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ABSTRACT

A study was done to determine what differences, if any, existed in the level of dental health knowledge between pupils at continuous resident (CR) schools (schools which employed a full-time dental hygienist) and pupils at nonresident (NR) schools (schools which provided only classroom instruction by the teacher). Demographic characteristics of the sample, such as socioeconomic status and educational level of Ss' parents, were controlled. Samples were drawn from the Denver public school system and an adjacent tri-county area. A 35-item, multiple-response questionnaire testing dental health knowledge, attitudes, and practices was administered. A 90% level of statistical confidence for questionnaire items was accepted. Significant differences pointed to a more favorable level of dental health knowledge, attitudes, and practices for CR pupils than for NR pupils. Sex of Ss, however, was not a controlled factor, and significant differences did occur within groups with a higher percentage of females. (JB)

COMPARATIVE FINDINGS IN SCHOOL SYSTEMS WITH DIFFERING APPROACHES TO DENTAL HEALTH EDUCATION

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Special Dental Health Study - Spring 1967

by

Colorado State Department of Public Health
Dental Health Section

in cooperation with

Denver Public Schools
Health Services Department

Tri-County Area Public Schools
Adams-Arapahoe School District
Eastlake School District
Englewood School District

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BACKGROUND AND PROBLEM

What is an effective dental health program for school pupils? How can positive habits of dental health be transmitted most effectively to pupils? Who influences pupils about dental health practices?

During the Spring of 1967, a Special Dental Health Study was conducted to evaluate the effects of differing approaches to dental health programs in public school systems. One school system, Denver Public Schools (D), has employed full-time dental hygienists since the World War II period (1945) to conduct a sequential dental health program. This program has included classroom dental inspections with educational talks, demonstrations and projects for elementary school children, first through sixth grades. Pupils in the other school systems, which are adjacent to Denver in the Tri-County area (T), have been instructed by the classroom teachers in dental health education without the services of school-employed dental hygienists. Dental health instruction in the T schools was integrated into the school-health curriculum as part of the total educational program, without classroom dental inspections.

OBJECTIVES

The purpose of this study was to collect information about the dental health knowledge, attitudes and practices of continuous-resident pupils in school systems with differing approaches to dental health education. Specific objectives of this study were to determine the following:

1. Are there differences in the dental health knowledge, attitudes and practices of continuous-resident pupils in a school system with a sequential dental health program (D) as compared to school systems without such a program (T)?
2. What are the levels of likes and dislikes of pupils on selected dental health activities and items?
3. Who are the persons the pupils believe are helpful in learning about dental health?

CRITERIA FOR STUDY

Pupils participating in the study had similar socio-economic backgrounds, with parents of comparable educational attainment, income levels and housing units. Groups of pupils from middle socio-economic classifications were used in the study. Middle socio-economic classifications were determined from information of the U.S. Bureau of the Census (1960)[5] by census tracts in the respective school systems. Five schools were selected to participate in the study according to school boundary areas which coincided with the middle socio-economic census tracts. (Refer to map in Appendix). The schools included the following:

Denver Public Schools (D)	Tri-County Area Public Schools (T)
Rishel	Aurora East - Adams-Arapahoe School District
Skinner	Coronado - Eastlake School District
	Sinclair - Englewood School District

Pupils who had attended continuously the same school system (D or T) since first grade were classified as continuous-residents (CR). All other pupils were classified as non-residents (NR).

Availability of professional dental care was equal for both groups of pupils. Dental manpower of approximately 500 practicing dentists in the Denver and Tri-County area was determined to be sufficient to meet the dental treatment needs of pupils seeking dental care.

Both groups of eighth-grade continuous-resident pupils were exposed to the benefits of fluoridation. The Denver Board of Water Commissioners initiated controlled fluoridation at the one ppm level in 1954. This water supply serves both the Denver and Tri-County area.

METHOD OF STUDY

The method of study will be presented in the sections, *study personnel*, *questionnaires* and *dental examinations*.

STUDY PERSONNEL

The Dental Health Consultant of the Colorado State Department of Public Health was responsible for the design, coordination of administration, implementation and evaluation of the study. Two dental hygienists employed by the D school system assisted in their respectively assigned schools. Three dental hygienists employed by the Tri-County Health Department, which serves as the local health agency for the Tri-County Schools, assisted in the T schools. Each school nurse in the five study schools served as the local school coordinator to make arrangements for the study to be conducted in her school. Staff in the Statistical Section of the Colorado State Department of Public Health tabulated data from the questionnaires and conducted all statistical evaluations.

QUESTIONNAIRE

Questionnaires with 35 multiple-response questions on dental health knowledge, attitudes and practices were administered to 1,474 eighth-grade pupils in the five schools. Prior to final revision, the questionnaire was pretested with 55 eighth-grade pupils in schools not participating in the study. Consultation on the design of the questionnaire was received from several sources including staff from the Laboratory of Educational Research, University of Colorado. (Refer to sample copy of questionnaire in Appendix).

The dental hygienists and classroom teachers served as monitors and explained the instructions for the questionnaire. It took approximately 10-15 minutes for each class of pupils to complete the questionnaire. Monitors assisted pupils with interpretation of question number one, after which the pupils independently answered the questionnaire. Pupils were assured that the questionnaire was not a test.

White questionnaires were used in the D schools to differeniate from yellow questionnaires used in the T schools. The two forms were identical except for the first question.

The first question on the questionnaire determined school-residency status of the pupils. Questionnaires analyzed for continuous-resident (CR) pupils included 864; 500 in the D school system and 364 in the T school systems. There were 610 questionnaires studied for non-resident (NR) pupils; 236 in the D school system and 374 in the T school systems. The results of the questionnaires for all pupils were analyzed to determine what differences occurred between the two groups.

Table 1 presents the total number and percent of CR and NR pupils by schools.

TABLE 1. NUMBER AND PERCENT OF CR AND NR PUPILS BY SCHOOLS

SCHOOLS	CR Pupils		NR Pupils		Total Pupils	
	No.	Pct.	No.	Pct.	No.	Pct.
Rishel	254	70.9	104	29.1	358	100.0
Skinner	246	65.0	132	35.0	378	100.0
D SCHOOLS Sub-total	500	67.9	236	32.1	736	100.0
Aurora East	99	32.8	203	67.2	302	100.0
Coronado	121	53.5	105	46.5	226	100.0
Sinclair	144	68.5	66	31.5	210	100.0
T SCHOOLS Sub-total	364	49.3	374	50.7	738	100.0
TOTAL	864	58.6	610	41.4	1,474	100.0

Of the 736 eighth-grade pupils who participated in the study from the two D public schools, 500 or over two-thirds had attended D schools continuously since first grade. Of the 738 pupils in the three T public schools, 364 or almost one-half had attended T schools continuously since first grade.

DENTAL EXAMINATIONS

Dental examinations were conducted only for CR pupils immediately after all pupils completed the questionnaire. Three types of dental indexes were used to determine the state of dental health which may indicate the dental practices of CR pupils. The indexes were the following: decay, missing and filled (DMF), gingival treatment (GTI)[4] and simplified oral hygiene (OHI-S)[1]. The form for recording the results of the dental examinations was printed on the back of the questionnaire. One dental examiner and one recorder from the Colorado State Department of Public Health conducted the dental examinations for all 864 CR pupils. The dental examinations averaged approximately one to two minutes per pupil. Dental equipment used in the study included a portable dental light (Burton), standard dental mirrors (non-magnifying No. 4), half-round explorers (No. 23) and periodontal probes (Williams).

RESULTS

Statistical analysis of the data revealed the following findings which will be discussed in the sections on *pupil characteristics, responses on the questionnaire, discussion on selected questions,* and *dental examinations.* Since the study was concerned with differences in the school systems, the following results are presented as composite data for the school systems, with the exception of selected findings from the dental examinations.

PUPIL CHARACTERISTICS

Table 2 indicates sex distribution and age range of continuous-resident pupils by school systems.

TABLE 2. SEX DISTRIBUTION AND AGE RANGE OF CR PUPILS BY SCHOOL SYSTEMS

School System	No. Pupils	Male		Female		Age in Years							
						13		14		15		16	
		No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
D	500	228	45.0	272	55.0	322	64.4	174	34.8	4	0.8	0	-
T	364	195	54.0	169	46.0	239	65.6	115	31.6	8	2.2	2	0.6
TOTAL	864	423	49.0	441	51.0	561	64.9	289	33.5	12	1.4	2	0.2

More CR pupils in the D school system were females (272 or 55.0%) while in the T school systems more CR pupils were males (195 or 54.0%). Age variance was approximately the same for the two groups of pupils with the majority of CR pupils (850 or 98.4%) between 13 and 14 years of age.

RESPONSES ON QUESTIONNAIRE

The questionnaires for both CR and NR pupils were tabulated and analyzed by the Statistical Section of the Colorado State Department of Public Health. (Refer to copies of D and T tabulated questionnaires in Appendix). A level of statistical confidence was accepted at 90 percent and above. Results of a chi-square test of contingency, which analyzed responses independently, classified questions two through 35 into four groups.

The four groups with questions in each respective group are as follows:

Group One - Questions which SIGNIFICANTLY DIFFERENTIATED between D and T schools for CR pupils but not NR pupils.

Group Two - Questions which did NOT significantly differentiate between D and T schools for either CR or NR pupils.

Group Three - Questions which significantly differentiated between D and T schools for NR pupils but not CR pupils.

Group Four - Questions which significantly differentiated between D and T schools for both CR and NR pupils.

	Group One	*Group Two*	*Group Three*	*Group Four*
Question Numbers	9,14,16	4,5,6	2,7,28	3,10,11
	17,19,21	8,12,13		26,29,30
	23,24,25	15,18,20		
	27	21,31,32		
		33,34,35		

Discussion on Questions in Group One

Since the purpose of this study was to determine what differences, if any, existed between CR pupils in the school systems, the following discussion is limited to questions which showed significant differences (Group One).

Table 3 indentifies questions in Group One by level of significant difference, type of question (knowledge, attitude, practice) and which school system the difference favors. The school system which the difference favors is the one where a higher percentage of CR pupils chose responses, which were considered to reflect a more favorable level of dental health knowledge, attitudes and practices.

TABLE 3. LEVEL OF SIGNIFICANT DIFFERENCES IN QUESTIONS IN GROUP ONE, TYPE OF QUESTION AND SCHOOL SYSTEM DIFFERENCE FAVORS

Level of Confidence as Pct.		Question	Type of Question	School System Difference Favors
99.5	16.	How often do you eat candy?	Practice	Denver
	17.	How do you feel about going to the dentist?	Attitude	Denver
	23.	Why do you brush your teeth?	Knowledge Attitude	Denver
	25.	How much do you like going to the dentist?	Attitude	Denver
	27.	How much do you like brushing your teeth?	Attitude	Denver
95.0	19.	At about which age does the first permanent tooth come in the mouth?	Knowledge	Denver
90.0	9.	Calculus (tartar) contributes most to which <u>one</u> of the below?	Knowledge	Tri-County
	14.	If you knew that candy or pop was bad for your teeth, would you eat or drink it anyway?	Knowledge Attitude	Denver
	21.	Which one of the below best describes fluoridation of public water supplies?	Knowledge	Denver
	24.	How much do you like milk?	Attitude	Denver
97.5	Sex	Greater proportion <u>female</u> (55.0%) CR pupils in D schools Greater proportion <u>male</u> (54.0%) CR pupils in T schools		

It appears from the above data that CR pupils in the D schools have a more favorable level of dental health knowledge, attitudes and

practices than CR pupils in the T schools. However, on question nine the reverse was shown.

One potentially biasing characteristic, which was not controlled in selecting pupils in the two study groups, was the sex composition. A difference in the sex proportion between CR pupils in the school systems was significantly different at the 97.5 percent level of confidence. The D schools had a greater proportion of female pupils than the T schools.

Question 23 was the only open-ended question on the questionnaire. Responses were classified individually, then tabulated into the following six general categories:

Category	Response relating to...
1	PERSONAL APPEARANCE ("have a healthy smile, pleasant breath, clean mouth, like clean feeling in my mouth")
2	TOOTH DECAY ("prevent cavities, keep holes from coming in my teeth")
3	PERIODONTAL DISEASE ("prevent gum disease, keep healthy gums, keep gums from bleeding")
4	PARENTS INSIST ("mother makes me, to keep mother happy")
5	OTHER ("I like to, like taste of tooth paste, keep my teeth a long time, good for me, want own teeth -- not false, keep germs out of my mouth")
6	NO ANSWER

Since questions in Groups Two, Three and Four did not reflect differences only on the basis of exposure to different programs of dental health education in the school systems, they will not be discussed as extensively as questions in Group One. However, selected questions in these other Groups are discussed in the following section.

DISCUSSION OF SELECTED QUESTIONS

One of the specific objectives of this study was to determine from the pupils' viewpoint persons who were helpful in learning about dental health (questions 29 through 35). Table 4 indicates the rank order of responses, one through four, by CR pupils in the school systems of such persons. Rank was determined by number of responses to four possible selections; one is high, four is low.

TABLE 4. RANK ORDER OF RESPONSES FOR PERSONS WHO HELPED CR PUPILS LEARN ABOUT DENTAL HEALTH IN D AND T SCHOOL SYSTEMS

Persons	Not Helpful		Somewhat Helpful		Quite Helpful		Very Helpful	
	D	T	D	T	D	T	D	T
Teachers	3	2	1	1	2	3	4	4
School Dental Hygienist	4	3	2	1	1	2	3	4
School Nurse	2	1	1	2	3	3	4	4
Parents	4	4	3	3	2	2	1	1
Dentist	4	4	3	3	2	2	1	1
Brothers, Sisters Friends	1	1	2	2	3	3	4	4
Advertizers on TV, or magazines	1	1	2	2	3	3	4	4

Pupils in both study groups generally agreed about the persons who helped them to learn about dental health. The dentist and parents were ranked by the majority of pupils in both groups as "very helpful" while brothers, sisters, friends and advertizers were ranked "not helpful". The school dental hygienist was ranked by over one-third of D pupils as "quite helpful". It should be noted that T schools do not employ a school dental hygienist, however nearly one-third of T pupils responded that this person was "somewhat helpful"! Teachers were considered by the majority of pupils in both groups to be "somewhat helpful". The school nurse was ranked by over one-third of D pupils as "somewhat helpful" while T pupils ranked her "not helpful". (Refer to tabulated questionnaires (page 3) in Appendix for percentage of responses to each selection).

Pupils were asked to indicate how often they visit the dentist (question two). While 71.0 percent of CR pupils in the D schools responded that they visit the dentist "once a year or more often", 72.2 percent of CR pupils in the T schools responded the same. A higher percent of D pupils (8.2%) indicated they had "never been to a dentist" than T pupils (7.7%). Verification of these responses was tested by a dental examination for all CR pupils.

DENTAL EXAMINATIONS

Pupils were not given the results of their individual examinations from this study, but were urged to make appointments with their own dentist for a thorough dental examination. The results of the dental examinations from this study are presented for each of the three indexes.

Results of the DMF and OHI-S indexes are presented by individual schools as well as the two school groups for the reader's benefit of comparing individual school rates.

DMF Index - Decayed, Missing and Filled Permanent Teeth

The DMF index was used to determine the number of permanent teeth affected by tooth decay. The following table presents data on the individual components of this index and the dental care ratio for CR pupils by schools in the school systems. The professional dental care ratio was determined from the total number of teeth using the formula, number of filled teeth / number of decayed plus filled teeth $\left(\frac{F}{D + F} \times 100\right)$.

TABLE 5. DMF RATES AND CARE RATIO FOR 864 CR PUPILS BY SCHOOLS AND SCHOOL SYSTEMS

Schools	No. Pupils	Decayed D	Missing M	Filled F	Total DMF	Care Ratio
Richel	254	.32	.15	2.36	2.83	88.0
Skinner	246	.66	.08	2.25	2.99	76.9
D SCHOOLS Sub-total	500	.48	.12	2.30	2.90	82.5
Aurora East	99	.54	.12	2.95	3.61	84.6
Coronado	121	.69	.16	2.48	3.33	78.1
Sinclair	144	.77	.10	2.88	3.75	78.9
T SCHOOLS Sub-total	364	.68	.13	2.76	3.57	80.2
TOTAL	864	.56	.12	2.50	3.18	81.4

A lower DMF tooth index was experienced by CR pupils in the D schools (2.90) as compared with CR pupils in the T schools (3.57). Pupils in the D schools also had less decayed teeth, than T school pupils (approximately one-half tooth per pupil in the D schools versus approximately two-thirds of a tooth per pupil in the T schools). The D, F and DMF rates for CR pupils in the D school system were significantly lower at the 95 percent level of confidence.

Evidence has shown that females experience more tooth decay than males.[2,3,6] The lower D, F and DMF rates for CR pupils in the D school system reflect more conclusive evidence of real differences when considering that the sex proportion of the two groups had more females than males in the D group.

Both groups of pupils displayed a high level of professional dental care for teeth affected by tooth decay (82.5% in the D schools and 80.2% in the T schools). It should be noted that the highest (Rishel) and the lowest (Skinner) care ratios for all schools appeared within the D school system.

GTI - Gingival Treatment Index

The GTI was used to determine dental treatment needs of the early stages of periodontal disease. The six categories of the GTI are progressive in the amount of professional dental treatment needed. (Refer to Appendix for a brief technical explanation of this index). Table 6 presents the number and percent of CR pupils by school systems for each category of the GTI. Category one represents the "least" severe stage of periodontal disease progressing in complication to category six as the "most" severe stage as defined by this index.

TABLE 6. NUMBER AND PERCENT OF CR PUPILS BY SCHOOL SYSTEMS FOR EACH CATEGORY OF THE GTI

School System	No. Pupils	Category 1		2		3		4		5		6	
		No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
D	500	291	58.2	16	3.2	2	0.4	166	33.2	21	4.2	4	0.8
T	364	179	48.9	17	4.8	4	1.1	137	37.8	16	4.4	11	3.0
TOTAL	864	470	54.4	33	3.8	6	0.7	303	35.1	37	4.3	15	1.7

Approximately one-half of CR pupils in the school systems (58.2% D, 48.9% T) exhibited evidence of GTI in category one. With the exception of category one, T pupils consistently displayed a higher percent in each of the other respective categories. Approximately one-third of the pupils in both school groups showed clinical evidence of needing professional dental treatment (category four) for the early stages of periodontal disease. The results of the GTI did not reveal any particularly significant information in this study that was not found by the OHI-S.

OHI-S - Simplified Oral Hygiene Index

The OHI-S was used to determine amounts of retained food debris and calculus (tartar) on teeth. Results of this index provided information regarding home and professional dental care practices of CR pupils. The debris (DI-S) component was interpreted in this study as an indication of the toothbrushing practices of pupils. The calculus (CI-S) component was interpreted as an indication of the level of professional dental care received by pupils for oral prophylaxis.

Table 7 indicates the debris and calculus components of the simplified oral hygiene index as an average rate per pupil for the 864 CR pupils by schools and school systems. The DI-S and CI-S values range from zero to three. The OHI-S is the sum of the two components (DI-S + CI-S) with a numerical range of zero to six.

TABLE 7. OHI-S AS AVERAGE PER PUPIL FOR 864 CR PUPILS BY SCHOOLS AND SCHOOL SYSTEMS

Schools	No. Pupils	DI-S Ave/pupil	CI-S Ave/pupil	OHI-S Ave/pupil
Rishel	254	.67	.48	1.15
Skinner	246	.54	.28	.82
D SCHOOLS Sub-total	500	.61	.38	.99
Aurora East	99	.89	.55	1.44
Coronado	121	.83	.53	1.36
Sinclair	144	.90	.41	1.31
T SCHOOLS Sub-total	364	.88	.49	1.37
TOTAL	864	.72	.43	1.15

A lower oral hygiene index was experienced by CR pupils in the D school system (.99) as compared to CR pupils in the T school systems (1.37). The lower average of debris and calculus per pupil in the D school system

was interpreted as indicating a higher level of personal and professional oral hygiene care. The lower average of debris per pupil in the D school system was interpreted as showing better toothbrushing practices by the pupils. The DI-S and OHI-S were significantly lower in the D school system at the 95 percent level of confidence.

SUMMARY AND CONCLUSIONS

What does the preceeding information mean? In summary, the purpose of this study was to collect information on the dental health knowledge, attitudes and practices of continuous-resident pupils in different school systems. The public school systems had different approaches to dental health education. The Denver Public Schools (D) employed full-time dental hygienists to conduct a sequential dental education-inspection program, first through sixth grades. Pupils in the Tri-County area public schools (T) were instructed by the classroom teacher in dental health education without the services of school-employed dental hygienists.

Two groups of eighth-grade continuous-resident (CR) pupils with similar socio-economic backgrounds, exposed to adequate dental manpower and the benefits of fluoridation showed significant differences in dental health knowledge, attitudes and practices. One characteristic of the pupils who participated in this study which was not controlled was the sex distribution. It proved to be significantly different between the two groups with more females than males in the D school system. Results of a multiple-response questionnaire and dental examinations for 864 CR pupils were analyzed. Significant differences pointed to a more favorable

level of dental health knowledge, attitudes and practices for CR pupils in the D school system. The differences were apparent through 11 questions on the questionnaire (Group One), through a lower DMF permanent tooth index and lower OHI-S index for 500 CR pupils in the D school system, when compared with the same information for 364 CR pupils in the T school systems.

Pupils were asked to indicate how much certain groups of persons helped them to learn about dental health. The majority of pupils in both study groups responded that the dentist and parents were "very helpful".

Who or what is responsible for these differences between the CR pupils in the two study groups on dental health knowledge, attitudes and practices? The differences may be the result of efforts by dental hygienists who conduct a sequential dental health program in public schools. This approach to dental health education appears to be the significant variable between the school systems.

ACKNOWLEDGEMENTS

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The writers also wish to express their deep appreciation to the school administrators, nurses, teachers and pupils whose enthusiastic participation made this study possible.

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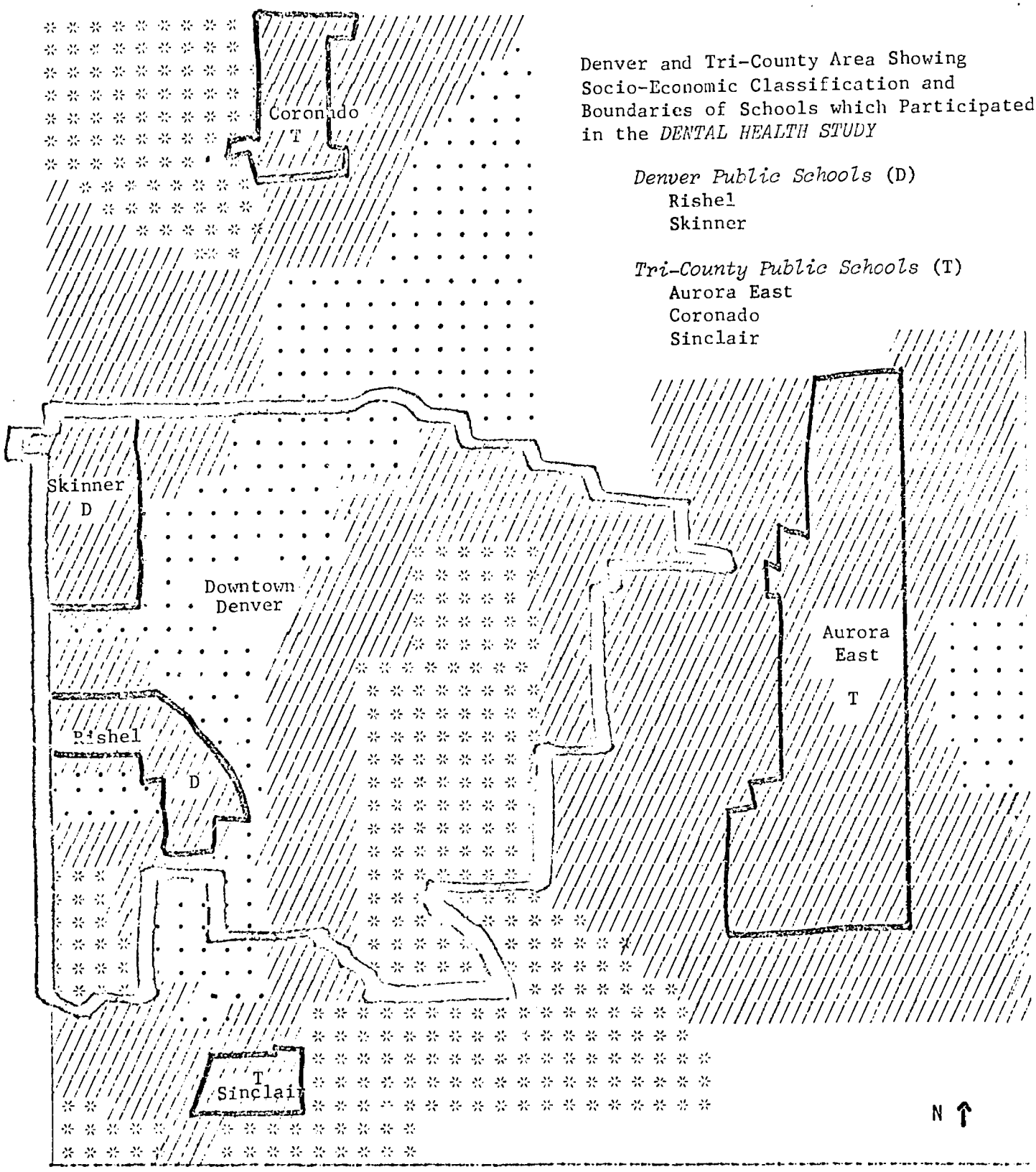
APPENDIX



Denver and Tri-County Area Showing Socio-Economic Classification and Boundaries of Schools which Participated in the *DENTAL HEALTH STUDY*

Denver Public Schools (D)
- Rishel
- Skinner

Tri-County Public Schools (T)
- Aurora East
- Coronado
- Sinclair

Socio-Economic Classification:

- ✲ ✲ ✲ ✲ Upper Fourth
- /////// Middle Half
- . . . . Lower Fourth

School Boundaries

Denver City Limits

SOURCE: Socio-Economic Data - U. S. Bureau of the Census (1960)
School Boundaries - Denver Public Schools (1967)
Tri-County Public Schools (1967)

Colorado State Department of Public Health
Special Study - Dental Health

EIGHTH-GRADE STUDENT'S QUESTIONNAIRE

Do Not Write Here

NO._____

CR NR

SCHOOL_____ SCIENCE TEACHER_____

NAME_____ MALE___ FEMALE___ AGE___

Please CHECK ☑ ONE BOX for each item.

1. Have you always attended Denver *PUBLIC* Schools since first grade (NOT private nor parochial)?

   Yes ☐ 1
   No ☐ 2

   If NO, in what other cities have you gone to school_____

2. How often do you visit the dentist?

   Every 6 months or oftener ☐ 1
   About once a year ☐ 2
   Every 2 or 3 years ☐ 3
   Never been to a dentist ☐ 4

3. How many students in your class do you think need to go to a dentist now?

   Nearly all ☐ 1
   Some ☐ 2
   Few ☐ 3
   None ☐ 4

4. Should primary (baby) teeth be filled when cavities form?

   Yes ☐ 1
   No ☐ 2

5. Have you had any toothaches since school started last fall?

   Many ☐ 1
   Few ☐ 2
   None ☐ 3

6. Do you think tooth decay (cavities) affects many school-age students?

   Yes ☐ 1
   No ☐ 2

7. Do your gums bleed when you brush your teeth?

   Yes, often ☐ 1
   Yes, sometimes ☐ 2
   No ☐ 3

8. How often do you chew gum?

   Every day ☐ 1
   More than twice a week ☐ 2
   Less than twice a week ☐ 3
   Don't chew gum ☐ 4

9. Calculus (tarter) contributes most to which one of the below?

   Tooth decay ☐ 1
   Mouth cancer ☐ 2
   Malocclusion ☐ 3
   Periodontal disease ☐ 4

10. What kind of care do you think you give your teeth?

    Very good ☐ 1
    Good ☐ 2
    Fair ☐ 3
    Poor ☐ 4

(CHECK ☑ ONE BOX for each item)

11. If you chew gum, what type do you usually chew?

Bubble gum	☐	1
Regular gum	☐	2
Sugarless gum	☐	3

2. If you had your choice of one snack after school, which would you choose?

Apple	☐	1
Candy bar	☐	2
Fruit juice	☐	3
Pop	☐	4

13. Which one below helps to prevent tooth decay?

Chlorides	☐	1
Fungi	☐	2
Fluorides	☐	3
Penicillin	☐	4

14. If you knew that candy or pop was bad for your teeth, would you eat or drink it anyway?

Yes	☐	1
No	☐	2

15. Do you think it is necessary for a person to lose his teeth when he gets old?

Usually	☐	1
Frequently	☐	2
Occasionally	☐	3
Seldom	☐	4

16. How often do you eat candy?

Every day	☐	1
More than twice a week	☐	2
Less than twice a week	☐	3
Don't eat candy	☐	4

17. How do you feel about going to the dentist?

Like it	☐	1
Don't mind it	☐	2
Don't like it	☐	3

18. If you eat candy, how do you get it?

Usually buy it myself	☐	1
Usually get it at home	☐	2

19. At about which age does the first permanent tooth come in the mouth?

4 years	☐	1
6 years	☐	2
8 years	☐	3
10 years	☐	4

20. Do stains on the teeth indicate poor home care?

Usually	☐	1
Occasionally	☐	2
Seldom	☐	3

21. Which one of the below best describes fluoridation of public water supplies?

Beneficial but expensive	☐	1
Safe but impractical	☐	2
Beneficial and inexpensive	☐	3
Expensive and not beneficial	☐	4

22. Can periodontal disease be prevented?

Usually can	☐	1
Usually cannot	☐	2
Uncertain	☐	3

23. Why do you brush your teeth? (Write answer on lines below)

_____

_____

Below are listed some things which you may like, and some which you may not like. Please circle how much you like each item. The HIGHER the number the more you like each item.

ere is an example:

How much do you like each item?	Don't Like	Like a Little	Like Fairly Well	Like Very Much
Candy.....	1	2	3	4

If you DO NOT LIKE candy you would circle (1). If you like it a LITTLE you would circle (2). If you like it FAIRLY WELL you would circle (3), and if you LIKE IT VERY MUCH you would circle (4).

lease circle ONE NUMBER to show how much you like each item below.

How much do you like each item?	Don't Like	Like a Little	Like Fairly Well	Like Very Much
24. Milk.....	1	2	3	4
5. Going to the dentist.....	1	2	3	4
26. Cookies or cake.....	1	2	3	4
7. Brushing your teeth.....	1	2	3	4
28. The way your teeth look.....	1	2	3	4

lease continue to circle ONE NUMBER for each item to show who helped you to learn about dental ealth.

Who helped you to learn about dental health?	Not Helpful	Somewhat Helpful	Quite Helpful	Very Helpful
29. Teachers.....	1	2	3	4
0. School dental hygienist.....	1	2	3	4
31. School nurse.....	1	2	3	4
2. Parents.....	1	2	3	4
33. Dentist.....	1	2	3	4
34. Brothers, sisters, friends.....	1	2	3	4
5. Advertizers on TV, or magazines.....	1	2	3	4

HANK YOU for your cooperation in completing this questionnaire.

If you would like to know more about dental health, please list below which topics you would like more information.

NAME_____ AGE____ M___ F___ SCHOOL_____ NO._____
(last) (first)

DATE_____ EXAMINER_____ CR NR

	UPPER			LOWER			Total Teeth	DI-S CI-S
	Buccal Right Molar	Labial Right Central	Buccal Left Molar	Lingual Left Molar	Labial Left Central	Lingual Right Molar		
DEBRIS							6 =	
CALCULUS							6 =	

D	M (EI)	F	TOTAL DMF	GTI	DI-S	CI-S	OHI-S	DPS-HR

COMMENTS:

Colorado State Department of Public Health
Public Health Dentistry Section
Special Study - Spring 1967
SH-DH-57b (12-66-9)

Colorado State Department of Public Health
Special Study -- Dental Health

EIGHTH-GRADE STUDENT'S QUESTIONNAIRE

Do Not Write Here:
NO _____
CR 364 NR 374

SCHOOL T (Sinclair, Aurora East, Coronado Hills) SCIENCE TEACHER _____

NAME _____ MALE 54% FEMALE 46% AGE ___

NA = No Answer Please CHECK ONE BOX for each item.
Numbers expressed as percentages for CR pupils only

1. Have you attended schools in Denver METROPOLITAN AREA (NOT in the city of Denver) since first grade?

49.3	Yes	☐	1
50.7	No	☐	2

If NO, in what other cities have you gone to school _____

2. How often do you visit the dentist?

40.4	Every 6 months or oftener	☐	1
31.8	About once a year	☐	2
20.1	Every 2 or 3 years	☐	3
7.7	Never been to a dentist	☐	4

3. How many students in your class do you think need to go to a dentist now?

14.4	Nearly all	☐	1
36.5	Some	☐	2
40.6	Few	☐	3
8.5	None	☐	4

4. Should primary (baby) teeth be filled when cavities form?

56.5	Yes	☐	1
43.5	No	☐	2

5. Have you had any toothaches since school started last fall?

1.5	Many	☐	1
20.3	Few	☐	2
78.2	None	☐	3

6. Do you think tooth decay (cavities) affects many school-age students?

82.7	Yes	☐	1
17.0	No	☐	2
NA .3			

7. Do your gums bleed when you brush your teeth?

5.7	Yes, often	☐	1
49.1	Yes, sometimes	☐	2
45.2	No	☐	3

8. How often do you chew gum?

20.8	Every day	☐	1
32.4	More than twice a week	☐	2
38.4	Less than twice a week	☐	3
8.2	Don't chew gum	☐	4
NA .2			

9. Calculus (tarter) contributes most to which one of the below?

65.1	Tooth decay	☐	1
12.9	Mouth cancer	☐	2
10.7	Malocclusion	☐	3
9.6	Periodontal disease	☐	4
NA 1.7			

10. What kind of care do you think you give your teeth?

12.4	Very good	☐	1
45.9	Good	☐	2
36.5	Fair	☐	3
5.2	Poor	☐	4

(CHECK ONE BOX for each item)

1. If you chew gum, what type do you usually chew?

22.5	Bubble gum	☐	1
69.2	Regular gum	☐	2
6.6	Sugarless gum	☐	3
NA 1.7			

2. If you had your choice of one snack after school, which would you choose?

31.9	Apple	☐	1
13.7	Candy bar	☐	2
11.0	Fruit juice	☐	3
43.4	Pop	☐	4

13. Which one below helps to prevent tooth decay?

8.3	Chlorides	☐	1
1.1	Fungi	☐	2
87.9	Fluorides	☐	3
1.9	Penicillin	☐	4
NA .8			

14. If you knew that candy or pop was bad for your teeth, would you eat or drink it anyway?

84.3	Yes	☐	1
15.4	No	☐	2
NA .3			

15. Do you think it is necessary for a person to lose his teeth when he gets old?

16.2	Usually	☐	1
11.3	Frequently	☐	2
33.3	Occasionally	☐	3
39.0	Seldom	☐	4
NA .2			

16. How often do you eat candy?

22.3	Every day	☐	1
39.8	More than twice a week	☐	2
35.2	Less than twice a week	☐	3
2.7	Don't eat candy	☐	4

17. How do you feel about going to the dentist?

7.1	Like it	☐	1
64.6	Don't mind it	☐	2
27.5	Don't like it	☐	3
NA .8			

18. If you eat candy, how do you get it?

64.8	Usually buy it myself	☐	1
33.5	Usually get it at home	☐	2
NA 1.7			

19. At about which age does the first permanent tooth come in the mouth?

8.0	4 years	☐	1
44.2	6 years	☐	2
34.6	8 years	☐	3
12.9	10 years	☐	4
NA .3			

20. Do stains on the teeth indicate poor home care?

59.1	Usually	☐	1
29.9	Occasionally	☐	2
10.4	Seldom	☐	3
NA .6			

21. Which one of the below best describes fluoridation of public water supplies?

31.6	Beneficial but expensive	☐	1
13.7	Safe but impractical	☐	2
45.9	Beneficial and inexpensive	☐	3
7.7	Expensive and not beneficial	☐	4
NA 1.1			

22. Can periodontal disease be prevented?

48.1	Usually can	☐	1
6.6	Usually cannot	☐	2
44.5	Uncertain	☐	3
NA .8			

23. Why do you brush your teeth? (Write answer on lines below)

1	2	3	4	5	6
46.7	36.3	2.4	4.7	8.5	1.4

Below are listed some things which you may like, and some which you may not like. Please circle how much you like each item. The HIGHER the number the more you like each item.

ere is an example:

How much do you like each item?	Don't Like	Like a Little	Like Fairly Well	Like Very Much
andy.....	1	2	3	4

If you DO NOT LIKE candy you would circle (1). If you like it a LITTLE you would circle (2) you like it FAIRLY WELL you would circle (3) and if you LIKE IT VERY MUCH you would circle (4).

lease circle ONE NUMBER to show how much you like each item below.

How much do you like each item?	Don't Like	Like a Little	Like Fairly Well	Like Very Much	NA
. Milk.....	1 3.8	2 7.2	3 29.4	4 59.6	
. Going to the dentist.....	1 26.7	2 27.7	3 38.7	4 5.8	1.1
26. Cookies or cake.....	1 2.5	2 17.0	3 39.0	4 41.2	.3
. Brushing your teeth.....	1 7.4	2 22.3	3 48.1	4 21.4	.8
28. The way your teeth look.....	1 17.3	2 16.2	3 39.6	4 26.9	

ease continue to circle ONE NUMBER for each item to show who helped you to learn about dental alth.

Who helped you to learn about dental health?	Not Helpful	Somewhat Helpful	Quite Helpful	Very Helpful	NA
2. Teachers.....	1 25.5	2 54.2	3 15.1	4 5.2	
. School dental hygienist.....	1 25.8	2 31.6	3 27.5	4 13.7	1.4
31. School nurse.....	1 41.2	2 31.0	3 18.4	4 8.8	.6
3 . Parents.....	1 2.2	2 15.4	3 28.0	4 54.4	
3 . Dentist.....	1 6.6	2 9.6	3 18.7	4 63.5	1.6
3 . Brothers, sisters, friends.....	1 55.0	2 28.3	3 9.6	4 6.6	.5
3 . Advertizers on TV, or magazines.....	1 43.1	2 35.4	3 11.0	4 9.1	1.4

THANK YOU for your cooperation in completing this questionnaire.

If you would like to know more about dental health, please list below which topics you would like more information.

NAME _____ AGE ____ M ___ F ___ SCHOOL _____ NO. _____
(last) (first)

DATE _____ EXAMINER _____ CR NR

	UPPER			LOWER			Total / Teeth	DI-S / CI-S
	Buccal Right Molar	Labial Right Central	Buccal Left Molar	Lingual Left Molar	Labial Left Central	Lingual Right Molar		
DEBRIS							6 =	
CALCULUS							6 =	

D	M (EI)	F	TOTAL DMF
.68	.13	2.76	3.57

GTI

DI-S	CI-S	OHI-S
.88	.49	1.37

COMMENTS:

Colorado State Department of Public Health
Public Health Dentistry Section
Special Study - Spring 1967
DH-57c (12-66-9)

Colorado State Department of Public Health
Special Study - Dental Health

EIGHTH-GRADE STUDENT'S QUESTIONNAIRE

Do Not Write Here

NO. _____

CR (500) NR 236

SCHOOL D (Skinner, Rishel) SCIENCE TEACHER _____

NAME _____ MALE 45% FEMALE 55% AGE ____

NA = No Answer Please CHECK ☑ ONE BOX for each item.
Numbers expressed as percentages for CR pupils only

1. Have you always attended Denver PUBLIC Schools since first grade (NOT private nor parochial)?

67.9	Yes	☐	1
32.1	No	☐	2

If NO, in what other cities have you gone to school _____

2. How often do you visit the dentist?

36.6	Every 6 months or oftener	☐	1
34.4	About once a year	☐	2
20.6	Every 2 or 3 years	☐	3
8.2	Never been to a dentist	☐	4

NA .2

3. How many students in your class do you think need to go to a dentist now?

12.4	Nearly all	☐	1
50.4	Some	☐	2
32.2	Few	☐	3
4.8	None	☐	4

NA .2

4. Should primary (baby) teeth be filled when cavities form?

58.0	Yes	☐	1
42.0	No	☐	2

5. Have you had any toothaches since school started last fall?

1.0	Many	☐	1
19.0	Few	☐	2
80.0	None	☐	3

6. Do you think tooth decay (cavities) affects many school-age students?

86.2	Yes	☐	1
13.6	No	☐	2

NA .2

7. Do your gums bleed when you brush your teeth?

6.6	Yes, often	☐	1
55.0	Yes, sometimes	☐	2
38.4	No	☐	3

8. How often do you chew gum?

18.2	Every day	☐	1
37.8	More than twice a week	☐	2
36.4	Less than twice a week	☐	3
7.4	Don't chew gum	☐	4

NA .2

9. Calculus (tarter) contributes most to which one of the below?

73.0	Tooth decay	☐	1
10.0	Mouth cancer	☐	2
7.2	Malocclusion	☐	3
8.6	Periodontal disease	☐	4

NA 1.2

10. What kind of care do you think you give your teeth?

8.4	Very good	☐	1
42.4	Good	☐	2
41.4	Fair	☐	3
7.8	Poor	☐	4

(CHECK ✓ ONE BOX for each item)

11. If you chew gum, what type do you usually chew?

13.8	Bubble gum	☐	1
75.8	Regular gum	☐	2
7.0	Sugarless gum	☐	3
NA 3.4			

12. If you had your choice of one snack after school, which would you choose?

32.0	Apple	☐	1
9.6	Candy bar	☐	2
13.8	Fruit juice	☐	3
44.4	Pop	☐	4
NA .2			

13. Which one below helps to prevent tooth decay?

9.8	Chlorides	☐	1
1.6	Fungi	☐	2
84.8	Fluorides	☐	3
3.2	Penicillin	☐	4
NA .6			

14. If you knew that candy or pop was bad for your teeth, would you eat or drink it anyway?

79.2	Yes	☐	1
20.6	No	☐	2
NA .2			

15. Do you think it is necessary for a person to lose his teeth when he gets old?

18.2	Usually	☐	1
8.8	Frequently	☐	2
35.0	Occasionally	☐	3
37.6	Seldom	☐	4
NA .4			

16. How often do you eat candy?

12.8	Every day	☐	1
45.2	More than twice a week	☐	2
38.0	Less than twice a week	☐	3
4.0	Don't eat candy	☐	4

17. How do you feel about going to the dentist?

9.4	Like it	☐	1
71.8	Don't mind it	☐	2
16.8	Don't like it	☐	3
NA 2.0			

18. If you eat candy, how do you get it?

62.8	Usually buy it myself	☐	1
35.8	Usually get it at home	☐	2
NA 1.4			

19. At about which age does the first permanent tooth come in the mouth?

7.0	4 years	☐	1
53.6	6 years	☐	2
26.2	8 years	☐	3
13.0	10 years	☐	4
NA .2			

20. Do stains on the teeth indicate poor home care?

62.8	Usually	☐	1
30.6	Occasionally	☐	2
6.6	Seldom	☐	3

21. Which one of the below best describes fluoridation of public water supplies?

26.0	Beneficial but expensive	☐	1
15.2	Safe but impractical	☐	2
52.2	Beneficial and inexpensive	☐	3
4.6	Expensive and not beneficial	☐	4
NA 2.0			

22. Can periodontal disease be prevented?

44.4	Usually can	☐	1
4.6	Usually cannot	☐	2
50.0	Uncertain	☐	3
NA 1.0			

23. Why do you brush your teeth? (Write answer on lines below)

1	2	3	4	5	6
47.4	32.0	2.4	1.2	15.4	1.6

Below are listed some things which you may like, and some which you may not like. Please circle how much you like each item. The HIGHER the number the more you like each item.

Here is an example:

How much do you like each item?	Don't Like	Like a Little	Like Fairly Well	Like Very Much
Candy	1	2	3	4

If you DO NOT LIKE candy you would circle (1). If you like it a LITTLE you would circle (2). If you like it FAIRLY WELL you would circle (3) and if you LIKE IT VERY MUCH you would circle (4).

Please circle ONE NUMBER to show how much you like each item below.

How much do you like each item?	Don't Like	Like a Little	Like Fairly Well	Like Very Much	NA
24. Milk	1 3.2	2 6.6	3 22.2	4 68.0	
25. Going to the dentist	1 15.0	2 28.4	3 48.8	4 7.6	.2
26. Cookies or cake	1 2.6	2 21.6	3 43.2	4 32.6	
27. Brushing your teeth	1 3.6	2 16.2	3 55.2	4 24.4	.6
28. The way your teeth look	1 16.6	2 20.2	3 37.6	4 25.4	.2

Please continue to circle ONE NUMBER for each item to show who helped you to learn about dental health.

Who helped you to learn about dental health?	Not Helpful	Somewhat Helpful	Quite Helpful	Very Helpful	NA
29. Teachers	1 14.8	2 50.4	3 24.4	4 10.4	
30. School dental hygienist	1 9.0	2 28.0	3 36.8	4 25.6	.6
31. School nurse	1 34.0	2 35.0	3 20.6	4 10.0	.4
32. Parents	1 2.8	2 11.8	3 34.2	4 51.2	
33. Dentist	1 3.6	2 8.2	3 18.2	4 67.2	2.8
34. Brothers, sisters, friends	1 51.8	2 30.2	3 11.4	4 5.2	1.4
35. Advertizers on TV, or magazines	1 44.2	2 39.6	3 9.8	4 5.6	.8

THANK YOU for your cooperation in completing this questionnaire.

If you would like to know more about dental health, please list below which topics you would like more information.

NAME_____ AGE____ M___ F___ SCHOOL_____ NO._____
(last) (first)

DATE_____ EXAMINER_____ CR NR

	UPPER			LOWER			Total Teeth	DI-S CI-S
	Buccal Right Molar	Labial Right Central	Buccal Left Molar	Lingual Left Molar	Labial Left Central	Lingual Right Molar		
DEBRIS							6	
CALCULUS							6	

D	M (EI)	F	TOTAL DMF
.48	.12	2.30	2.90

GTI

DI-S	CI-S	OHI-S
.61	.38	.99

DPS-HR

COMMENTS:

Colorado State Department of Public Health
Public Health Dentistry Section
Special Study - Spring 1967
SH-DH-57b (12-66-9)

CODING CRITERIA FOR GTI INDEX (Smith)*

METHOD

A. The lingual surfaces of the mandibular anterior teeth (cuspid through cuspid) and the buccal surfaces of the maxillary first permanent molars are examined for calculus. If the first molar is missing then the second molar is examined.

B. The facial surfaces of all maxillary and mandibular anterior teeth and the buccal surfaces of the maxillary first permanent molars are examined for extrinsic stain and debris. The second permanent molars are examined if the first molars are missing.

C. A subject is not examined unless at least three mandibular anterior teeth and one maxillary first or second molars are present.

GTI CATEGORIES

1 No calculus nor extrinsic stain present. Soft debris may cover 1/3 of the exposed tooth surface of one or more teeth.

2 No calculus present, extrinsic stain present and/or soft debris covers more than 1/3 of the exposed tooth surface of one or more teeth.

3 Supragingival calculus but no subgingival calculus present. Debris and stain may be present.

4 Subgingival calculus covering less than 1/3 of a tooth in a horizontal direction. Supragingival calculus, debris and stain may be present.

5 Subgingival calculus covering more than 1/3 of a tooth surface in a horizontal direction. Supragingival calculus, debris and stain may be present.

6 Presence of gross hypertrophy (enlargement of gingival tissue covering more than 1/3 of the anatomic crown), recession exposing more than 3 mm. of the root surface, cleft of the gingival tissue and periodontal pockets.

*Smith, Lowell W. The gingival treatment index: a survey method to estimate need and time required for gingival treatment. Denver, Colorado State Department of Public Health, Residency Program: Dental Public Health, June 1966. 17 p. typed.