



Pan American Health Organization
Division of Health Systems and Services Development
Regional Program of Oral Health
and the
Ministry of Health, Drug Abuse Prevention and
Rehabilitation of Cayman Islands B.W.I



Cayman Islands Oral Health Survey

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ORAL HEALTH SURVEY OF CHILDREN AND ADULTS IN CAYMAN ISLANDS - BWI, 1995

BACKGROUND

The Cayman Islands are an archipelago of three islands, Grand Cayman, Little Cayman and Cayman Brac, located approximately 200 miles N.W. of Jamaica in the Caribbean.

The total territory extends approximately 90 square miles. The population of Cayman was estimated at 31,567 in 1994 and it is expected to increase to 34,052 by 1996 and to 39,021 by the year 2,000. Approximately 31% are under age 19, 63% adults under 65, and 6% are 65 and older. About 52% of the total population live in George Town, 21% in West Bay, 15% in Bodden Town and the rest distributed between Sister Islands, East End and North Side.

The school enrollment in 1993 was 2,622 in Primary, 791 in Middle and 1,019 in High School for a total of 4,479 children. It is estimated that about 6000 children are presently in school this year.

DENTAL HEALTH SERVICES IN THE CAYMAN ISLANDS

Dental health services are provided by at George Town Hospital, Faith Hospital - Cayman Brac, Prison and two High Schools. A mobile dental van is used to service all the primary schools.

The dental Clinic at George Town Hospital is a modern facility opened in June, 1991. This facility has six treatment rooms (one each for a Dental Officer, two Dental Auxiliaries, and one Dental Hygienist). Other facilities are located at West Bay and Cayman Brac.

Dental services are mainly provided for clients entitled to free medical care, eg. Civil Servants and their dependents, indigents, seamen, and school children until 16 years of age. Additionally, because the fees are artificially low compared to the private sector, it attracts a significant number of paying patients.

The school children are treated almost exclusively by four New Zealand style dental Auxiliaries working independently. The rest of the patient load is carried by two full time dental officers and a Senior Dental Officer who is 30% clinical and 70% administrative¹.

ORAL HEALTH STATUS

Data from 1989–1990 reported to WHO Global Oral Data Bank indicated a mean DMF–T of 4.6 for 12 year–olds, which falls into the severe category.

Oral Health has been included as one of the priorities for the Ministry of Health program for the population of Cayman Islands. Strategies could not be properly designed without updated information on the oral health status and treatment needs, therefore development of an oral health survey was an indispensable requirement.

A comprehensive clinical assessment including intraoral and extraoral examination using the latest World Health Organization (WHO) Oral Health Survey methodology (4th edition draft), was recommended. However, due to non availability of funds and sufficient number of dentists to conduct examinations, a simplified survey following WHO guidelines (3d. edition) was selected.

STATEMENT OF OBJECTIVE

The main objective of this survey was to collect basic information about oral disease status and treatment needs of the population of Cayman Islands.

ORGANIZATION OF THE ORAL HEALTH SURVEY

Information on the survey design and population groups included in the previous survey conducted in Cayman Islands was not readily available, therefore, the survey design for the 1995 study, basically followed recommendations from the World Health Organization (WHO) for Oral Health Surveys². The simplified form was modified to include information on treatment urgency, nationality, residence duration in Cayman Islands, denture wearing and need for dentures. Ethnic groups were not considered a variable to be included in the survey. Information on fluorosis was obtained for all six upper anterior teeth as recommended by the Pan American Health Organization (PAHO)³. Periodontal assessment was conducted in adult subjects and the Community Periodontal Index (CPI) recorded following WHO guidelines. In children, healthy sextants as well as bleeding on probing or presence of supra or subgingival calculus were recorded. No attempt was made to record shallow or deep pockets in children.

Age Groups

Following WHO guidelines, the following age groups were included in the survey: 5, 6-7, 12, 15-16, 35-44 and 65 and over.

Number of Subjects

Precise information on the population of children and adults from each age group selected to participate in the survey was not available. WHO "Pathfinder" guidelines and the estimated severity of disease prevalence were taken into consideration for estimating population sample stratifying clusters by age-groups.

The present situation of dental disease in Cayman Islands was uncertain, but it was estimated that the level of disease may have improved over the last five years and that the category could be considered to be moderate. With this assumption, a minimum of 35 subjects per cluster was estimated that would need to be examined.

Examination sites.

The survey included residents from George Town, West Bay, Bodden Town and Cayman Brac. Residents from the communities of East End and North Side were also allowed to participate, although these communities were not designed as specific examination sites; this decision was made considering that disease were expected to be similar. Further, there is only one primary school in each community and the number of children within the age groups selected was not sufficient to meet the proposed cluster sampling requirements.

Distribution of population sample.

Considering that approximately half of the population of the Cayman Islands lives in George Town, two clusters of each age group were estimated that would need to be examined here. One from children attending private schools and one from public schools. This distinction was made to assure participation of various levels of socio-economic status. One cluster of each group was examined in the other communities selected for the survey. The adult population was drawn from individuals without discrimination of their income.

The sample groups for each index-age were estimated and divided as follows:

TABLE I

Cayman Islands Oral Health Survey, 1995

ESTIMATED SAMPLE PER LOCATION

Region	Age 5	Age 6-7	Age 12	Age 15-16	Age 35-44	Age 65 and over	Totals by Region
George Town*	35	35	35	35	35	35	210
George Town**	35	35	35	35	35	35	210
West Bay†	35	35	35	35	35	35	210
Bodden Town‡	35	35	35	35	35	35	210
Cayman Brac=	35	35	35	35	35	35	210

* Children from public schools

** Children from private schools

† Children from primary schools, George Hicks and John Gray

‡ Children from primary schools, George Hicks and John Gray

= Children from public schools

Total number of children 700

Total number of adults 350

Total estimated population sample = 1,050 subjects

This sample would correspond to about 11.6% of all children in school age, and about 7% of adults between the ages of 35-44 and 65 years and older.

Reliability and validity of data.

The Pan American Health Organization sponsored a training exercise during October 23-25, 1995 in Grand Cayman, to calibrate examiners and recorders in charge of conducting the survey.

The Pan American Health Organization Representative from Jamaica made arrangements for a team of dental professionals from Jamaica to participate in the calibration exercise. This team included, Dr. Bernard Sutherland, Chief Dental Health from Jamaica as team leader, one dentist, four dental nurses and four dental assistants.

In addition, dental professionals from Cayman Islands, two dentists, four dental nurses and three dental assistants also participated in the calibration exercise.

The theoretical aspects of the calibration were conducted at the Hospital and the practical exercises at the George Town dental clinic facility

The initial session included a review of the record form and codes, diagnostic criteria use of clinical instruments and other pertinent information for implementing the survey. Final results of the calibration exercise are summarized in Tables II-VI

TABLE II
Cayman Islands Oral Health Survey 1995
Calibration of Examiners
Examiner 1 was the "Standard"

Tooth Status

EXAMINER	PERCENT AGREEMENT	INTER-OBSERVER AGREEMENT (Kappa)
2	87.5	0.82
3	95.8	0.93
4	93.8	0.91
5	93.7	0.90
6	90.6	0.86
7	93.7	0.90
8	84.4	0.75
9	100.0	1.00

TABLE III
Cayman Islands Oral Health Survey, 1995
Calibration of Examiners

Recommended Dental Treatment

EXAMINER	PERCENT AGREEMENT	INTER-OBSERVER AGREEMENT (Kappa)
2	96.9	0.87
3	95.8	0.88
4	90.6	0.74
5	92.7	0.80
6	81.2	0.59
7	87.5	0.64
8	84.4	0.70
9	84.37	0.56

TABLE IV
Cayman Islands Oral Health Survey, 1995
Calibration of Examiners

CPI ASSESSMENT

EXAMINER	PERCENT AGREEMENT	INTER-OBSERVER AGREEMENT (Kappa)
2	83.3	*
3	72.2	*
4	60.0	*
5	38.9	*
6	83.3	*
7	75.0	*
8	66.7	*
9	83.3	*

TABLE V
Cayman Islands Oral Health Survey, 1995
Calibration of Examiners

FLUOROSIS

EXAMINER	PERCENT AGREEMENT	INTER-OBSERVER AGREEMENT (Kappa)
2	100.0	*
3	100.0	*
4	76.6	*
5	66.6	*
6	100.0	*
7	50.0	*
8	100.0	*
9	100.0	*

TABLE VI
Cayman Islands Oral Health Survey, 1995
Calibration of Examiners

Treatment Urgency

EXAMINER	PERCENT AGREEMENT	INTER-OBSERVER AGREEMENT (Kappa)
2	100.0	*
3	66.6	*
4	80.0	*
5	33.0	*
6	100.0	*
7	100.0	*
8	00	*
9	00	*

* As indicated during the calibration exercise, the ideal situation for the calibration exercise is obtained when the "standard examiner" examines all subjects and all examiners examine the same individual. The inter-observer agreement computed is more meaningful when a large number of observations are made. The program is very sensitive in areas of small sample size and agreement on only one category, therefore, no fractional scores (Kappa) were calculated for CPI, Fluorosis and treatment urgency.

A desirable examiner agreement should be between 85-90% with sufficient number of observations. From the above results it could be deducted that closer agreement exists on dentition status and treatment needs, however, fair to poor agreement was observed in CPI, fluorosis and treatment urgency. Nevertheless, results should be evaluated carefully, since some examiners were only able to examine one subject having limited chances for agreement. In the case of fluorosis for instance, one different score from the "standard examiner" would drop the percent agreement to 83%.

In spite of the variables obtained in this analysis, the survey leader felt confident that after a revision of the criteria, examiners and recorders would be able to conduct the survey with necessary accuracy.

Emphasis was made on the need to conduct duplicate examinations on at least 5 - 10% of the sample population so that intra-examiner reliability could be assessed. The schedule for the calibration exercise is appended.

IMPLEMENTATION OF THE SURVEY⁴

Personnel

Sixteen (16) persons were involved in the actual survey implementation. Five teams of three persons each were formed, plus a coordinator. One team covered West Bay area and three George Town and Bodden Town. The fifth team was sent to Cayman Brac.

The original plan involved examination of 1,050 individuals over the entire area (see Table I). Due to unavoidable circumstances, the quota was not fully met in certain areas.

In Cayman Brac there were only 20 - 12 year old children and 27 of the 15-16 year-old. In West Bay area not enough 35-44 year-old subjects were available, and only 22 individuals of the 65 years and over. The teams worked well together and worked surprisingly hard. Many were intent on finding enough subjects and were using telephone, personal visits and institutional links in order to come up with the 1,034 subjects enrolled in the survey. It is acknowledged that the total number enrolled was not a pure random sample, but is definitely a representative sample of a country that has 32,000 persons.

TABLE VII
Cayman Islands Oral Health Survey, 1995
Actual Sample Population by Age and Location

Region	Age 4&5	Age 6-7	Age 12	Age 15- 16	Age 35- 44	Age 65 & Over	Totals by Region
George Town [*]	44	45	42	36	79	49	295
George Town ^{**}	35	34	26	40	0	0	135
West Bay	43	37	34	39	35	28	216
Bodden Town	46	42	32	26	29	17	202
Cayman Brac	25	34	20	27	37	35	178
N.Side E. End	0	1	0	0	1	0	2
Total	193	193	154	178	181	129	1028 ⁺

^{*} Georgetown Public schools

^{**} Georgetown private schools

⁺ 4 missing observations

TABLE VIII
Cayman Islands Oral Health Survey, 1995
Sample Population Distribution by Sex and Location

LOCATIO N	AGE 4 & 5		AGE 6-7		AGE 12		AGE 15 & 16		AGE 33- 44		AGE 65 & OVER	
	M	F	M	F	M	F	M	F	M	F	M	F
GEORGE TOWN*	17	27	29	16	17	25	14	22	20	59	22	27
GEORGE TOWN**	18	17	18	16	11	15	17	23	0	0	0	0
WEST BAY	19	24	16	21	17	17	20	19	14	21	15	13
BODDEN TOWN	24	22	24	18	22	10	18	18	10	19	14	3
CAYMAN BRAC	13	12	15	19	6	14	12	15	9	28	18	17
N.SIDE E.SIDE	0	0	1	0	0	0	0	0	1	0	0	0
TOTAL	91	102	103	90	73	81	81	97	54	127	69	60

* George Town public schools

** George Town private schools

DATA COLLECTION

The criteria for data collection recommended by the World Health Organization (WHO) were followed. Data were recorded using the WHO simplified form² with the modifications noted on the section of survey design described earlier. Ethnicity was not considered a variable in Cayman Islands; therefore, entry of this information was omitted. Instead, Cayman nationality and residence duration of the participating subjects were recorded.

Treatment urgency was recorded according to the following criteria⁵:

0 = No dental treatment

1 = Routine dental care needed, oral hygiene needs emphasized

2 = Frank carious lesions, but no pain or infection are present, subject needs to be seen promptly by a dentist.

3 = Pain or infection. Subject needs to be seen immediately by dentist.

Fluorosis was recorded following Dean's criteria. The condition of the facial surfaces of all six upper anterior teeth was recorded. PAHO made this modification to the standard WHO criteria based on the fact that fluorosis is not considered a dental disease, but rather a possible cosmetic problem. The facial surfaces of the upper maxillary teeth are most important in social interactions⁶.

Data was analyzed using SPSS program.

RESULTS

Disease Prevalence

Results for caries prevalence, contribution of each component to DMF-T, proportions of persons with untreated decay, caries free and caries experience are summarized in Tables IX, X, XI and XII.

TABLE IX
Cayman Islands Oral Health Survey, 1995
Age-Specific Means and Standard Deviations for Selected
Indices of Dental Caries Prevalence in Both Dentitions

AGE	N	df-t MEAN	SD	DF-T MEAN	SD	DMF-T MEAN	SD
4 & 5	193	1.96	2.94	NA	NA	NA	NA
6 & 7	193	1.86	2.49	NA	NA	NA	NA
12	154	NA	NA	1.67	2.24	1.70	2.29
15&16	178	NA	NA	3.29	3.33	3.56	3.66
34-44	181	NA	NA	8.14	5.19	12.98	5.71
65 & OVER	91	NA	NA	5.44	5.14	17.25	7.35

TABLE X

Cayman Islands Oral Health Survey, 1995
Age-Specific Relative Contribution of Each DMF-T Element
Among those with DMF-T>0 (Permanent Dentition)

AGE	N (DMF-T>0)	% D/DMFT	% M/DMFT	% F/DMFT
6 & 7	6	83.33	0	16.66
12	93	50.88	0.54	48.57
15 & 16	133	28.42	5.50	66.08
34 - 44	179	10.57	37.08	52.35
65 & OVER	91	9.00	67.71	23.28
TOTALS	502	23.35	27.05	49.59

TABLE XI

Cayman Islands Oral Health Survey, 1995
Age-Specific Degree of Caries Experience

AGE	N	DMF-T=0		1<DMF-T<3		3≤DMF-T<5		DMF-T≥5	
		N	%	N	%	N	%	N	%
4 & 5	66	66	100	0	0	0	0	0	0
6 & 7	169	163	96.4	6	3.6	0	0	0	0
12	154	61	39.6	68	44.2	18	11.7	7	4.5
15 & 16	178	45	25.3	55	30.9	44	24.7	34	19.1
34-44	181	2	1.1	6	3.3	16	8.8	157	86.7
65 & OVER	91	0	0	1	1.1	9	9.9	81	89
TOTALS	839*	337	40.2	136	16.2	87	10.4	229	333

*193 Missing observations

TABLE XII

Cayman Islands Oral Health Survey, 1995
Age-Specific Proportion of Caries-Free Persons and with untreated Decay
(dt+DT) in Temporary and Permanent Dentitions

AGE	N	CARIES-FREE PERMANENT		CARIES-FREE BOTH		UNTREATED DECAY PERMANENT		UNTREATED DECAY BOTH	
		N	%	N	%	N	%	N	%
4 & 5	193	66	100	129	66.8			193	31.6
6 & 7	193	164	97	117	60.6	169	3	193	38.3
12	154	93	60.4	93	60.4	154	39.6	NA	
15 & 16	178	107	60.1	NA	NA	178	39.9	NA	
34-44	181	91	50.3	NA	NA	181	49.7	NA	
65 & OVER	129	41	45.1	NA	NA	91	54.9	NA	
TOTALS	1028	562*		339		773		386	

* 193 Missing observations. (189 Subjects did not have permanent teeth, and 4 were outside age groups selected).

** 42 Missing observations (38 subjects did not have teeth, and 4 were outside age groups selected)

TABLE XIII

Cayman Islands Oral Health Survey, 1995
Community Periodontal Index (CPI)
Mean Number of Sextants (SD)

AGE	N	0*	1**	2***	3****	4*****	X*****
4 & 5	193	4.5 (1.7)	1.33 (1.67)	0.17 (0.65)	NA	NA	0
6 - 7	193	4.3 (1.8)	1.49 (1.73)	0.12 (0.57)	NA	NA	0
12	154	3.8 (1.9)	2.09 (1.95)	0.12 (0.33)	NA	NA	0
15 & 16	178	4.8 (1.5)	1.14 (1.49)	0.09 (0.39)	NA	NA	0
35 - 44	181	2.5 (2.1)	3.03 (1.98)	2.17 (1.89)	1.2 (1.6)	0.35 (0.88)	0
65 & Over	129	0.75 (1.4)	1.73 (1.97)	1.42 (1.75)	.68 1.2)	0.15 (0.47)	0
Total	1028+						0

+ Four (4) missing observations

* Healthy

** Bleeding or higher score

*** Calculus or higher score

**** Shallow pockets or higher score

***** Deep pockets

***** Excluded sextants

FLUOROSIS

Ninety seven percent of the subjects included in the survey were scored either as having no fluorosis or their upper anterior teeth could not be accurately examined for this condition, these teeth could have not been erupted in children, or had numerous restorations or crowns that would make difficult an accurate diagnosis. Approximately three percent had either questionable, very mild, mild or moderate fluorosis scores, however, it should be noted that only one person had all six upper anteriors with mild fluorosis and one with moderate fluorosis. Nobody was found with teeth having severe fluorosis. These results indicate that fluorosis is not a public health problem in the Cayman Islands.

TREATMENT URGENCY

Dental treatment urgency was recorded on all subjects, based on the need for routine dental care and the presence of pain or infection. Slightly over half of the participants did not need any dental treatment and approximately one third needed routine dental care. The largest percentage (38.8%) were located in Cayman Brac, followed by the group sampled from George Town with children attending public schools, Bodden Town, West Bay and George Town with children attending private schools. Eight percent of all subjects had frank carious lesions and were in need of prompt dental care; the largest group was for children in public schools in George Town. Followed by Cayman Brac, West Bay, Bodden Town and George Town with private schools. An additional category of treatment urgency was given to individuals who were in need of dental treatment for periodontal reasons, two localities were of significant interest, George Town with children in public schools and West Bay. A breakdown of treatment urgency by location is given in Table XV.

TABLE XV
Cayman Islands Oral Health Survey, 1995
Dental Treatment Urgency by Location (N=1031)

LOCATION	N	0	%	1	%	2	%	3	%	4	%
George Town*	295	152	51.5	93	31.5	31	10.5	6	2.0	13	4.4
George Town**	135	102	75.6	22	16.3	4	3	6	4.4	1	0.7
West Bay	218	125	57.3	48	22	18	8.3	15	6.9	12	5.5
Bodden Town	203	132	65	53	26.1	13	6.4	2	1.0	3	1.5
Cayman Brac	178	84	47.2	69	38.8	17	9.6	5	2.8	3	1.7
N.Side/ E.End	2	1								1	50
TOTALS	1031 ⁺	596		285		83		34		33	

* Children attending public schools

** Children attending private schools

⁺ One missing observation

0 = No dental treatment needed

1 = Routine dental treatment

2 = Prompt dental care needed

3 = Pain or infection, carious lesions require immediate (urgent) dental care

4 = Pain or infection for periodontal reasons

Treatment urgency was also analyzed by age groups, from the results depicted in Table XVI, it could be deducted that need for routine dental care gradually increases as population reach middle age. The lower need in the older adults could be attributed to the fact that they have fewer teeth and require other type of dental treatment. However, prompt care need was highest in this group followed by children in the 6-7 years of age. Immediate care due to carious lesions with pain or infection was highest in children 4 & 5 and 6-7 years of age, and middle age adults indicating a need for dental services for these age groups. Table XVI summarizes specific treatment urgency for each age group.

TABLE XVI
Cayman Islands Oral Health Survey, 1995
Age-Specific Percentage of Dental Treatment Urgency (N=1032)*

AGE	N	NO NEED	ROUTINE	PROMPT	IMMEDIATE	OTHER REASONS
4 & 5	193	68.9	18.7	4.7	7.8	
6 - 7	193	62.7	22.3	10.9	4.1	
12	153	64.1	26.8	8.5	0.7	
15 & 16	178	59.0	34.3	6.2		0.6
34 - 44	181	42.0	34.8	7.2	4.4	11.6
65 & Over	129	47.3	31.0	12.4	1.6	7.8

* Five missing observations

DENTAL TREATMENT NEEDS

Need for sealants in the permanent dentition is summarized in the following table.

TABLE XVII
Cayman Islands Oral Health Survey, 1995
Age-Specific Distribution of Subjects in need of
Pit-and-Fissure Sealants in Permanent Teeth
(N= 1028)*

AGE	N	% Need of Sealants
6 & 7	42	21.8
12	35	22.7
15 & 16	4	2.2
34 - 44	12	6.6
65 & Over	4	3.1
Total	93	

* Four missing observations

Restorative Care, Pulp care, Other Dental Treatment and Extractions

The need for surface restorations in the deciduous dentition was 15% for the 4 & 5 year-olds (N=193) and 3.7 % in the 6 & 7 year old age group (193). The need for two or more surface restorations was greatest in middle age adults, children 6 & 7 years old and in older adults. Crowns were only needed by adults and the need was relatively low. Pulpcare was needed by 15 & 16 year-olds and middle age adults, but the need for this type of treatment was also low. Other treatment needed is quite high in both adult age-groups, this code may include restorative treatment that may be needed for trauma, esthetics or any restorative care not due to caries.

The examining team also decided to utilize this score for edentulous spaces that could be restored with a bridge. This was done in consideration to the fact that some examiners were Dental Auxiliaries who did not feel comfortable in making a diagnosis for fixed partial dentures (code 5 in the recording form).

The summary of age-specific percentage of subjects in need of restorative care and extractions is given on Table XVIII.

TABLE XVIII

Cayman Islands Oral Health Survey, 1995
 Age-Specific Percentage of Subjects Needing one or more surface
 restorations, crowns, pulpcare, other treatment and extractions
 in Permanent Dentition*

AGE	N	1	2 or more	Crown	Pulp care	Other Treat.	Ex tract
6 & 7	193	15.5	23.8	0	0.5	0.5	9.3
12	154	33.1	11.0	0	0.6	0	0
15 & 16	178	36.0	10.7	0	2.2	0.6	0
34 - 44	181	24.3	33.1	1.7	1.7	51.4	8.8
65 & Over	129	16.3	21.7	1.6	0	41.1	11.6

TABLE XIX
 Cayman Islands Oral Health Survey, 1995
 PERCENTAGE OF ADULTS WEARING DENTURES
 by Age Category (N=310)

LOWER				UPPER			
AGE	N	No Denture	Partial Denture	Complete Denture	No Denture	Partial Denture	Complete Denture
35-44	181	90.1	8.8	1.1	78.5	18.8	2.8
65 & Over	129	49.6	56.8	34.1	32.6	22.5	45.0

TABLE XX
Cayman Islands Oral Health Survey, 1995
Percentage of Adults Need ing Dentures by
Age Category (N=310)

LOWER						UPPER			
AGE	N	No Need	Need Repair	Need RPD	Need Complete	No Need	Need Repair	Need RPD	Need Complete
35- 44	181	58	0.6	41.4	0	71.3	2.8	26.0	0
65 & Over	129	42.6	5.4	39.5	12.4	55.8	8.5	23.3	12.4

DISCUSSION

A report made by E. Jackson (PAHO) in 1981⁷ indicated that 28% of children examined in primary schools (n=857), 39% in Middle school (n=270) and 46% in High school (700) were caries free. Results from the 1995 oral health survey indicated that 66.8% of 4-5 year-olds, 60.6% of 6-7, 60.4% of 12 year-olds and 60.1% of 15-16 years of age were caries free. The mean DMF-T for 12 year-olds found in the 1995 oral health survey, is also lower than the corresponding value reported to the WHO Global Data Bank in 1989-1990. No specific details are available for the surveys in 1981 and 1989-1990. The results found in the 1995 survey are lower than any of these and demonstrate a marked decrease of caries in children living in the Cayman Islands. The mean DMF-t of 1.70 for 12 year olds meets the expected goal set by WHO for the year 2000. The reasons for the reduction of caries may be explained by the implementation of preventive programs in schools, fluoride supplements, supervised tooth brushing etc. However, although the results observed in young children are encouraging, a marked increase in caries was observed in children 15-16 years of age. The mean DMF-T doubled (3.6), which demonstrates a change in behavior of the teen age group. The caries condition worsens in the 34-44 adults (13.0) and is much worse in the elderly (17.3) in whom the mean DMFT is ten times higher than in twelve year-olds. It is known that caries increases with age. Various factors such as inadequate oral hygiene, lack of regular dental visits, diet, lack of education on dental preventive measures and unavailability of dental services are the most frequent. It should be noted that in Cayman Islands, the F component in the DMF-T is 52% in middle age adults, and drops to 23% in the elderly, the missing component (M) however, increases to 68%. In spite of the relatively low caries prevalence in children, it should be noted that routine dental care was needed by children 18.7% of 4-5 olds, 22.3% of 6-7 year-olds and 26.8% of 12 year olds. The need for prompt and immediate care needs to be taken into account in children of all age groups. It should be noted that the proportion of children 6-7 years of age, doubles (33%) in the twelve year-old group. The proportion of children 6-7 needing 2 or more surface restorations is relatively high (24%). Treatment urgency by location is also needs to be taken into consideration; The proportion of persons needing routine dental care is highest in Cayman Brac, George Town including children attending public schools, followed by Bodden Town, West Bay and lastly Children attending private schools. Similar patterns are observed for need of prompt care. Immediate care need was highest in West Bay. The results imply a need to improve dental care services in Cayman Islands, dental health education, implementation and maintenance of preventive services for children and conservative care for the adults. The need for sealants was determined in all age groups. The need was highest in young children, Approximately 22% of the 6-7 and 12 year old children were in need of sealants. The benefit of sealants has been demonstrated in numerous studies throughout the world.

As noted on the specific section, dental fluorosis is not a public health problem in Cayman Islands. Nevertheless, it is very important to know the possible sources of fluoride. Children are likely to be ingesting fluoride, but the source was not precisely defined at the time this survey was conducted. Information on fluoride on drinking water was not available, nor was the use of tablets, drops, fluoridated salt or toothpaste, diet etc. A study to determine use of fluoride by children is recommended.

There is no information available on previous studies on periodontal conditions of the population of Cayman Islands. The mean number of sextants with bleeding or higher score was 1.1 for children 15-16 years of age. The mean triplicates in the middle age adults (3.0), but drops to 1.7 in the elderly; this can be explained by the fact that this group has more missing teeth. A mean of two sextants had calculus or higher score which confirms the lack of periodical dental visits in middle age adults.

Partial or complete edentulism can be observed from results summarized in Table XIX. Approximately 20% of middle age adults wear either lower or upper partial dentures; the proportion is much higher in the 65 years of age or older where 56% wear lower partials. The need for lower partials is high in both age groups (41%) and forty one percent of elder group need complete upper denture.

It may be of interest to know that above 81% of the children and 85% of the elderly subjects and only 47% of middle-age adults participating in the survey were Caymanians. The remaining 53% in this age group were non-Caymanians but have lived in Cayman Islands for over 5 years. Although there were differences on severity of disease prevalence and treatment needs, the differences were not significant.

CONCLUSIONS AND RECOMMENDATIONS

The results obtained in the oral health survey indicate the need to emphasize preventive and conservative services for the people of Cayman Islands.

Dental Health education should be strengthened with special emphasis on the youth.

Studies of fluoride ingestion and use of supplements should be instituted following PAHO recommendations for epidemiological surveillance systems.

Dental Health services should be restructured as to be able to provide adequate care for those with untreated carious lesions in all age groups.

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6. Horowitz, H., Pan American Health Organization, Epidemiological Surveillance Systems, 1995
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WHO ORAL HEALTH ASSESSMENT FORM (1986)

(SIMPLIFIED)

Amended

COUNTRY Cayman Islands

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NEED FOR DENTURES <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">upper (103) <input type="text"/> <input type="text"/></div> <div style="text-align: center;">lower (104) <input type="text"/> <input type="text"/></div> </div> 0 = no denture needed 1 = need to repair denture 2 = need for partial denture 3 = need for full denture
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SCHEDULE FOR CALIBRATION EXERCISE

CAYMAN ISLANDS

OCTOBER 23-25 1995

09:00 **Introductory remarks**
Dr. Bernard Sutherland

09:30 **Calibration Exercise**

The calibration exercise will comprise four sessions

1. Review of the clinical examination procedure

This session includes review of the record form and codes, diagnostic criteria, use of clinical examination instruments.
Dr. Ramon Baez

10:30 **Break**

10:45 **2. Clinical exercise**

Six children belonging to the two age groups to be included in the survey (6-8 and 12-15) and who have the conditions that will be examined during the survey.
Children will be seated in the examining chairs which will be numbered 1,2,3,4,5 and 6.

Method A

The dentists being calibrated examine all six children, the "calibrators" will be called to verify the diagnosis and entry to be made.

Method B

The dentists being calibrated and the calibrators will examine all six children. This method facilitates comparison against a standard.

Examiners as well as recorders and calibrators will be encouraged to discuss clinical findings, diagnostic criteria, codes, and recording errors in order to reach an acceptable level of agreement.

12:00 **Lunch**

13:30 3. Actual Calibration Exercise

Examination of 15 children from each age group
Each team of examiners and recorders will
examine all children in both age groups.
Examiners and recorders will not be allowed to
discuss their clinical findings with members
of the other teams. After each individual
examination, the record will be handed over to
the activity coordinator.

15:30 Break

15:45 Calibration exercise continues

17:00 Adjourn

Tuesday October 24, 1995

09:00 Calibration exercise continues

10:30 Break

10:45 Calibration exercise continues

12:00 Lunch

13:00 Calibration exercise continues

15:00 4. Final discussion

The last two hours of the calibration exercise
will be used for making sure that the
examination teams are completely familiar with
all the examination and recording procedures,
diagnostic criteria, record forms, handling
instruments and supplies. Infection control
procedures etc.

17:00 Adjourn

NOTE:

This schedule has been prepared taking into
consideration the availability of subjects for the
calibration exercise, the time limitation and that
examiners to be calibrated have previously
participated in similar oral health surveys. Based
on these facts and considering that subjects will
have to be examined several times, it is
recommended that up to four examiners be calibrated
during this activity. It should be emphasized that
all examiners participating in a survey should be
calibrated so that all examinations are performed
in a consistent manner.

Duplicate examinations should be conducted during calibration, about half way through the survey , and at the end of the survey. WHO guidelines recommend that about 10% of the subjects should be reexamined. "Care must be taken to carry out at least 20 duplicate examinations in each age group at each period, so that a reasonable estimate of changes can be made". (Intra and Inter-examiner reliability).

It is recommended that if there are other dentists who plan to participate in the survey, they should be encouraged to attend the review and practical sessions to be conducted during October 23-25, 1995.

From the information provided, one thousand fifty children will be examined. If six examiners are available, it will be necessary to have a minimum of twenty sets of plain mirrors and WHO probes. If twelve examiners were available, each examiner would need a minimum of ten sets so that instruments can remain in the disinfecting solution for approximately 30 minutes while the others are being used.

It is important to recognize that the form and criteria that will be followed correspond to the WHO Basic Methods Third edition, in which caries explorers were used.