THE IMPACT OF POLICY CHANGE IN DENTAL HEALTH CARE:

An Examination of the Effect of Implementing Screening to Gain Access to Dentists' Examinations and Preventive Care in the North York Public Health Department

(Pilot Study Findings)

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Implementing Screening to Gain Access to Dentists Examinations and Care in the North York Public Health Department

Background

The North York Public Health Department (NYPHD) has operated a school-based dental treatment program since 1939. The children receive dental care at no charge and until 1992, enrolment was offered to all children up to and including those attending grade 6. In 1991-92, about one-half of parents chose to have their children attend private dentists. Presumably these parents preferred private dental care and had access to dental insurance or other financial resources to pay for it. In early 1992, North York public health officials believed that all 65,000 school-aged children in the city had access to a full range of diagnostic, preventive and treatment services through the combined coverage by the NYPHD dental programs and the community's private dental practitioners (PDP).

In June 1992, the NYPHD received notice from the Ontario Ministry of Health that subsidy for the school-based treatment program would be withdrawn immediately. Over the summer and early fall the dental care program managers in the NYPHD received approval from the Board of Health for a revised program fully funded by the municipality. As a result, in 1992-93 and for the foreseeable future, the NYPHD dental program activities consist of:

1) screening children attending school in North York from Junior Kindergarten to Grade 8 (1992-93 estimate 60,000 children) and notification of findings to parents/guardians;

2) offering NYPHD services children with identified need for clinical preventive (1992-93 estimate: 7,000 children) and treatment (1992-93 estimate: 11,000 children) services;

3) providing appropriate services to identified children whose parents enrol them in the NYPHD program (1992-93 estimate: 2,000 children for prevention plus 8,000 for diagnosis and treatment)

Thus, those children who have no dental needs identified on screening, will not be offered diagnostic treatment or preventive services by the NYPHD. Approximately 20,000 of these children would have been NYPHD patients in 1991-92 and the question arises as to whether they will suffer adverse health outcomes as a result of the policy change.

Purpose of Study

We set out to answer the following questions:

1) Does dental heath status, as measured by an epidemiological examination, differ between children who are clients of the NYPHD vs clients of private dental practitioners (PDP)?

2) Do dental services received over two years prior to the epidemiological examination, differ between clients of NYPHD vs clients of PDPs?

3) Do social, economic and behavioural factors differ between the families of children who are clients of NYPHD vs clients of PDPs, and are these differences associated with their health status and the services they received?

Design of the study

The study design was approved by the Research Committee of the Faculty of Dentistry, University of Toronto, Offices of Research Services for ethics in human experimentation, The Research Committee of the North York Board of Health, and both the Public and Separate Boards of Education in North York. In brief, we proposed to collect information on the social and dental health patterns and dental health and services obtained by children in North York after two years of the screening program. The data on which this report is based, were collected in April and May 1993, as a pilot study to the two-year study..

Children in all schools in North York are screened. Traditionally, in more affluent areas, almost all parents chose to have their children obtain care from private dentists. In the areas with low socio-economic status, almost all children enrol in the school-based (NYPHD) program. We felt that the impact of the policy change would be more clearly assessed where parents had opportunities to access either source of care. Evidence for such opportunities is strongest where parents of children in the same schools have made different choices.

We first randomly selected 15 elementary schools from a master list of all private and public schools that had at least nine clients of the NYPHD and eleven PDP clients in grade 3 in the 1991-92 school year. We thereby excluded very small schools where virtually all Grade 3 children attended one system of care.

We selected Grade 3 students as the study group because we wanted both an older age group, to allow for the accumulation of more disease, and a cohort which

we could re-examine in a possible follow-up component of the study. Grade 3 children remain in elementary schools until they are 12-13 years-old, allowing for a two or three year follow-up. In the selected schools we attempted to enrol all Grade 3 students.

We sent home letters of explanation and a parental consent form. We then telephoned parents to conduct the parent questionnaire, to obtain consent for the child's examination, and to encourage the parent to sign the request to the child's dentist. The request authorized the child's dentist to release the record of dental care provided to the child over the previous year, approximately May 1992 to June 1993. When we obtained consent, we examined children and sent a short questionnaire to the dentist named by the parent, and the request to return a copy of the child's record of care. Finally, we consulted the NYPHD independently maintained screening records for each of the children ultimately included, to learn their screening results for the academic year, 1992-93.

Instruments

The parent questionnaire contained questions on the child's residence history, source and pattern of dental care, preventive dental behaviours and social and economic status of the family followed by the parents' self-reported dental status and preventive dental behaviours (Appendix 1).

The dental examination protocol sought information on dental development, fluorosis, periodontal health (CPITN), dental caries status on each surface of each tooth, and the recommended treatment for each tooth (Appendix 2).

The dentist questionnaire (Appendix 3) asked if the named child was a regular patient, whether (s)he were covered by dental insurance, and whether the child received all the care that was recommended.

The service record (also Appendix 3) asked each dentist to provide the services using the same numeric codes used in billing third party payers for date of service, tooth, procedure and surface.

Data Collection

The research associate working on the study conducted most parent interviews by telephone; private and most school dentists completed and mailed their own questionnaires. In a few schools, where the dental team had moved on to another school, the research associate abstracted the treatment information from the records maintained in the first school.

Three dentists were recruited and trained to examine the children to the written criteria. They also re-examined six patients to measure inter and intra-examiner error. The project dentists were not otherwise employed by the NYPHD and were unaware of the usual source of care for the children. Trained assistants recorded the findings from the examination.

The research assistant obtained the results of the screening examinations from records maintained by the NYPHD.

Data Analysis

All information was entered on computer files, using Epi Info[1] and processed on microcomputers with SPSS/PC+[2].

Results

The results reported here are the pilot study findings and serve to initially address purposes 1), 2) and some of 3).

Overall, 779 children and their parents were invited to participate, of which 434 gave either written or verbal consent . Each data collection stage allowed further opportunity to decline participation and thus all of the data sets have slightly different numbers of participants. We interviewed 397 parents, examined 424 children and obtained records of treatment for 365 children. We have complete interview, examination and dental service records for 340 children. We have NYPHD screening results for all 779 children.

Findings Relevant to Purpose 1

Does dental health status, as measured by an epidemiological examination, differ between children who are clients of the NYPHD vs clients of private practitioners?

The source of care for the child was taken from the returns of the dentists. If children received one or more services in the previous year or, if the dentist identified them as regular attenders, they were allocated to that source of care. About 44% of

the children were exclusively NYPHD patients and one third were exclusively patients of private practitioners. Some 37 children visited both sources and for 59 we received no service data and their source is therefore classified as 'unknown'.

Because dental caries is the major dental disease of children and much of practitioners time is devoted to caries prevention and treatment, the major comparison between the oral health status of the groups was based on the conventional measures of dental caries and the levels of care that are evident on examination. Table 1 sets out the caries data by source of care. The 424 children had a mean of 3.09 decayed missing or filled deciduous and permanent teeth. The highest severity count (combined deft/DMFT = 3.75) was found in the children who had visited both sources of care. The clients of private practitioners had the lowest (best) caries counts (2.51) and the 59 children who had no known source of care have the second lowest (2.80). The table also shows the results of a separate analysis where we compared the mean counts between the NYPHD and the private practitioner clients using the 'Students t - test' for group data. The mean deft and mean combined deft/DMFT scores were statistically different between the two groups.

The f/deft and F/DMFT ratio shows the proportion of the disease that has been successfully treated and was used to compare dental treatment levels. Over 70% of the disease in both deciduous and permanent teeth was successfully treated in all groups except the permanent teeth of the 'unknown' group. The highest treatment ratio (0.91) was observed in the permanent teeth of PDP clients. The statistical comparison between the means of the NYPHD and PDP clients did not show any

statistical differences.

The mean number of sealed teeth, is one measure of the extent of preventive care provided. The overall average was 0.47 sealed teeth per child with PDP patients having more than twice the number compared to the NYPHD patients (0.73 vs 0.29). This difference was statistically significant.

The table also shows the extent of the more severe outcomes, namely the percent of children needing large fillings or tooth extraction of critical teeth or having lost a critical tooth due to caries. Child clients of NYPHD had higher prevalence of severe outcomes than any other group. Taken together, 14% of NYPHD had one or more poor outcomes versus 6.3% of PDP patients. While the trends seem obvious none of the differences between single measures were statistically significant.

Not shown in the table are the actual components of the deft/DMF counts. At base-line, children in the NYPHD program had more decayed teeth (0.67) than the patients of PDP (0.29).

Findings relevant to Purpose 2

Do dental services provided, over the year previous to the base-line examination, differ between clients of NYPHD vs clients of PDPs?

On examination of the data, we discovered that the designation of NYPHD and PDP patients was not clear-cut. Aside from the 37 children who visited both sources of care, there were obvious gradations of attendance and service type. Some children received preventive and treatment services and were described as regular attenders for care. Others had visited only for pain and had received emergency services in

connection with that single incident.

Table 2 shows the attendance pattern among the 335 children for whom we know the source of care. The attendance pattern was not reported by the dentist in 30 cases, reducing the number from the 365 children for whom we have clinical service records

Overall, the dentists reported 73% of children visited regularly for care and only 4% visited for relief of pain. Chi-square analysis confirmed there were no significant differences in reported attendance patterns between the children attending either or both sources of care.

Table 3 shows the percent of children who received one or more services in the year previous to our examination. The table includes all 365 children with service records and displays a cross-tabulation by identified source of care and attendance pattern, as reported by the dentist. Overall, 72% of children received one or more services. This varied little by reported attendance pattern, i.e., from 74% to 79% where the clinician reported a care pattern. Receiving services was, however, influenced by the source of care; 57% of children identified as exclusively NYPHD clients received one or more services compared to over 90% for the children who visited private dentists or both sources. Mantel-Haenszel Chi-square analysis showed this difference to be highly significant between the NYPHD and PDP patients while controlling for reported pattern of care.

Summarizing Tables 2 and 3 and comparing the two groups whom we identified as receiving care exclusively from either the NYPHD or private dentists,

we see that 75% of the private practitioners patients attended regularly and 92% of all received one or more services in the year previous. Among the NYPHD children 73% attended regularly and 52% of all received care in the previous year.

To compare the actual pattern of dental services received we next assigned children to two groups, confirmed patients and unconfirmed patients. Table 4 shows the decision matrix we used to allow comparison within and between sources of care. Children for whom we have no clinicians report on their attendance pattern, but who received services, were assigned as confirmed patients. This assignment was decided upon after reviewing these cases and studying the dentists' responses to other questions about the child.

To compare the amount and pattern of care that children received we converted each specific service to relative value units (RVUs) as defined by, or consistent with, the 1993 Ontario Dental Association fee guide. RVUs are a single measure of the time and difficulty of dental procedures which have been published by the Ontario Dental Association for the purposes of establishing a province-wide fee guide. They are considered a valid and reliable measure of service intensity, to the extent that they are accepted as the basis for payment by services by government and private programs, and almost all dentists use them as the basis for their office fee schedule.

We then listed the services by category and calculated the mean RVUs in total and by category for confirmed and unconfirmed patients. Tables for children attending each of NYPHD, private practitioners or both are shown as Appendix 4, Tables 1, 2 and 3.

For example, in Appendix 4, Table 1, we compare the mean relative value units of care between NYPHD confirmed and unconfirmed patients. Only 93 of 144 confirmed and 4 of 42 unconfirmed patients received one or more services. Overall the NYPHD dentists provided 3.6 RVUs of care to confirmed patients and 0.5 RVUs of care to the unconfirmed patients. This was a mean of 5.6 RVUs for the 93 children confirmed patients who were actually treated and 5.7 for the four unconfirmed patients who were treated.

To address Purpose 2 we compared the RVUs by category of service for confirmed patients who had visited either the NYPHD or the PP clinics only. In this way we hoped to clearly identify any differences in the type and intensity of care provided by the two different sources among children who appeared to have potentially similar access to care. The mean scores were tested for statistical significance using one way ANOVA.

Table 5 compares the mean number of services received by confirmed patients of NYPHD private practitioners or both. The total mean RVUs provided by NYPHD are less than a half (3.59 vs 8.40) those provided in PDP. In fact, child patients of private dentists receive more preventive care than NYPHD patients in total. On average, children, confirmed as patients by either NYPHD or private practitioners and receiving care from both, received the most diagnostic, restorative and surgical services, and confirmed patients of private practitioners received the most preventive, endodontic and orthodontic services. NYPHD confirmed patients received the fewest mean services overall, and, in almost every category of care. The p-values for the

ANOVA test confirm the statistical significance of these clinically important differences.

Some of the differences in mean services seen in Table 5 are due to the fact that only 93 of 144 NYPHD patients received a service. Table 6 compares the mean number of services received by those who received at least one service. Using this perspective, the total mean RVUs are 5.55 in NYPHD patients vs 8.46 and 8.58 in the other two groups. The NYPHD provides more restorative RVUs per child than private practitioners (2.71 vs 1.48), but not more than both sources provide in total to children who attended both (2.80).

Overall, child patients of private dentists received 50% more care compared to NYPHD patient (8.46 RVUs vs 5.55 RVUs). Most of this difference occurred in preventive services where private patients received nearly 260% more than NYPHD patients (3.63 RVUs vs 1.01 RVUs). Mean Orthodontic and Examination RVUs were also higher in private patients.

Findings relevant to Purpose 3

Do social, economic, behavioural factors differ between the families of child clients of NYPHD vs those of PDPs and are these associated with any differences detected in health status (Purpose 1) and service provision (Purpose 2)?

Table 7 shows the distribution of families by some of the socio-demographic responses obtained from the parent questionnaire, according to the sources of care used for Table 1. Families whose children attend private dentists are the most advantaged in almost every indicator shown. They have the highest proportions of

parents and children who were born in Canada, lowest proportion immigrating to Canada within the ten years previous to our survey, highest percent of parents completing high school or greater, highest percent of fathers employed full-time, lowest percent of fathers receiving social assistance or unemployment insurance, highest proportion of fathers with incomes above $30,000 and having a private dental insurance plan. Conversely, families whose children attend NYPHD for care are the most disadvantaged on every indicator. The differences in some cases are startling. For example:

- 47% of NYPHD families report incomes above $30,000 compared to 81% of PDP families;
- over twice as many mothers (47% vs 22%) and fathers (51% vs 24%) of NYPHD clients have immigrated to Canada within the last ten years compared to clients of PDPs; and
- 57% of fathers of children attending NYPHD are employed full-time compared to 94% of fathers of children attending PDPs.

The socio-demographic characteristics of families whose children attend both NYPHD and PDPs and families of children for whom we received no record of care, for the most part, fall between the two extremes of the private and NYPHD clients.

Table 8 shows the preventive dental behaviours reported in the parent questionnaire. Parents reported their children had high rates of brushing (all over 95%) and visiting a dentist (all over 85%). Lowest rates were reported for daily flossing (19% NYPHD to 29% PDP). We observed the largest difference in the receipt

of topical fluorides, where 92% of private practitioners' patients reported receiving one or more compared to 46% of NYPHD patients.

Discussion

We have collected three sets of information about 424 children in North York: their oral health status, their record of dental care and their families' socio-demographic status along with the child's reported dental behaviours. We set out to compare this information between children receiving dental care from NYPHD and from private dental practitioners.

We found that in 1992-93 some children obtained care from both sources. Three reasons may explain this. First, parents may have lost employment (and dental insurance) during the year and the child, who formerly attended a private dentist, then obtained care from the NYPHD program. Second, parents obtain dental care for the child from NYPHD to avoid costs to the family or the time-costs of them picking up, waiting for, and returning children to school. These time-costs are significant and a major factor in the economic burden of dental diseases[3]. Third, current NYPHD policies specifically exclude children whose families have sufficient income or dental insurance to obtain care from private dentists. This exclusion policy was only introduced in the 1992-93 school-year, but dates for services received extend back into the 1991-92 school-year when children were free to visit both the NYPHD and PDP clinics. Recall error on the part of the parent cannot be used to explain this finding. Parents provided us with this information which we subsequently verified

by obtaining the record of care from the reported dentist.

The second major finding was the extent of differences by social, economic and demographic indicators between the families of children obtaining dental care from NYPHD clinics and private dentists. Generally NYPHD patients came from families who are much more likely to be recent immigrants (i.e., within the last ten years), have lower family incomes, to be receiving unemployment insurance or social assistance, to have lower education, and not to have dental insurance. As an example, over 45% of the NYPHD children were born outside Canada compared to less than 25% of children attending private dentists.

Our third major finding is the extent of differences in oral health status. NYPHD clients have had significantly higher levels of dental caries in their deciduous teeth and more fillings compared to PDP patients. However, using the proportion of diseased teeth filled to total diseased teeth (e.g., f/deft) all groups have similar proportions of their care needs met, i.e., about 75%.

Private patients have significantly more sealed teeth. Two explanations are possible. First, the NYPHD dentists are not providing this preventive service when it is indicated and private dentists are. This undertreatment may be a lack of compliance with the program standards or it may result if NYPHD dentists are not seeing the children at the appropriate stage in their development to apply sealants, whereas private dentists are. This might be due to the itinerant nature of school populations from disadvantaged families versus the longer, more stable residence histories of higher income families and their establishment of visiting patterns with

private dentists. Alternately NYPHD dentists may be providing the sealants appropriate to the age and teeth of children and private practitioners are over-treating patients.

Our fourth finding is the marked differences in patterns of care when comparing children attending PDPs and NYPHD clinics. Even allowing for the fact that NYPHD does not provide orthodontic care, the profile of care received by the respective groups is vastly different.

Based on these results, we plan an additional study to answer the questions:

1) Do children, with screening results which identified a need for dental care, obtain care; What factors (family income, dental insurance, previous care seeking behaviour, dental emergency, recency of residency, etc.) were associated with obtaining care, and the type and amount of care obtained?

2) Do children, who had no dental needs identified on screening, still take their child to the dentist and what factors were associated with both that and the amount of care received?

3) Do children, who had no dental needs identified on screening, experience excess dental disease or emergencies?

We propose to collect two years of continuous service data subsequent to the first screening result, to assess how well children access the dental care system and what impact that has on their health.

Conclusion

While this report is the pilot for a larger study we can conclude the following:

- Children attending NYPHD clinics have higher dental caries levels and lower numbers of sealants when compared to clients of general practitioners, however they have the same proportion of disease treated.
- Child patients attending NYPHD received fewer dental services in the year previous to our survey examination. In particular, they received fewer preventive, diagnostic and orthodontic services; they did, however, receive more restorative care.
- Child patients of NYPHD came from families who are markedly disadvantaged compared to the families of patients attending PDPs.

More analysis and of these data will be undertaken to explore the extent of these factors on the dental health of the children and the service they receive. In addition we plan to conduct a more definitive study to follow-up on the two-year results of the introduction of the screening program to limit access to children with identified needs.

TABLE 1

Dental Health Status and Needs of Examined Children by Source of Care

	NYPHD[1]	PDP[2]	Both	Unknown	Total
n	186	142	37	59	424
Mean					
deft	[3]2.83	2.02	3.24	2.17	2.50
DMFT	0.66	0.49	0.51	0.63	0.59
Total deft/DMFT	[3]3.49	2.51	3.75	2.80	3.09
f/deft	0.73	0.78	0.71	0.75	0.75
F/DEFT	0.71	0.91	0.80	0.58	0.74
Sealed teeth	[3]0.29	0.73	0.43	0.46	0.47
Percent of Children:					
Needing one or more 4-surface filling	2.7	2.1	0.0	0.0	1.9
Needing tooth [4]extraction due to caries	2.7	0.0	0.0	0.0	1.2
With tooth [4]missing due to caries	8.6	4.2	5.4	6.8	6.6

[1] *NYPHD = North York Public Health Department*

[2] *PDP = private dental practitioners*

[3] *NYPHD client means significantly different from PDP client mean*

[4] *Any permanent tooth or deciduous second molar or maxillary canine*

TABLE 2

Percent of Children by Source of Care and Reported Care Pattern

	NYPHD	PDP	Both	All
n	162	136	37	335
Reported Attendance Pattern				
• **Regularly**	73	75	68	73
• **Irregularly**	24	21	24	23
• **When in Pain**	3	4	8	4

Chi Square = 2.5 df = 4 p = 0.6

NYPHD = North York Public Health Department

PDP = private dental practitioners

TABLE 3

Percent of Children Receiving Dental Care Services by Attendance Pattern and Source of Care

Reported Attendance Pattern	NYPHD	PDP	Both	All
• **Regularly**	57 (118)	99 (102)	92 (25)	78 (245)
• **Irregularly**	59 (39)	86 (28)	100 (9)	74 (76)
• **When in Pain**	80 (5)	67 (6)	100 (3)	79 (14)
• **No Answer**	13 (24)	33 (6)	0 (0)	17 (30)
TOTAL	**52 (186)**	**92 (142)**	**95 (37)**	**72 (365)**

( ) = number in denominator of the cell

NYPHD = North York Public Health Department

PDP = private dental practitioners

TABLE 4

Decision Matrix to Allocate Children to Confirmed and Unconfirmed Patient Groups

Reported Attendance Patterns	Received One or More Services	
	Yes	**No**
Regularly	Confirmed	Confirmed
Irregularly	Confirmed	Unconfirmed
When in Pain	Unconfirmed	Unconfirmed
No Answer	Confirmed	Unconfirmed

TABLE 5

Mean Relative Value Units of Dental Services Provided to Confirmed Patients of Either NYPHD of PDP by Category of Service

Service Category	(n)	Confirmed Patients NYPHD (144)	PDP (128)	Both (34)	ANOVA P =
Diagnostic					
• Examination		0.88	1.37	1.79	.000
• Radiographs		0.03	0.65	0.46	.000
Total diagnostic*		**0.91**	**2.03**	**2.25**	**.000**
Preventive					
• Sealants		0.23	0.34	0.44	.289
• Prophylaxis		0.19	2.24	1.23	.000
• Topical fluorides		0.13	0.84	0.55	.000
• Other spaces and discing		0.10	0.18	0.03	.580
Total prevention		**0.65**	**3.60**	**2.25**	**.000**
Restorative					
• Amalgams		1.64	0.90	2.16	.062
• Composite		0.11	0.56	0.64	.015
Total restorative*		**1.75**	**1.47**	**2.80**	**.170**
Endodontic		0.04	0.20	.000	.194
Surgical		0.23	0.45	0.86	.033
Orthodontic		0.00	0.60	0.06	.017
Other		0.01	0.06	0.16	.119
TOTAL*		**3.59**	**8.40**	**8.38**	**.000**

* *May not add due to other services not separately reported but included in the total.*

TABLE 6

Mean Number of Relative Value Units of Dental Services Provided to Confirmed Patients Who Received One or More Services by Category of Service and Source of Care

Service Category (n)	Source of Care NYPHD (93)	PDP (127)	Both (32)	All (252)	ANOVA P = value
Diagnostic	1.41	2.05	2.39	1.86	.000
Preventive	1.01	3.63	2.39	2.50	.000
Restorative	2.71	1.48	2.97	2.12	.030
Endodontic	0.05	0.20	0.00	0.12	.356
Surgical	0.35	0.47	0.91	0.48	.161
Orthodontic	0	0.60	0.06	0.31	.059
Other	0.02	0.06	0.17	0.06	.212
TOTAL	**5.55**	**8.46**	**8.90**	**7.44**	**.001**

TABLE 7

Percent Distribution of Socio-demographic Characteristics of Families by Child's Source of Care

	Percent of Respondents				
	NYPHD	**PDP**	**Both**	**Unknown**	**Pearson Chi Square P = values**
Born in Canada					
• Mother	10.3 (165)	39.6 (134)	11.8 (34)	23.4 (47)	.000
• Father	9.9 (151)	30.6 (124)	13.3 (30)	21.6 (37)	.000
• Child	53.8 (169)	75.6 (135)	61.8 (34)	65.3 (49)	.002
Immigrated to Canada 1984 or later					
• Mother	46.6 (163)	21.5 (130)	35.3 (34)	36.2 (47)	.000
• Father	50.7 (136)	24.1 (116)	31.0 (29)	40.5 (37)	.000
Completed high school or higher					
• Mother	73.1 (156)	88.3 (128)	68.0 (34)	71.1 (45)	.004
• Father	79.5 (132)	88.8 (116)	79.3 (29)	64.7 (34)	.013
Employed or self-employed, fulltime					
• Mother	32.5 (160)	44.7 (132)	35.3 (34)	47.8 (46)	.096
• Father	57.4 (132)	94.1 (119)	82.8 (29)	82.4 (34)	.000
Receiving Social Assistance/UIB					
• Mother	36.1 (155)	6.8 (133)	15.2 (33)	23.9 (46)	.000
• Father	19.8 (126)	6.8 (117)	10.7 (28)	11.8 (34)	.026
Pre-tax income ≥ $30,000	47.1 (85)	81.1 (90)	63.6 (22)	54.5 (33)	.000
Have a dental plan					
• Covers all	19.3 (161)	40.0 (135)	20.6 (34)	32.6 (46)	.000
• Covers part	21.7 (161)	41.5 (135)	47.1 (34)	37.0 (46)	.000

( ) = number in denominator

TABLE 8

Percent of Children With Reported Preventive Dental Behaviours by Source of Dental Care

Preventive Dental Behaviour	Source of Care: NY	PDP	Both	Unknown	Pearson Chi Square P = value
Child uses dental floss	23.5 (170)	28.9 (135)	25.7 (35)	19.1 (47)	0.542
Child brushes once or more each day	97.1 (170)	98.5 (135)	100.0 (35)	95.9 (49)	0.529
Child had dental appoint. in last year	85.8 (141)	94.0 (133)	91.2 (34)	93.8 (48)	0.109
Child received one or more topical fluorides in last year	46.0 (100)	91.7 (109)	58.6 (29)	56.3 (32)	0.000

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APPENDIX 1

ORAL HEALTH INTERVIEW SURVEY FORM
FOR
PARENTS OF NORTH YORK CHILDREN

ID NUMBER _____

Date [|] [|] [|] **Interviewer** .....[|]
year month day

Person Interviewed .....[|]
01 = Mother 02 = Father 03 = Other

SCHOOL (PRINT).....[| |]
Print name; Record number from Manual

Student's Name.....**Age**.....[|]
Print: Last, first

Student's Sex.....[|]
01=male 02=female

Home Postal Code .....[| | | | |]

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1) Please list all places (city/town/state) where this child has lived for more than six months, and the dates when he/she lived there. Start with your current residence and go back in time.

	City or Town	Province (State) (Country)	Dates lived there	Public water supply 00 = NO 01 = YES
a	_____ current	_____	From ___ ___ to ___ ___	[	]
b	_____	_____	From ___ ___ to ___ ___	[	]
c	_____	_____	From ___ ___ to ___ ___	[	]
d	_____	_____	From ___ ___ to ___ ___	[	]

e use the other side of this page if necessary.

2) **Has this child ever had rheumatic fever, congenital heart problems, heart surgery, or joint replacement?**.....[|]
00 = no 01 = yes

We would like to know if you feel that your child is getting the dental services he/she needs. First, may we ask you some questions about your child and his/her dental care?

3) **Where does he/she go to get dental care?.....[|]**
   00 = Don't go
   01 = Dentist's office
   02 = School clinic
   88 = Do not know
   99 = No Answer/No Response

4) **How long ago was his/her last appointment or visit for dental care?..(make clear this was not a screening visit).....[|]**
   01 = less than 1 year
   02 = 1 to 2 years
   03 = 3 to 5 years
   04 = 6 to 10 years
   88 = Do not know
   99 = No Answer/No Response

5) **Are you generally satisfied or dissatisfied with the way he/she was looked after at the last dental visit?.....[|]**
   00 = Very dissatisfied
   01 = Dissatisfied
   02 = Satisfied
   03 = Very satisfied
   88 = Do not know
   99 = No Answer/No Response

6) **Can you tell us your reason(s) for saying that?.....**

   .....

7) **Do you want an appointment for his/her dental care now?..[|]**
   00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

8) **When do you usually make an appointment or visit for (his/her) dental care?.....[|]**
   00 = Never
   01 = For check-ups
   02 = Only when there is pain or other trouble
   03 = When the dentist calls him/her in for an appointment
   04 = When the school dentist/hygienist sends a note home saying he/she should go
   88 = Do not know
   99 = No Answer/No Response

9) **Over the course of this school year, do you expect that he/she will receive a complete examination and all necessary care from the school dentist (public health department).....[|]**
   00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

10) **Has he/she ever received any of the following for home application?**
   00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

   a) Fluoride drops from age ____ to age ____ [|]
   b) Fluoride tablets from age ____ to age ____ [|]
   c) Fluoride liquids or gels from age ____ to age ____ [|]

11) **Has he/she had any other fluoride treatment?**
00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

Through a school program..... [|]
At a private dentist's office..... [|]

12) **How many fluoride treatments has he/she received in the last year?** .....[|]

00 = None
01 = One or two
02 = Three or more
88 = Do not know
99 = No Answer/No Response

13) **Has he/she now, or over the last 4 weeks, has he/she had any of the following problems?**
00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

a) Pain or discomfort in his/her teeth.....[|]
b) Pain, discomfort or bleeding from gums, cheek, lips, etc.....[|]

14) **Teeth can be important to our appearance, to chewing well and to our ability to speak clearly. Are you satisfied with his/her:**
00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

a) appearance of teeth?.....[|]
b) ability to chew?.....[|]
c) ability to speak?.....[|]

15) **Does he/she usually use any of the following to clean his/her teeth?**
00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

a) Toothbrush .....[|]
b) Toothpaste.....[|]
c) Dental floss.....[|]
d) Other(name).....[|]

16) **How often does he/she brush his/her teeth?**.....[|]

00 = Never
01 = Once per month
02 = A few times per month
03 = Once per week
04 = A few times per week
05 = Once per day
06 = Two or more times per day
88 = Do not know
99 = No Answer/No Response

17) **Over the last 24 hours, did he/she eat or drink any of the following foods?**
00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

a) Bread.....[|]
b) Sugar coated cereal.....[|]
c) Fresh fruit.....[|]
d) Cake, pie or doughnuts.....[|]
e) Pop, cola - diet.....[|]
f) Pop, cola - non diet (sugar) .....[|]
g) Nuts or cheese.....[|]
h) Jam, honey.....[|]
i) Dried fruit.....[|]
j) Chewing gum with sugar.....[|]
k) Chewing gum - no sugar.....[|]
l) Candy, chocolate bar.....[|]
m) Tea, coffee with sugar.....[|]
n) Tang or similar drink.....[|]
(made from crystals)

THIS NEXT SECTION IS TO BE ASKED ONLY OF ADULT PARENTS OR GUARDIANS ABOUT THEIR OWN SITUATION

We now would like to have some information about you family which will help us assess how well the DENTAL DEPARTMENT at the North York Public Health Department serves you and other families in the city.

	Mother	**Father**
18) **Last Name**	.....	.....
First Name	.....	.....

19) **Age**

Mother..... [|]
Father..... [|]

20) **Marital Status**

Mother..... [|]
Father..... [|]

01 = Married or equivalent (and not separated)
02 = Separated or Divorced
03 = Never married (single)
04 = Widowed
88 = Do not know
99 = No Answer/No Response

21) **What is the place of birth of:**

Mother..... [|]
Father..... [|]
Child ..... [|]

01 Ont.	11 Alberta	21 Jamaica	31 Caribbean
02 PEI.	12 N. W. T	22 India	32 Other .....
03 NS.	13 United Kingdom	23 Sri Lanka	88 Don't Know
04 NB.	14 Italy	24 Hong Kong	99 No Answer
05 Nfld.	15 United States	25 Vietnam	
06 Yukon	16 Portugal	26 Philippines	
07 Que.	17 Poland	27 Hungary	
08 Man.	18 Germany	28 Yugoslavia	
09 Sask.	19 Holland	29 El Salvador	
10 B. C.	20 Greece	30 China	

22) **What is your (and other parent's) ethnic\cultural identity?**

Mother [|]
Father [|]

01 French	12 Hungarian
02 English	13 Polish
03 German	14 Portuguese
04 Scottish	15 North American Indian
05 Irish	16 Metis
06 Italian	17 Inuit
07 Ukrainian	18 Canadian
08 Dutch	19 Other .....
09 Chinese	
10 Jewish	88 Do not know
11 East Indian	99 No Answer/No Response

23) **If born outside Canada, in what year did you immigrate to Canada?** (Record year 19__ __)

Mother [|]
Father [|]

00 = Born in Canada
98 = Do not Know
99 = No Answer\No Response

24) **What language is spoken most often at home?** [|]

01 English	08 Greek	88 Do not Know
02 French	09 Spanish	99 No Answer/No Response
03 Italian	10 Hungarian	
04 Portuguese	11 Chinese	
05 Polish	12 Vietnamese	
06 German	13 Tamil	
07 Dutch	14 Other	

25) **Do you have any of your own natural teeth, or have you lost them all?**

Mother [|]
Father [|]

00 = Have no natural teeth, have lost them all
01 = Have one or more natural teeth
88 = Do not know
99 = No Answer/No Response

26) **How long has it been since you last had a tooth taken out?**
(Record in years e.g. 01 to 09, 10, 11 etc.)

Mother [|]
Father [|]

88 = Do not know
99 = No Answer/No Response
00 = Not applicable, never had a tooth taken out

27) **During the last month have you or the child's other parent had any of the following problems?**

00 = no 01 = yes 88 = Do not know 99 = No Answer/No Response

	Mother	Father
a) toothache	[|]	[|]
b) pain in teeth from hot or cold or sweet foods or liquids	[|]	[|]
c) pain in jaw joints	[|]	[|]
d) pain\discomfort from dentures	[|]	[|]
e) sore or bleeding gums	[|]	[|]

28) **How long has it been since you and the other parent last saw the dentist or other dental care practitioner?**

Mother [|]
Father [|]

01 = Within the last 6 months
02 = 6 months to 1 year
03 = 1 - 2 years
04 = 3 - 5 years
05 = More than 5 years
06 = Never been
88 = Do not know
99 = No Answer/No Response

29) **If you (or other parent) did not visit a dentist or other dental care practitioner last year, what was the main reason?**

Mother [|]
Father [|]

00 = Not applicable; visited dentist within the last year
01 = too expensive
02 = afraid or dislike dentist
03 = too busy
04 = nothing wrong
05 = don't know a dentist
06 = physical\medical problem prevented from going
07 = other.....
88 = Don't Know
99 = No Answer/No Response

30) **How often do you (other parent) usually see a dentist or other dental care practitioner?**

Mother [|]
Father [|]

01 = regularly (i.e. at least once a year for check ups)
02 = less than once a year
03 = only when in pain or other trouble
04 = Never visit the dentist
88 = Do Not Know
99 = No Answer/No Response

31) **Do you have any kind of government or private dental plan which pays for all or part of your regular dental care?**

[|]

01 = yes - all
02 = yes - part
03 = no
88 = Do not know
99 = No Answer/No Response

a) **If YES - PART, about what percentage of your regular dental care costs are covered?**

[|]%

98 = Do not know
99 = No Answer/No Response
00 = Not applicable

b) **If NO, did you previously have a dental plan which paid for all or part of your dental care?**

[|]

01 = yes - all
02 = yes - part
03 = no
88 = Do not know
99 = No Answer/No Response
00 = Not applicable

32) **What best describes your (and other parent's) work status <u>today</u>?**

Mother [|]
Father [|]

01 = Employed full-time for wages
02 = Employed part-time for wages
03 = Self employed
04 = Seeking employment
05 = Work at home (not paid)
88 = Do not know
99 = No Answer/No Response

33) **Thinking back to exactly one year ago has this work status changed? Have you (or other parent)**

Mother [|]
Father [|]

01 = stayed in same job
02 = become unemployed
03 = become employed for wages
04 = otherwise changed employment status
05 = remained seeking employment
88 = Do Not Know
99 = No Answer/No Response

34) **Are you (or other parent) receiving unemployment or social assistance payments?**

Mother [|]
Father [|]

00 = no
01 = yes
88 = Do not know
99 = No Answer/No Response

35) **Can you take time off from work to take your child to the dentist?**

Mother [|]
Father [|]

00 = no
01 = yes but I have to make up the time
02 = yes but I lose wages
03 = yes, with no loss of wages or time
88 = Do not know
99 = No Answer/Does not apply

36) **How far did you (and other parent) go in school?**

Mother [|]
Father [|]

01 No formal schooling
02 Some Primary school
03 Completed Primary school
04 Some secondary or
High school
05 Completed secondary or
High school
06 Some community college, technical college
07 Completed community or technical college
08 Some University (not completed)
09 University degree (completed)
Bachelor
Masters
Ph.D
88 Don't Know
99 No Answer/No Response

37) **What was your approximate total household income for the year 1991 before income tax deductions?**

[|]

01 No income
02 Less than $6,000
03 $ 6,000 - $11,999
04 $12,000 - $19,999
05 $20,000 - $29,999
06 $30,000 - $39,999
07 $40,000 - $49,999
08 $50,000 - $59,999
09 $60,000 - $69,999
10 $70,000 - $79,999
11 $80,000 or more
88 Do not know
99 No Answer/No Response

APPENDIX 2

STUDY OF ORAL HEALTH

OF NORTH YORK CHILDREN

FIELD SURVEY MANUAL

AND

CODING CRITERIA

FIELD SURVEY MANUAL AND CODING CRITERIA
TABLE OF CONTENTS

I.D.NUMBER [ ] [ ] [ ] [ ] [ ]

Date __/yr __/mo __/dd

CDHSRU ORAL HEALTH ASSESSMENT FORM

Participant's name.....☐

Examiner .....☐

Recorder.....☐

Participant's Sex.....☐
1=Male 2=Female

Dentofacial anomalies.....☐

0 = none
1 = cleft lip
2 = cleft palate
3 = cleft lip and palate
4 = surgical repair
5 = post surgical defect
6 = other_____

Malocclusion.....☐

0 = none
1 = slight
2 = maxillary overjet >=9mm
3 = mandibular overjet, anterior crossbite >=full tooth depth
4 = open bite
5 = midline shift >4mm
6 = crowding or spacing >4mm
7 = two or more severe categories

Mucosa & Enamel Lesions

0 = absent
1 = present, no trt
2 = present, needs trt

Lesions of oral mucosa.....☐

Specify.....

Non-fluoride lesions of enamel.....☐

Specify.....

Descriptive Criteria and Scoring System for the Tooth Surface Index of Fluorosis (TSIF) (16)

Numerical Score	Descriptive Criteria
0	Enamel shows no evidence of fluorosis.
1	Enamel shows definite evidence of fluorosis, namely area with parchment-white color that total less than one-third of the visible enamel surface. This category includes fluorosis confined only to incisal edges of anterior teeth and cusp tips of posterior teeth ("snowcapping").
2	Parchment-white fluorosis totals at least one-third of the visible surface, but less than two-thirds.
3	Parchment-white fluorosis totals at least two-thirds of the visible surface.
4	Enamel shows staining in conjunction with any of the preceding levels of fluorosis. Staining is defined as an area of definite discoloration that may range from light to very dark brown.
5	Discrete pitting of the enamel exists, unaccompanied by evidence of staining of intact enamel. A pit is defined a s a definite physical defect in the enamel surface with a rough floor that is surrounded by a wall of intact enamel. The pitted area is usually stained or differs in color from the surrounding enamel.
6	Both discrete pitting and staining of the intact enamel exist.
7	Confluent pitting of the enamel surface exists. Large areas of enamel may be missing and the anatomy of the tooth may be altered. Dark-brown stain is usually present.
9	Missing tooth

Fluorosis (TSIF Criteria)

13 12 11 21 22 23

Debris

16 11 26

46 31 36

0 = none
1 = gingival 1/3 of surface covered or stain
2 = middle 1/3 of surface covered
3 = incisal 1/3 of surface covered
9 = missing tooth

HAS PARTICIPANT HAD RHEUMATIC FEVER, CONGENITAL HEART PROBLEMS, OR HISTORY OF HEART SURGERYOR JOINT REPLACEMENT? ☐

00 = NO 01 = YES (do not probe)

Periodontal Status (CPITN)

16 11 26

46 31 36

0 = healthy
1 = bleeding
2 = calculus, overhangs
3 = pocket, band partly covered
4 = pocket, band covered
8 = 01/rheu fever
9 = missing

Calculus Score

16 11 26

46 31 36

0 = none
1 = supragingival
2 = subgingival flecks
3 = sub gingival bands
8 = 01/rheu fever
9 = missing tooth and substitute

Tooth Space	Tooth Type	Tooth Status	Caries Scores								Restorative Score	Treatment Needs
			D	BP	FG	M	LP	LG	O	DOP		
17												
16												
15												
14												
13												
12												
11												
21												
22												
23												
24												
25												
26												
27												
37												
36												
35												
34												
33												
32												
31												
41												
42												
43												
44												
45												
46												
47												

SUMMARY OF TREATMENT NEEDS

0 = none 1 = one or more

Urgent for pain, infection..[ ]
Extractions, surgery.....[ ]
Restorations.....[ ]

Periodontal scaling.....[ ]
Prophylaxis (for stain).....[ ]
Preventive instruction.....[ ]

TOOTH TYPE

1 = deciduous
2 = permanent
9 = tooth absent

CARIES STATUS CODES

All surfaces

00 = sound
88 = excluded
99 = missing tooth

Pits and fissures

01 = sound with sealant
02 = dark line at base of fissure or opacity adjacent to fissure
03 = break in enamel wall
04 = break in enamel and soft base

Smooth surfaces

05 = white spot - smooth enamel
06 = white or brown spot with rough enamel
07 = opacity (demineralization) under marginal ridge
08 = break in enamel with softness at the base

Filled

09 = temporary filling
10 = filled- 'no 4, no 8'
11 = filled- 'with a 4 or an 8'

TOOTH STATUS CODES

1 = missing due to caries
2 = missing due to trauma or other dental condition, eg. orthodontic care
3 = absent congenitally, exfoliated and unerupted
4 = root tips, or so extensively decayed that extraction is the only correct treatment
5 = crowned for reasons other than decay, e.g., trauma or as an abutment for a spacer
6 = crowned for decay
7 = tooth present

RESTORATIVE SCORE CODES

0 = no restoration
1 = no defects - could also apply for sealants
2 = contour shows, bulk or deficient at gingiva
3 = flat contact
4 = overhanging gingival margin of 1mm or more
5 = open contact
6 = open margin of 1mm or more
7 = cracked
8 = lost in part
9 = lost in full
99 = missing tooth

TREATMENT NEEDS CODES

0 = none
1 = one-surface filling
2 = two-surface(s) filling
3 = three-surface(s) filling
4 = four or more surface(s) filling or crown
5 = extraction for caries
6 = extraction for other reasons
7 = sealant
8 = other (specify).....
.....

FIELD SURVEY MANUAL AND CODING CRITERIA

General

This manual is specific for this oral health survey of North York Children.

The form for recording the results of oral health assessments described in this manual is reproduced on the preceding pages.

Completed forms must be returned at the end of the day to the dental division of the Health Department.

Definition of Roles

"Participants" in the survey are the children who will be examined. Because children are being examined, parents or guardians will be interviewed over the telephone for background characteristics and preventive dental behaviours.

"Parent or Guardians" will give consent for all children to participate in the survey.

"Examiners" are dentists who have been trained to examine "participants" following the exact criteria in this manual. They are responsible for the completeness and accuracy of the information which is recorded on the survey form. They should also ensure the forms are kept secure and confidential.

"Recorders" write down the "examiners'" findings using the standard codes described in this manual. They assist the "examiner" by calling out the next area on the form to be filled in. Thus, they set the pace and order of the examination. When "examiners" are not familiar with the choices permitted under each area "recorders" can also assist by calling out those choices.

Standard Codes

PRINT THE ONE CORRECT NUMBER CODE IN EACH APPROPRIATE "BOX". Number codes have been assigned to all the likely answers or conditions you will encounter. These standard codes must be used for all "boxes" of every form. In most cases the possible codes are shown near the appropriate "boxes" right on the survey form. Where the codes are not shown, they can usually be found in an Appendix to this Manual. If there is no code, the recorder can print a short note in the margin.

FILL EACH AREA OF EVERY "BOX". In some cases you will need to record what is called a leading zero. For example, at the top of the survey form there are "boxes" to record the date of the examination. If the number of the month or day is less than ten you must record a 0 in the first part of the "box". Otherwise the computer will not be able to distinguish between January (month 01) and October (month 10)

EXAMINERS: CALL OUT FINDINGS CLEARLY; ALLOW TIME TO RECORD ACCURATELY.

INTERVIEWERS AND RECORDERS: PRINT ALL CODES CLEARLY AND IN COLOUR. Red or green are colours which stand out from the page and make it easy to type the codes into the computer. Confusing similarities commonly occur in writing 1 and 7, 2 and 4, and 6 and 0. Numbers must be printed clearly.

CORRECT MISTAKES DRAWING A LINE THROUGH THE INCORRECT CODE. Print the correct code close to (above or below) the box.

The two-digit numbers pre-printed on the left margin on the last page, indicate specific teeth, or more accurately for our purposes the specific permanent tooth space, according to the system used by the International Dental Federation (FDI). The first digit specifies the quadrant of the mouth and the second the actual tooth. In designating a tooth (or tooth space), call the quadrant number, then the tooth number - for example, the upper right second incisor, 12 = "one-two" rather than "twelve"; the lower left first molar, 36 = "three-six" rather than "thirty-six".

IDENTIFICATION SECTION FOR THE ORAL HEALTH ASSESSMENT

The dental examination is done after obtaining informed consent.

Clinical instruments are to be sterilized and kept on a clean tray cover or paper towel. Instruments required include:

- periodontal probe;
- plane mirror;
- explorer; and
- 2 x 2 gauze.

You should have the participant in the dental chair. Use the standard dental light for illumination. Accurate findings on oral mucosa, etc. will require you consistently use the bright light source.

Complete the examination form as per the following instructions:

1) Date of Examination
   Enter the date of examination in the year/month/day format, for example, 92/10/21.

2) Participant's Name
   Print name of participant if not already on the form.

3) Examiner's Name
   Print the examiner's name on the line; last name, then first name. Do not record a number in the field at the end of the line.

4) Recorder's Name
   Print the recorder's name on the line; last name, then first name. Do not record a number in the field at the end of the line.

5) Participant's Sex
   Record the gender of the participant.
   1 = male; 2 = female

ORAL HEALTH AND TREATMENT NEED ASSESSMENT

The epidemiologic method requires that findings be scored with absolute certainty. If any doubt exists, the next lower or less severe condition is scored, even if that means recording the condition as absent or the person as healthy. If the criteria that follow are not obviously met, the condition does not exist for the purpose of this survey. Once the examiner is familiar with the criteria, the first impression is usually the best response.

The recorder should set the pace and order of the examination. The recorder calls out the area on the form to be next filled and the examiner directs attention to that part of the examination. For example, to start:

The recorder would call:

> "Dento-facial anomalies - none, cleft lip, cleft palate, surgical repair, or post surgical defect"

The examiner would respond, for example with:

> "none"

The recorder would record '0' in the box, then call:

> "Malocclusion - none, slight, maxillary overjet >=9mm, mandibular overjet, anterior crossbite >=full tooth depth, open bite, midline shift >4mm, crowding or spacing >4mm, two or more severe categories

The examiner would respond with the condition he or she observes, etc.

The examination proceeds to the end, with the recorder leading the examiner to each next item. This will ensure that all fields an the form are completed and that the recorder has enough time to print the responses legibly.

The clinical examination should start with an overall look at the participant. General appearance, colour of face, symmetry, etc., should be noted. The examination should then proceed to the clinical oral assessment.

1) **Dentofacial Anomalies**

Record gross defects (cleft lip or cleft palate) according to one of the following number codes

0 = none
1 = cleft lip
2 = cleft palate
3 = cleft lip and palate
4 = surgical repair
5 = post surgical defect

2) **Malocclusion**

Two levels of anomaly are distinguished, i.e., very slight (a twisted or tilted tooth or slight crowding or spacing (code 1) and anomalies that are generally regarded as causing an unacceptable effect on facial appearance, or a significant reduction in masticatory function, or impairment of speech (codes 2 to 6). Use code 7 when two or more severe conditions are found.

Record malocclusion according to one of the following number codes:

0 = no anomaly or malocclusion
1 = slight anomalies, such as one or more rotated or tilted teeth or slight crowding or spacing, which disturb the regular alignment of the teeth

Code the more serious anomalies, specifically, the presence of one or more of the following conditions of the four anterior incisors:

2 = maxillary overjet estimated to be 9 mm or more
3 = mandibular overjet, anterior crossbite equal to or greater than a full tooth depth
4 = open bite
5 = midline shift estimated to be more than 4 mm
6 = crowding or spacing estimated to be more than 4 mm
7 = two or more of the above codes ranging from 2 to 6

3) **Mucosa and Enamel Lesions**

A screening examination of the oral mucosa and the hard and soft tissues in and around the mouth should be made on every subject examined. The examination should be thorough and systematic; it should begin with the lips, and proceed to the upper and lower sulcus and retromolar area, the upper and lower labial mucosa, the left buccal mucosa and the right buccal mucosa. The palatal mucosa and the surface and margins of the tongue should be inspected and the mobility of the tongue checked. Finally, the inferior surface of the tongue and the floor of the mouth should be examined. Examination of the oral mucosa is facilitated by the use of a 2" by 2" cotton sponge to retract the tongue. Mucosal or facial tissues that seem to be abnormal, as well as the submandibular, sublingual, and cervical lymph nodes, should be palpated digitally.

Conditions or diseases of the oral mucosa to which examiners should be alert during screening examinations, include the following:

- acute necrotizing ulcerative gingivitis
- acute necrotizing ulcerative stomatitis
- herpes labialis or stomatitis

Enamel lesions include non-fluoride opacities and others such as hypoplasia (disturbance of matrix),intrinsic stain (e.g. tetracyclines), mutilation (may be due to cultural shaping of teeth), and attrition.

Record only non-fluoride enamel lesions here. These will include:

- non-fluoride opacities (as per the following table)
- hypoplasia (disturbance of matrix)
- intrinsic stain (e.g. tetracyclines)
- mutilation (may be due to cultural shaping of teeth)
- attrition

The following is a summary of the differential diagnosis of mild fluoride and non-fluoride opacities of enamel:

TABLE 1

Differential Diagnosis: Milder Forms of Dental Fluorosis (Questionable, Very Mild, and Mild) and Nonfluoride Opacities of Enamel, from Russell (1961)

Characteristic	Milder Forms of Fluorosis	Nonfluoride Enamel Opacities
Area affected	Usually seen on or near tips of cusps or incisal edges.	Usually centered in smooth surface; may affect entire crown.
Shape of lesions	Resembles line shading in pencil sketch; lines follow incremental lines in enamel, form irregular caps on cusps.	Often round or oval.
Demarcation	Shades off imperceptibly into surrounding normal enamel.	Clearly differentiated from adjacent normal enamel.
Color	Slightly more opaque than normal enamel; "paper white." Incisal edges, tips of cusps may have frosted appearance. Does not show stain at time of eruption (in these milder degrees, rarely at any time).	Usually pigmented at time of eruption; often creamy-yellow to dark reddish-orange.
Teeth affected	Most frequent on teeth that calcify slowly (cuspids, bicuspids, second and third molars). Rare on lower incisors. Usually seen on six or eight homologous teeth. Extremely rare in deciduous teeth.	Any tooth may be affected. Frequent on labial surfaces of lower incisors. May occur singly. Usually one to three teeth affected. Common in deciduous teeth.
Gross hypoplasia	None. Pitting of enamel does not occur in the milder forms. Enamel surface has glazed appearance, is smooth to point of explorer.	Absent to sever. Enamel surface may seem etched, be rough to explorer.
Detection	Often invisible under strong light; most easily detected by line of sight tangential to tooth crown.	Seen most easily under strong light on line of sight perpendicular to tooth surface.

4) **Fluorosis (TSIF Criteria):**

We will use the Tooth Surface Index of Fluorosis (TSIF) criteria for the unrestored labial surface of maxillary permanent anterior teeth. (Do not substitute deciduous teeth.)

- Do not dry the teeth
- If multiple forms of fluorosis are on the same surface, assign the highest numerical score.
- Record according to the criteria Table 2:

TABLE 2

Descriptive Criteria and Scoring System for the Tooth Surface Index of Fluorosis (TSIF) (16)

Numerical Score	Descriptive Criteria
0	Enamel shows no evidence of fluorosis.
1	Enamel shows definite evidence of fluorosis, namely area with parchment-white color that total less than one-third of the visible enamel surface. This category includes fluorosis confined only to incisal edges of anterior teeth and cusp tips of posterior teeth ("snowcapping").
2	Parchment-white fluorosis totals at least one-third of the visible surface, but less than two-thirds.
3	Parchment-white fluorosis totals at least two-thirds of the visible surface.
4	Enamel shows staining in conjunction with any of the preceding levels of fluorosis. Staining is defined as an area of definite discoloration that may range from light to very dark brown.
5	Discrete pitting of the enamel exists, unaccompanied by evidence of staining of intact enamel. A pit is defined a s a definite physical defect in the enamel surface with a rough floor that is surrounded by a wall of intact enamel. The pitted area is usually stained or differs in color from the surrounding enamel.
6	Both discrete pitting and staining of the intact enamel exist.
7	Confluent pitting of the enamel surface exists. Large areas of enamel may be missing and the anatomy of the tooth may be altered. Dark-brown stain is usually present.
9	missing tooth

5) **Debris/Stain**

Oral debris is the soft foreign matter loosely attached to the teeth. It varies in colour from grayish-white to green ororange. To examine gently wipe the side of the straight probe or explorer along the labial (facial) surfaces of teeth 16, 11, 26, and 31 and the lingual surfaces of 36 and 46. If the first molar is absent, substitute the second or third molar; if all three are absent mark 9; if an anterior tooth is absent substitue the central incisor from the opposite side of the end-line. Only fully erupted permanent teeth are scored. Observe the stain and incisal extent of the debris and record as follows:

0 = no debris or stain present

1 = soft debris covering not more than one-third of the tooth surface being examined or the presence of extrinsic stains without debris regardless of surface area covered

2 = soft debris covering more than one third but not more than two-thirds of the exposed tooth surface

3 = soft debris covering more than two-thirds of the exposed tooth surface

9 = missing tooth and substitutes, not able to be examined (e.g. tooth only partially erupted)

STOP: IMPORTANT!:

A) ASK OR DETERMINE IF THE PARTICIPANT HAS A HISTORY OF HEART MURMUR, RHEUMATIC FEVER, OPEN HEART SURGERY OR HIP JOINT REPLACEMENT.

B) IF THERE IS SUCH A HISTORY, DO NOT PROBE THE GINGIVA

6) **Calculus**

Oral calculus is defined as a deposit of inorganic salts composed primarily of calcium carbonate and phosphate mixed with food debris ,bacteria and desquamated epithelial cells. Dental calculus is differentiated by its location relative to the free gingival margin:

- supragingival calculus - usually white to yellowish brown in colour, located occlusal to the free gingival margin
- subgingival calculus - ususally light brown to black in colour because of the inclusion of blood pigments, located apical to the free gingival margin

Use an explorer to estimate the surface area covered by the supra-gingival calculus and to probe for the sub-gingival calculus. Examine the same teeth and surfaces as for debris.

Assign scores according to the following criteria:

0 = no calculus present
1 = supragingival calculus covering not more than one-third of the exposed tooth surface being examined
2 = supragingival calculus covering more than one third but not more than two-thirds of the exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth
3 = supragingival calculus covering more than two-thirds of the exposed tooth surface or, a continuous heavy band of subgingival calculus around the cervical portion of the tooth
8 = rheumatic fever
9 = missing tooth and substitutes

7) **Community Periodontal Index of Treatment Needs (CPITN)**

The mouth is considered to have 6 sextants - 2 posterior sextants and 1 anterior sextant (from canine tooth to canine tooth) in both the maxilla and the mandible.

Index teeth are examined to represent each sextant. The **Index teeth** (and the deciduous substitutes) to be examined are:

	RIGHT MOLARS	ANTERIOR	LEFT MOLARS
	(55, 54)	(51)	(64, 65)
MAXILLA	17, 16	11	26, 27
MANDIBLE	47, 46	31	36, 37
	(85, 84)	(71)	(74, 75)

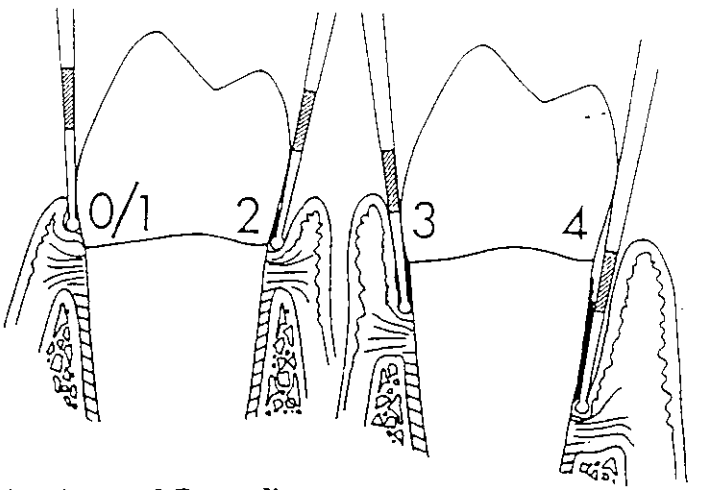
If an index tooth, qualifying for examination, is absent from a posterior sextant, score the remaining one. If no index tooth is present in a sextant qualifying for examination, single, fully-erupted incisors (anterior sextants) or premolars or deciduous molars (posterior sextants) may be substituted.

Sensing the gingival status. An index tooth should be examined using the probe as a "sensing" instrument to detect subgingival calculus and bleeding response. The sensing force used should be no more than 20 grams. A practical test for establishing this force is to place the probe tip under the thumb nail and press until blanching occurs. For sensing subgingival calculus, the lightest possible force that will allow movement of the probe ballpoint along the tooth surface should be used.

When inserting the probe, the tip should follow the anatomical configuration of the surface of the tooth root. If the patient feels pain during probing, this is indicative of the use of too much force.

The probe tip should be inserted gently into the gingiva at 6 points on each tooth: mesio-buccal, mid-buccal, disto-buccal and the corresponding lingual sites.

ILLUSTRATION OF CPITN CODES



Examination and Recording

The incisor and the first and second molars should be sensed and the highest score recorded in the appropriate box. For children 12 and under, codes in descending order of severity are:

2 = no part of the black band is covered but calculus or overhanging margin of restoration felt during probing
1 = bleeding observed, directly or by using mouth mirror, after sensing
0 = healthy
8 = rheumatic fever
9 = missing tooth

Where non-index teeth are examined, the highest score found in the sextant is recorded in the appropriate box. If there are no teeth remaining or are indicated for extraction in a sextant, code 9 should be placed in the appropriate box.

8) **Tooth Type**

Record the type of tooth present in the tooth space.

1 = deciduous
2 = permanent
9 = tooth absent

If both a permanent and deciduous tooth occupy the same space, record the following information for the permanent tooth only. If no tooth is present record 9 and record specific status under 'tooth status' column.

9) **Tooth Status**

A tooth should be considered present in the mouth when any part of it is visible or can be touched with the tip of the explorer without unduly displacing soft tissue. If a permanent and a primary tooth occupy the same tooth space, the status of the permanent tooth only should be recorded.

Examiners will be able to quickly exclude the detailed examination of the tooth surfaces and restorations where the tooth is missing or the surfaces can not be examined because of extensive decay. Examine each tooth space to see if the tooth can be described by:

1 = missing due to caries as determined from evidence of extensive caries and asking the child

2 = missing because of trauma or other dental disease

3 = absent (congenitally/unerupted/exfoliated) when the tooth is absent congenitally, or is a unerupted permanent tooth without a primary tooth. In some age groups, it may be difficult to distinguish between unerupted teeth (code = 3) and extracted teeth (codes 1 or 2). Basic knowledge of tooth eruption patterns, the status of the corresponding contralateral tooth, the appearance of the alveolar ridge in the area of the tooth space in question, the caries status of other teeth in the mouth and asking the child may provide helpful clues making a differential diagnosis between unerupted and extracted teeth

4 = root tips or so extensively decayed that extraction is the only correct treatment

5 = crowned for reasons other than decay, e.g., trauma or as a bridge or space maintainer abutment (note: **caries status** should be 99)

6 = crowned for reasons of decay (note: **caries status** should be 10 or 11)

7 = tooth present

10) **Individual Tooth Caries Status**

a) Method of assessing caries

- The examination for dental caries should be conducted with a plane mouth mirror and an explorer.
- Examiners should dry the quadrant with air to ensure the early 'white spot' carious lesions are evident.
- **EXAMINERS SHOULD NOT PROBE 'WHITE SPOT' OR OTHER SUSPECTED 'EARLY' LESIONS OF THE ENAMEL TO AVOID PREJUDICING THE OPPORTUNITY FOR THE SURFACE TO REMINERALIZE. INSTEAD DRAG THE TIP OF THE EXPLORER ACROSS THE SURFACE TO DETERMINE WHETHER IT IS ROUGH. PROBE, WITH MODERATE PRESSURE ONLY, WHERE YOU SUSPECT THE LESION REACHES INTO DENTIN AND YOU WANT TO CONFIRM SOFTNESS AT THE BASE.**
- Examiners should follow the recorder's systematic approach to the examination for dental caries, proceeding in an orderly manner from one tooth or tooth space for all recordings before proceeding to the adjacent tooth or tooth space.

b) Ensure correct codes

- A numerical coding system is used for recording the status of tooth surfaces.
- The recorder must call out the tooth (space) number and, until the examiner memorizes the criteria and codes, the status, caries, restoration and treatment categories for each tooth surface.
- All boxes must have a code.

c) Codes and criteria for recording surface status

Surfaces are designated as follows:

D = distal	LG = lingual gingival
BP = buccal pit	O = occlusal
FG = facial gingival	M = mesial
LP = lingual pit	OP = occlusal posterior pit (upper molars only)

All surfaces

00 = Sound

- A surface is recorded as sound if it shows no evidence of treated or untreated clinical caries.
- Surfaces with the following defects, in the absence of other positive criteria should be coded as sound:
  - non-fluoride enamel opacities (see earlier differential diagnosis);
  - fluorosis lesions (see earlier differential diagnosis);
  - discoloured or rough spots that are within the matrix of the enamel.

88 = Excluded, e.g. surface has a restoration, band, or crown placed for trauma, orthodontics, or space maintenance

99 = Missing Tooth, as defined in the earlier tooth status examination

Pit or fissure surfaces

01 = sound with sealant as per above criteria but where a sealant has been placed and is partly or fully present

02 = no break in enamel but possible early caries in the form of a dark line at the base of the fissure; or white opacity adjacent to the pit or fissure which contrasts with the surrounding tooth structure

03 = possible early caries in the form of a break in enamel wall of fissure with shadow or opacity beneath the enamel adjacent to the pit or fissure

04 = break in enamel at base or walls of fissure with soft dentin upon exploring

Smooth surfaces

05 = possible early caries in the form of a white spot with intact, smooth enamel surface

06 = possible early caries in the form of a white or brown spot with enamel surface roughness or etching confined to enamel

07 = visual opacity, as evidence of subsurface demineralization, under marginal ridge on proximal surfaces

08 = discontinuity of enamel in which an explorer will enter and demonstrate softness at the base

Filled

09 = temporary filling

10 = filled - 'no 04 or 08' when one or more permanent restorations are present and there is no other area of the surface with a score of 04 or 08 (above); this includes surfaces filled by a crown placed because of previous decay

11 = filled - 'with 04 or 08' when the surface has one or more permanent fillings and one or more areas scoring 04 or 08 which are either separate from or in contact with the restoration(s)

11) **Restoration Codes**

Examiners should check each restoration for the following defects. Record only one code for each tooth, no matter how many restorations it has. Where there is more than one restoration or defect, record the most serious finding only. The potential defects are listed in order with the most serious having the higher numbers.

0 = no restoration
1 = no defects
2 = restoration contour shows bulk or is deficient perhaps at the gingiva where it is under or over-contoured, or on the occlussal where there are high spots
3 = flat contact in the interproximal embrasure spaces are too small
4 = overhanging gingival margin of 1mm or more
5 = open contact in the interproximal causing food impaction
6 = open margin between restoration and enamel of 1mm or more
7 = cracked material, usually amalgam and usually at the isthmus of a Class 2 restoration
8 = lost in part; some of the restorative material has been fractured or worn out of the preparation
9 = lost in full; all of the final restorative material has been lost although the liners may be present
99 = missing tooth

12) **Treatment Requirements of Individual Teeth**

Record the type of treatment required immediately after the caries status and restoration codes have been recorded, and before proceeding to the next tooth space. If no treatment is required, score "0" in the appropriate treatment box. (If this is not done, it will be impossible to determine later, when the data are processed, whether no treatment was necessary or whether the examiner or recorder omitted to make an appropriate entry).

The codes and criteria for treatment needs are:

0 = **None** (no treatment)

Use this code if a tooth is sound, or if a tooth cannot or should not be extracted or receive any other treatment.

1 = **One surface filling**

2 = **Two surface filling**

3 = **Three surface filling**

4 = **Four or more surface filling**

. One of the codes 1, 2, 3 or 4 should be used to indicate the treatment required to:

- treat initial, primary or secondary caries;
- repair damage due to trauma;
- treat discoloration of a tooth, a pulpal condition, or a developmental defect; or
- replace unsatisfactory fillings.

. A filling is considered unsatisfactory if one or more of the following conditions exist:

- a deficient margin to an existing restoration and where there are caries present;
- an overhanging margin of an existing restoration that causes obvious local irritation to the gingivae and cannot be removed by recontouring of the restoration; or
- a fracture of an existing restoration that either causes it to be loose or permits leakage into dentin.

5 = **Extraction for caries**

Record this when:

- caries has so destroyed the crown that it cannot be restored;
- caries has progressed to such an extent that there is an obvious and open exposure of the pulp and restoration of the tooth is not possible; or when
- only the roots remain.

6 = **Extraction for other reasons**

- Use this to indicate the need for extraction for trauma, to make way for a prothesis, for orthodontic or cosmetic reasons, or because of impaction.

7 = **Need for sealant on permanent molars**

- For "high-risk" children.

8 = **Need for other care**

- Specify the types of care for which code 7 is used.

13) **Overall Treatment Needs**

The examiner should review the form and patient and score whether each type of the following care is required.

Record for each type of care one of the following codes:

0 = none
1 = one or more services of that type

Urgent for pain or infection:

Urgent treatment is required if there is a life-threatening condition; if there is a fracture of the jaw; or if pain, infection or serious illness is present or will result unless treatment is provided within a month.

Examples of conditions that require immediate attention include:

- acute periapical abscess;
- acute necrotizing ulcerative gingivitis;
- gross caries; and
- chronic alveolar abscesses.

Extractions:

As recorded in individual tooth treatment needs.

Restorations:

As recorded in individual tooth treatment needs.

Periodontal scaling:

For CPITN scores of 2.

Prophylaxis:

For stain removal.

Preventive instruction:

For those with the sum of debris scores on the two teeth greater than 1, CPITN scores greater than 0, or apparently recent cavities.

APPENDIX 3

I.D. NUMBER [ ] [ ] [ ] [ ] [ ]

COMMUNITY DENTAL HEALTH SERVICES RESEARCH UNIT
STUDY OF DENTAL HEALTH AND CARE IN NORTH YORK SCHOOL CHILDREN

Record of Dental Care

Patient's Surname: _____ Given Name: _____

Age: _____ Sex: Male ___ Female ___

Dentist's Name: _____

Address: _____

City: _____ Postal Code: _____

1. Please check (✓) how long ago this person first attend this practice?

( )	Never	( )	1 - 2 years ago
( )	1 - 6 months ago	( )	3 - 5 years ago
( )	7 - 11 months ago	( )	6 or more years ago

(NOTE: If NEVER, please return the form so we can complete our records)

2. Please list the services provided in the twelve month period

From: ___(Yr) ___(Mo) ___(Day) To: ___(Yr) ___(Mo) ___(Day)

Date of Service Day		Month		Year		ODA Procedure Code					Tooth Code		Tooth Surface

Additional space, if necessary, is provided on the back of this page.

3. Does this child attend your practice (check one only):

( ) Regularly for check-up(s)
( ) Irregularly for check-up(s)
( ) Only when in pain or trouble

4. Does this patient have third-party coverage of dental costs?

( ) Yes, Private insurance
( ) Yes, CINOT (from Health Dept)
( ) Yes, Family Benefits (from COMSOC)
( ) Other
( ) No
( ) Don't Know

5. Over the past two years, has this patient visited another dental care provider such as a dental specialist or general practitioner?

( ) Yes ( ) No ( ) Don't Know

If **YES**, check the type of dental care provider (check all that apply):

( ) General Dental Practitioner ( ) Dental Specialist ( ) Don't Know

6. At the last series of visits, did this patient receive all the treatment you recommended?

( ) Yes ( ) No ( ) Don't Know

If **NO**, please indicate what was recommended but not provided.

_____

If **NO**, why did the patient not receive all the care you recommended? (check all that apply)

( ) Parent could not afford it
( ) Third party plan didn't cover it
( ) Parent did not see it as a priority
( ) Parents want the care but are delaying having it done until a more appropriate time

Other reason(s) (please write):_____

_____

7. At the last series of visits, did you provide services requested by the patient (or parent) which you had not recommended?

( ) Yes ( ) No ( ) Don't Know

This ends our survey. Thank you for your help.

APPENDIX 4

APPENDIX 4, TABLE 1

Mean RVUs Per Child for NYPHD Patients

By Type of Service

Service	Confirmed	s.d.	Unconfirmed	s.d.	Total
n	144		42		186
Exam	.880	1.20	.161	0.59	.718
Xray	.032	0.16	.041	0.19	.034
Prophy	.193	0.53	.037	0.24	.158
Fluoride	.129	0.13	.029	0.13	.107
Consult - diag.	.000	0.00	.000	0.00	.000
Sealant	.228	0.69	.060	0.39	.190
Discing - prev.	.000	0.00	.000	0.00	.000
Spacers	.104	0.90	.000	0.00	.081
Pain control - other, see number	.000	0.00	.000	0.00	.000
Amal prim (1^0)	1.216	2.85	.176	0.75	.981
Amal perm (2^0)	.425	1.25	.000	0.00	.329
Comp 1^0 ant	.078	0.48	.000	0.00	.060
Comp 2^0 ant	.028	0.33	.000	0.00	.022
Comp 1^0 post	.000	0.00	.000	0.00	.000
Comp 2^0 post	.000	0.00	.000	0.00	.000
Endo	.035	0.21	.000	0.00	.027
Infection control - other, see number	.000	0.00	.000	0.00	.000
Perio, including scaling	.010	0.12	.000	0.00	.008
Extractions	.229	1.07	.036	0.23	.186
Frenectomy - surg.	.000	0.00	.000	0.00	.000
TOTAL	**3.587**	**5.65**	**.539**	**1.88**	**2.899**
Number of patients with at least one service	**93**		**4**		**97**

APPENDIX 4, TABLE 2

Mean RVUs Per Child for Private Practitioner Patients

By Type of Service

Service	Confirmed	s.d.	Unconfirmed	s.d.	Total
n	128		14		142
Exam	1.371	0.75	.482	0.96	1.284
Xray	.652	0.74	.455	1.02	.632
Prophy	2.238	0.97	.111	0.42	2.028
Fluoride	.844	0.42	.000	0.00	.761
Consultation	.008	0.09	.000	0.00	.007
Sealant	.336	0.90	.000	0.00	.303
Discing	.063	0.35	.000	0.00	.056
Spacers	.117	0.79	.000	0.00	.106
Pain control	.010	0.11	.089	0.33	.018
Amal, prim T	.756	2.32	.782	2.93	.759
Amal, perm T	.147	0.76	.536	1.68	.185
Comp prim ant	.000	0.00	.000	0.00	.000
Comp perm ant	.136	0.86	.000	0.00	.123
Comp prim post	.118	0.72	.000	0.00	.107
Comp perm post	.308	1.11	.000	0.00	.278
Endo	.195	1.22	.357	1.34	.211
Infection control	.000	0.00	.107	0.40	.011
Perio	.047	0.53	.107	0.40	.053
Extractions	.426	1.17	.482	1.00	.431
Frenectomy	.027	0.31	.000	0.00	.025
Ortho	.598	2.72	.000	0.00	.539
TOTAL	**8.396**	**6.35**	**3.509**	**8.25**	**7.914**
Number of patients with at least one service	**127**	**4**			

APPENDIX 4, TABLE 3

Mean Relative Value Units of Dental Services Provided to Patients Attending Both Sources of Care by Category of Service

	Confirmed Patients Attending					
	Both Sources			One Source		Total Combined Using "best" result
Service Category	**NYPHD**	**PP**	**Total**	**NYPHD**	**PP**	
n	17	17	17	10	6	34
Exam	1.412	1.279	1.346	.675	1.000	1.79
Xray	.000	.594	.297	.053	.447	.46
Prophy	.092	1.634	.863	.000	2.080	1.23
Fluoride	.671	.106	.388	.060	.800	.55
Consult	.000	.000	.000	.000	.000	.00
Sealant	.630	.074	.352	.315	.000	.44
Discing	.000	.059	.029	.000	.000	.03
Spacers	.000	.000	.000	.000	.000	.00
Pain	.000	.074	.037	.000	.000	.07
Amal, prim	.188	1.178	.683	1.076	3.972	1.83
Amal, perm	.074	.368	.221	.375	.000	.33
Comp prim A	.000	.000	.000	.000	.000	.00
Comp perm A	.000	.000	.000	.000	.000	.11
Comp prim P	.118	.202	.160	.000	1.323	.39
Endo	.000	.000	.000	.000	.000	.00
Infection	.000	.000	.000	.000	.000	.00
Perio	.177	.000	.088	.000	.000	.09
Surgery	.000	.838	.419	.000	1.500	.86
Frenectomy	.000	.000	.000	.000	.000	.00
Ortho	.000	.118	.059	.000	.000	.06
TOTAL	**2.927**	**7.220**	**4.074**	**2.554**	**11.122**	**8.38**