



**ORAL HEALTH
SURVEY OF
SCHOOLCHILDREN
IN TRINIDAD & TOBAGO**

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CONTENTS

	Page
Acknowledgements _____	6
List of Tables _____	7
Executive Summary _____	9
Introduction _____	11
Materials and Methods _____	17
Results _____	22
Discussion _____	31
General Recommendations _____	33
Conclusion _____	33
Report of the Meeting held to discuss the Recommendations of the Oral Health Survey _____	34
Action Points _____	46
References _____	48
List of Appendices _____	49
Appendices _____	50

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LIST OF TABLES

Table 1:	Number of children by age group and RHA.
Table 2:	Sample by gender and age group.
Table 3:	Proportions of decayed, missing and filled teeth by age group and gender.
Table 4:	Caries free children (dfmt / DMFT=0) by age group.
Table 5:	Proportion of children with Decayed, Missing and Filled Teeth by age group for children with some caries experience (dmft/DMFT>0).
Table 6:	Proportion of children with three or more Decayed Teeth (D=3+).
Table 7:	Proportion of children with Decayed, Missing and Filled Teeth by RHA.
Table 8:	Caries experience for the whole sample.
Table 9:	Caries experience for children with some experience (dmft/DMFT>0).
Table 10:	Mean DMFT /dmft by age group and RHA.
Table 11:	Prevalence of treatment need.
Table 12:	Prevalence of treatment needs by age group and RHA.
Table 13:	Need for urgent care and referral.
Table 14:	Dental Fluorosis by age group and RHA.
Table 15:	Distribution of permanent molars at risk by age group.
Table 16:	Summary of questionnaire results (12 and 15 year-olds).



EXECUTIVE SUMMARY

Background

The World Health Organisation (WHO) recommends that surveys of oral health be used to collect information about oral disease, oral health and treatment needs of a population, for the planning of dental services and to monitor changes in levels and patterns of these variables over time. The WHO adopted in its World Health Assembly, May 1981, a global indicator of oral health status of children, as an average of not more than three decayed (D), missing (M) or filled (F) permanent teeth (T) at the age of 12, by the year 2000 (i.e. DMFT = 3.0). The last national child dental health survey Trinidad and Tobago in 1989 reported a DMFT for 12 year-olds of 4.9 with 86% of children having experienced dental caries (tooth decay), indicating a high prevalence and severity of disease at that time. There have been improvements in living standards in Trinidad and Tobago over the last 15 years but it is not clear whether this includes gains in oral health that should be reflected by lower DMFT scores.

Objectives

To conduct a survey of schoolchildren in order to determine their oral health status and treatment needs. These data would be used to determine changes in disease levels and patterns of oral health since the 1989 survey. The findings would also be used to guide policy makers and programme managers in the planning of appropriate dental services and the targeting of resources towards those sections of the population most in need. In addition, the data can serve as a baseline against which future interventions can be evaluated.

Survey Method

A national oral health survey of schoolchildren in Trinidad and Tobago was conducted between March and April 2004. The study comprised three groups of children: aged 6-8 years, 12 years and 15 years. In order to select the children for the study, a stratified cluster sampling design was used. The sampling frame comprised primary (for children aged 6-8 years) and secondary (for children aged 12 to 15 years) schools. Before their random selection, schools were stratified by Regional Health Authority (RHA). Children were measured from a total of 18 primary schools and 19 secondary schools.

Data were collected on dental caries, treatment need and dental fluorosis. Measurements were based on WHO criteria. Examiners were trained and calibrated to international standards and had excellent reliability throughout the period of data collection.

Before measurements were taken, the children had to return signed consent forms from their parents. Permission for the survey was obtained from the Ministry of Health, Ministry of Education and from school principals.

Findings

A total of 1604 children were examined in the survey (92% of those whose parents submitted written consent forms). This exceeded the number required for statistically sound results at the level of the RHA.

A significant improvement was seen in the oral health of 12 year-old schoolchildren in Trinidad and Tobago over the last 15 years, with the current DMFT being 0.6. This means the country has surpassed the WHO goal of 3.0 by the year 2000. Oral health of 15 year-olds was also good with the DMFT score being 1.1. However, the oral health of 6-8 year-olds was poor compared to secondary schoolchildren (dmft = 2.5). In addition 62% of 6-8 year-olds had caries experience with 33% of 12 year-olds and 45% of children aged 15 years. The most prevalent experience was decayed teeth. The results indicate a significant drop in caries experience in 12 year-old children from 86% in 1989.

Treatment needs in secondary schoolchildren were lower than those from primary school reflecting the generally low caries experience in the older age groups. Overall 72% of children aged 6-8 years had some treatment needs compared with 59% of 12 year-olds and 65% of children aged 15 years.

Almost half of the sample required fillings, with 33% requiring fissure sealants and 13% extraction. Treatment needs were greatest in Tobago (84%) and lowest in the North West region (56%). Need for extraction was greatest in the South West region (16%) and lowest in the North West region (9%). Dental fluorosis was uncommon.

General Recommendations

- Increase oral health promotion to children and parents at the pre-school stage to reduce risk of caries by the primary school years.
- Improve the oral health of primary schoolchildren through the strengthening of school oral health promotion programmes.
- Improve access to dental care for primary schoolchildren.
- Examine the feasibility of introducing national salt fluoridation with respect to improving the oral health of primary schoolchildren..
- Monitor the oral health of secondary schoolchildren to ensure good oral health is maintained.
- Conduct regional and national oral health surveys of schoolchildren at 5-10 year intervals to measure disease levels, trends in oral health and the effectiveness of interventions.

INTRODUCTION

Oral Health Surveys

The World Health Organisation (WHO) recommends that for the planning of dental services, surveys of oral health be used to collect information about oral disease, oral health and treatment needs of a population, and to monitor changes in levels and patterns of these variables over time¹.

Dental Caries and The DMFT Index

Dental caries (tooth decay) is a common oral disease and is usually more severe during childhood. The outcome of dental decay is often pain and abscess necessitating urgent dental treatment such as fillings or extraction of teeth (both of which may be traumatic for young children). Although its prevalence is decreasing in the developed world there has been a trend of increasing caries prevalence among some developing nations^{2,3}.

Dental caries is preventable through reducing frequency of sugary food intake, good oral hygiene, early diagnosis of at risk individuals or communities and use of fluoride. The reduction in prevalence in developed countries has been largely attributed to increasing awareness of these factors and use of strategies to address them. The increasing caries prevalence in some developing nations is thought to be due to the greater availability of confectionary and sweetened snack foods and drinks.

Caries experience for a population is expressed as the average number of decayed (D) missing (M) and filled (F) teeth (T), abbreviated to mean DMFT. For the primary dentition this is expressed as dmft. Apart from expressing lifetime accumulation of treated and untreated dental caries, the DMFT value also indicates the severity of the disease:

Caries severity rating using the DMFT, is described by the WHO as follows:

0.0 - 1.1	very low severity
1.2 - 2.6	low
2.7 - 4.4	moderate
5.5 - 6.5	high
6.6 +	very high

Goals for Oral Health

The WHO adopted in its World Health Assembly, May 1981, a global indicator of oral health status of children, as an average of not more than three decayed, missing or filled permanent teeth at the age of 12, by the year 2000 (i.e. DMFT=3)⁴. Improvements in oral health should be reflected by lower DMFT scores.

More recently, the WHO has embarked on producing oral health goals for 2020. For these no absolute values have been given, as these have to be established on the basis of local priorities and oral health systems, as well as disease prevalence and severity and socio-environmental conditions.⁵

Dental Caries in Trinidad and Tobago and the Caribbean

Most developed nations have met or greatly exceeded the goal of DMFT 3 e.g. WHO data from oral health surveys undertaken in the english speaking Caribbean show that many of these countries have also met this target ⁶:

Country	Year of survey	DMFT (12 year-olds)
Anguilla	1991	2.5
Antigua Barbuda	1989	1.7
Bahamas	2000	1.6
Barbados	2001	0.9
Cayman Islands	1995	1.7
Dominica	1989	2.5
Grenada	2000	2.2
Guyana	1995	1.3
Jamaica	1995	1.1
St. Vincent & The Grenadines	1991	3.2
Trinidad and Tobago	1989	4.9

The last national child dental health survey Trinidad and Tobago 1989 reported a DMFT of 12 year-olds of 4.9 with 86% of children having experienced caries⁷. This indicates a high prevalence and high severity of disease at that time. Of note is that the DMFT of Jamaican 12 year-olds was 6.7 in 1984 as compared to the figure of 1.1 in 1995. This 84% reduction in caries experience has been attributed to the introduction of a national salt fluoridation programme in 1987 ⁸. Salt fluoridation has been proposed as a wholly viable and cost effective alternative to water fluoridation as a method of preventing dental caries at the community level. The accepted concentration for salt fluoridation programmes is 250mg per Kg salt, at which concentration optimal caries prevention is achieved without any danger of toxicity ⁸. As a national public health intervention, it is fully endorsed by the WHO and FDI (World Dental Federation), and forms the essence of the Pan American Health Organisation (PAHO) regional oral health strategy for Latin America and the Caribbean ⁹.

Before initiation of any fluoridation programme it is essential to record baseline oral epidemiological data on dental caries prevalence and severity. It is also essential to gather data on levels of 'dental fluorosis' (discolouration of teeth due to excess fluoride intake), which is usually due to naturally occurring fluoride in some ground water sources or the excessive use of fluoride supplements (e.g. tablets and drops). This information can help determine which child population groups will benefit from fluoridation.

Treatment Needs

In addition to providing baseline data on disease levels, oral health survey data also serve as a 'needs assessment' allowing the planning of appropriate dental health services and the targeting of resources toward those sections of the population most in need of care (i.e. those with the worst oral health).

Training in Oral Health Survey Methodology in the Caribbean and Technical Co-operation between Countries

In order to enable consistency and comparability between epidemiological surveys of oral health in the English speaking Caribbean, PAHO in collaboration with the University of Texas in San Antonio, arranged for training of senior dental officers, dental nurses and representatives of the UWI in 2002. This training laid the foundation for the development for a new oral health survey of schoolchildren in Trinidad and Tobago. A proposal for the survey was formally accepted by PAHO and the Ministry of Health in 2003.

Dental Services in Trinidad and Tobago

Trinidad and Tobago is a twin island democratic republic near the North East Coast of Venezuela in the Caribbean Sea. It has a total area of 5,128 sq. km of which Trinidad covers 4,828 sq. km. The country became a republic in 1976. Executive power lies with the Prime Minister and the Cabinet, legislative power lies with the Parliament. The bicameral legislature has an elected House of Representatives and an appointed Senate. The island of Tobago has considerable autonomy under the Tobago House of Assembly Act. Trinidad and Tobago's society's main ethnic roots are in Africa and India, but it also has strong historical and cultural ties to Great Britain. The population is approximately 1.4 million and it is estimated that 39.6% are of African descent, 40.3% East Indian, 18.4% of mixed racial ancestry, the rest are Caucasian, Asian and others.

The Health Care Sector is comprised of a large public Sector including nine (9) general hospitals and a large network of approximately 105 primary care health centres. As a result of a Health Sector Reform Programme which was instituted in 1994. The Ministry of Health became responsible solely for developing national health policy based on Health Needs Assessments and strategies to determine priorities in the health service. The country was divided into five (5), subsequently reduced to four (4) Regional Health Authorities (now reverted to 5), which are responsible for the delivery of health care. Dental Services which was a vertical service is in the process of decentralization in accordance with the dictates of the Health Sector Reform Programme.

The profession is regulated by the Dental Profession's Act first passed in 1980 and amended in 1998. The Act needs to be extensively amended to bring it into line with the current trends. A Dental Council is charged with the regulation of the profession. The Council is a statutory body that is elected by the members of the

Dental Board. The Senior Dental Surgeon is an ex-officio member of the Council representing the Minister of Health on this body.

The number of registered dentists in Trinidad and Tobago is 273, of these 235 are currently in practice, the majority being in the private sector. Government dental officers are allowed private practices. There has been a marked increase in the number of dentists in the country with the advent of the UWI School of Dentistry at the Faculty of Medical sciences at Mt. Hope. At present, 83 U.W.I graduates are currently in practice in Trinidad and Tobago. There are 108 undergraduates from Trinidad and Tobago out of a total of 158 currently being trained. In the last two years the intake has been approximately 50% Trinidadian and 50% foreign students.

During the 1970's the number of practicing dentists fell to 55. At that time it was felt that an auxiliary would be useful to increase the productivity of the profession. Trinidad and Tobago chose to develop a cadre of Dental Nurses based on the New Zealand model who would treat patients 5 to 12 years old, and provide Dental Health Education to school children and nursing mothers, thereby easing the burden on the small number of dentists in the public sector. A Regional Dental Nurses Training School was set up in Port of Spain in 1976 with the assistance of PAHO. The first class graduated in 1978 and presently there are 46 in practice.

The Current Staffing of Dental Services:

	Posts available	No. in Post
Senior Dental Surgeon	1	1
Dentist 1	29	15
Dental Nurse	66	46
Dental Assistants	39	31

There are 2 Dental Nursing Instructors at the Dental Nursing Training School. There are also 4 additional Dental Nursing Instructors available. A reasonably comprehensive range of care is provided at government clinics. Dental Nurses perform examinations, cleanings, restorations, extractions for children up to the age of 12 and provide dental health education in schools, at ante natal clinics, at PTA meetings, and health fairs. This aspect of their work has probably had the greatest impact on the population. They work under indirect supervision, and are not permitted by law to treat children over 12 years of age. Dentists in the public sector treat children up to the age of 18 and provide relief of pain, mainly extractions, for anyone above that age.

As part of The Health Sector Reform Programme, all Health Centres are being upgraded and there will be an increase in the number of Dental Clinics. Throughout Trinidad and Tobago there will be 106 primary care health facilities. These include either, District Health Facilities, Health Centres or Outreach Centres,

the majority of which will have dental clinics. The number of these clinics by region will be:

NWRHA	CRHA (former)	ERHA	SWRHA	TRHA
13	20	11	16	5

The total number of dental chairs available throughout Trinidad and Tobago will be 83 of which 10 will be in Tobago. These clinics are being equipped with sophisticated equipment that will require the present nurses to undergo upgrades in their training.

At present there is a shortage of Dental Nurses given the number of new clinics being opened. A new cadre of dental nurses and dental surgery assistants are to be trained to man these clinics. The School of Continuing Studies (U.W.I.) intends to offer an Associate Degree course in Dental Nursing, Dental Hygienists and Dental Technology. This course commenced in January 2005. With the increasing number of graduates from the Dental School it is hoped that the Regional Health Authorities will offer more attractive remuneration packages so that these graduates will seek careers in the public sector.

The private sector provides the majority of care in all branches of dentistry though offices are concentrated in urban areas. With the increase in the number of dentists outlying areas are gradually being served by the private sector. There are a number of specialists - Orthodontists (8), Oral Surgeons (6). There are two Oral Surgery clinics at the Port of Spain and San Fernando General Hospitals which tend to the maxillofacial needs of trauma victims and provide extractions under general anaesthesia for patients referred from government clinics. The waiting time for the latter service can be lengthy. Services offered in government clinics are free. It has been suggested that services be made available on a fee for service basis outside normal working hours in order to maximize the use of the clinics and as a means of raising revenue. In the private sector a limited number of patients benefit from insurance coverage usually provided by their employers. A National Health Insurance Scheme is in the preparatory stage.

DENTAL CARE DATA FROM GOVERNMENT CLINICS

Care provided to teenagers by government dentists in 2003

ACTIVITY	NUMBER
Clinical Sessions	602
Attendance	3786
Treated	2113
Examination Only (Advice & Referrals)	1370
Exodontia (Extractions)	1407
Amalgam Fillings	726
Cement (IRM)	207
Composite fillings	109
Prophylaxis (Scaling)	188
Charted	374
Overall Health Education	14

Care provided to children by Dental Nurses in 2003 (12 years & under)

ACTIVITY	NUMBER
Clinical Sessions	4834
Attendance	24656
Treated	23098
Examined Only (Advice & Referrals)	1180
Charted & Treatment Plan	10103
Exodontia (Extractions)	5590
Amalgam fillings	1747
Cement (IRM)	1934
Composite fillings	253
Prophylaxis (Scaling & Rubber Cup)	14134
Sealants	87
Fluoride Treatment	9702
Oral Health Education (Schools, Ante-Natal Clinics, Child Welfare Clinic, Chairside & Parental Counselling, PTA etc.)	3607

MATERIALS AND METHODS

Sampling Method

The study comprised three groups of children: aged 6-8 years, 12 years and 15 years. In order to select the children for the study, a stratified cluster sampling design was used.

The sampling frame comprised primary (for children aged 6-8 years) and secondary (for children aged 12 and 15 years) schools. Before selection, schools were stratified by Regional Health Authority (RHA). This was not only to facilitate the sampling process but also because it was intended that each RHA would use the study results to inform their programme planning. Within each RHA (stratum), systematic random sampling was used to select the schools using probability proportional to their estimated size. The number of children enrolled during the 2001-2002 academic year was used to estimate school enrolment during the study period. This information was obtained from the Ministry of Education. Before the selection, small schools i.e. those with less than 40 children of the required age, were combined with nearby schools.

The sampling strategy was based on identifying children attending schools. This meant that other children (those not attending school) were omitted from the sample. Since school attendance is compulsory up to age 12y in Trinidad and Tobago, this was not a problem for the 6-8y and 12y age groups. It should also be noted that the children aged 12y were selected from secondary schools. Consequently, 12y old children attending primary school were not included in the sample. This decision was taken because most 12y old children in Trinidad and Tobago are enrolled in secondary schools and the others would be in the primary school class preparing for the Secondary Entrance Examination. Access to the latter would have been very difficult.

When a school was selected, children of the required age were given consent forms to take home to their parents explaining the nature of the survey and inviting them to give permission for their children to participate. Only children who had returned the signed consent forms, qualified to be examined. When the study began, it was not clear how many children would have returned the signed consent form but it was thought that there would be a high attrition rate. Consequently, it was decided that all the children of the study age in the selected schools would be invited to participate in the study. The overall non-response rate would therefore include the children who did not return the consent forms as well as those who refused to have their measurements taken and those who were absent from school on the day that the data collection team visited.

After stratifying by RHA and school type (primary and secondary), a total of

37 schools were randomly selected for the study. There were nine schools each from the North-West, East and Tobago RHAs and ten from the South-West RHA. Overall there were 18 primary and 19 secondary schools.

Sample Size

The sample size was based on the estimation of treatment needs of children aged 6-8y, 12y and 15y. The results of the 1989 dental survey conducted in Trinidad and Tobago indicated that 64%, 80% and 89% of children aged 6y, 12y and 15y respectively needed various forms of treatment. These data were used as estimates in determining the minimum sample size needed for each age group within the RHAs. To give a precision rate of 7% ($P=0.05$), the minimum sample size needed for each age group is shown in the Table below. The total sample size required was 1429 children.

Required Sample size by age group and RHA

	Age Group			Total
	6-8 y	12 y	15 y	
	n	n	n	n
North-West RHA	177	124	77	378
Eastern RHA	172	118	75	365
South-West RHA	176	124	76	376
Tobago RHA	144	97	69	310
Total	669	463	297	1429

Approval and Consent

Permission for the survey was obtained from the Ministry of Health and Ministry of Education (APPENDIX 1(a) and 1(b)). Consent for individual dental exams was obtained from parents using returned consent forms that were distributed at schools through liaison with Head Teachers. (APPENDIX 2)

Information recorded and measures used

Oral Health (APPENDIX 3)

<i>Dental caries experience</i>	-	DMFT index
<i>Fluorosis</i>	-	Dean's Index of Fluorosis
<i>Treatment need</i>	-	WHO Index of Treatment Need
<i>Treatment urgency</i>	-	PAHO Index of Treatment Urgency

Oral Health and Dietary Practices (APPENDIX 4)

Demographic Variables*Age**Gender**School**Health Authority Region***Human Resources***Chief Responsible Individuals*

Dr. Ian Prevatt (Senior Dental Surgeon)

Dr. Rahul Naidu (UWI Lecturer)

Methodological/Statistical advice and services

Dr. Oswaldo Ruiz (PAHO Consultant)

Dr. Donald Simeon (Statistician)

Local Coordinators

Mrs. Indira Gobin and Ms June Bascombe-Martin

Dental examiners and recorders

Dental auxiliaries and dentists seconded from the Ministry of Health and RHAs. Three examination teams (North, South and Tobago):

NORTH

Amanda Blackman (Examiner)

Marlene Johnson (Recorder)

Sherma Sampson (Assistant)

Indroutie Deonarine (Examiner)

Zita Noel (Backup support)

SOUTH

Cheryl Roberts (Examiner)

Azeeda Ramkissoon (Recorder)

Desiree Reid (Recorder)

Joyce Ramtahal (Assistant)

Sylvia Gervais Valentine (Examiner)

TOBAGO

Leslyn Noray-Duncan (Examiner)

Jemma Walters (Recorder)

Cheryl Jack (Recorder)

Noreen Guy (Examiner)

Karlson Brooks (Assistant)

Drivers

(3)

Training and Calibration Exercise

Training of examiners ensured consistency in interpretation of examination criteria for all dental indices to be used (APPENDIX 5) and calibration of examiners ensured reliability of recorded data. Calibration of examiners was undertaken by a PAHO consultant over 5 day period at UWI School of Dentistry and the TML School, St Joseph. The calibration exercise included measures of Inter and Intra-examiner reliability. The exercise comprised four sessions:

1. *Introduction to the clinical examination procedure (1/2 days)*
Review of record form and codes, diagnostic criteria, use of clinical examination instruments.
2. *Training exercise day (1 day)*
Each examiner assessed 6 children in each of the relevant age groups (6, 12 and 15 year-olds). These 6 children were placed supine on the examination table and the tables identified as 1, 2, 3 etc. The examination team (i.e. examiner and recorder) rotated from table to table until each team examined all the children. This was done for each age group. During this exercise, the examiner and recorder were allowed to discuss discrepancies in clinical findings, interpretation of diagnostic criteria, codings and recording errors to come to agreement. The trainer (OR) reviewed the examinations done by all by comparing them against his own recording 'the gold standard' and worked closely with examiners to ensure they understood the criteria and codings.
3. *The Calibration exercise (3 days)*
The actual calibration was performed in the same manner as in the clinical training exercise except that (a) the number of children examined was 15-20 in each age group and (b) the examiners and recorders were not allowed to discuss their findings with each other. After each individual examination the record form was given to the 'roving' trainer (OR) for analysis.
4. *Final day*
The last day was used for making sure that all the examiners were completely familiar with the examination procedures and protocols.

Results of Calibration Exercise

Data from the examination forms were analysed to establish percentage levels of agreement to the gold standard (OR) and determine Kappa scores. Where Kappa scores were initially low some further training was undertaken.

Total children examined	53
Total days (calibration)	3
Examiners	6
Total examinations	423

Kappa scores for the calibration exercise:

Examiner	% agreement	Kappa
2	99.3	0.83
3	97.4	0.58
4	99.3	0.83
5	99.3	0.83
6	98.3	0.69
7	98.1	0.66

Oral Examination Protocol

Examination conducted at selected schools. Examinations were conducted using dental mouth-mirrors and CPTIN explorers. Exams conducted with child in a supine position using head-mounted examination lights. Reliability of data from field examinations were assessed by re-examination of 10% of subjects.

Data Recording

Survey data collected on examination record sheets (**APPENDIX 3**) and transcribed to database software (EpiInfo 6).

Duration of Survey Field Work

Data collection took place between March–April 2004

Data Processing and Analysis

Statistical support provided by DS. The data were summarized and described using relative frequencies and percentages for categorical variables (such as the presence of decayed teeth) and means for the interval scaled variables (such as the DMFT score). When the outcome variables were categorical, Chi-square tests were used to examine differences by gender, regional health authority and age group for statistical significance. Because the interval scale variables were not normally distributed, differences in means were examined using the Mann-Whitney U and the Kruskal-Wallis tests.

Cohen's Kappa was used to measure the intra- and inter-observer reliability of the examiners. The Kappa statistics were calculated to measure the level of agreement in duplicate assessments of the status of each tooth. Data were analyzed using SPSS Version 11.0 for Windows. Statistical significance was set at $p < 0.01$ because of the large number of statistical tests conducted.

Equipment and Expenditure

The equipment, supplies and resources used in the survey are shown along with their cost, in **APPENDIX 6**.

RESULTS

Sample Size and Demographics

A total of 3783 students met the selection criteria and were given consent forms to take home for their parents to allow their participation in the study. Of these, 1736 (46%) children returned their forms indicating that they had permission to be examined. The rate of return of consent forms was much higher in children aged 6-8 years (63%) compared with those aged 12 years (39%) and 15 years (34%). Of the children whose parents had given consent, 1604 (92%) were included in the study. The response rate, further broken down by RHA and age group, is shown in **APPENDIX A**.

The sample size achieved in this survey (1604) exceeded the statistically required number (1429). This was the case in all age groups and all Regional Health Authorities except the older children in the South-West RHA. The sample measured by age and RHA is shown in Table 1.

Table 1: Number of children by age group and RHA.

RHA	6-8years n (schools)	12 years n (schools)	15 years n (schools)	Total n (schools)
North-West	194 (5)	145 (4)	101 (3)	440 (9)
South West	220 (5)	117 (5)	64 (5)	401 (10)
Eastern	221 (3)	119 (5)	89 (4)	429 (9)
Tobago	153 (5)	107 (4)	74 (4)	334 (9)
Total	788 (18)	488 (18)	328 (16)	1604 (37)

The distribution of the sample by gender and age group is shown in Table 2. More than half the sample were female (55%). There were significant gender differences ($p < 0.01$) by age group with more males than females in the 6-8 year-olds but the opposite was the case among the 12 and 15 year-olds. There were no gender differences by RHA.

Table 2: Sample by gender and age group

Gender	6-8 years n (%)	12 years (n) %	15 years (n) %	Total (n) %
male	460 (58)	168 (34)	99 (30)	727 (45)
female	328 (42)	320 (66)	229 (70)	877 (55)
Total	788	488	328	1604

The distribution of schools by RHA is described in **APPENDIX B**

To obtain results for the country as a whole, weights were applied to the data from each of the four RHAs. The weights comprised the total number of children in the relevant age groups enrolled in government schools.

EXAMINER RELIABILITY

Inter-observer reliability was established by taking duplicate measurements in 141 children while intra-observer-reliability was determined on 53 children. The results indicated that between these duplicate measurements of the status of individual teeth was very good. Kappa ranged from 0.97 to 1.0 for inter-observer reliability and from 0.93 to 1.0 for intra-observer reliability. The results of the reliability analysis i.e. the Kappa statistics are shown by tooth, in **APPENDIX C**.

DENTAL CARIES

Prevalence

The proportion of children by age, in each of the categories of the dmft/DMFT, is shown in Table 3.

Table 3: Proportions of decayed, missing and filled teeth by age group.

Tooth status	6-8 years		12 years		15 years	
	n	(%)	n	(%)	n	(%)
DT/dt	122	59	34	28	27	35
MT/mt	33	17	9	7	5	7
FT/ft	4	2	9	6	10	11

Caries free children

The proportion of caries free children (i.e. those with no decayed, missing or filled teeth), for each of the three age groups, is shown in Table 4.

Table 4: Caries free children (dfmt / DMFT=0) by age group.

Age group	Caries free (%)
6-8 years	(38)
12 years	(66)
15 years	(55)

Table 5 describes dmft/ DMFT by age for all children and for those children with some caries experience (i.e. dmft/ DMFT >0).

Table 5: Proportion of children with decayed, missing and filled teeth by age group for children with some caries experience (dmft/ DMFT >0).

Age group Years	Decayed Teeth DT (n)%	Missing Teeth MT (n)%	Filled Teeth FT (n)%
6-8	472 (60)	127 (16)	29 (4)
12	124 (25)	29 (6)	34 (7)
15	106 (32)	26 (8)	43 (13)

Children with untreated decay

Table 6 describes the proportion of children with 3 or more decayed teeth in each age group. The greatest proportion (33.1%) was in the 6-8 year olds.

Table 6: Proportion of children with three or more decayed teeth (D=3+).

Age group Years	(D=3+)	
	N	(%)
6-8	261	(33)
12	19	(4)
15	25	(8)

Regional Variation in Caries Prevalence

Comparison between the four RHAs showed significant differences for several of the categories of the dmft/ DMFT (Table 7). The proportion of 6-8 years-olds with filled teeth in Tobago (12%) was much higher than in the others regions.

For 12 year-olds (39%) and 15 years-olds (48%), the greatest proportion with decayed teeth were in the South West. The North West had the lowest proportion of children with decayed teeth (21%) among 15 year-olds.

Table 7: Proportion of children with decayed, missing and filled teeth by RHA.

		Regional Health Authority (RHA)								
Age Group	Tooth Status	North-West		South-West		Eastern		Tobago		p-value
		n	%	n	%	n	%	n	%	
6-8 years		(n-193)		(n-220)		(n-220)		(n-153)		
	Decayed	106	55	131	60	143	65	92	60	0.22
	Missing	31	16	29	16	49	22	18	12	0.02
	Filled	1	0.5	7	3	3	1	18	12	<0.001
12 years		(n-145)		(n-117)		(n-119)		(n-107)		
	Decayed	26	18	46	39	24	20	28	26	<0.001
	Missing	10	7	9	7	9	8	1	1	0.10
	Filled	14	10	4	3	7	6	9	8	0.22
15 years		(n-101)		(n-64)		(n-89)		(n-74)		
	Decayed	21	21	31	48	30	34	24	32	0.003
	Missing	6	6	5	8	4	5	11	15	0.08
	Filled	18	18	4	6	7	8	14	19	0.03

Caries Experience

The caries experience (mean dmft/ DMFT) of the whole sample is described in Table 8. Six to eight year-olds had the highest caries experience. In the permanent dentition, twelve year-old children had a much lower caries experience than 15 year-olds. Most of the caries experience in 6-8 years olds was from decayed teeth (dt).

Table 8: Caries experience for the whole sample.

Age group (n)	DT/ dt Mean (sd)	Mt / mt Mean (sd)	FT/ft Mean (sd)	DMFT/ dmft Mean (sd)
6-8 (788)	2.2 (2.9)	0.3 (0.8)	0.0 (0.5)	2.5 (3.1)
12 (488)	0.4 (0.8)	0.1 (0.3)	0.1 (0.4)	0.6 (1.1)
15 (328)	0.8 (1.5)	0.1 (0.3)	0.2 (0.8)	1.1 (1.9)

Footnote to Table 8**THE DMFT INDEX**

- DMFT INDEX counts the number of decayed, missing and filled teeth in the mouth:

D = decayed M = missing F = filled

A score of one (1) is given to each Decayed, Missing or Filled tooth.

Value expressed as an 'average' for a population i.e. mean DMFT (adult teeth) or mean dmft (primary teeth).

Table 9 describes mean values for those children with some caries experience (DMFT/dmft >0) and shows that average disease levels are considerably higher when caries free children are excluded.

Table 9: Caries experience for those children with some experience.

Age group (n)	DMFT/dmft Mean (sd)
6-8 (628)	4.0 (3.1)
12 (187)	1.8 (1.1)
15 (175)	2.5 (2.0)

Regional Variation in Caries Experience

Table 10 shows caries experience by health authority region RHA and age group. Complete results for dmft/ DMFT by age group, school and RHA are shown in APPENDIX D(i) and D(ii).

Table 10: Mean DMFT /dmft by age group and Regional Health Authority.

Tooth status DMFT	Regional Health Authority			
	North West	South West	Eastern	Tobago
	Mean (sd)	Mean (sd)	Mean (sd)	Mean (sd)
6-8 yrs	2.32 (3.20)	2.52 (3.20)	2.68 (2.80)	2.67 (3.37)
12 yrs	0.47 (0.86)	0.79 (1.19)	0.53 (1.16)	0.70 (1.40)
15yrs	0.88 (1.72)	1.42 (2.14)	0.78 (1.16)	1.32 (2.09)

TREATMENT NEED

The treatment needs of the total sample are shown in Table 11. Overall, 67% of the sample had some type of need. The most frequently occurring need (42%) was for fillings. This includes 28% of the total sample needing 2 or more surface fillings. The next frequent need was for fissure sealant (33%) and preventative treatment, caries arresting care (12%). Extraction of one or more teeth was necessary in 13% of the children.

Table 11: Prevalence of treatment needs.

	%
Any type of treatment needs	67
No treatment needs	33
<i>Types of need</i>	
One surface filling	25
Two or more surface fillings	28
Fissure sealant	33
Preventative treatment, caries arresting care	12
Extraction	13
Crown	1

Regional variation in treatment need

Treatment need by, age and RHA is shown in Table 12. Significant differences were found across the regions for treatment need. There were no significant differences by gender.

For 6-8 year-olds the largest proportion of need was in the categories for fillings. This age group also had the highest need for extractions. In the older age groups the greatest need was for fissure sealants. More males (33%) than females (25.6%) required two or more surface fillings ($p < 0.001$).

84% of children in Tobago had some form of treatment need compared with 56 % in the North West and 67% in the South West and 63% in the East. Children in Tobago had more need for preventive care (i.e. caries arresting care) (38%) and fissure sealants (64%), than the other regions. Children in the South West had more need for extraction (16%) and one surface fillings (31%). The North West had the lowest treatment needs which is reflected in it having most children in the 'no need for treatment' category. Treatment needs for each of the schools sampled is described in APPENDIX E.

Table 12: Prevalence of treatment needs by age group and RHA.

	Regional Health Authority				p value	Age			p value
	NW	SW	Eastern	Tobago		6-8 years	12 years	15 years	
	n %	n %	n %	n %		n %	n %	n %	
Any type of treatment needs	247 56	268 67	269 63	282 84	<0.001	564 72	290 59	212 65	<0.001
No treatment needs	192 44	134 33	160 37	52 16		224 28	198 41	116 35	
Types of Needs									
One surface fillings	89 20	123 31	105 24	87 26	0.007	225 29	98 20	81 25	0.003
Two or more surface fillings	104 24	117 29	142 33	97 29	0.02	364 46	51 11	45 14	<0.001
Fissure sealant	140 32	136 34	122 28	213 64	<0.001	228 29	213 44	171 52	<0.001
Preventative treatment, caries arresting care	16 4	75 19	35 8	126 38	<0.001	195 25	29 6	28 9	<0.001
Extraction	38 9	65 16	61 14	34 10	0.003	143 18	32 6	23 7	<0.001
Crown	13 3	4 1	9 2	1 0.3	0.02	9 1	11 2	7 2	0.25

NEED FOR URGENT CARE AND REFERRAL

There were no reported life-threatening conditions in any of the children examined. However, pain was present in 6% while 2% had an infection (Table 13). There were no gender differences in the need for care due to pain.

Table 13: Need for Urgent Care and Referral.

		Percent
Need for care	Life-threatening conditions	0
	Pain	6
	Infection	2
	Other conditions	2
Referral	Yes	9

FLUOROSIS

Of the children in whom dental fluorosis was measured, nearly all were normal. As this required assessment of the upper anterior teeth, very few 6-8 year olds had enough fully erupted permanent teeth to allow recording of this variable. Fluorosis was more prevalent in Tobago than other regions, Table 14. It should be noted data were recorded in only 51% of the children.

Table 14: Dental fluorosis by age group and RHA.

		Normal	Questionable	V. Mild	Mild
		%	%	%	%
Age Group	6-8 years	88	13	-	-
	12 years	97	3	-	-
	15 years	97	3	-	-
Regional Health Authority	North West	96	4	0.4	-
	South West	98	2	-	-
	East	97	3	0.5	-
	Tobago	89	7	3	0.6

PERMANENT MOLARS AT RISK OF CARIES

Table 15 shows the distribution of permanent molars at risk by age group. 10% of 6-8 year olds, 47% of 12 year olds and 54% of children aged 15 years had permanent molars at risk. The mean numbers at risk were 0.18, 1.07 and 1.54 in the three age groups respectively.

Table 15: Distribution of permanent molars at risk by age group.

	Number at risk	Frequency	Percent
6-8 years (n=764, mean=0.18, SD=0.62)	0	687	89.9
	1	43	5.6
	2	17	2.2
	3	10	1.3
	4	7	0.9
12 years (n=488, mean=1.07, SD=1.48)	0	260	53.3
	1	85	17.4
	2	59	12.1
	3	42	8.6
	4	26	5.3
	5	9	1.8
	6	6	1.2
	8	1	.2
15 years (n=325, mean=1.54, SD=1.94))	0	151	46.0
	1	55	16.8
	2	40	12.2
	3	23	7.0
	4	19	5.8
	5	24	7.3
	6	10	3.0
	7	4	1.2
	8	2	.6

QUESTIONNAIRE

Participants in the oral health survey were asked to complete a questionnaire (**APPENDIX 4**) on oral health issues. These were completed before the actual examination process. The questionnaires for the 6-8 year-olds were completed by the child's parent, guardian or teacher whereas the 12 and 15 year-olds completed their own questionnaire. The results of a preliminary analysis of the questionnaire data for 12 and 15 year-olds is shown in Table 16.

Table 16: Summary of questionnaire results (12 and 15 year-olds).

QUESTIONS	TRINIDAD		TOBAGO	
	12 YRS	15 YRS	12 YRS	15 YRS
Excellent oral health	15.4 %	16.1 %	22.5 %	16 %
Good oral health	60.1 %	54 %	59.8 %	62.7 %
Never had toothache in 12 mths	58.4 %	59.8 %	56.9 %	57.3 %
Satisfied with appearance of teeth	51.2 %	52.1 %	53.9 %	38 %
Avoided smiling and laughing because of teeth	8.8 %	6.1 %	10.8 %	6.7 %
Missed classes because of toothache	6.3 %	9.2 %	6.9 %	14.7 %
Never visited dentist during past year	44.4 %	53.6 %	36.3 %	60 %
Visited Dentist for pain	13.4 %	11.5 %	4.9 %	19.4 %
Dental appointment made by parents	33.4 %	24.9 %	49 %	37.9 %
Taught how to care for teeth	15.8 %	9.2 %	18.6 %	18.7 %
Had cleanings done during the last dental visit	24.4 %	13.8 %	55.9 %	40 %
Brushed teeth more than twice daily	73.2 %	74.3 %	87.3 %	93.3 %
Used fluoride toothpaste	92.4 %	89.7 %	87.3 %	94.7 %
Did not know if toothpaste had fluoride	5.7 %	7.7 %	10.8 %	2.7 %
Rarely ate fresh fruit	40.5 %	43.7 %	42.2 %	48 %
Ate sweet cakes etc. many times a day	17.4 %	21.3 %	13.7 %	21.1 %
Used sugared drinks once daily	44.5 %	42.1 %	40.2 %	46.7 %
Consumed sweets/candies/chocolates daily	28.3 %	31.4 %	18.6 %	18.7 %
Drank tea with sugar daily	49 %	54 %	52.9 %	61.3 %

DISCUSSION

The sample size in the survey was calculated to ensure that the numbers were large enough to facilitate the description of the results by Regional Health Authority. In addition, the methodology was sound in that the children were selected using random sampling and the sampling frame included all government schools on the two islands. The measurements were done according to international protocols and the persons who collected the data were trained and calibrated before the survey began. The results of the reliability measurements conducted during data collection indicated that the quality of the data was excellent.

The findings from this survey reveal a remarkable improvement in the oral health of 12 year-old schoolchildren in Trinidad and Tobago over the last 15 years. The present DMFT of 0.6 has greatly exceeded the WHO goal of 3 by the year 2000. This is similar to the situation in several other Caribbean countries. The drop from a DMFT of 4.9 in 1989 to 0.6 in 2004 is particularly striking as no official public health intervention was made during this time.

We can therefore only speculate as to the cause of the improvement in Trinidad and Tobago. Methodological differences between the two surveys included sampling method and the use of sharp probes to examine teeth in the 1989 survey as compared to visual diagnosis in 2004 (the use of sharp probes can overestimate caries prevalence).

The introduction of fluoridated salt in Jamaica in the mid 1980's has been credited with the 80% reduction in DMFT in that island by the mid 1990's. Undoubtedly fluoridated salt has made its way to Trinidad as part of normal trade in the Caribbean and may have been purchased by consumers here both knowingly or unknowingly. However a recent investigation of fluoride content in 14 brands of salt available in Trinidad, undertaken by the department of Analytical Chemistry at UWI St Augustine,¹⁰ found only one brand with the recommended 250ppm required for caries prevention. The almost negligible levels of dental fluorosis found in this present survey lends support to the fact that there may be little fluoride intake in children via this systemic route. Furthermore an analysis of urinary fluoride levels in schoolchildren in St Joseph, Trinidad found that systemic fluoride levels in these children were well below the 1ppm necessary for caries prevention¹¹.

It is likely that a large part of the improvement has been due to an overall increasing awareness of dental health and health care by the public, which may have included use of fluoride toothpaste and dental visits by children. Oral health promotion to schoolchildren is one of the stipulated duties of Dental Nurses in Trinidad and Tobago and interestingly was regarded by them as one of the most

rewarding aspects of their job¹². It should be noted that the caries experience of 15 year-olds was not as good as the 12-year-olds and suggests some possible change in behaviour during the early teenage years.

Of major concern however, is the relatively high caries prevalence and severity of 6-8 year-olds. In this age group only 38% had no caries experience and the dmft score was 2.54. Decayed teeth in the primary dentition can have detrimental impacts on both young children and their families such as pain, abscess and need for emergency treatment.

A recent study conducted at the UWI School of Dentistry on paediatric dental emergencies found that most of the presenting children were in the mixed dentition and had pain due to decay and infection in the primary molars¹³. As the primary molars erupt between the period 1 to 2½ years of age they are very susceptible to the early childhood diet and oral care practices undertaken at home. Poor infant feeding and weaning practices have been associated with early childhood caries often due to the use of a sweetened comforter or baby bottle at night. Ongoing research at the UWI School of Dentistry suggests there may be low awareness among parents in Trinidad of the importance of the 'baby teeth' and appropriate preventive dental care for the young child¹⁴.

Addressing the high caries experience of primary school children in Trinidad and Tobago will require increased oral health promotion for parents and caregivers both at primary school age and at the preschool stage to enable them to implement effective preventive regimes for their children. Dental health education should include information on reducing the frequency of sugary foods and drinks in the diet, good oral hygiene, use of fluoride toothpaste and early attendance at the dentist or dental nurse for advice and care.

Treatment needs in secondary schoolchildren were generally low reflecting the generally low caries experience in these age groups. Conversely, the treatment needs for 6-8 year-olds was high with almost one half requiring fillings and almost a fifth needing extraction. Therefore improving access to dental care and encouraging uptake of dental services should form part of any health promotion strategy for primary school children.

The preliminary analysis of the questionnaire data from 12 and 15 year-olds has highlighted some interesting issues. Most of these children rated their oral health as good/excellent and reported brushing their teeth regularly. In Tobago cleanings and advice on brushing appear to be more commonly given during a dental visit than in Trinidad although more children in Trinidad reported visiting a dentist in the last year. A more detailed analysis of the questionnaire data is intended including any relationship to DMFT and treatment need data.

Limitations

The main limitation of the survey was the low return rate of signed consent forms by the children (46%). This low return rate may have been related to indifference or a lack of understanding of the importance of the study by some children and parents and teachers. These factors are not expected to be associated with the oral health of the children. The sample measured is therefore likely to be representative of schoolchildren of the same age.

GENERAL RECOMMENDATIONS

- Increase oral health promotion to children and parents at the preschool stage to reduce risk of caries by the primary school years.
- Improve the oral health of primary school children through the strengthening of school oral health promotion programmes.
- Improve access to dental care for primary schoolchildren.
- Examine the feasibility of introducing national salt fluoridation with respect to improving the oral health of primary schoolchildren
- Monitor the oral health of secondary schoolchildren to ensure good oral health is maintained.
- Conduct regional and national oral health surveys of schoolchildren at 5-10 year intervals to measure disease levels, trends in oral health and the effectiveness of interventions.

CONCLUSION

The 2004 national survey of the oral health of schoolchildren has shown a tremendous improvement with respect to the caries experience of 12 year-old children, compared to the last survey of 1989. The oral health of 15 year-old children was also found to be good. Caries experience in primary schoolchildren aged 6-8 years was found to be high in terms of prevalence and severity and untreated decay in this age group was common. Effective oral health promotion strategies need to be implemented to improve the oral health of primary schoolchildren. The oral health of secondary schoolchildren requires careful monitoring to maintain the reported improvements.

REPORT OF THE MEETING HELD TO DISCUSS THE RECOMMENDATIONS OF THE ORAL HEALTH SURVEY 28TH OCTOBER, 2005.

Present were representatives of:

Tobago Regional Health Authority

Mrs. Noreen Guy, Regional Dental Nurse

Dr. Leslyn Noray, Dentist I

Mrs. Julia Solomon-Wylie, Dental Assistant

North West Regional Health Authority

Mrs. Eileen Clarke

South West Regional Health Authority

Mr. Michael Harris, Chief Executive Officer

Dr. Albert Persaud, Executive Medical Director for Health

Dr. Videsh Rambissoon, Dentist I

Dr. Selwyn Mohan, CMOH, St. Patrick

Dr. Ajodha Rajnarinesingh, CMOH, Victoria

Eastern Regional Health Authority

Dr. Carl L. Ferdinand, CMOH, Nariva/Mayaro

Dr. Kevin Antoine, CMOH(Ag), St. Andrew/St. David

University of the West Indies

Dr. Rahul Naidu, Lecturer, School of Dentistry

Caribbean Health Research Council

Dr. Donald Simeon, Director

Caribbean Epidemiology Centre (CAREC)

Ms Marsha Ivey, Statistician

Ministry of Education

Mr. Samuel Gittens

Ministry of Health Head Office

Ms Nicole Cooper, Planning Analyst

Ms Yvonne Lewis, Manager, School Health Programme

Mr. Oscar Ocho, Deputy Director, Health Promotion

Dental Association of Trinidad & Tobago

Dr. Suren Maharaj, President

Dental Nurses Association

Mrs. Sonja Ruthman-Spann, President

Dental Assistants Association

Mrs. Lydia Watts-Sorzano

Dental Services, Ministry of Health

Dr. Ian Prevatt, Senior Dental Surgeon

Mrs. June Bascombe-Martin, Dental Nursing Instructor I

The Senior Dental Surgeon welcomed all present. He stated that in June 2005 the preliminary report on the oral health survey was presented. Compared to the

survey conducted in 1989, there had been a vast improvement in the oral health of the nation's children. It was believed that the increased awareness of oral health and health care by the public had played an important role. The use of fluoride toothpastes and the promotion of oral health by Dental Nurses had also played a part.

The purpose of the meeting today was to put our heads together to see how best we could build on the achievements since the last survey and use the baseline data to inform decision making and policy formulation. There was now an opportunity to put forward policies and plans based on needs assessed. In the past oral care plans started with the construction of well equipped clinics and the provision of restorative services. No attention had been paid to what was needed and how best those needs could be catered for. This survey had shown that greater benefits had been gained from health promotion and prevention than the intervention of clinicians.

Present today were representatives of the Ministry of Education, the Ag. Director of Health Promotion, the Director of Policy Planning and Research, the Manager of the School Health Programme, representatives of the RHA's, the Dental Professional Associations, UWI and the Caribbean Health Research Council and personnel from Dental Services. Unfortunately due to prior commitments no representative from PAHO had been able to attend.

Having these various disciplines together would give us the opportunity to put oral health in the context of general health. Oral health affected general health by causing considerable pain and suffering and by changing what people ate, their speech, their quality of life and well being. Oral diseases were chronic diseases, which had determinants in common with other chronic diseases. Risk factors in oral health were common to a number of chronic diseases, e.g., diet, hygiene, smoking, alcohol, risky behaviours etc. The aim should be to incorporate oral health into general health promotion.

The recommendations put forward would form the basis of our discussions. The comments of those present were being sought. It was hoped that the discussions would be kept on a practical level, ensuring that whatever was decided was feasible. The RHA's would be responsible for implementing our decisions so they could give an insight as to what was possible. Our discussions would be recorded and our decisions circulated. They would be included in the final report of the survey. Those present would receive a copy of that report.

The Senior Dental Surgeon (SDS) suggested that the meeting move straight into the discussion of the report. Copies of the executive summary of the report and the recommendations had been circulated. Copies of the Liverpool Declaration (APPENDIX F), outlining the WHO's ideas on strengthening the oral health procedures in countries to 2020, had also been circulated to give us an idea of what

we should aim to achieve. We needed to decide how much we could achieve and how we would achieve it. He welcomed the representative of the Ministry of Education, as the schools were the basic resource of Dental Services. He suggested that there was no need to go through the report, as most of those present had attended the preliminary presentation.

He said a few words of thanks to PAHO, which had been the driving force behind the survey. Without that help the survey would not have become a reality. He thanked Dr. Saskia Estupinan-Day, Regional Advisor of Oral Health in Washington and Dr. William Adu-Krow, Advisor for Family and Reproductive Health at CPC in Barbados. In July 2001, Dr. Adu-Krow had organized a workshop on oral health survey methodology in Grenada. Its purpose had been to train a cadre of regional professionals to conduct oral health surveys so that there would be no need to employ foreign consultants. Drs. Naidu and Simeon and the SDS were part of that programme. Apart from some help from Dr. Ann Goldman, a PAHO consultant, who assisted in writing the proposal, and Dr. Oswaldo Ruiz of PAHO, who conducted the calibration exercises, this survey was all our work. Dr. Naidu had written the report, Dr. Simeon did the statistical analysis with the assistance of Ms. Marsha Grey of CAREC. He also thanked Ms. Marilyn Entwistle, Advisor on Health Services Administration and Dr. Lillian Reneau-Vernon, Country Representative - PAHO office, POS, for their help. Unfortunately they had not been able to attend this meeting. PAHO has generously funded the data entry and scanning of the results and the presentation of the preliminary report.

A copy of the results by RHA had also been handed out so that each body would be able to see results pertinent to their areas.

Dr. Naidu welcomed everyone. He noted that the slide of the recommendations had been displayed and assumed that the majority of those present had attended the preliminary presentation. He hoped that everyone had had a chance to look at the results and the recommendations developed from them. He invited comments to get the discussion going based on issues arising out of the recommendations or data. If there were problems with the results they could be reviewed but the intention was to see how you the stakeholders present interpreted what had been produced. He invited comments upon which the discussions could be built.

Dr. Simeon expressed his pleasure at being at a forum where the application of research findings into policy was being made. Being a health researcher, he had rarely seen the transition from findings to implementation, practice and policy. He hoped that the issues that prevented this from happening would be addressed so that some of these recommendations would be implemented to improve the quality of services to the population. The SDS stated that policy had often been determined by factors other than evidence or research findings. There was now an opportunity to address that shortcoming. The findings would be shared so that by

implementing the recommendations an improvement in the quality of services to children and the nation as a whole would result.

Mr. Mike Harris, CEO, SWRHA expressed concern at the level of dental care to the population in the southwest region. While admitting that the RHA's and the Ministry had a role to play, he queried the thought processes that led to Recommendation #3 – improved access to dental care for primary school children. Dr. Simeon said that that was a very good question and he felt that at this juncture a summary of the findings should be given as the recommendations had come out of the findings. He briefly stated that the national survey had been conducted on three age groups of children, 6-8, 12 and 15 year olds to measure the status of caries experience and treatment needs. The survey was conducted so that the results would be relevant to each RHA. The sampling was done on the basis of RHA's. He asked Dr. Naidu to summarize the findings.

Dr. Naidu gave details of the methodology used for the survey and noted that PAHO guidelines had been used. The examiners were trained to look at dental disease. A good cross section of socio-demographic and socio-economic representation was obtained. He explained the meaning of DMFT, pointing out that the D=decayed, M=missing (assumed due to decay), F=filled teeth. The DMFT is a mean of the total number of decayed, missing and filled teeth of the children in school. He explained what high and low values meant. Previously a DMFT of three (3) was considered acceptable in the year 2000. Many Caribbean states had reported DMFT's of less than three (3). In the late 80's T&T's figure were 4.9. It was hoped that there would have been an improvement. In the 6-8 age groups, DMFT was found to be 2.4, 12 year olds <1; there was a slight increase in this result for fifteen-year-olds. The improvement in 12-year-olds was significant.

There was concern worldwide for primary school children. In this category findings showed 60% untreated decay, 4% filled and 16% missing which indicated that there might be problems with access to care. Access had many dimensions, including the awareness of services, availability of resources – not enough children in this age group were getting appropriate dental care. Prevention had not been effective and disease was not being well treated in this age group.

Eileen Clarke, NWRHA, commenting on health promotion stated that the NWRHA had conducted a mini health fair in Beetham Gardens. Eighty children, ages unknown were examined by dental nurses. Sixty-four had presented with caries. At another health fair, health promotion nurses reported that the majority of children examined had dental caries.

Ms. Noreen Guy, Senior Dental Nurse, Tobago stated that the parents or maybe someone else were responsible for the home oral health care of minors. Parents were responsible for the brushing of their children's teeth until they were 8 years old. Parents needed to be educated on oral health for children. The dental

nurse should be allowed to visit homes as the district health visitor did to talk to parents about the dental care of the child.

She said that more health promotion material was needed. Thanks to Colgate, we had obtained some material. The health education unit needed to produce material on dental health. Their film unit needed to produce more films on dental health. A few films such as Dr. Rabbit and others were available and repeatedly shown, but the children had tired of these.

With respect to chair side health education, there was perhaps too much emphasis on figures i.e. producing reports on the number of teeth cleaned or filled each month. There was a need to stand at the chair and talk with Mommy and instruct her how to brush and floss her child's teeth. There was no need to focus only on the numbers at the end of the month but to ensure that parents were spoken to.

Dr. Rajnarinesingh, CMOH, Victoria said that he wanted to add a little something on health education, re: brushing of teeth by Mummy. He said that there was the single parent issue where Mummy had to put food on the table. Sometimes she had to do two jobs and would leave for work very early in the morning. Mummy only had time to give the baby his/her feed so that left the grandparents/guardians to take care of the baby. They would have to ensure that the baby was fed but might not know how to administer proper oral health care. He said that there was a need to invite them to the health education programme. They might or might not come but the issue of getting Mummy to brush the baby's teeth before she went to work had to be dealt with.

Dr. Maharaj, President of the Dental Association, stated that the majority of patients were uninformed and did not follow instructions. Antenatal care as far as dentistry was concerned was lacking. He mentioned that in Trinidad, according to the survey, neither the water nor salt was fluoridated. He wondered where our youngsters would get their fluoride. He said vitamin tablets containing fluoride were very expensive and not readily available.

There was a need for public awareness. People needed to be made more aware of health education. More human resources were needed to provide for this, which was not just handling out pamphlets but using the media to do health promotion. A return to the 'old time days' when there was a radio programme called 'Dial a Dentist' was recommended. There was a need for more dentists. He quoted from a page in the report re, posts available and posts filled in Dental Services. He said that out of twenty-nine available positions only fifteen had been filled. The remuneration packages needed to be better to keep dentists in the service.

The SDS pointed out that from the findings of the survey, health promotions

had had a greater impact on the improvement of the oral health of the nation than any other factor. When talking of the quantity of antenatal, pre-school, and primary school care given, there was a need to look at the number of providers available. It was not up to the dental professionals alone. Parents and teachers were also providers but care had to be taken to ensure that they were properly trained. He asked Mr. Gittens to suggest what he thought the teachers could do to be part of the team.

Mr. Gittens of the Ministry of Education stated that the Ministry had set up a Student Support Services division about one year ago. Formerly, there was a Special Education Unit and a Guidance Unit, which had been amalgamated to form a school social work department to provide student support services. This was a relatively new development in the school system. He said that certain schools had been targeted in each education districts and there was a school-based team that could liaise with the administrators in these districts. If the health education personnel wanted to have the education department facilitate its work, this could be done through the diagnostic specialist of the Student Support Services Division at Head Office.

Mr. Gittens asked how teachers could be encouraged to be part of the dental health promotion team. He believed that if the promotion targeted children, parents and teachers, once sold on the idea of passing on information using the diagnostic specialist, this would not be a problem. He said that the teachers do not know as much as they need to know so they needed to be informed. This would not be universal but limited to primary schools and below. The Ministry of Education was willing to help in facilitating the Ministry of Health in assisting school children.

Dr Simeon mentioned a package put out by WHO called Health Promoting Schools where dental health promotional material was incorporated within the curricula of these schools. The idea being that subtle messages would be placed in several subjects, Mathematics and Social Sciences included. With the worldwide drive toward oral health it is important that with the partnership between the Ministries of Health, Education and the RHA's in place, mechanisms needed to promote this idea were found.

Dr. Naidu commented on expanding the role of the Dental Nurses in oral health promotion and the suggestion of visits to homes and communities similar to that of DHVs. In the U.K where there were great dental health needs in certain communities, funding had been made available for a specific post of oral health promoter, school, community or home based. Getting more dental professionals into the community in new roles or expanding their present roles had been shown to be very effective in communities similar to ours.

Mr. Harris commented on Dr. Simeon's notes on the health promoting

schools and said that subtle messages from teachers would not come, as they were uninformed. Perhaps they should be targeted at an early stage in training college. Every school term, each education district had a conference of principals. A request should be made for time at these conferences to submit proposals developed at this meeting. The Ministries of Health and Education were already partners in the school health programme and these overtures would certainly be welcome.

The SDS stated that the focus should be placed on the part oral health played on general health. Perhaps oral health should be a component of general health promotion.

Dr. Ferdinand, CMOH, Nariva/Mayaro, re-inforced Dr. Maharaj's point about part time dentists in dental services. The CMOH was responsible for dental services in the county. He believed that the dentists should be employed full time and noted that there was a lack of leadership from the dentists, who needed to plan and strategize with their staff. He also felt that the dental nurses should be made travelling officers. This would build the oral health promotion capacity. He felt that this should be discussed with the CPO as a matter of urgency.

Mr. Harris developed on Dr. Ferdinand's point stating that the dental nurse and dental surgery assistant had been de-linked from the Ministry of Health. Dentists should also be de-linked so that the RHA's could pay them appropriately in order to provide a proper service. This was imperative if progress was to be made.

Ms. Clarke agreed that the RHA should employ dentists, train dental nurses and provide a competitive package. They should have control of hiring of dentists and dental nurses.

The SDS said that in July 2000, soon after he became SDS, he had conducted a workshop on the decentralization of dental services. Out of that workshop a ministerial policy had been approved which stated that dental services would be decentralized to the RHAs. That was in July 2000. Recently the Permanent Secretary had stated that there was no structure within the RHAs to permit this transition. He mentioned that this was a problem in many vertical services. He hoped that discussions to achieve this would soon take place. As far as traveling for dental nurses was concerned he said that he agreed with Dr. Ferdinand. He had recommended that the dental nurses be made travelling officers and hoped that discussions currently in progress would bear fruit in the near future.

Mr. Ocho, Deputy Director of Health Promotion apologized for being late. He began by saying that dental health promotion was crucial and critical and it should be looked at from a strategic approach. It should not be looked at as just a curriculum.

If one depended solely on teachers one could end up with a situation similar

to that of health and family life education where the curriculum had become overloaded. All the education issues could impact negatively on the gains that had been achieved.

He suggested that as part of health promotion agenda, we should look at forming alliances with people who were selling in schools. Looking at what they were selling. We were talking about behaviour that was not fixed. There were many things that we knew to be wrong but these were so difficult to correct in practice.

We needed to build alliances. Instead of selling sweets to children, we needed to get more natural fruits as part of the culture. This needed to be reinforced by the teachers. If teachers practiced healthy eating habits this would impact on oral health, not just general health, and would be transferred to the students. We desired most things that tasted good but were not healthy for us.

In some pre-schools, teachers took the children to the bathroom to wash their hands before and after meals. Was it not possible to collaborate with a toothpaste company to supply the school with toothpaste, so that the teachers could brush their teeth after lunch and the students could follow their example.

People learned by modelling. We must create a modelling environment so that when the children saw the adults in the environment doing certain things, they would copy that type of behaviour. This would help.

The Manufacturers' Association must be sensitized about the products they manufactured. These must be produced in such a way so as to minimize the risk of dental caries.

Mr. Ocho said that his department would continue to support the production of material such as brochures and posters as part of the health promotion thrust. They could also develop short advertisements for various types of media. They would ensure that they gave that kind of support. He suggested that the Healthy Spaces Initiative started by PAHO should be continued.

Ms. Yvonne Lewis, Ministry of Health, reiterated what Mr. Ocho had said in some areas. She also stated that the health promotion approach must be used as follows:

1. **Make recommendations about policy.** Fluoridation of water – this should be looked at the level of policy; the first strategy was developing healthy public policy; nutrition at school being another policy issue. There was a need to see more of this at school where certain foods promoted oral health and prevented dental caries.
2. **Reorienting health services** – the dentist should not be part time, the

organization of the delivery of oral health should be looked at; whether the dentist should be part time or full time, the role of the dental health nurse; salaries etc. She said that functionally, dental nurses acted as district health visitors. The DHVs were travelling officers but the dental nurses did not have the training that would permit them to be certified as DHVs. We needed to look at the training component in health with the aim of building skills and competencies among dental nurses and to make futuristic recommendations on their behalf.

3. **Developing and increasing personal health skills** – using health education strategies i.e. health fairs etc.
4. **Empowering community health education strategies**– health care in Beetham. We needed to look at forming partnerships with community development and others who provided various health education programs, including parent education as it pertained to oral health and the well being of children..
5. **Creating supportive environments**– because dental nurses were not travelling officers, the ERHA had developed a rural dental outreach programme whereby vehicles under the control of the dental nurses, had been made available to the oral health programme. This created a supportive health environment. She said that these steps could be taken now while awaiting decisions on their travelling officers' status.
6. **Building of alliances with others**– there was a need to identify whom we could build alliances with.

There was a need to review the school health policy that would open avenues to look and see what needed to be implemented to ensure that steps were taken to promote the oral health and well being of children. Perhaps fluoridation could be looked at here. Other opportunities to look at strategies in terms of oral health promotion and education within the school setting needed investigation.

There were always problems with dental equipment in dental clinics and health centers. These needed to be addressed.

Dr. Naidu stated that putting everything in a context of the health promotion approach gave us a framework on which to build these strategies. He agreed that everything that Ms. Lewis had said sounded feasible. There were a lot of policy issues. That was the barrier that had to be crossed.

Dr. Rambissoon stated that education is an integral part of health promotion and we needed to look at our target groups. Too often parents had been left out.

Dr. Maharaj asked that with regard to health promotion in the Ministry/RHA, whether it would be possible to contract one of our local icons, for example, Brian Lara or Ato Bolden and invite them to be spokespersons? He said that some of these things sold. If one talked to any four-year-old, they could sing the songs of Bunjie Garlin because they identified with him. The bureaucracy and policy-making were all right but one had to look at simple means of reaching our population. He said that a spokesperson was important to these ventures. We needed to get individuals in our society that everyone could recognise and identify with, and use them.

Ms Lewis stated that we should encourage further research in the area of oral health at the level of the RHAs and not just at a national level, using dental nurses, dentists' etc. She remembered working with Ms. Ruthman-Spann and some other nurses at the Eastern Region who identified specifically that night brushing was the issue and that the children did not have a practice of brushing at night. This had encouraged the formation of dental caries. The nurses developed a health promotion proposal, looked at the issues, worked with parents, children, teachers etc, to promote night brushing. Further research at the level of the RHA should be looked at to encourage and build an alliance with the Health Research Council.

Dr Simeon stated that reasons for the high rate of caries had not been investigated. Mr. Harris noted that the sampling had been done at the level of RHAs that cover a wide geographical area, and queried to what extent was the sample appropriate to the various regions. Dr. Simeon responded that the sample consisted of a range of school types, both urban and rural, which covered the various demographics to represent the average RHA child.

The SDS stated that health promotion had been well covered and policy had also been discussed. Ms Lewis had reiterated the importance of putting in place policy guidelines. She said that an attempt had been made to draft an oral health policy without much success, as the necessary information was not available. On the question of salt fluoridation, he stated that this would require legal inputs and suggested that that topic be deferred at this time, as the legal process would take some time. The availability of fluoridated salt was questioned. Research at the University had suggested that fluoride was not available in salt as indicated by the label on the packaging.

Ms Noreen Guy suggested that weekly fluoride mouth rinses be done in schools. She said that maybe fluoride could be purchased and a programme of mouth rinses instituted. Salt fluoridation was a bit out of the way right now.

Dr. Naidu stated that this was a good suggestion. It had been tried in Bermuda in the past and had had some initial success. The problem had been co-ordination in schools. Rinsing with fluoride mouthwash required teachers to

interrupt their lessons, deal with cups and children spitting out fluoride. This had become very difficult to manage and that was really the barrier. It had been discontinued because it was very expensive and proved unsustainable. Fluoride rinses at school seemed not to be an effective public health measure.

Ms Guy said that there was a breakfast programme for children in Tobago. There was a need to look at providing toothbrushes and toothpaste at school. Dentists in Tobago also attended to teenagers. Children on reaching twelve continued to see the dentist until the age of eighteen.

Mrs. Watts-Sorzano the dental assistant, Mayaro, pointed out that with regard to fluoride, dental nurses went out to the schools and took the children to the health facility and performed whatever treatment they required. In the Nariva/Mayaro area the dental nurses went to all pre-schools to administer fluoride, on different days, to limit the amount of caries. When the children did come into the outreach programme they were less prone to or had limited caries. Topical fluoride was also administered to primary school children.

Dr. Naidu enquired about the type of fluoride treatment. He said topical fluoride treatment for pre-schoolers should be done in a surgery setting, with suction. This was not recommended for children under six because of the safety issues involved.

Dental Nurse, S. Ruthman-Spann said that the fluoride application was done with the aim of introducing the oral health promotion campaign. A dental corner had been set up at schools, with tooth brushing as part of the curriculum. Most of the schools had taken part. They had started allowing children to brush after lunch. Nurses also showed parents how to brush their teeth and used fluoride in small amounts to show parents what the nurses did and the effects that it had.

Mrs. Ruthman-Spann said that dentistry should be more social and that they would like all children in the Eastern Region to be dentally fit to enter primary school, similar to the need to be immunized in order to go to school. For far too many times children had to be taken away from school to get treatment at health centres. Teachers had to stop teaching to carry the children to the health centres. Nothing could be done in these cases, as no one could complete the consent forms. She said that dental nurses had one-on-one sessions with antenatal mothers, especially those on their first pregnancies. As of October 2005, postnatal mothers came in after six weeks to be shown how to clean their babies' mouths. A lot of parents used honey on pacifiers in the mouths of babies to keep them quiet. This was a tradition. Dental nurses would also be working with the District Health Visitors (DHVs) to synchronize information about breast-feeding because some of the information being given was incorrect.

Dr. Naidu said he was amazed at how much was being done in the Eastern

Region. He enquired about any barriers they were experiencing right now and if there was anything that would help them achieve their aims. Mrs. Spann said that they had plans to conduct a dental survey within the Eastern Region so that they could revise their oral health promotion programme. She said that they had learnt that they needed to work with what they had and that the past CEO, Mr. Mohammed had been very supportive of what they did. They hoped that the thrust would continue.

Dr. Simeon said that the data available for the ERHA could be analyzed further. It was suggested that the data collected in the oral health survey could be used. Mrs. Ruthman Spann said that they wanted to do their own survey because they needed to be trained.

She said that there was a need for the upgrading of dental nurses. None had been available for the past twenty-five years. Plans were afoot to start a course to train dental hygienists in September 2006. She felt that existing nurses should be upgraded so that they would all be at the same level.

Dr. Naidu said that if ERHA were to conduct a survey he hoped that they would examine pre-school children, an age group not included in the present survey.

The SDS said that the question of training had again come up and he felt that this was important, not only for dental nurses but also for dentists who tended to shy away from public health dentistry in favour of private practice. UWI needed to address these problems. Given the results of the survey and the particular needs identified, more emphasis needed to be placed on community dentistry. Dr. Naidu responded by saying that he was a lecturer in Community Dentistry attached to the Paedodontic Department at the dental school. His course element was largely theoretical within a curriculum geared toward patient care for adults. The Paedodontic course taught techniques in managing disease in children. Sadly, no hands-on curriculum, where students could go out to work in the community, was available. Many of the graduates wanted to be involved in community care – health promotion etc. If encouraged, however, where were the career pathways in the public service. This was a chicken and egg situation. Perhaps a service could be created which would absorb these graduates. Policy decisions were needed both at the Dental School and Dental Services. Community dentistry should be a hands-on programme. The SDS suggested that the RHAs should look at instituting such a community service particularly as the plan was to decentralize dental services. Tobago had led the way.

Dr. Rambissoon mentioned the length of time it took to employ dentists in the RHA's and the frustration that this had caused.

Dr. Maharaj mentioned continuing education and the need to make this

mandatory. All professionals should be up to date on the latest techniques. The Dental Council needed to look into the matter of enacting legislation to this end. Dr. Naidu stated that while the dental school had had a good response to a series of continuing education lectures in the past, they had not been able to sustain them.

Dr. Simeon said that with the arrival of the Caribbean Single Market Economy, the renewal of registration would depend on gaining continuing education credits.

The SDS, in wrapping up the session said that the feedback received had been good. A report of the meeting would be circulated. Copies of the Health Promoting Schools document would also be circulated. He thanked all present for the attendance and hoped that we would get something done, and that our efforts would make a difference.

ACTION POINTS

1. Make recommendations about policy

- Develop Oral Health policy.
- Fluoridation of salt and/or water.
- Feasibility of salt fluoridation.
- Develop healthy public policy.
- School nutrition policy.
- Dental Services to be included in National Health Insurance System.
- Review school health policy – D.E strategies in schools.

2. Reorienting health services

- Dental Nurses to function similar to District Health Visitors.
- Increased remuneration for dental service personnel.
- Alternate arrangements for transporting Dental Nurses.
- Maintenance of equipment in Dental Clinics.
- Upgrading skills of Dental Nurses.
- Travelling posts for Dental Nurses.
- Implementation of Community Dental Service.
- Oral health promoters.
- Organization of delivery of health care.
- All dentists to be full time – decentralize Dental Services.
- Hands-on Community Dentistry programme.
- Regular surveys to identify trends and effectiveness of programmes.
- Monitoring oral health of secondary school children.

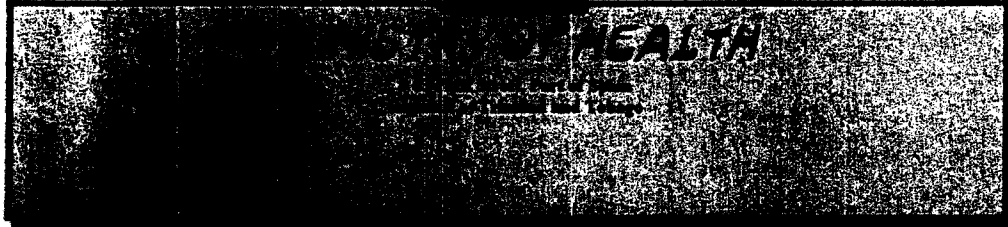
3. **Developing and increasing personal health skills**
 - Include guardians in Dental Health Education
 - Chair side education of parents and guardians
 - Develop and increase personal health skills – Health Education Strategies e.g. Health Fairs, etc.
 - Continuing education
 - Updated Promotional material needed – including film.
4. **Empowering communities**
 - Responsibility for tooth brushing of minors – Parent education
 - Need for greater manpower – providers to include parents/guardians and teachers
5. **Creating supportive environments**
 - Availability of fluoridated salt
 - Tooth brushing in schools, teachers to set example
 - Teacher training in DHE at training college
 - Health promoting schools
 - Dental fitness to enter primary schools
 - Tooth brushing after breakfast programme
6. **Building of alliances with others**
 - Local icons as spokespersons on dental health
 - Partnership with Community Development Division
 - Alliances with vendors in schools to introduce health foods
 - Increased public awareness through media messages
 - Research at level of Regional Health Authority

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LIST OF APPENDICES

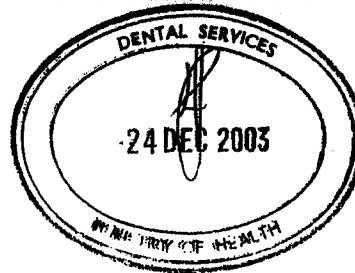
APPENDIX 1 (a):	Permission letter (Ministry of Health)
APPENDIX 1 (b):	Permission letter (Ministry of Education)
APPENDIX 2:	Parental consent form
APPENDIX 3:	Oral health assessment form
APPENDIX 4:	Questionnaire
APPENDIX 5:	Criteria for recording of dental conditions
APPENDIX 6:	Equipment and expenditure
APPENDIX A:	Response Rate
APPENDIX B:	Distribution of schools by RHA
APPENDIX C:	Reliability data
APPENDIX D (i):	dmft by school and RHA (primary schools)
APPENDIX D (ii):	DMFT by school and RHA (secondary schools)
APPENDIX E:	Treatment needs by schools

APPENDIX 1(a)**Permission Letter - Ministry of Health**

He: 10/7/108 Vol. II

December 16, 2003

Dr. Ian Prevatt
Senior Dental Surgeon
Dental Services
Queen Mary Avenue
Arima



Dear Sir

Re: Oral Health Survey

Approval has been granted for you to conduct an Oral Health Survey in selected primary and secondary schools in Trinidad and Tobago by the:

- i. Permanent Secretary
Ministry of Education
- ii. Administrator
Division of Education
Youth Affairs and Sports
Tobago House of Assembly
- iii. Secretary of Health and Social Services
Division of Health and Social Services
Tobago House of Assembly

Yours faithfully

Permanent Secretary

APPENDIX 1(b)

Permission Letter—Ministry of Education



MINISTRY OF EDUCATION
Director of School Supervision
18 Abercromby Street,
Port of Spain
624-6412

27th January, 2004

Dr. Ian Prevatt
Senior Dental Surgeon
Dental Services
Ministry of Health
Queen Mary Avenue
ARIMA

Dear Dr. Prevatt

Re: Request for permission to conduct the National Health Survey
in selected Primary and Secondary Schools in Trinidad.

I acknowledge receipt of your correspondence dated December 09, 2003.

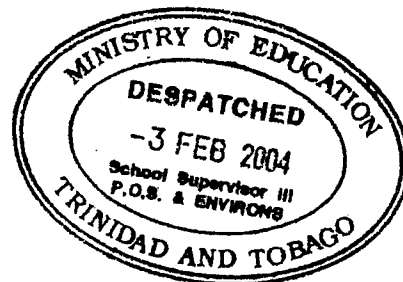
The Ministry of Education endorses this initiative and grants permission for the Oral Health Survey to be conducted during March 01, 2004 to March 26, 2004.

Principals of the selected Primary and Secondary Schools are asked to cooperate to ensure the success of this initiative.

Yours faithfully

Amie Doherty SS III

f) Joyce Barnett (Mrs)
Director of School Supervision (Ag)
/f/ Permanent Secretary
Ministry of Education



APPENDIX 2

Parental Consent Form

Trinidad and Tobago Oral Health Survey 2004

CONSENT FORM

The Ministry of Health is conducting an Oral Health Survey in Trinidad and Tobago and needs information on the oral health of children in order to plan dental care programmes. Accordingly, we are carrying out an examination survey and are asking that you or your child complete a questionnaire to assess the health of the children age 6, 12 and 15 years. If you agree to participate, one of our trained clinicians will examine your child's mouth. The information we obtain on your child will be kept confidential; the results will be analysed on a computer and published only as averages for each age group. We will send the information on what we find home with your child so that you may use it to decide if your child/ward should go to a dentist.

If you have any questions, please feel free to phone your child's or ward's school or the person who is coordinating the survey, Dr. Ian Prevatt - Senior Dental Surgeon at 667-5652.

Please complete below on behalf of your child and return this form to your child's teacher as soon as possible.

I _____ hereby give consent for the teeth of my child/ward _____ to be examined by the dentist/nurse.

I understand that I will be advised of the need for immediate dental treatment (fillings and/or extractions) if required.

Signature _____ Date _____

APPENDIX 3

Oral Health Assessment Form

NAME		HOME ADDRESS				DATE					
Country		Identification Number		Duplicate Exam.		Examiner		Sex		Date of birth Age	
<input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/>		<input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

DENTITION STATUS AND TREATMENT NEED

	55 54 53 52 51 61 62 63 64 65 18 17 16 15 14 13 12 11 21 22 23 24 25 26 27 28	Primary teeth	Permanent teeth	0 = Sound 1 = Decayed 2 = Filled, with decay 3 = Filled, no decay 4 = Missing, as a result of caries 5 = Missing, any other reason 6 = Fissure sealant 7 = Bridge abutment, special crown or veneer/implant 8 = Unerupted tooth, (crown)/unexposed root 9 = Trauma (fracture) Not recorded	0 = None P = Preventive, caries-arresting care F = Fissure sealant 1 = One surface filling 2 = Two or more surface fillings 3 = Crown for any reason 4 = Veneer or laminate 5 = Pulp care and restoration 6 = Extraction 7 = Need for other care (specify)..... 8 = Need for other care (specify)..... 9 = Not recorded
Treatment	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>				
	85 84 83 82 81 71 72 73 74 75 48 47 46 45 44 43 42 41 31 32 33 34 35 36 37 38				
Treatment	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>				

DENTAL FLUOROSIS

- 0 = Normal
 1 = Questionable
 2 = Very mild
 3 = Mild
 4 = Moderate
 5 = Severe
 8 = Excluded
 9 = Not recorded

NEED FOR IMMEDIATE CARE AND REFERRAL

Life-threatening condition

Oral infection

Other condition (specify).....

APPENDIX 4

Questionnaire for Schoolchildren

Trinidad and Tobago Oral Health Survey 2004
QUESTIONNAIRE FOR SCHOOLCHILDREN

NAME _____

AGE

SCHOOL _____

(Please tick the appropriate box)

1. How would you evaluate the health of your teeth and gums?

Excellent ☐ Good ☐ Poor ☐ Don't know ☐

2. How often during the last 12 months did you have a toothache?

Often ☐ Rarely ☐ Never ☐ Don't remember ☐

3. Are you satisfied with the appearance of your teeth?

They are OK ☐ Not really ☐ I don't care ☐ Don't know ☐

4. Do you avoid smiling and laughing because of your teeth?

Yes ☐ No ☐

5. Has toothache ever forced you to miss classes?

Yes ☐ No ☐

6. How often did you go to the dentist during the last year?

Once ☐ More than three times ☐Twice ☐ No visit to dentists ☐Three times ☐ Don't remember ☐

7. What was the reason of your last visit to the dentist?

Parents had made an appointment ☐ Follow-up treatment ☐Appointment initiated by the dentist ☐ Pain with teeth or gums ☐Made appointment myself ☐ Don't remember ☐

APPENDIX 4

Questionnaire (cont'd)

8. Please try to remember what the dentists did during your last visit

Provided Fillings	<input type="checkbox"/>	Cleaning	<input type="checkbox"/>
Examined my teeth	<input type="checkbox"/>	Did an X-ray	<input type="checkbox"/>
Told me how to take care of my teeth	<input type="checkbox"/>	Other treatment	<input type="checkbox"/>
Don't remember	<input type="checkbox"/>		

9. How often do you brush your teeth?

Never	<input type="checkbox"/>	Once a day	<input type="checkbox"/>
2-3 times a month	<input type="checkbox"/>	2 or more times a day	<input type="checkbox"/>
Once a week	<input type="checkbox"/>		

10. Do you use toothpaste containing fluoride?

Yes	<input type="checkbox"/>	Don't use toothpaste	<input type="checkbox"/>
No	<input type="checkbox"/>	Don't know	<input type="checkbox"/>

11. What do you use of the following to clean your teeth?

Toothbrush	<input type="checkbox"/>	Toothpicks	<input type="checkbox"/>
Floss	<input type="checkbox"/>	Other	<input type="checkbox"/>

12. How often do you eat or drink any of the following foods, even in small quantities?

	Many times a day	Daily	Rarely	Never
Fresh fruit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biscuits, cakes, sweet pies, buns, bread and jam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lemonade, Coca-Cola, other soft drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sweets, candies, chocolates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Milk and sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tea with sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX 5

Criteria for Recording of Dental Conditions

PAN AMERICAN HEALTH ORGANIZATION REGIONAL ORAL HEALTH PROGRAM PAHO/WHO

General Information

- Identification number: Recode the subject identification number
- Date: (dd/mm/yy)
- Name of the subject: Recode first the second name
- Subject address: Write the address and telephone number
- Country: 1 Trinidad 2 Tobago
- Area: 1 Urban, 2 Rural.
- Examiner: The examiner number
- Original/duplicate: 1 Original; 2 duplicate
- Sex: 1 male; 2 female
- Date of birth: (dd/mm/yy)

DENTITION STATUS AND TREATMENT NEED

The examination for dental caries should be conducted with a plane mouth mirror, CPI probe and artificial light (head lamp).

Examiners should adopt a systematic approach to the assessment of dentition status and treatment needs. The examination should proceed in an orderly manner from one tooth or tooth space to the adjacent tooth or tooth space.

A tooth should be considered present in the mouth when any part of it is visible. If a permanent and primary tooth occupy the same tooth space, the status of the permanent tooth only should be recorded.

The criteria for diagnosis and coding (primary tooth codes within parentheses) are:

- O (A) Sound crown.** A crown is recorded as sound if it shows no evidence of treated or untreated clinical caries. The stages of caries that precede cavitation, as well as other conditions similar to the early stages of caries, are excluded because they can not be reliably diagnosed. Thus, a crown with the following defects, in the absence of other positive criteria, should be coded as sound:
- White or chalky spots;
 - Discolored or rough spots that are not soft to touch with a metal CPI probe;
 - Stained pits or fissures in the enamel that do not have visual signs of undermined enamel, or softening of the floor or walls detectable with a CPI probe;
 - Dark, shiny, hard, pitted areas of enamel in a tooth showing signs of moderate to severe fluorosis
 - Lesions that, on the basis of their distribution or history, or visual/tactile examination, appear to be due to abrasion.
- 1(B) Decayed crown.** Caries is recorded as present when a lesion in a pit or fissure, or non a smooth tooth surface, has an unmistakable cavity, undetermined enamel, or a detectable softened floor or wall. A tooth with a temporary filling, or one which is sealed (code 6 (F) but also decayed, should also be included in this category. In cases where the crown has been destroyed by caries and only the root is left, the caries is judged to have originated on the crown and therefore scored as crown caries only. The CPI probe should be used to confirm visual evidence of caries on the occlusal, buccal and lingual surface. Where any doubt exists, caries should not be recorded as present.
- 2 (C) Filled crown with decay.** A crown is considered filled, with decay when it has one or more permanent restorations and one or more areas that are decayed. No distinction is made between primary and secondary caries (i.e. the same code applies whether or not the carious lesions are in physical association with the restoration(s)).
- 3 (D) Filled crown, with no decay.** A crown is considered filled, without decay, when one or more permanent restorations are present and there is no caries anywhere on the crown. A tooth that has been crowned for reasons other than decay, e.g. a bridge abutment, is coded 7 (G)).
- 4 (E) Missing tooth, as a result of caries.** The code is used for permanent or primary teeth that have been extracted because of caries and is recorded under coronal status for missing primary teeth, this score should be used only if the subject is at an age when normal exfoliation would be a sufficient explanation for absence.

In some age groups, it may be difficult to distinguish between unerupted teeth (code 8) and missing teeth (codes 4 and 5). Basic knowledge of tooth eruptions patterns, the appearance of the alveolar ridge in the area of the tooth space in question, and the caries status of other teeth in the mouth may provide helpful clues in making a differential diagnosis between unerupted and extracted teeth.

Code 4 should be used for teeth judge to be missing for any reason other than caries.

APPENDIX 5

Criteria for Recording of Dental Conditions (cont'd)

- 6 (F) Fissure sealant.** This code is used for teeth in which a fissure sealant has been placed on the occlusal surface. If a tooth with a sealant has decay, it should be coded as 1 or B.
- 7 (G) Bridge abutment, special crown or veneer.** This code is used under coronal status to indicate that a tooth forms part of a fixed bridge, i.e. as a bridge abutment. This code can also be used for crowns placed for reasons other than caries and for veneers or laminates covering the labial surface of a tooth on which there is no evidence of caries or a restoration.
Note: Missing teeth replaced by bridge pontics are coded 4 to 5 under coronal status.
- 8 (-) Unerupted crown.** This classification is restricted to permanent teeth and used only for a tooth space with an unerupted permanent tooth but without a primary tooth. Teeth scored as unerupted are excluded from all calculations concerning dental caries. This category does not include congenitally missing teeth, or teeth lost as a result of trauma, etc. For differential diagnosis between missing an unerupted teeth, see code 5.
- T (T) Trauma (fracture).** A crown is scored as fractured when some of its surface is missing as a result of trauma and there is no evidence of caries.
- 9 (-) Not recorded.** This code is used for any erupted permanent tooth that cannot be examined for any reason (e.g. because of the orthodontic bands severe hypoplasia, etc.)

Treatment needs of individual teeth

Countries vary greatly in the capacity of the dental profession to meet demands for oral health care and in professional attitudes and treatment techniques. There may therefore be wide variations in the findings of examiners from different areas, and even in the same area, on treatment needs.

Examiners are encouraged to use their own clinical judgment when making decisions on what type of treatment would be most appropriate, based on what would be the probable treatment for the average person in the community or country. This could be extended to scoring code "O" even though the dentition status has been a different score.

Data on treatment needs are of great value at local and national levels because they provide a basis for estimating personnel requirements and costs of an oral health program under prevailing or anticipated local conditions, provided that demand levels for those needs are taken into account.

The codes and criteria for treatment needs are:

O – None (no treatment). This code is recorded if a crown and a root are both sound, or if it is decided that a tooth should not receive any treatment.

P	-	Preventive, caries-arresting care (e.g. fluoride)
F	-	Fissure sealant

1 – One surface filling

2 – Two or more surface fillings.

3 – Crown for any reason

4 – Veneer or laminate (may be recommended for aesthetic purposes).

5 – Pulp care and restoration. This code is used to indicate that a tooth probably needs pulp care prior to restoration with a filling or crown because of deep and extensive caries, or because of tooth mutilation or trauma.

Note: a probe should never be inserted into the depth of a cavity to confirm the presence of a suspected pulp exposure.

6 – Extraction. A tooth is recorded as "indicated for extraction", depending on the treatment possibilities available, when:

- caries has so destroyed the tooth that it cannot be restored;
- periodontal disease has progressed so far that the tooth is loose, painful or functionless and, in the clinical judgment of the examiner, cannot be restored to a functional state;
- a tooth needs to be extracted to make a way for a prosthesis; or
- extraction is required for orthodontic or cosmetic reasons, or because of impaction.

7/8 – Need for other care. The examiner should specify the types of care for which codes 7 and 8 are used. The use of these two codes should be kept to a minimum.

9 – Not recorded

APPENDIX 6

Equipment & Expenditure

Expenditure for Oral Health Survey - March 2004

Items supplied by C-40 and Dental Nurses Training School

ITEMS - C-40/D.N.T.S.	COST PER ITEM \$	TOTAL \$
4 Boxes Crepe Sheeting	700.00 each	2800.00
6 Plastic Containers (small)	35.00 each	210.00
4 Large Containers	70.00 each	280.00
12 pks Garbage Bags	10.00 each	120.00
50 Boxes of Gloves	43.00	2150.00
25 Boxes Face Masks	100.00	2500.00
8 Rolls Autoclave Tape	4.50 each	36.00
3 Boxes Staples	3.60	10.80
3 Stapling Machines	24.00	72.00
24 Pencils	70¢ each	16.80
24 Pens	1.25 each	30.00
6 Erasers	2.30 each	13.80
50 File Jackets (large)	75¢ each	37.50
100 Envelopes (large)	1.00 each	100.00
SUB-TOTAL		8376.90
ITEMS - ADDITIONAL PURCHASES	COST PER ITEM \$	TOTAL \$
2,500 Disposable Mouth Mirrors	3.00 each	7500.00
3 Boxes Sterilization Puches	1.25 each	37500
3 Pen Torches w/Batteries	34.00 each	102.00
9 Hand Sanitizers	19.95 each	179.55
10 Clip Boards (long)	18.00 each	180.00
80 Rolls Paper Towels	12.50 each	1000.00
3 Large Water Coolers	65.00 each	195.00
50 pks Sanitary Cups	2.95 each	14750
SUB-TOTAL		9,679.05
ITEMS - INCIDENTAL EXPENSES		TOTAL \$
Postage to Tobago (Couriers TT Post)		26.00
Postage to Tobago (Couriers TT Post)		26.00
Transport of Material to Tobago		28750
Refreshment for Calibration Exercises (HiLo Foods)		155.36
Refreshment for Calibration Exercises (HiLo Foods)		4730
Transport of Material to Tobago		345.00
Pencils and Erasers (Benco Sales Agency)		10.45
Pencils and Sharpener (Ansteph Ent. Ltd.)		10.95
Phone Card for Coordinator South		87.00
Pencils (Complete Care Pharmacy Ltd.)		24.00
Liberty Card for Coordinator North		34.50
Pencil (Ansteph Ent. Ltd.)		5.00
Phone Card for Coordinator South (B&S Drugs)		87.25
Lunch/Snack for Calibration Exercises		8125.00
Juice and Water for Officers duuring Survey		4800.00
SUB-TOTAL		14,071.31
ANALYSIS OF DATA AND PREPARATION OF REPORT		27,500.00
OVERALL TOTAL		59,627.26

APPENDIX A

Response Rate including number of consent forms delivered and returned and number of students measured

	6-8 y		12 y		15 y	
	# consent forms returned/forms delivered	# students measured/# consent forms returned	# consent forms returned/forms delivered	# students measured/# consent forms returned	# consent forms returned/forms delivered	# students measured/# consent forms returned
North West RHA	201/288 (70%)	184/201 (96%)	172/435 (31%)	145/172 (84%)	125/260 (48%)	100/125 (81%)
East RHA	232/430 (54%)	221/232 (95%)	132/340 (39%)	119/132 (90%)	102/395 (26%)	89/102 (87%)
SouthWest	228/325 (70%)	220/228 (96%)	129/450 (29%)	117/129 (91%)	73/335 (22%)	64/73 (88%)
Tobago RHA	153/240 (64%)	153/153 (100%)	114/180 (63%)	107/114 (94%)	75/105 (71%)	74/75 (99%)
TOTAL	63%	97%	39%	89%	34%	87%

APPENDIX B

Distribution of Schools by RHA

NORTH WEST

Primary

Diego Martin Boys RC	30
Diego Martin Girls RC	41
Maraval RC	45
Cunupia Government Primary	12
Arima Boys Government Primary	65

Secondary

ASJA Boys College	38
Barataria Senior Comprehensive	98
Diego Martin Junior Secondary	11
St. Joseph Convent	99

Total

439

SOUTH WEST

Primary

San Fernando Boys RC	79
Siparia Union Presbyterian	89
Robert Village Hindu Primary	52

Secondary

San Fernando East Junior Secondary	46
Princess Town Junior Secondary	49
Couva Junior Secondary	23
Union Claxton Bay Senior Comprehensive	28
Caraipichaima Junior Secondary	14
Vessigny Government	21

Total

401

EAST

Primary

Rio Claro Hindu School	53
Sangre Grande Government Primary	38
North Oropouche RC	21
Mayaro Government Primary	59
Sangre Grande SDA	49

Secondary

Toco Composite	56
Bates Memorial	28
Valencia High	21
Mayaro Composite	30
North Eastern College	73

Total

428

TOBAGO

Primary

Signal Hill Government Primary	23
Belle Garden Anglican	49
St. Andrew's Anglican Primary	36
Mason Hall Government Primary	27
Pembroke Anglican Primary	18

Secondary

Scarborough Secondary	60
Mason Hall Government Secondary	21
Bishops High School	36
Signal Hill Senior Comprehensive	64

Total

334

APPENDIX C

Intra-and Inter-Observer Reliabilities as measured using Kappa

Tooth Number	Inter-observer (n=141)	Intra-observer (n=53)	Tooth Number	Inter-observer (n=141)	Intra-observer (n=53)
17	0.98	0.96	47	0.97	0.96
16	1.0	0.95	46	0.98	1.0
15/55	0.99	0.96	45/85	0.98	1.0
14/54	1.0	1.0	44/84	0.98	1.0
13/53	0.99	1.0	43/83	0.99	1.0
12/52	0.98	1.0	42/82	0.99	1.0
11/51	0.99	1.0	41/81	1.0	1.0
21/61	0.99	0.99	31/71	1.0	0.98
22/62	0.99	1.0	32/72	1.0	1.0
23/63	1.0	1.0	33/73	0.99	1.0
24/64	1.0	1.0	34/74	1.0	1.0
25/65	1.0	1.0	35/75	0.99	1.0
26	0.98	1.0	36	0.96	0.93
27	0.97	0.96	37	0.98	0.98

APPENDIX D (i)

Mean Dmft by school and RHA – Primary Schools

School and Regional Health Authority	6-8 years		
	n	Mean	SD
North West RHA			
Arima Boys' Government Primary	65	1.89	2.751
Diego Martin Boys' RC	30	2.63	3.605
Diego Martin Girls' RC	41	2.44	2.748
Maraval RC	45	2.09	3.288
Cunupia Government Primary	12	4.17	4.84
South West RHA			
San Fernando Boys' RC	78	1.62	2.451
Siparia Union Presbyterian	89	2.84	3.398
Robert Village Hindu Primary	51	3.29	3.591
East RHA			
Rio Claro Hindu School	53	2.87	3.082
Sangre Grande Government Primary	38	1.89	2.115
North Oropouche RC	21	2.81	2.977
Mayaro Government Primary	59	3.20	2.89
Sangre Grande SDA	49	2.42	2.73
Tobago RHA			
Mason Hall Government Primary	27	3.22	3.816
Signal Hill Government Primary	22	1.68	2.918
Belle Garden Anglican Primary	49	2.57	3.109
St. Andrew's Anglican Primary	36	2.42	3.083
Pembroke Anglican Primary	8	3.83	4.260
Total	783	2.54	3.125

APPENDIX D (ii)**Mean DMFT by school and RHA – Secondary Schools**

School and Regional Health Authority	12 years			15 years		
	n	Mean	SD	n	Mean	SD
North West						
ASJA Boys' College	29	0.48	0.738	9	0.56	1.130
Barataria Senior Comprehensive	40	0.32	0.764	58	0.90	1.935
Diego Martin Junior Secondary	11	0.45	0.820	—	—	—
St. Joseph Convent	65	0.55	0.969	34	0.94	1.455
South West						
Carapichaima Junior Secondary	6	0.83	0.983	8	2.00	2.673
Couva Junior Secondary	23	0.35	0.647	—	—	—
San Fernando East Junior Secondary	31	0.94	1.459	15	1.87	1.959
Princes Town Junior Secondary	32	1.13	1.314	17	1.12	2.205
Union Claxton Bay Senior Comprehensive	4	0.75	1.500	24	1.17	2.057
Vessigny Government	21	0.57	0.926	—	—	—
East RHA						
Valencia High	13	0.77	1.235	8	0.63	0.916
Mayaro Composite	7	1.00	2.236	23	0.48	0.790
North Eastern College	56	0.55	1.174	17	0.65	0.786
Tooco Composite	17	0.18	0.529	39	1.05	1.468
Bates Memorial	26	0.46	0.989	2	0.50	0.707
Tobago RHA						
Scarborough Secondary	30	0.87	1.676	30	1.30	1.985
Mason Hall Government Secondary	16	0.87	1.147	5	1.00	1.225
Bishop's High School	24	0.38	0.875	12	0.75	1.422
Signal Hill Senior Comprehensive	37	0.70	1.525	27	1.67	2.542
Total	488	.61	1.150	328	1.06	1.785

APPENDIX E (i)

Distribution of Treatment Needs by School

School	Treatment Needs											
	Extraction		Two or More Surface Fillings		Preventative Treatment		No Treatment Needed					
	n	%	n	%	n	%	n	%	n	%	n	%
Sangre Grande Gov't Primary	6	15	17	44	3	8	15	39				
North Oropouche RC	4	19	13	62	4	19	5	24				
San Fernando East Junior Secondary	8	17	4	9	-	-	13	28				
ASJA Boys' College	1	3	7	18	2	5	10	26				
Princes Town Junior Secondary	7	14	8	16	-	-	20	41				
Union Claxton Bay Senior Comprehensive	3	11	3	11	-	-	10	36				
San Fernando Boys RC	7	9	25	32	22	28	34	43				
Diego Martin Boys' RC	4	13	13	43	-	-	11	37				
Rio Claro Hindu School	11	21	23	43	16	30	16	30				
Siparia Union Presbyterian	19	21	47	53	31	35	24	27				
Scarborough Secondary	5	8	14	23	11	18	19	32				
Mason Hall Gov't Secondary	1	5	4	19	12	57	1	5				
Bishops High School Tobago	-	-	3	8	11	31	4	11				
Signal Hill Senior Comprehensive	4	6	10	16	9	14	5	8				
Signal Hill Gov't Primary	2	9	8	35	10	44	7	30				
Belle Garden Anglican	10	20	22	45	22	45	7	14				
St. Andrew's Anglican Primary	5	14	12	33	16	44	4	11				
Mason Hall Gov't Primary	4	16	12	44	22	82	3	11				

APPENDIX E (ii)

Distribution of Treatment Needs by School

School	Treatment Needs													
	Extraction		Crown		Two or More Surface Fillings		One Surface Fillings		Preventative Treatment		Fissure Sealant		No Treatment Needed	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Pembroke Anglican Primary	3	17	-	-	12	67	8	44	13	72	9	51	2	11
Barataria Senior Comprehensive	6	6	2	2	7	7	15	15	-	-	39	40	47	48
Couva Junior Secondary	2	9	-	-	-	-	6	26	1	4	13	57	7	30
Maraval RC	13	28	3	7	11	24	6	13	-	-	21	46	15	33
Robert Village Hindu Primary	16	31	-	-	24	46	17	33	21	40	15	29	11	21
Toco Composite	8	14	3	5	5	9	16	29	-	-	32	57	15	27
Bates Memorial	1	4	-	-	4	14	3	11	-	-	9	32	15	24
Caraipichaima Junior Secondary	3	21	-	-	3	21	7	50	-	-	8	57	3	21
Diego Martin Girls' RC	7	17	3	7	25	61	11	27	-	-	6	15	14	34
Vessigny Government	-	-	1	5	3	14	4	19	-	-	6	29	12	57
Diego Martin Junior Secondary	-	-	1	9	-	-	1	9	-	-	-	-	9	82
Valencia High	-	-	-	-	1	5	5	24	-	-	8	38	11	52
Arima Boys' Gov't Primary	5	8	1	2	28	43	20	31	1	2	13	20	27	42
Mayaro Composite	-	-	1	3	6	20	3	10	1	3	12	40	13	43
Cunupia Gov't Primary	2	17	-	-	7	58	5	42	5	42	9	75	3	25
St. Joseph Convent	-	-	1	1	6	6	14	14	8	8	27	27	56	57
Mayaro Gov't Primary	14	24	-	-	37	63	19	32	8	14	19	32	11	19
Sangre Grande SDA	10	21	1	2	26	54	16	33	1	2	7	15	15	31
North Eastern College	6	8	4	6	9	12	10	14	2	3	12	16	44	60
Total	197	12	27	2	462	29	404	25	252	16	615	38	538	34

APPENDIX F

The Liverpool Declaration

Promoting Oral Health in the 21st Century

A CALL FOR ACTION

The 8th World Congress on Preventive Dentistry (WCPD) took place from 7-10 September 2005 in Liverpool, United Kingdom. The WCPD was organized jointly by the International Association for Dental Research (IADR)/ the World Health Organization (WHO)/ the European Association of Dental Public Health (EADPH) and the British Association for the Study of Community Dentistry (BASCD). Participants from 43 countries addressed the prevention of oral diseases which are significant burdens on children and adults worldwide. The good news is that oral diseases are preventable and considerable improvements can be made if appropriate public health programmes are established.

The participants emphasized that oral health is an integral part of general health and well-being and a basic human right. Participants took note of the World Health Organization's Bangkok Charter for Health Promotion in a Globalized World¹ (Bangkok, Thailand, 2005) and affirmed their commitment to support the work carried out by national and international health authorities, research institutions/non-governmental organizations and civil society for the promotion of health and prevention of oral diseases.

In this Call for Action, the following areas of work for oral health should be strengthened in countries by the year 2020:

1. Countries should ensure that the population has access to clean water, proper sanitation facilities, a healthy diet and good nutrition.
2. Countries should ensure appropriate and affordable fluoride programmes for the prevention of tooth decay.
3. Countries should provide evidence-based programmes for the promotion of healthy lifestyles and the reduction of modifiable risk factors common to oral and general chronic diseases.
4. The school should be used as a platform for promotion of health, quality of life and disease prevention in children and young people/ involving families and communities.
5. Countries should ensure access to primary oral health care with emphasis on prevention and health promotion.
6. Countries should strengthen promotion of oral health for the growing numbers of older people/ aiming at improving their quality of life.
7. Countries should formulate policies for oral health as an integral part of national health programmes.
8. Countries should support public health research and specifically consider the recommendations of WHO which recommends 10% of a total health promotion programme budget be devoted to programme evaluation.
9. Countries should establish health information systems that evaluate oral health and programme implementation/ support the development of the evidence base in health promotion and disease prevention through research and support the international dissemination of research findings.

The participants and Associations support the efforts of the WHO Oral Health Programme which aims at coordinating and supporting inter-country sharing of experiences in health promotion and oral disease prevention.

