 15 & Q1 lact o | 87 | Caries in the primary teeth and salivary Streptococcus mutans and lactobacillus levels as indicators of caries in permanent teeth | Alaluu sua et al | Obs, follow up to previous data collection | Helsinki, Finland | 129 teenagers with low caries activity | PSS, dip slide MSB | Visible decalcific ations and xrs | | Results suggest that caries experience of primary dentition was associated with caries experience of subsequent permanent dentition. This assoc is stronger in subjs who were caries inactive and weaker in those wo were caries active in the primary dentition.<br>The caries activity in the now teenage cohort was low. |
| Q1 m2 16 | 87 | A 30-month longitudinal study of the effects of some oral hygiene measures on Streptococcus mutans and approximal dental caries | Axels son et al | 30 month, 3 grp longi interventional; initial assignment randomized; all on OH and instructional programs, grp 1 prof mechanical tooth cleaning then 0.2% CH rinse x3 for 2 min ea then 1% CH gel x3 for 5 min followed ea time by rinse, mechan tooth cleaning, tongue | Karlstadt,Swe den, 13 yo | Tot= 187; grps approx equal sized | Sal ms and interprox plaque ms on MSB | BWxrs/ Not possible to blind subjects | Confounders? Blinding? Intimidation effects?/ Statistical methods stated, but not results of statistical analyses. | Group I showed a significant immediate reduction of S. mutans in saliva as well as an approximal tooth surfaces.<br>After six months, there were no differences among the three groups regarding these variables.<br>Compared with baseline, there was a significant reduction of S. mutans in all groups.<br>There was no significant difference in caries progression among the three groups.<br>However, the selected "high-risk" individuals in group I developed 0.25 new manifest caries lesions approximally/year, compared with 0.27 for all children of the same age group in the area.<br>Seventeen individuals had approximal surfaces with consistently high or consistently low S. mutans levels.<br>Forty-six percent of the surfaces with high values developed new or progressive caries, compared with 2% of the surfaces with low values. |

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| | | | | scraping and repeats.<br>All subj got diagram of dentition marking where ms was high on dentition, and urged to use dental tape on it. F toothpaste also urged to all.<br>Also, retrospective comparison with other (ie a 4th grp) nonparticipating subjects in area re caries scores. | | | | | | |
| Q1 m2 17 & Q1 lact o | 87 | The distribution of Streptococcus mutans serotypes and dental caries in a group of 5- to 8-year-old Hampshire schoolchildren | Beighton et al | Obs, xsec | Hampshire, UK, 5-8 yo schoolchildren | 97 | Tongue loop, to MSB and LBS for ms and lb. Ms confirmed by subculture and serotyping. | 2 examiners calibrated | | 75 of 97 children harbored ms: 57 sero c, 18 sero e and 7 serotype d/g. 14 harbored >1 serotype.<br>The number of ms in saliva correlated with caries activity DS + ds (r=0.694, p<0.001). |
| Q1 m2 18 & Q1 lact o & Q1 a | 87 | A bacteriological study of rampant caries in children | Boue et al | Obs rampant caries cohort | 1-5 yo, sweetened pacifiers and/or nursing bottle at bedtime beyond usual weaning period. Also freq cho-rich | 19 | Plaque samples from labial lesions, RTF, M1 broth for dilutions, enriched Tsoy, MS, MSB, CNAC-20, and Beighton and Colman medium, Veilonella mediumand media | ? | | Aciduric flora, Streptococcus mutans, Veillonella, and Lactobacillus predominated in plaque over the lesions.<br>Extracellular polysaccharide-producing streptococci other than S. mutans, as well as Actinomyces, were more abundant in plaque from sound surfaces. |

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| | | | | | betw meal snacks in place of bottle. | | for bacteroids, yeast, staph, and Rogosa SL. Multiple culture standards run. | | | |
| Q1 m2 20 | 87 | High prevalence of mutans streptococci in a population with extremely low prevalence of dental caries | Carls son P et al | Obs | Sudan, rural, schch, extremely low caries experience | 307 | Spatula, MSB. Subset to VMGII and plated in 1 mo. Confirmatory tests. | | No data on fluoride exposure or diet | High prevalence of ms (mostly S. mutans, some S. sobrinus) in population despite low caries experience. |
| Q1 m2 21 | 87 | Strains of mutans streptococci isolated in a population with extremely low caries prevalence are cariogenic in the hamster model | Emils on et al | May be strains isolated in study 220 | Low caries population in Sudan. Of 61 chldrn, 60 lesion free. | | 4 Pure isolates of S. mutans and S. sobrinus used to inoc hamsters free of ms. | Keyes method | | 4 isolates shown fully virulent in albino hamster model. Used known virulent ms as control. Hence, lack of caries in humans who were colonized by these 4 isolates is not likely to be explained by loss of virulence of these ms. |
| Q1 m2 23 & Q1 lact o | 87 | Caries status and microbial conditions in children in 1973 and 1984 | Klock and Krass e | Xsec randomized comparison of current with 11 yr-previous data set for comparable subjects | Bohuslan, Sweden, 9-12 yo | 1973N=?; randomly chosen =250 in 1984 | 8 am to 2 pm stim saliva collections, paraffin, VMGII, workup within 24 hr. MSB and Rogosa agars for ms and lb. Microscopic confirmation. | WHO/ Four dentists, one from 11-yr-previous study. | Lower baseline decay prevalence and extimates of ms. / Widespread present use of F, more common antibiotic use. Estimated that sucrose and other diet factors not changed (but no data). | Both the number of cariogenic microorganisms and the caries prevalence were significantly lower in 1984 than in 1973 (P less than 0.001). |
| Q1 m2 24 & Q1 lact o | 87 | Mutans streptococci, lactobacilli and caries prevalence in 11- and 12-year-old | Kohle r and Bjarn ason | Obs, xsec | | 217 Icelandic 11 and 12 yo | Parafffin stim sal S mutans, S sobrinus, and lb; VMGII and MSB and SL. | Dentist (ex. training) | | In 2% of the children mutans streptococci were not found whereas 31% and 35% of the 11-yr-olds and 12-yr-olds respectively carried more than 10(6) CFU per ml saliva.<br>The mean caries prevalence (DFS), initial caries included, for 11-yr-olds was 21.6 and for 12-yr-olds 28.8. |

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| | | Icelandic children | | | | | | | | Both mutans streptococci and lactobacilli were significantly correlated to each other as well as to caries prevalence.<br>An increased number of these microorganisms, especially the mutans streptococci, were associated with an increased DFS.<br>Children with high salivary counts of mutans streptococci and lactobacilli had four times higher DFS than children with low numbers.<br>The magnitude of salivary cariogenic bacteria as well as caries prevalence was found to resemble the situation in Sweden 10 yr ago. S. mutans (serotype c/e/f) was carried by all mutans streptococci positive children. S. sobrinus (serotype d/g) was found in 60 children (30.2%).<br>Children with both S. mutans and S. sobrinus had significantly higher salivary counts of mutans streptococci and lactobacilli as well as caries prevalence than children with only S. mutans. |
| Q1 m2 25 | 87 | Longitudinal clinical and microbiological study on the relationship between infection with Streptococcus mutans and the development of caries in humans | Lang et al | 24 mo prospective, | Swiss, 7-8 yo | 48 | Plaque from mesial or occlusal fissures of first molars. 1528 samples.<br>RTF and anaerobic workup in enriched nutrient agar for total flora and HLR of Ritz for total strep and HLR + bacitracin for ms. | ? | | Abstr states: …the results confirmed the role of S mutans as an imprtant but not exclusive initiator of dental caries. Furthermore, a temporal relationship between infection with S mutans and clinical diagnosis [of carious lesions] could be demonstrated. |
| Q1 m2 26 | 87 | Caries incidence in orthodontic patients with high levels of Streptococcus mutans | Lundstrom and Krasse | Interventional longi study of high salivary ms 5x10E5 subjects about to undergo ortho tx with fixed appliances. ± 1% CH gel tx throughout | Sweden, 11-15 yo | | PSS, to VMGII and plated within 30 h, generally. MSB agar | | All subjects got dietary and OH advice, and F varnish, and F toothpaste bid, and F mouthrinse bim and of F varnish. All of above are SOP. | A difference in caries incidence seen betw grps primarily on buccal surfaces of bonded teeth, but ns. |

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| | | | | active ortho phase whenever ms rose above inclusion threshhold (above).. | | | | | | |
| Q1 m2 27 & Q1 lact o | 87 | Dietary habits, gingival status and occurrence of Streptococcus mutans and lactobacilli as predictors of caries in 3-year-olds in Sweden [published erratum appears in Community Dent Oral Epidemiol 1988 Jun;16(3):192] | Schro der and Edwa rdsso n | Obs; with stepwise pooling strategy based on caries status and retrospective eval of hypoth risk factors/correla tes | Sweden; 3 yo/ 1st visit to dentist | All= 133 | Sal ms and lb | Dentist (ex. training) | Three levels of gingival status and dietary habits | Two groups in respect of dietary habits and oral hygiene were formed by stepwise pooling of the caries data for the nine possible combinations of oral hygiene and dietary habits, setting the most discriminating border (screening level) where sensitivity (0.86) and specificity (0.69) simultaneously reached their highest value. PV + was 0.58 and PV- 0.91.<br>Higher predictive values were obtained when presence/absence of lactobacilli and of S. mutans were combined.<br>Combinations of defined levels of dietary habits, gingival status and presence/absence of lactobacilli showed sensitivity 0.87, specificity 0.95, PV + 0.87 and PV- 0.95, presence/absence of S. mutans sensitivity 0.94, specificity 0.76, PV + 0.74 and PV- 0.95. |
| Q1 m2 28 & Q1 lact o | 87 | Lactobacilli and Streptococcus mutans in saliva, diet and caries increment in 8- and 13-year-old children | Steck sen-Blicks | Obs, 2 cohorts by age | Umea, Sweden. Larger ongoing health study with random selection of subjs. | 88 8 yo; 97 13 yo/<br>7 8 yr old and 4 13 yr old dropped out of diet study | Paraffin stim sal, Dentocult dip slide for ms and lb. | dmfs or DMFS , requiring penetratio n of probe for scoring, and BWs as required/ Single examiner | If restorations needed, they were done before entrance to study, and sal sample taken 1 wk subsequently.<br>Diet questionnaires with focus of analysis on sugars, sucrose and habits—by dietitians remote from this study and from dentistry.<br>Done in g/day./ Measure of meal effects and specific | In the 8 yr olds, total sugar and sucrose consumption and number of meals per day were correlated with salivary ms ($p<0.05$ and $p<0.01$).<br>In the 13 yr olds, total meals per day were correl with lb ($p<0.01$).<br>Dietary parameters correlations with caries increment were generally low.<br>In the 13 yo group, however, sucrose consumption and number of meals per day were corrl with caries increment ($p<0.05$). |

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| | | | | | | | | | substance consumption (g/day) probably not most critical for detecting possible effects | |
| Q1 m2 29 & Q1 lact o | 86 | Identifying children who will experience high caries increments | Bader et al | Discriminant anal on 18 month longi data with multiple hypothesized predictors recorded. Prediction performance assessed by comparisons with the actual high increment group, those with increments in the upper quartiles of DMFS within age groups. | Not identified/ Volunteers from another study. Prescreened to proved even distrib of caries prevalence among/across children in ages covered, then divided by age group. | 197 5-18 yo | Sal ms and lb by spatula tech and MSB and LBS agars, no stated confirmation | Explorer penetratio n and depth. DMFS/Ex aminer training and reliability not identified/ not stated | Race, DMFS,defs, nujmber perm teeth present, fissure retentiveness, occlusal morphol, sex. | Prediction performance was assessed by comparisons with the actual high increment group, defined as those children with increments in the upper quartiles of the DMFS distributions within age groups.<br>The analyses predicted between 56% and 91% of actual high increment children depending on age group. The children identified in the analyses experienced between 59% and 91% of the disease experienced by the actual high increment groups. |
| Q1 m2 30 | 86 | Streptococcus mutans and dental caries in urban and rural schoolchildren in Thailand | Bratth all et al | 2 grp obs, xsec. | Thailand, urban and rural chld 11-13 yo | 100 urban Bangkok); 71 rural (Petchboon) | Sal ms by spatula after paraffin, microscopic confirm of cfus | WHO DMFT/ Single examiner (Peter Carlsson) | In urban, fluoride rinse program est for 1 yr. No fluorosis seen. In rural, 1 mod fluorosis 5 very mild and 4 questionable. | The prevalence of caries 89% in Bangkok and 18% in the rural district.<br>Mean DMFT was 3.46 and 0.38 respectively.<br>S. mutans was found in 98% of the urban children and in 82% of the rural.<br>The differences in distribution between S. mutans and DMFT classes were statistically significant for the total sample by chi sq.<br>Mild fluorosis was present in some of the rural children. |
| Q1 m2 31 | 86 | Quantitative comparisons of potentially cariogenic microorganism s cultured from noncarious and | Brow n et al | Obs, xsec, micro association with sound and carious crown and root surfs | Houston TX; 22 to 84 yo | 150 samples from 25 in situ teeth with initial RSC lesions and in 25 extracted teeth with | Plaque; comprehensive workup | ? | No F info, drugs, xerostomia etc. | Proportions of microorganisms did not differ significantly between noncarious enamel and root sites, but the noncarious coronal and root sites had higher ($p< 0.05$) proportions of actinomyces than did the root lesion.<br>Enamel lesions had a greater ($p< 0.05$) percentage of Lactobacillus spp. than did root lesions. |

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| | | carious root and coronal tooth surfaces | | | | advanced RSC lesions. There were 50 root and 10 enamel lesions and 47 sound root and 43 sound enamel samples. | | | | The number of streptococci recovered from root lesions was greater (p< 0.01) than the number of actinomyces at the same site.<br>S. mutans was recovered from initial root lesions in greater numbers (p< 0.001) than were actinomyces and lactobacilli.<br>The number of S. mutans recovered at the initial root lesions was greater (p< 0.01) than that recovered from the advanced root lesions. |
| Q1 m2 32 | 86 | Caries prevalence, salivary Streptococcus mutans and dietary scores in 13-year-old Swedish schoolchildren | Kristo fferss on et al | Obs; | Karlstad , Sweden; 13 yo | N=388, all attendees of the Public Dental Health Service . All thus on plaque control and topical F. Probably all used F toothpaste at home. | Sal ms by spatula | Bite wings and records | Dietary self report to questionnaire, post hoc categorization/ Reliability of dietary report. Strong atmosphere in Karlstad re OH and education and extensive F exposure. No weighting in dietary survey re per se dwell time of foods in mouth. Treats ketsup on fatty meal equal to lollipop./ Questionable appropriateness of dietary comparisons re frequency and duration of sweet in mouth. | Significantly lower DFS values were found in the group with no detectable S. mutans compared to three of the four groups with salivary S. mutans (p< 0.01).<br>No differences were found between the DFS values of individuals with high, moderate or low dietary scores |
| Q1 m2 35 | 85 | Serum antibodies against oral Streptococcus mutans in young children in relation to dental caries and maternal close-contacts | Aalto nen et al | Xsec, obs Seeks relnshp betw serum Abs against ms and caries and closeness of contact with mothers | Karkkila, Finland/ Initial interview of mothers of 7 month old infants to get info about possible means of | 36 chld, 2.6-4.9 yo | Sal S. mutans by selective medium of Masuda, MS, and MSB; serum IgG, IgM and IgA antibodies against Strep. mutans 10449, serotype c. | Exams by one dentist, dmfs. | freq close maternal contact. Nonfluoridated. | Significant positive correlation (r = 0.49, p < 0.01) was found between the number of Strep. mutans and caries-index in children.<br>In median tests, high antibody titre and avidity of serum IgG antibodies against Strep. mutans were associated (p < 0.05) with low counts of Strep. mutans. No such relationship was found with IgM or IgA antibodies.<br>Children who had had frequent maternal close-contacts in their first year had significantly more (p |

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| | | | | | transmission of ms to mouth of infant: eg. Cleaning pacifier in mouth, sharing spoons, etc | | | | | < 0.05) IgG antibodies against Strep. mutans than children with rare close-contacts. |
| Q1 m2 37 & Q1 lact o | 85 | The microflora associated with the progression of incipient carious lesions of children living in a water-fluoridated area | Boyar and Bowd en | Obs, 1 yr longi. Radiographic assessment of progressivity of lesions approximally, and correlated to microbiology. Compared incipient lesions with control sites which were initially lesion free. | Winnepeg, CA. Childrens Hosp dental clinic. | 22, age 4-9. | Plaque from approx by stripping, to RTF, to nonselective and selective agars for ms, lb, total flora, others. | Incipient lesions – by concurren ce of 3 examiners of BW xrs. By 3 blinded examiners of xrs. Xrs done q6m for 1 yr. | | Lb present at 85% progressive lesions before clinical dx of progression made.<br>Lb was never isolated from non-progressive lesions.<br>Stat signif correls betw ms, lb, Veillonella and A. odontolyticus and p;rogressive lesions.<br>Stat signif negative correls betw progressivity and S. mitior, A naeslundii and A viscosus. |
| Q1 m2 38 | 85 | A study of Streptococcus mutans levels in both infants with bottle caries and their mothers | Brow n et al | Obs, cohorts of caries free vs bottle caries and their respective mothers, all <6 yo | Brisbane Australia children's dental hosp./ On availability | 11 bottle caries and mothers.<br>13 caries free and mothers | Spatula saliva to MSB | Dentists | Vit C, fruit syrups, other sweet drinks, antibiotic intake, diet, F – surveyed. | Mothers and childrens scores significantly related.<br>Ms scores for bottle caries pats were high.<br>Suggest strategy for primary prevention. |
| Q1 m2 40 | 85 | Dental caries and Streptococcus mutans in Sudanese schoolchildren | El Tayeb Ibrahi m et al | obs | Sudanese 12-14 yo | 120 schch, 3 schools in/around Khartoum | Spatula onto MSB | WHO | | 97% colonized by ms.<br>>10E6 in 44%.<br>Skewed caries scores, most children with DMFT 0-1. Some of these children had high ms (semiquant scare).<br>Children with higher DMFT, 4-5, more frequently had high than low ms. |
| Q1 m2 41 & | 85 | Longitudinal microbiological investigation of a hospitalized | Ellen et al | Obs , 34 month longitudinal | London, Ontario, Canada, Elderly, | 44 subjects presenting 154 caries-free surfs. | Plaque, sharp instrument, tangentially drawn over depth of | Discrete discolorati on and soft. | Many variables including salivation rate, medications… | The microbial count data were highly variable, precluding the finding of significant differences in caries association for either subjects or sites.<br>Streptococci, especially S. mutans, correlated |

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| Q1 lacto & Q1 a | | population of older adults with a high root surface caries risk | | | hospitalized, root surfs at risk for caries. Thus, starts with intact root surfaces and follows longitudinally, a prospective study. | | lesion. RTF and eval on dftl and selective and enrichment media for implicated bact | One examiner who also took plaque samples. Assessment at 12, 20, 24, 28,32, and 34 months | | highly with lactobacilli in the samples. |
| Q1 m242 & Q1 lacto & Q1 a | 85 | Streptococcus mutans and Lactobacillus detection in the assessment of dental root surface caries risk | Ellen et al | Obs, longitudinal for at least 1 yr. | Canada; Described by Banting et al in press at time of this pub./ Hospitalized pts avg 68.6 yr | 45 | 7 plaque samples taken q6m over a period of 32 months for most subjs.<br>Plaque from 150 root surfs, RTF, with eval on MS, SL, and enrichment media. | Most, 6 monthly root surface assessments during a 32 month period. | Many variables including salivation rate, medications… | The presence or absence of S. mutans and lactobacilli in samples taken at baseline could discriminate between subjects who were to be root-caries-active and those who were to remain root-caries-inactive during the subsequent observation period.<br>Moreover, if both bacteria were detected or only S. mutans was detected on a root surface at its entry into the study, that surface had a greater risk for developing a root lesion.<br>However, the tests could not predict which root surfaces within the mouths of caries-active subjects were to become carious. |
| Q1 m243 | 85 | The more Streptococcus mutans, the more caries on approximal surfaces | Kristoffersson et al | Obs, 2 yr longi | Malmo, Sweden | 28 --13 yo at baseline | 700 surfs for plaque sampling by toothpick | Approx lesions by trained xr examiner | | More new caries lesions and progression caries lesions were found on surfaces positive for S. mutans than on surfaces without.<br>The more S. mutans, the more lesions, 52% of the surfaces with positive S. mutans findings at all three sampling occasions became carious or had caries in a progressive form.<br>Among the surfaces with no detectable S. mutans, the corresponding figure was 8%.<br>80 out of the 530 surfaces diagnosed as intact at the start of the study became carious over the two-year period.<br>69 of these were S. mutans-positive at the first and/or second sampling. |
| Q1 m245 | 85 | Selection of a micromethod and its use in the estimation of salivary | Matee et al | Obs. | Tanzanian children | 144 | Comparison of culture media for differential cultivation of ms. TYCSB vs MSB. | | | Of relevance here: ms and lb were high/ml of saliva, despite probable low sugar exposure and low caries experience.<br>Probably #s /ml saliva reflects # on teeth and tongue, respectively, not proportion of flora on teeth |

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| | | Streptococcus mutans and lactobacillus counts in relation to dental caries in Tanzanian children | | | | | Also comparison of sample collection methods. | | | and tongue which is either ms or lb.<br>Authors voice concern with potential for caries if diet changes. |
| Q1 m2 46 | 85 | The microflora associated with developing lesions of nursing caries | Milne s and Bowd en | One yr longi of micro of nursing caries | Canadian Indian chldrn | 9 | ? Post hoc Comprehensive plaque sample eval for implicated supraging bact | ? | | 5 developed lesions; 4 remained lesion free.<br>No bacteriological correlates clear. |
| Q1 m2 47 | 85 | Streptococcus mutans and caries prevalence in rural Thai | Reich art et al | Obs<br>DMFT 4.12 under age 10 | Rural Thailand | 521;<br>ages ?? | Qualitative mutans assessment | | Betel chewing and highly variable F.<br>Not clear communication | Plaque material from 500 patients was examined qualitatively for S. mutans. The DMFT (dmft) index score was comparably high for patients under 10 yr of age (4.12). |
| Q1 m2 48 & Q1 lact o | 85 | Salivary counts of lactobacilli and Streptococcus mutans in caries prediction | Steck sen-Blicks | Obs. To observe value of adding lactobacillus est to mutans in predicton of disease | Sweden | 179 8-13 yo | Sal ms and lb | | | these tests or a combination of them are not specific in selecting caries risk patients.<br>combination of the two tests, however, was more efficient in selecting these patients than each test used by itself |
| Q1 m2 49 | 84 | Microbial characteristics of the human dental caries associated with prolonged bottle-feeding | Berko witz et al | obs | Cleveland OH | 7 nursing bottle caries | Plaque from lesions and white spot margins and lesion-free smooth surfaces.<br>4-6 samples from ea subject. | dentist | Bottle contents detnd by hx. All with fruit juice and either milk or formula | All plaques contained unusually high proportions of Streptococcus mutans.<br>The proportion of lactobacilli present in plaque from caries lesions was statistically greater ($p< 0.01$) than the proportion present in plaque obtained from white spot margins of these lesions or caries-free smooth enamel surfaces. |
| Q1 m2 51 & Q1 lact o | 84 | The effect of caries-preventive measures in mothers on dental caries and the oral | Kohle r et al | 3 yr longi, interventional (sucrose avoidance instruction, alternately assigned to | Sweden, primiparous mothers | 40 control mothers; 37 test mothers/ 4 lost | Mothers: Sal ms. VMGII and MSB and SL.<br>Children: If able to cooperate, paraf stim sal with RTF and MSB and SL. | 2 dentists independ ently, criteria of Koch (stick with explorer)/ | Breastfeeding? | The test mothers as a group showed approx. 10-fold fewer Strep. mutans during the test period.<br>At the age of 3 years, 70 per cent of the children in the control group carried Strep. mutans, compared with 41 per cent in the test group (p less than 0.01).<br>Fifty-two per cent of the children who carried Strep. mutans had caries at this age, compared to 3 per |

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| | | presence of the bacteria Streptococcus mutans and lactobacilli in their children | | Tx or control. Intervention delivered to mothers (or not) consisted of airm at reduction of S mutans, repeated q2-4m, till children 3 yo. Entry depended on sal ms of ≥1E6 ms and child of 3-8 mo. | | | AB confirmation of identities of serotypes and species. | no subject blinding | | cent of the children without this organism.<br>The time when Strep. mutans was first detected in the children seemed to influence subsequent development of caries because 77 per cent of the children who carried Strep. mutans at the age of 15 months had caries at the age of 3 years.<br>Approximately 40 per cent of the children in both the control and the test group had detectable lactobacilli in their saliva at 3 years.<br>In general, the children in the control group had more lactobacilli.<br>No signif diff in self reported frequency of sucrose intake. |
| Q1 m252 & Q1 lacto & Q1 s | 84 | Longitudinal investigation of bacteriology of human fissure decay: epidemiological studies in molars shortly after eruption | Loesche et al | 3 yr longi, repeat obs of bacteria in occl fissures of first molars. Subjects stratified into 5 grps according to prior caries experience. | US 1st and 2nd graders, Coldwater, MI | 368. About 700 fissures studied | Plaque from occl fissures and workup for implicated orgs. MS, MM10, MSB, LBS. | | Non-fluoridated water. Strong, with parametric stats | Teeth destined to become decayed exhibited a significant increase in the proportions of S. mutans from 6 to 24 months before the diagnosis of dental decay.<br>Lactobacilli were sporadically detected but when present were associated with dental decay.<br>Children whose teeth exhibited the greatest number of decayed surfaces had, at all time periods, significantly higher proportions of S. mutans than did children who were caries free.<br>Many teeth had high proportions of S. mutans at their entry into the study.<br>About 10% of the monitored teeth erupted during the period of observation, and in these teeth both S. mutans and lactobacilli could be significantly associated with decay.<br>In these newly erupted teeth S. mutans outnumbered lactobacilli by ca. 20 to 1.<br>S. sanguis, veillonellae, and the unidentified actinomyces-like organism could not be associated with the development of decay. |
| Q1 m253 | 84 | A comparison of S. mutans prevalence in relation to caries experience in | Scheie et al | Xsec; Obs, 2 cohorts of same caries experience, age and sex were | Norway: Native Norwegian and Vietnamese immigrant | 17 Vietnamese, 3-15 yo; presumably same number and age of | Saliva and plaque over caries lesions, and from fissures, and from sound smooth surfaces. V | DMFT/ Dentist/ not possible to blind examiner | Diet? | The S. mutans distribution appeared very similar in the two groups.<br>Only in untreated Vietnamese children were the S. mutans saliva levels higher, probably reflecting the numerous untreated caries lesions present in this group. |

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| | | Norwegian and immigrant Vietnamese children | | compared with resp to ms in saliva and plaque. Some restorative intervention. Pair matched Norwegian chldrn were pair matched to Vietnamese recent immigrant chldrn by age, sex, and DMFT | children | Norweigians | children done once on arrival in Norway and another time after all teeth restored. N children sampled once. | | | After caries treatment, we observed significant reduction in S. mutans levels in both saliva and smooth surface plaque.<br>Regardless of ethnic group, S. mutans prevalence was highest in plaque over caries lesions and from fissures, and lowest in plaque from smooth surfaces. |
| 254 | 83 | Streptococcus mutans establishment and dental caries experience in children from 2 to 4 years old | Alaluusua and Renkonen | 3 yr longi; obs | Finland | 39 2-4 yr old, successive order in clinic | Unstim sal and plaque on MS and MSFA (per Linke). Biochemical confirmation | Dmfs/ dentist | Diverse SES/ good | S. mutans was found in 38% of the children, and the predominant serotype group was c/e/f.<br>A total of 16 children got caries before the age of 4. Children who harbored S. mutans in their plaque at the age of 2, appeared to be the most caries-active individuals.<br>Their caries index values (dmfs = 10.6 +/- 5.3) at the age of 4 differed significantly from the values of children who harbored S. mutans later (dmfs = 3.4 +/- 1.8, p< 0.005) or remained free from S. mutans infection (dmfs = 0.3 +/- 1.1, p< 0.0003) |
| Q1 m2 55 | 83 | Prevalence, distribution of serotypes, and cariogenic potential in hamsters of mutans streptococci from elderly individuals | Fitzgerald DB et al | Obs xsec isolation of ms from elderly subjects and test of cariogenicity in hamster model | US, elderly age 60-87 | 169=all | Salivary ms, then inoculation of 87 pure culture isolates in hamsters | Hamster methods, per Keyes | | Human isolates are cariogenic in hamster model, and thus presumably in human subjects.<br>A considerable degree of variation in virulence between different strains was observed.<br>These differences were not relatable to individual species or serotypes or to whether the organisms were isolated from denture wearers or naturally dentate subjects.<br>Elderly individuals with either natural or artificial dentitions may be a hitherto unrecognized reservoir of mutans streptococci having varying degrees of potential cariogenicity. |
| Q1 m2 56 | 83 | The acidogenic microbial composition of dental plaque from caries- | Hayes et al | Obs, plaque samples from non-carious surfaces or caries free | UK;<br>fam members of Bristol Dental Hosp | 8 3-9 yo with sound occl fissures and no clinically or radiologically | Plaque quant assess of total flora, total streps, S. mutans, actinos; also | DMFS/total surfaces. Teeth extracted | Sugar exposure/ All subjects had used F toothpaste, 2 of each grp had F tablets. None of | The acidogenic "ratio" remained constant in sequential samples from caries-prone subjects but was increased by frequent exposure to sugar. Streptococci, Actinomyces and Strep. mutans were isolated from all samples but no consistent |

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| | | free and caries-prone people | | and caries prone SUBJECTS, NOT SITES. | | detectable leseions. Compared with 7 children with lesions, 4-10 yo in hosp for extn of carious teeth. Also 94 dental students stratified for caries status. | "acidogenic ratio"; samples taken after 12 fast or at least 2 hr after food intake. | due to ortho tx were excluded as were 3rd molars | fam member cohort had sealed teeth, all of non-fam had sealed teeth./ Questionable controls and confounding "dental culture". | relationship was found between either their isolation frequency or proportions and caries status. Confounded and strange design, noncomparable controls. |
| Q1 m2 57 | 83 | Comparative study of Streptococcus mutans laboratory strains and fresh isolates from carious and caries-free tooth surfaces and from subjects with hereditary fructose intolerance | Vade boncoeur and Trahan | an in vitro comparison of ms strains from subject populations with stock cultures | | | Physiological comparisons on several parameters | | | No notable differences betw HFI strains and other ms strains. Hence, cannot attribute lack of caries to change of virulence of ms from HFI patients who have virtually nil caries scores. Appears that lack of caries experience in HFI is due to severe sucrose restriction in such patients. |
| Q1 m2 58 | 83 | Correlation of level and duration of Streptococcus mutans infection with incidence of dental caries | Zicker t et al | 3 yr Longi, randomized, interventional test v control grps. Interv consisted of sealants of all unfilled molar and premolar fissures and 1% CH gel (in applicator?) | Sweden | 47 control vs 44 test completed the trial. | PSS MSB | Gustafsson criteria | When sal ms ≥ 2.5E5, retx with CH | S. mutans infection was suppressed by antimicrobial measures when the number of S. mutans exceeded 250 X 10(3) CFU per ml of saliva. The results illustrate that the level and duration of the S. mutans infection are strongly correlated to the incidence of caries. |
| Q1 m2 59 | 82 | A microbiological analysis of | Meiers et al | Obs, xsec, case control (caries free | US naval recruits | 68 teeth sampled: 48 carious and | Occl fissures sample with sterile burs; Total | dentist | | There was a four-fold increase in the total number of microorganisms recovered from carious (N = 48) compared to non-carious (N = 20) fissures. |

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| & Q1 lact o& Q1 s & Q1 a & Q1 e | | human early carious and non-carious fissures | | and caries active) | | 20 noncarious | bacterial counts, total streptococcal counts, and counts of Streptococcus mutans, Streptococcus sanguis, Streptococcus faecalis, Actinomyces viscosus, and lactobacilli | | | S. mutans was the only microorganism common to all carious fissures |
| Q1 m2 60 | 82 | Streptococcus mutans in caries-free and caries-active naval recruits | Walte r and Shklai r | obs | caries active naval recruits, US | 53 caries active vs 120 caries free. 17-24 yo. | Plaq sample and colorimetric assay with semiselective growth medium. 1837 plaque samples. + result confirmed by plating on MS. | Naval criteria visual tactile xr and WHO criteria. | | No of + sites greater in caries active subjects. Low % of false + and false – identifications of presence of ms. |
| Q1 m2 61 & Q1 lact o | 82 | Effect of caries preventive measures in children highly infected with the bacterium Streptococcus mutans | Zicker t et al | 3 yr longi, interventional. Interv was 1 % CH gel qd x14 d which greatly reducted ms. Retreated those who exceeded baseline inclusionary criterion when tested, on 4 month basis. | Sweden, 13-14 yo, schch. | N=101: 53 control; 48 test | Salivary ms, lb q6m. All test had ≥ 2.5xE5 for inclusion. Data stratified according to ms level in saliva. MSB and Rogosa SL. | Mirror explorer. Gustafsso n criteria.(1 954). | For all subj, all carious lesions restored at baseline, defective fillings fixed, OH instructions, dietary advice, tooth cleaning and topic fluoride varnish. Also education re role of ms and lb in caries./ strong | After 3 years, the mean number of new carious lesions was 9.6 in the control group and 4.2 in the test group.<br>In the children with 10(6) Strep. mutans at the start of the study, the corresponding figures were 20.8 compared with 3.9. |
| Q1 m2 62 Q1 lact o | 82 | Streptococcus mutans, lactobacilli and dental health in 13-14-year-old Swedish children | Zicker t et al | Obs, xsec. At baseline all subjs brought to good restorative status by restoration of all cavitated lesions, got | Molndal, Sweden, 13-14 yo/ All children in 4 classes | 101 | 2-5 weeks after tx completed—paraffin stim saliva, VMGII, MSB, SL for ms and lb. Biochem confirmation | BWs and white spots, ie. Incipient lesions then detected. | Plaque and gingivitis assess | DFS at baseline was 10.1 and 12.8 for girls and boys, ns.<br>Ms not detected in 11% while 21% had more than 10E6.<br>Lb not detected in 21% while 11% had more than 10E5..<br>There was statist signif correl betw ms and lb, betw ms and DFS, lb and DFS, and ms+lb and DFS. Increasing numbers of ms and lb, alone and in |

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| | | | | diet advice, prof tooth cleaning, and F varnish | | | | | | combination were assoc with increased lesions. |
| Q1 m2 64 | 81 | Comparison of Streptococcus mutans concentrations in non-banded and banded orthodontic patients | Corbett et al | Obs of pts prior to and following banding. Intervention in form of ortho tx to one cohort. | U Texas Dental Br. Ortho clinic | 2 grps, balanced by age and caries experience and existing malocclusions . N=18 in ea. Banded vs non banded | Plaq samples comparable area. 2 samples pooled from ea subj Calibrated size sampling cups. MS agar. | Doesn't discuss any lesions/ orthodontist | Pts in tx for 14 months avg. | Banded patients had significantly higher levels of S. mutans in plaque and greater numbers of S. mutans-infected sites than did caries-free patients. Caries-free banded patients had more S. mutans-infected sample sites than did the caries-free non-banded group. Hence, implication for increased caries risk for ortho patients. |
| Q1 m2 66 | 81 | Microbial studies on plaque from carious and caries-free proximal tooth surfaces in a population with high caries experience | Mikkelsen et al | obs | Greenland, 4 villages, very high caries prevalence | 39 15-47 yo, | Plaque sample from 1 carious lesion and one interprox site/subj to nutrient broth medium | | Other data would suggest that both types of sites colonized. Transport and storage in nutrient broth might have eliminated any differences that could have existed. | No differences in microb composition noted betw the two types of sites. |
| Q1 m2 72 | 79 | Streptococcus mutans and dental caries in humans: a bacteriological and immunological study | Huisin't Veld et al | Obs, 10 mo longi, plaque samples from caries active vs caries free subjs vs random subjects. All were military recruits. | Netherlands | 18-20 yo, lesion free military recruits (n=20); randomly selected 20 recruits; caries active 20 recruits | Plaque samples. Media not detailed, but followed with serotyping would seemingly good sera. | Explorer and xr and visual/ dentist | New to military; diet changes probably random/_strong | Plaque samples from caries-active subjects showed a higher incidence of S. mutans than plaque samples from caries-free subjects. This was especially evident in approximal incisor plaque. S. mutans serotype d was almost exclusively present in approximal plaque obtained from caries-active subjects. Tooth surfaces infected with S. mutans still harbored this micro-organism 10 months later, while uninfected tooth surfaces remained free of S. mutans. Caries development predominantly occurs on those tooth surfaces which harbor relatively high percentages of S. mutans (> 5%). No relationship of serum IgG or parotid IgA to infection status or caries status |
| Q1 m2 73 7Q | 79 | Longitudinal investigation of the role of Streptococcus | Loesche and Straff | Longi study of fissure microbiol | Michigan, patients at dental school clinic; | 52 5-12 yo ; 195 teeth; 42 with carious fissures; 153 | Plaque sampling and comprehensive workup including | Explorer catch. All detected lesions | All teeth restored before entry to study/_Very good micro and stats | Longitudinal analysis, which showed the the proportions of S. mutans to increase significantly at the time of caries diagnosis, Cross-sectional comparisons, which showed that |

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| 1 s | | mutans in human fissure decay | on | | | noncarious fissures/ Couldn't spot it. There must have been some lost | ms, lb and sanguis. MS, MSB, MM10, BA, etc | were confirmed as such by staff pedodontist and thereafter restored, as ethically demanded./ Dentist, single examiner. | (para and non para) | the proportions of S. mutans in the carious fissures were significantly higher than in caries-free fissures. Three subjects who had a low caries expereince developed five new carious lesions. Lactobacilli were prominent members of the caries-associated flora in these subjects greatly outnumbering S. mutans. The levels and proportions of S. sanguis tended to be higher in the caries-free fissures. |
| Q1 m2 74 | 79 | Longitudinal survey of the distribution of various serotypes of Streptococcus mutans in infants | Masuda et al | 30 month Longi obs | Japanese infants | 22, 5 –13 mo | Plaque from labial surfs max incisors using excavator, 9x over study period. MS and MSB, confirmatory tests. | Mirror and probe, no xrs.,/ Single examiner, no comment re experience/ Clinicians and microbiologists different people (ex. blinding) | Half of subjects developed lesions at sampling sites during study. | No clear-cut association between the initiation of dental caries and previous detection of S. mutans was noted. However, all 12 of the infants with caries had S. mutans isolated at some time during the course of this study. The initiation of carious lesions could be found in a few cases even when S. mutans comprised about 1% or less of the total streptococcal count of the specimen from the tooth surfaces. Serotype d/g strains tended to develop carious lesions on smooth surfaces, although serotype c was isolated from almost all individuals who developed caries. |
| Q1 m2 75 & Q1 lacto | 78 | Relationship of Streptococcus mutans and lactobacilli to incipient smooth surface dental caries in man | Duchin and van Houte | Obs, | | 2 grps of 5 6-12 yo child with multiple carious teeth | Minute sharp explorer tip samples of plaque across white spot lesions. Adjacent and distant sound surfaces similarly sampled. Workup on MS, MSB and MS without tellurite, and Rogosa for lb. | Visual, after removal of small area adjacent plaque | Plaque score 3 by Silness and Loe and debris score 3 by Greene and Vermillion | Proportions of ms much higher over ws lesions than adjacent or distant sites. Lactos not recovered from ws sites but were recovered from adjacent sound tooth sites. Topographical assoc of far higher % ms with incipient lesions (ms). Extensive statist support. |

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| Q1 m2 76 | 78 | Dental caries induction in experimental animals by clinical strains of Streptococcus mutans isolated from Japanese children | Hamada et al | Test of cariogenicity of 7 human isolates of ms in SPFSD rats.<br><br>Also tested human isolates of S sanguis, lb, and lab strains of ms. | Japanese children, | 7 human strains | Isolates of carious lesions of children | | | All the seven strains tested were easily implanted and persisted during the experimental period.<br>Extensive carious lesions were produced in rats inoculated with clinical strains of S. mutans belonging to serotypes c, d, e, and f, and maintained on caries-inducing diet no. 2000 [high in sucrose].<br>Noninfected rats did not develop dental caries when fed diet no. 2000.<br>All three S. sanguis strains could be implanted, but only one strain induced definite fissure caries.<br>Two S. salivarius strains could not be implanted well in the rats and therefore they were not cariogenic.<br>Four different species of lactobacilli also failed to induce dental caries in rats subjected to similar caries test regimen on diet no. 2000.<br>Therefore, ms strains isolated from humans are cariogenic in rats and likely cariogenic in humans. |
| Q1 m2 77 | 77 | Comparative cariogenicity of streptococcus mutans strains isolated from caries active and caries resistant adults | Fitzgerald DB et al | Obs, 6 pure isolates of ms. | US | 3 isolates from DMF=0 and 3 isolates from DMF≥10. Tested in N=12 hamsters in ea of 7 groups. One grp uninoc. | Pure culture isolation procedures. Hamster checked for indigenous ms. High sucrose diet | Human—DMF Hamster—Keyes' method | All from low F area | All isolates were cariogenic in hamster model.<br>No reason to ascribe diffeerence in human disease experience to virulence difference of their ms. |
| Q1 m2 78 | 77 | A longitudinal epidemiological study on dental plaque and the development of dental caries--interim results after two years | Hardie et al | 2 yr longi, | UK | 50 child (avg age 12.5) recruited from 700 in a longi epi study. 19 of these studied. | Premolar plaque sites sampled tiy, bilaterally by abrasive strip method. Total of 224 samples. Comprehensvie workup for facultative bact and categorization by gram stain | Bws at alternate exams, 2 evaluators trained | Pooling of approx plaque inevitable by abrasive stip meth. | During the two-year period, caries developed at 20% of the target premolar sites.<br>The microbial composition of plaque samples from caries-free sites and from carious sites before and after radiographic detection of lesions was broadly similar.<br>Numerical domination of particular sites by S mutans before detection of caries can occur, but has only been observed so far in 2 of 15 sites.<br>Pooled data from sites that have developed lesions indicate a rise in the isolation frequency and mean numbers of S. mutans after detection of caries.<br>In two of 15 instances no isolations of S mutans were made from sites which developed caries.<br>To date, no single species appears to be uniquely |

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| | | | | | | | | | | associated with the onset of dental caries. |
| Q1 m2 79 & Q1 lact o | 77 | Microbial and salivary conditions in 9- to 12-year-old children | Klock and Krasse | Obs, xsec | Tjorn, Sweden | 655, 9-12 yo | Paraffin stim sal, VMGII, MSB and SL for ms and lb. | 2 dentists, clin + xrs. Gustafsson criteria. | | Positive correlations were observed between S. mutans and lactobacilli.<br>Between S. mutans and incipient smooth surface caries.<br>Between lactobacilli and open carious lesions.<br>Nonpara stats ($p<0.01$) for all of above. |
| Q1 m2 80 | 76 | Correlation between streptococci of human dental plaques and dental caries | Biral | 6 month, Prospective obs | Two or more sound third molars required for inclusion in study. Piracicaba, SP, Brazil | 12 adults; 27 buccal tooth surfs | 3rd molar buccal plaque samples by curette; worked up for diverse streps on MS. Confirm tests per Carlsson. | | Control sites not sampled. | Clinical examinations carried out 6 months after the plaque samplings had strong positive correlation between detectable lesions and Str. mutans.<br>No correlation with S. mitis, S sanguis or S. spp. |
| Q1 m2 82 | 76 | Microbiological studies on plaque in relation to development of dental caries in man | Mikkelsen and Poulsen | Longi, obs, q6m , includes ages 5-7.5 | Denmark | 54 presch, with no approx decay of 1st molars | Approx plaque samples. Transported and stored samples in nutrient broth. Total aerobic/anaerobic counts, MS, IPS producers, etc | Not stated | - Nutrient broth tspt and storage probably exaggerated counts for growers. Poor choice probable. | No correl betw devel of approx lesions and either ms or IPS formers.<br>Ratio of aerobic to anaerobic bact decreased before lesions detected. |
| Q1 m2 84 | 75 | Prevalence and localization of Streptococcus mutans in infants and children | Catalanotto et al | Longi study of prevalence and localization of ms in children | US, Naval Hospital at birth and then day care ctr, Gt. Lakes IL | 92 newborn to 5 yo | plaque | Mirror explorer. Pediatric dentist | - | The edentulous newborns and infants with only their deciduous incisors did not harbor S mutans on the mucous membranes or the smooth surfaces of the incisors.<br>As the number of erupted deciduous teeth increased, there was a gradual increase in the isolation of the organism.<br>The greatest isolation frequency of S mutans, 46.3%, occurred in those children with a complete deciduous dentition and contact between the deciduous molars.<br>The interproximal areas where there was molar contact were the most frequent sites of early colonization of S mutans. |
| Q1 m2 86 | 75 | Predominant cultivable flora isolated from | Syed et al | Obs xsec | Ann Arbor, MI, dental school clinics, 23-70 | 15, All one grp | Plaque scraped with wire from bucco-cervical | ? | | 2 groups of bacteriolog findings:<br>S. mutans comprised 30 percent of the total cultivable flora. S. sanguis was either not found or |

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| & Q1 for lacto, s, a | | human root surface caries plaque | | | yr olds | | lesions, into RTF, with extensive aerobic and anaerobic workup, selective and enrichment media. Biochemical, Fab, and fatty acid analyses for identification vs authentic controls. | | | was present in very low number.<br>or<br>S. mutans was not detected, and S. sanguis formed 48 percent of the total plaque flora.<br><br>A. viscosus was the dominant organism in all plaque samples, accounting for 47 percent of the group I isolates and 41 percent of the group II isolates. |
| Q1 m2 88 | 74 | Relationship of Streptococcus mutans carrier status to the development of carious lesions in initially cariesfree recruits | Keene and Shklair | 1 yr longi study of 21 initially caries free naval recruits | Naval recruits | 21/0 lost | Plaque sampled from sound surfs (see #289). | - Dentist researcher | Free to eat as wish | 10 of 17 carriers, initially caries free individuals developed lesions in 1 yr. By chi sq, it is p>0.05.<br>If consider 10 or 21 initially caries free developed lesions in 1 yr, it is highly suggestive that caries is an infectious disease, not one based on genetic resistance or susceptibility.<br>Suggests that mutans colonization of sites is predictive of lesions. |
| Q1 m2 89 | 74 | The distribution of Streptococcus mutans on the teeth of two groups of naval recruits | Shklair et al | Obs of caries free and caries experienced cohorts | Naval training base, Illinois | 140 lesion free (DMFT=0) vs 92 lesion experienced. 17-22 yr old (DMFT=10.5) | Plaque sampled from sound occl, approx, and b-l of mand and max molars. Approx done with floss. Then pooled for ea subj. Plate on MS. | Dentist | | Lesion free grp: 12.9, 33.6, 37.1% of streps on b-l, occl, and approx sites respectivley are ms.<br>Lesion experience grp: 30.4, 71.7, and 69.6, for same sites.<br>Also ms less frequently isolated in lesion free than lesioned grp –56 vs 92%.<br>In genl, the % of total streps which are ms is higher in lesioned than non-lesioned subjects.<br>Stats by chi sq. All above are highly signif (<0.002). |
| Q1 m2 90 & Q1 lacto | 73 | Changes in Streptococcus mutans and lactobacilli in plaque in relation to the initiation of dental caries in Negro children | Ikeda et al | 18 mo longi study Black chld. | Birmingham AL, | 12 selected from 25. With lesion free lower 1st molar contacting a lesion free lower decid molar/0 lost | Sampled same tooth sites at baseline, 3, 6 and 12 mos.<br>MS and Rogosa SL. | At baseline, 3, 6, 12 and 18 mos, teth examined for appearance of lesions visually and by xr. 3 sites sample | 7-9 yr old at baseline | Mean number of S mutans increased with time on each of the 3 surfaces, it remained much higher in pits and fissures than on buccal and approx surfs.<br>Initiation of lesions tended to be preceded by elevated numbers of both sm and lb. However, lb became sizeable proportion of plaque biota only after appearance of lesions<br>Lesions often occurred in absence of lb, but not in absence of Sm. |

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| Q1 m2 91 | 73 | The ecology of streptococcus mutans in carious lesions and on caries-free surfaces of the same tooth | Rogers | Obs, | Australia | 21 | Plaque from lesions and sound surfs, VMGII and MS | DMFS, no xr data/not possible to blind ex. | Good micro with prompt workup in good tsp medium | In carious lesions, 39% of all strep are ms.<br>On caries free surfs, 9 %. (p<.01).<br>Smutans isolated from 23 of 25 lesion sites.and 6 of 23 sound sites |
| Q1 m2 92 | 73 | The occurrence of Streptococcus mutans in the dental plaque of a group of Central Australian Aborigines | Rogers | Obs , random selection of subjs from a grp of 1000 participating in genl health study | Australian Aborigines, 11-18 yo/ Random sel | 29 caries free subj 16M/13F vs 21 caries | Plaque samples on field trips, % ms in plaque | DMFT | - Up to 14 d in transprt medium VMGII could have resulted in change of proportions of recovered bact | 29 subj without decay had no detectable ms<br>21 subj with decay (DMFT range 1-5, mean 1.7) was detectable and abundant in 12/21 subjects |
| Q1 m2 93 | 72 | Demonstration of Streptococcus mutans strains in some selected areas of the world | Bratthall | Obs. Ms collected from plaque and tested for serotype | 10 different countries: Asutralia, Brazil, France, Japan, Netherlands, Poland, sweden. Egypt, UK, USA | 20+ from each | Tsp medium VMGII and nutrient agar and specif FA identification of serotypes | nana | - Good micro | Worldwide distrib implied with some suggestion of endemicity of serotypes.<br>Rough assoc with lesions, but cursorily studied. |
| Q1 m2 94 & Q1 s | 72 | Strep sanguis, Strep. mutans, and Strep. salivarius in saliva. Prevalence and relation to caries increment iand prophylactic measures. | Edwardsson et al. Odontologisk Revy. 23:277-296, 1972. | 1 yr longitudinal observation of relationship to caries increment of salivary titers of S. mutans, S. salivarius and S. sanguis . Intervention of F use to part of the high | 9-11 yo child from same class in Sweden. | 50 | Stim saliva, VMGII, plate on both MS and MC agar (selective for ms). | Clinical and xrs. | | No effect of F dentifrice on microorganisms in saliva.<br>Signif intrasubject variation of the numbers of the 3 microorganisms.<br>No correlation betw the occurrence of S sanguis or S salivarius and caries increment.<br>Signif correlation betw S mutans and caries increment, expressed as both the total number of new lesions and as the number of new lesions on buccal and lingual surfaces. |

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| | | | | salivary mutans group. | | | | | | |
| Q1 m2 95 | 72 | The association of Streptococcus mutans with early carious lesions in human teeth | Hoer mann et al | Obs, xsec | Male military recruits, reporting for duty. | 164 | Plaque samples with floss, approx, to holding medium and plated on MS for streptococci. Confirmatory tests. | BWs | Recruits from northeastern US. DMFT score >2 and < 8. | Strong positive correl between early detectable lesions and S. mutans. |
| Q1 m2 96 & Q1 s | 69 | Prevalence of Streptococcus sanguis and Streptococcus mutans in the mouth of persons wearing full-dentures | Carls son et al Arch Oral Biol. 14:24 3-249, 1069. | Obs, interventional | 20 edentulous subjects with complete dentures; Malmo, Sweden | 20; Also, a subset of 7 who gave up use of the dentures for 2 days, then reinserted them.. | Swab samples of dentures, after removal; saliva after removal of dentures. VMGII. Cultivate on MS. Also a selective medium for ms (MC agar). | | A FUNDAMENTAL OBSERVATION ABOUT THE BIOLOGY OF MUTANS STREP, SANGUIS STREP, AND SALIVARIUS STREP. | Mutans and sanguis strep constituted a higher percentage of denture plaque microbiota than salivary microbiota.<br>When dentures were surrendered for 2 days, the numbers of mutans and sanguis in saliva fell below detectability.<br>They reascended when denture use resumed.<br>Salivarius strep were present in all subjects and were not affected in numbers by removal of dentures.<br>There were few salivarius strep recovered from denture plaque.<br>Conclusion is that mutans and sanguis strep establish in the mouth if solid surfaces such as teeth and dentures present. Salivarius strep colonize mucosal surfaces. |
| Q1 Ha nd sea rch & Q1 s | 19 74 | Interdental localization of Streptococcus mutans as related to dental caries experience | Gibbo ns et al<br><br>Infect Immu n 9:481 -488, 1974. | Obs of 13-14 yr old children | Charlotte NC and Danvers MA. | 18 Charlotte; 20 Danvers | Floss samples of approx surfs and fissure surfs, collected weekly for 5 successive weeks.<br>Explorer samples from fissures and bucco-linguals. VMGII. MS agar for ms and total streptococci. | DMFS | Both communities fluoridated. Enamel biopsies reveal equal and high F levels.<br>Higher caries experience in Danvers cohort than Charlotte./_A FUNDAMENTAL OBSERVATION ABOUT THE BIOLOGY OF MUTANS STREP, SANGUIS STREP, AND SALIVARIUS STREP. | Consistent localization of ms is noted, with little spread to adjacent areas.<br>Surfaces free of colonization stay that way.<br>Number of sufaces colonized by detectable ms was far lower among Charlotte than among Danvers children.<br>This correlated with low caries experience in Charlotte and higher caries experience in Danvers.<br>Differential caries experience between the two cohorts cannot be ascribed to different exposures to or effects of F on enamel. |
| Q1 mH | 69 | The relationship | de Stopp | Obs, xsec | Tiel and Culemborg, | 126: 63 from each town | Smooth surface plaque sample | Backer-Dirks | Culemborg 0.1 ppmF; Tiel 1.1 ppm | Independent of fluoridation state—<br>Plaque from surfaces of recently developed lesions |

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| and sea rch & Q1 s | | between extracellular polysaccharide -producing streptococci an dsmooth surface caries in 13-year-old children | elaar et al | | The Netherlands, 13 yo | | from buccal or either mand 2nd molar or 1st molar. Transport in medium without carbohydrate and then plate on sucrose containing agar. Discriminate between mutans and sanguis streptococci. | criteria (sound, white spot, cavitated) | F | had higher proportions of S. mutans than plaques from caries free surfaces.<br>Buccal smooth surface caries scores (ws + cavitated) were higher in children with higher proportions of S. mutans than with lower proportions.<br>No relationship to caries scores was found to S. sanguis. |
| Q1 mH and sea rch | 70 | Recovery of specific "caries inducing" streptococci from carious lesions in the teeth of children | Littelt on et al | Obs, xsec | NIH, 13-14 yo | 26 | Sound and carious site-specific plaque samples. MS agar. | Dentist | Clear that "caries inducing" means Streptococcus mutans from text | All 26 carious surfaces colonized by ms.<br>In 12 of 26 of them, the ms were ≥50% or total streptococci.<br>In only 6 of 26 samples from sound surfaces were ms recovered, and only from 1 to 10 % of total streptococci. |
| Q1 mH and sea rch & Q1 s | 70 | The effect of carbohydrate restriction on the presence of Streptococcus mutans, Streptococcus sanguis and iodophilic polysaccharide -producing bacteria in human dental plaque | De Stopp elaar et al | Interventional with longi control 17 day carbohydrate restriction and provision | Netherlands/ Caries Res 4:114-123,1070 | 6 | Sucrose nutrient agar and flood of some plates with iodine reagt for IPS+ | | | During CHO free period, S mutans decreased to very low – undetectable, while simultaneously S sanguis increased.<br>% of IPS+ also decreased in this restriction period.<br>Restitution of normal diet including glucose and sucrose reduced S sanguis while both S.mutans and IPS+ greatly increased.<br>There is an inverse relationship betw S mutans and S. sanguis abundance. |
| Q1 mH and sea rch &Q 2 m | 98 | Caries prevention during pregnancy: Results of a 30-month study. | Branb illa et al. JADA 129:8 71-7,199 8 | 30 mo longi, randomized interventional. Intervention: Tx-- diet counseling; prophy and OH once; systemic F, 1 | Milan, Italy/ 310, of which 65 with ms/ml saliva >10E5 selected. | Tx=33; Control=32 | Mothers: unstim saliva, mid-morning, done at 6, 12, 18, and 24 mo after 3 mo baseline.<br>Infants: at 6, 12, 18, and 24 mo. MSB. Microscopic | Claimed that hygienist was blinded. Hard to exclude bias due to CH | | Statist signif redn of ms levels in mothers (p<0.001) and presumed concomitant caries risk reduction (lesions not scored).<br>Statist signif redn of early colonization of chile (by survival analysis, Kaplan-Meier) and by mean ms levels of children. |

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| | | | | mg/d starting from last week of 6th month of pregnancy; plus daily rinse with 0.05% F; daily rinse of 0.12 % CH. The latter was to occur in 3 cycles of 20 days ea, with 2 10-day rinse free periods. Controls: diet counseling; one session of professional prophy and OH instruc; systemic 1 mg F/day starting last week of 6th month. | | | confirmation and biochemical. | stain. | | |
| Embase Q1m& Q2m | 99 | Interdental caries incidence and progression in relation to mutans streptococci suppression after chlorhexidine-thymol varnish treatments in schoolchildren | Twetman and Petersson | 2 yr Longi interventional: Mod to high ms . Some Cervitec varnish 3x in 2 wks interdental spot application of the CH-thymol varnish; Controls not so treated. Control from a separate cohort in adjacent community. This is not a | Halland, Sweden, 8-10 yo/ Screened 210 for mod-high ms. 111 qualified | All= 111 63 controls; 47 exptl | Sal and plaque at 1,3, 6 and 12 mos. Strip Mutans (Dentocult SM) for saliva and, by modification, plaque. Plaque taken by soft brush (akin to saliva) and treaked once across the strip. | BWs only, single examiner with magnif device. | All subjs got regular care from school dental service. All used F toothpaste; 0.1 ppm in water. | Reduction of caries incidence and progression was clearly dependent on the outcome of the antibacterial treatment. A significantly (P<0.01) higher progression score was found among children who exhibited a less marked suppression of interdental MS levels compared with those with high suppression and the children of the reference group. The results suggest that a suppression of MS in interdental plaque may be an important event to prevent and arrest approximal caries development in schoolchildren at risk. |

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| | | | | randomized design. | | | | | | |
| Embase Q1 m4 | 96 | Prevalence of dental caries in 4- to 5-year-old children partly explained by presence of salivary mutans streptococci | Granath L et al | obs | S African 4-5 yo Multiracial/multiethnic. Multiple stratifications by race/ethnic/level of ms | 2700 | Paraffin stim saliva. VMGII, packed in ice for 2-3 days before workup. Ms and lb on MSB and Dentocult LB. | Dmfs and WHO. Sharp prove/# examiners not stipulated, but baseline calibration claimed at >90% with extracted teeth mounted in plaster blocks. | Various intakes of sweets, lb infection state, OH. VMGII samples do not stay in same mixed microbial population proportions when packed in ice (for 2-3 days).<br><br>Were teeth cleaned before examination?<br><br>Possibly not highly reliable data. Large methodological as well as biological confounding of the data set. | The distribution of the children in the eight caries classes was strongly associated with the ms class (P < 0.001), with those in the lower ms classes generally having low dmfs scores and those in the higher ms classes having dmfs scores distributed over the whole range.<br>Regression anal to correct for confounders.<br>Ms classes with correction for confounders result in low r values.<br>Calls for reevaluation of ms as a risk factor in caries.<br><br>Model for study in highly diverse populations probably biases for minimizing detection of role of any microorganism. |

Evidence Table Construction Sanguis streptococci Q1

Question 1: Are subjects who have high levels of specific oral microorganisms at an increased or decreased risk for developing carious lesions compared to subjects who do not have high levels of those same microorganisms?
Designate teeth:
Primary, permanent coronal, permanent root, or mixed dentition
Initial lit. scan by JMT, AT, JL

| # | Y | Paper title | Authors | Design per AHRQ | Sample source/country/mehtod.response rate | No subj, each grp/No subj lost | Micro methods/Evaluator blinding | Lesion detection/Examiner training/Examiner reliability/Examiner blinding/Subject blinding | Other relevant data, questionnaires, confounders, demography<br><br>Quality of data/strategy | Findings (stat measures: means, odds ratios, risk ratios, likelihood ratios, sensitivity, specificity, conf intervals). Inferences re topic of this evidence table. |
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| Q1 s2 | 00 | Relationship among mutans streptococci, "low-pH" bacteria, and iodophillic polysaccharide-producing bacteria in dental plaque and early enamel caries in humans | Van Ruyven et al | Obs, xsec, sound vs various numbers of white spot lesions | US | ? | Rel global eval of bact in supraging plaque. And "low pH" unidentified bactertia | | | Over half of the total plaque flora in subjects with 5, 6, or 7 white spots consisted of "low-pH"-type organisms (minimum pH < 4.4). Many of these were neither MS nor "low-pH" non-MS. |

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| Q1 s3<br><br>& Q1 m | 97 | Variations in the predominant cultivable microflora of dental plaque at defined subsites on approximal tooth surfaces in children | Babaahmady et al | Obs, anal of site specific lesion/bacterial association | Avg 12 yo schoolchild | 12 subjects, 21 extracted premolars | Plaque sampling around contact areas; selective and nonselective agars for wide battery of implicated bacteria | Sel of most lesion prone approx site: below contact area | na | The isolation frequencies of Strep. mutans and Strep. sobrinus were significantly higher at subsite B (A B $p < 0.01$ and $p < 0.05$, respectively).<br>A. naeslundii and A. odontolyticus were isolated more often at subsite B (90.5 and 57.1%, respectively), and A. israelii at subsite S (66.7%)<br>Strep. mitis 1 and Strep. sanguis were found more frequently at subsite S (76.2 and 66.7% respectively), whereas Strep mutans, Strep. sobrinus, Strep. gordonii and Veillonella spp. were recovered most commonly from subsite B (85.7, |

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| | | | | | | | | | | 33.3, 38.1 and 76.2%, respectively). |
| Q1 s8 & Q2 m | 91 | Mutacin activity of strains isolated from children with varying levels of mutants streptococci and caries | Alaluusua et al | obs | Finland | 94 child; 157 isolates of S mutans vs indicator strains | 157 isolates of S mutans vs indicator strains | | | Mutacin was produced by 83% of the isolates against one or more of the 14 indicator strains representing mutants streptococci. Streptococcus sanguis, Strep. oralis, Strep. gordonii, Strep. salivarius and Strep. pyogenes.<br>Isolates that had a broad inhibitory spectrum also produced larger inhibition zones than isolates that inhibited fewer strains. |
| Q1 s9 | 90 | Association of selected bacteria with the lesions of root surface caries | Bowden et al | obs | Canada | 165, avg 65.5-yo, 22-26 teeth | Global plaque culture; Group A (DMFS 16.4), B (DMFS 55.9), C3 (DMFS 48.1); B and C3 were free of unrestored root lesions and differed in their coronal caries experience. | | | Streptococcus oralis, Streptococcus mitis 1 and Streptococcus sanguis were isolated more frequently from Group A. |
| Q1 s10 & Q1 m | 90 | Comparison of the initial streptococcal microflora on dental enamel in caries-active and in caries-inactive individuals | Nyvad and Kilian | obs | Aarhus, Denmark | 7 caries-active vs 7 caries-inactive adolescents | Plaque samples. Comprehensive workup according to Kilian's taxonomy scheme. 700 streptococcal isolates | | | Predominant streptococci belonged to the species Streptococcus oralis, Streptococcus mitis biovar 1, and Streptococcus sanguis.<br>Early plaque from caries-inactive individuals differed from that of caries-active individuals by significantly higher proportions of S. sanguis (p less than 0.05) and IgA1 protease producing streptococci (p less than 0.05).<br>In caries-active individuals, there was a tendency to elevated levels of S. mitis biovar 1 (p less than 0.10).<br>Caries-active individuals were colonized by significantly higher numbers of mutans streptococci on the enamel surfaces (p less than 0.01).<br>However, in both groups Streptococcus mutans (serotype c) comprised less than or equal to 2% of the early streptococcal flora.<br>Streptococcus gordonii, S. mitis biovar 2, and Streptococcus salivarius were present in low proportions and did not have differences in |

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| | | | | | | | | | | distribution that could be related to caries activity. |
| Q1 s13 & Q1 m2 59 | 82 | A microbiological analysis of human early carious and non-carious fissures | Meiers et al | Obs, xsec, case control (caries free and caries active) | US naval recruits | 68 teeth sampled: 48 carious and 20 noncarious | Occl fissures sample with sterile burs; Total bacterial counts, total streptococcal counts, and counts of Streptococcus mutans, Streptococcus sanguis, Streptococcus faecalis, Actinomyces viscosus, and lactobacilli | dentist | | There was a four-fold increase in the total number of microorganisms recovered from carious (N = 48) compared to non-carious (N = 20) fissures.<br>S. mutans was the only microorganism common to all carious fissures |
| Q1 s 14 | 82 | Oral flora of children with "nursing bottle caries" | Van Houte | obs | US | 6 | Plaque from nursing bottle lesions | | | The proportion of S. sanguis, in contrast to those of S. mutans, were very low in plaque from upper anterior teeth and higher in plaque from posterior teeth.<br>Lactobacilli were found in nearly all plaque samples; plaque and carious material from cavities contained higher levels than plaque associated with white spots or clinically-sound tooth surfaces. |
| Q1 s15 & Q1 m 266 | 81 | Microbial studies on plaque from carious and caries-free proximal tooth surfaces in a population with high caries experience | Mikkelsen et al | obs | Greenland, 4 villages, very high caries prevalence | 39 15-47 yo, | Plaque sample from 1 carious lesion and one interprox site/subj to nutrient broth medium | | Other data would suggest that both types of sites colonized. Transport and storage in nutrient broth might have eliminated any differences that could have existed. | No differences in microb composition noted betw the two types of sites. |
| Q1 s 17 | 80 | Microflora and chemical composition of dental plaque | Hoover et al | Cases of HFI who restrict sugar intake vs controls | US and Switzerland. Age of cases is 6-54 yo, | 17 HFI and 14 controls. (equal proportions of | Supraging plaque from smooth surfs, fissures and approx (i.e. | Refers to other paper of Newbrunre caries | Est that controls ate 20x the amount of sucrose as the HFI | Of 271 samples from HFI and 220 samples from controls, no difference in freq of isolation of sanguis (233/271 vs 185/220). Large diffs in freq of isolation of mutans (71/271 vs 159/2 |

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| & Q1 L 195 & Q1 m | | from subjects with hereditary fructose intolerance | | who do not have HFI nor restrict sugar intake. | avg 29 yo. Control age 9-55, avg 26.5 yo | cases and controls from US and Switz.) | extensive sampling). Workup for sanguis, mutans, lactobacilli. Data in terms of both isolation freq from samples and bacterial cfu/unit protein of plaque. | scores (submitted) | /Inevitable confounder is that HFI subjects don't have lesions or much restorative experience vs controls. Important biological principle re impact of sugar. | 20) and of lactobacilli 28/271 vs 88/220.<br><br>Total cfu/microg plaque is the same for cases and controls.<br>Ms cfu/microg plaque is 7 x 10E1 for cases and 3 x 10E4 for controls. There was one exception HFI subject whose cfu ms was like that of controls. Authors didn't supply statists, but likely highly signif. Comparable total cfu/microg plaque for lactobacilli not provided, perhaps because of lower freq of isolation in cases. |

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| Q1 s 18 | 79 | Longitudinal investigation of the role of Streptococcus mutans in human fissure decay | Loesche and Straffon | Prospective | US | ? | to detect changes in the levels and proportions of Streptococcus mutans, S. sanguis, and lactobacilli before and at the time of lesion development in occlusal fissures. 195 teeth that received four examinations at approximately 6-month intervals. | | | The data obtained from 42 carious fissures and 153 caries-free fissures strongly indicated an etiological role for S. mutans in most of the diagnosed fissure lesions<br>The levels and proportions of S. sanguis tended to be higher in the caries-free fissures |

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| Q1 s 19 & Q1 m | 78 | Dental caries induction in experimental animals by clinical strains of Streptococcus mutans isolated from Japanese children | Hamada et al | Obs. Human isolates to SPFSD rats to test cariogenicity | Japan | | Pure culture inoculations | | | Extensive carious lesions were produced in rats inoculated with clinical strains of S. mutans belonging to serotypes c, d, e, and f, and maintained on caries-inducing diet no. 2000.<br>All three S. sanguis strains could be implanted, but only one strain induced definite fissure caries. |

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| & | 75 | Effects of | Staat | Obs; High | US | 8 | Cultured pooled | | Diets were | Sucrose-rich diets had no demonstrable effects on |

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| Q1 m | | dietary sucrose levels on the quantity and microbial composition of human dental plaque | et al | sucrose (150g/d) vs low sucose (15 g/d) diets compared | Minnesota, dental students | | plaque for ms, sanguis, and lb. | | equicaloric and with same amounts of protein, fat and carbohydrates | total plaque accumulation, whereas total viable microbial density, Streptococcus mutans, and the lactobacilli populations increased.<br>The S sanguis population was unaffected.<br>However, in individual subjects, an inverse relationship between the S sanguis and S mutans population was observed. |

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| Q1 s 23<br><br>& Q1 m<br><br>& Q1 a | 75 | Predominant cultivable flora isolated from human root surface caries plaque | Syed et al | Obs, flora assoc with RSC lesions | Michigan | ? | Comprehensive workup | | | The plaque samples could be divided into <u>two groups</u> on the basis of the presence or absence of S. mutans in the plaque.<br>In group I plaques, S. mutans comprised 30 percent of the total cultivable flora.<br>S. sanguis was either not found or was present in very low number.<br><u>In group II</u> plaques, S. mutans was not detected, and S. sanguis formed 48 percent of the total plaque flora.<br>A. viscosus was the dominant organism in all plaque samples, accounting for 47 percent of the group I isolates and 41 percent of the group II isolates |

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| Q1 s 24 & Q1 m 294 | 72 | Strep sanguis, Strep. mutans, and Strep. salivarius in saliva. Prevalence and relation to caries increment iand prophylactic measures. | Edwardsson et al. Odontologisk Revy. 23:277-296, 1972. | 1 yr longitudinal observation of relationship to caries increment of salivary titers of S. mutans, S. salivarius and S. sanguis . Intervention of F use to part of the high salivary mutans group. | 9-11 yo child from same class in Sweden. | 50 | Stim saliva, VMGII, plate on both MS and MC agar (selective for ms). | Clinical and xrs. | | No effect of F dentifrice on microorganisms in saliva.<br>Signif intrasubject variation of the numbers of the 3 microorganisms.<br>No correlation betw the occurrence of S sanguis or S salivarius and caries increment.<br>Signif correlation betw S mutans and caries increment, expressed as both the total number of new lesions and as the number of new lesions on buccal and lingual surfaces. |
| | | Embase search, no further on point citations | | | | | | | | |