ORAL HEALTH STATUS OF YOUNG ADULTS IN THE GA DISTRICT

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A Dissertation submitted to the School of Public Health. University of Ghana, Legon, in Partial fulfillment of the requirements for the award of Master of Public Health Degree.

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DECLARATION

I declare that this study has been the result of my own research conducted under supervision and has not been presented for a degree in any other university or institution.

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Finally, I wish to thank my family who have had to endure so many disruptions to make my dreams a reality.

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LIST OF ACRONYMS

CPITN	Community Periodontal Index of Treatment Needs
DA	District Assembly
DCE	District Chief Executive
DHMT	District Health Management Team
DFMT	Decayed Missing Filled Teeth
ID	Identity
JSS	Junior Secondary School
(N)	Number
PI	Principal Investigator
RP	Respondent
%	Percent
SES	Socio-economic Status
Sd	Standard Deviation
SSS	Senior Secondary School
TV	Television
WHO	World Health Organisation

ABSTRACT

An oral health survey was carried out among young adults in the Ga district to assess the oral health status of young adults in and out of school and to recommend types of treatment needed.

A stratified random sample of young adults 15 – 32 years old was selected from rural and urban Senior Secondary Schools and the communities. Questionnaires were administered by Ccommunity Health Nurses after which oral examinations and recording of data was carried out by the principal investigator assisted by eight final year dental students. A calibration exercise was undertaken in order to assess the reliability of the results obtained.

A mean DMFT of 0.63 was obtained with a caries free prevalence of 73.3%. The decayed component accounted for most of the DMFT. The proportion of young adults with healthy periodontal condition was low i.e. 13%. Eighty-six percent (86%) had poor oral hygiene/calculus deposits. The tooth-brush was found to be the most common cleaning implement.

The prevalence of mal-occlusion was low i.e. 7.8%, and the perception of badly arranged teeth was even lower – 1.6%. Fractured anterior teeth were few – 2.7%.

This study clearly shows the Ga district as disadvantaged in terms of availability of oral health care. It serves as a reliable basis of information on which oral health care services may be provided in the district.

Recommendations are made for the institution of intensive oral health education and promotion at the community level. A dental clinic is recommended for fillings, prosthesis and other forms of secondary treatment, in the medium term.

CHAPTER ONE

INTRODUCTION

Traditionally, oral health services in Ghana have been mainly curative. These services have been offered as part of the general clinical care provided in government/public health institutions, which are located mainly in urban areas. They have therefore been accessible to only a small proportion of the Ghanaian population. Curative/clinical oral health care has also been found to be expensive and often beyond the reach of quite a large proportion of our population. Thus there is a growing concern among some public health practitioners that current health care services do not effectively help in alleviating the oral health problems of most of the country [(1)].

Over the years studies have shown that the common dental diseases (e.g dental caries*/tooth decay and periodontal/gum disease**) can be prevented through oral health education and promotion. To stem increases in dental diseases in developing countries, the World Health Organization (WHO) has stressed the need to increase the application of preventive programs in oral public health practice [(2)] It recommends emphasis to be placed on preventive or control programs to minimize the need for curative, restorative and therapeutic treatment of oral disease. Policy making and planning in Ghana therefore needs to be tailored to increasing coverage and meeting the needs of the vulnerable groups in our society (e.g. children, youth and the economically deprived).

To achieve this, information on the present and future status of the population must be known,. This information must include measurements of morbidity and disability to be able to predict adequately sustainable interventions and treatment needs. Oral health surveys are used to collect information about the oral health status and treatment needs of a population and subsequently to monitor changes in levels and patterns of disease [3]. in this way it is possible to assess the appropriateness and effectiveness of the services being provided and plan to modify existing services and training programs as needed.

PROBLEM STATEMENT

In the last thirty years, only six prevalence studies of dental diseases covering selected cities (in the Greater Accra, Ashanti and Brong Ahafo) and limited age groups (of 6+ and 12 years) have been carried out. A national oral health survey, which was proposed years ago, is yet to be implemeneted[4]. Thus it has not been possible to formulate efficient and sustainable oral health intervention programs tailored to our needs in the country.

Oral health services in the country are located mainly in the urban areas[1]. The Greater Accra region possesses the greatest percentage of oral health care facilities and personnel in the country (both private and public) but they are all located in the urban areas. Ga district provides no oral health care services. It was not possible to locate records of any study of treatment needs of the population carried out previously, in the district.

RATIONALE

This study is being carried out to contribute to the sparse information gap on the prevalence of oral disease among youth and adults in Ghana and specifically as a baseline study to provide the minimum amount of data needed to commence oral health care services in the Ga district. Plans are in place to upgrade the Amasaman Health Center to a district hospital this year (confirmed at the 2001, Regional Meeting of District Directors of Health by the Regional Director of Health). It is important therefore that such a study be carried out to collect baseline data that can be used to assess oral health treatment needs in the district. It is hoped that this will facilitate planning, implementation and eventual evaluation of an oral health care program in the Ga district.

STUDY AREA

The Ga district is one of the districts in the Greater Accra region of Ghana. It is divided into five sub districts, Oboom, Danfa, Weija, Madina and Amasaman. The largest settlement is Madina, other large settlements are Bortianor, Pokuase, Dome, Kwashiman, Ofankor, Adzon Kotoku and Oshie. The population from the 2000 census is 556,581 with 278,895 male and 277,686 female. Based on the definition of population of more than 5,000 people as urban[5] the district can be described as 70% urban and 30% rural. Most of these urban areas however lack basic infrastructure e.g. good roads potable water, post office etc. The population is relatively young with about 44% below 15years of age[6]. The district consists of various ethnic groups Gas, Akans, Ewes, Hausas, Fulanis, Fantes, Zambramans and Dangmes. The main occupations of the inhabitants of the district involve primary production e.g. crop and livestock farming, mining, quarrying, forestry and hunting. Employing *** social classification based on educational levels, incomes and occupational strata which is applied to the public sector in Ghana most of the workers are found to belong in the lowest socio-economic status (SES). Young adults form about 63% of the population (i.e. 350,646 as calculated from 1998 Ghana demographic survey data). The male female ratio is 7:6. it has been estimated that about 51% of these young adults do not attend school due to poverty, poor access to schools and poor academic performance in senior secondary entrance

examinations[6]. This has resulted in a high dropout rate at this level. There are 178 Junior Secondary Schools (JSS) and 6 Senior Secondary Schools (SSS) in the district. Enrolment for 2000/2001 academic year was 6,171 in SSS and 19,800 in JSS. School attendance rate has generally been found to be low and irregular in the rural schools due to poverty.

Literacy rate (according to the latest tests conducted for the district) is about 55% and numeracy rate is about 40%, compared to the national average of about 60% and 45% respectively[6]. The district has no hospital or polyclinic. Each sub-district has a health center and there are a few privately owned health facilities scattered within the district. Cases beyond the capacity of the health centers are referred to hospitals outside the district (usually Ridge, Achimota and Nsawam Hospitals). There is no national health insurance scheme in existence. There is no access to oral health care services in the district, although the Greater Accra region possesses the highest number of oral health faciltiites and personnel in the country. All dental cases therefore have to be referred outside the district for management.

STUDY OBJECTIVES

GENERAL OBJECTIVE

To document the oral health status of the young adults in the Ga district, in order to facilitate planning, implementation and eventual evaluation of an oral health care program.

SPECIFIC OBJECTIVES

1. To determine the prevalence and distribution of:
   dental caries
   periodontal disease
   malocclusion
   fractured incisor teeth
   dento-facial abnormalities of cleft lip and palate among young adults in Ga district.

2. To determine the knowledge and practices amongst the youth adults in Ga district as pertains to

   a. oral cleaning practices
   b. treatment seeking behaviours
   c. eating habits.

DEFINITION OF VARIABLES

* Dental caries is a widespread disease that eventually leads to pain and tooth loss if left untreated. It is thought to result from a complex interaction among three factors: bacteria, diet and host susceptibility. Bacteria and plaque must be present on the tooth surface: these plaque bacteria produce acid by fermenting ingested refined carbohydrates, especially sugars. The acid by-product causes localized demineralization of the enamel surface, which if not checked results in destruction of the tooth structure.

Methods suggested by the WHO for control of dental caries include use of fluoride containing toothpaste, reduction in frequency of sugar intake, control of sugary foods at school, tooth brushing instructions at school and supervised tooth brushing either at school or home (or both).

** Periodontal disease refers to any disease of the tooth supporting structures (periodontium). Chronic marginal gingivitis and periodontitis are most common. These conditions are strongly associated with the presence of bacterial plaque at or beneath the gum margins. Gingivitis is a precursor of periodontitis, which may progress to pocket formation, and destruction of alveolar bone.

Suggested methods for control of gingivitis and periodontal disease are frequent physical removal of dental plaque by the individual using oral hygiene implements (toothbrushes, chewing stick) as well as removal of sub- and supra-gingival calculus by trained personnel where indicated. [2]

*** Social classification in Ghana[17].

Upper Class: Professional/technical specialist. High-ranking politicians/high ranking officials in the security forces, top administrators and managers/directors.

Upper Middle Class: Para-Professionals in medicine, administrative positions, senior technicians secretarial staff, salesmen, teachers in second cycle institutions.

Lower Middle Class: miners, mechanics, foremen, industrial workers, men of the security forces

Lower Class: Semi-skilled workers, petty traders, artisans, smallholder farmers, fishermen, hawkers, farm labours

CHAPTER TWO

LITERATURE REVIEW

Oral health status has been reported to have improved over the years in developed countries[2] but in the developing countries it is said to be deteriorating[7] It is therefore necessary to institute regular monitoring of oral health status in these countries so that programs can be put in place to reverse this trend. Oral health surveys provide a basis for such estimation of the oral health status of a population and its treatment needs[3]. When considering oral health status, epidemiological data focuses mainly on the two major dental conditions of dental caries and periodontal disease[8]. Other conditions worth noting are mal-occlusions, dento-facial abnormalities (e.g. cleft lip and palate) and fractured teeth.

DENTAL CARIES AND PERIODONTAL DISEASE

Although it is generally believed that the prevalence of dental caries in developing countries is increasing[2], reviews of studies from Africa provide equivocal evidence[9, 10] Infact, a review of Ghanaian literature from 1963 to 1999, has found a low prevalence and decreasing trend in dental caries[4].

Many reasons have been given for the wide differences in data available on caries prevalence in developing countries. Among these is the fact of difference in population groups[9] and study methods[10] For example in the diagnosis of dental caries some examiners have ignored precavitation lesions whilst others have made positive diagnosis at the earlier (sticky fissure) stage of lesion progression[9] These differences have persisted inspite of existing WHO guidelines for oral health surveys[3], which attempt to standardize information for comparisons[10] Examiners need therefore to be trained and calibrated prior to data collection to assure reliability and reproductibility of results.

It is striking however that regardless of the direction of the trend, caries levels tend to be low in both child and adult populations in developing countries[9].

A number of indices have also been developed for the qualification of dental epidemiological data. The Decayed, Missing and Filled Teeth (DMFT) index measures caries prevalence in permanent teeth showing evidence of caries attack by a demonstrable lesion of caries, a filling or a missing tooth. WHO provides a scale for categorizing the severity of dental caries based on the 12 year old DMFT as, DMFT between 0.0 and 1.1 to be very low, 2.8 to 4.4 to be moderate and 6.6 or more to be high[7].

The Community Periodontal Index of Treatment Needs (CPITN) is widely accepted as the method for epidemiological and screening studies for periodontal disease[11].

As the tissues involved in these diseases are readily accessible to direct visual examination by probing with appropriate instruments data collection becomes relatively easy.

Both dental caries and periodontal disease have been observed to vary with increasing age. Since the process of tooth decay is irreversible after cavitation has occurred, DMFT values tend to rise with increasing age[12]. Newburn (1975) explains that dental disease is a dynamic, time dependent process and is influenced by the duration of exposure of the teeth to the oral environment.

Most of the studies in the epidemiology of periodontal disease were limited to adult populations. This led to the belief that periodontal disease is a disease of adulthood. More recent studies however demonstrate that gingivitis is already present during the first year of life and increases with age[13]. In children gingivitis rarely progresses to periodontitis, and poor oral hygiene may not always result in the expected severity of gingivitis.

Females have been found to exhibit higher caries prevalence than males. In a study of oral status of black college students of average age 27.3 years in Khayeletsha, South Africa, the mean DMFT scores for males was found to be almost half that of females[9]. This observation may be due to earlier tooth eruption in the females. Higher DMFT scores in women has also been explained by the fact of more frequent dental visits among women which means more treatment and fewer sound teeth.

Difference between the sexes with regard to periodontal disease, has not been consistent. Some studies have shown less gingivitis in girls than boys of similar age, especially in developed countries. (Bruce reporting the work of Sutcliffe, *1968)*[13, 11], whilst others have shown the opposite trend. Studies in 1991[14] report a significant difference between the sexes for the presence of calculus. In a study of the oral health status of an adult population (aged 19-64yrs) in Greece, it was found that women presented with better oral hygiene than men. This was statistically significant in the younger age groups[15]. In a study in Iran males showed slightly less periodontal disease than females but the difference was not statistically significant[11].

Socio- economic status (SES) or social class is broad measure of an individual's background in terms of such factors as education, income and occupation. A parent's SES may influence the incidence of dental caries in the children. High SES usually implies increased access to

health care, ability to afford such care, time to get it, positive attitude etc.[16]. It is reported that as part of his landmark research in caries epidemiology, Klein observed that lower SES groups had higher values for the decayed and missing components of the DMF scores and lower values of the filled component. Children in higher SES had a higher filled component.

In a study on school children in Accra, Ghana, a very marked relationship was found between SES and dental disease. Caries experience was found to be higher in urban than rural areas[5] . This was attributed to variations in diet. Higher SES, rising income and urbanization was found to cause people to change their diet from the traditional starchy staples to more refined carbohydrates. in a study conducted in Kumasi, Ghana[17], it was explained that social class background reflects motivation and awareness of good oral hygiene. These factors are very significant predicators for oral cleanliness and CPITN.
Frequent dental attendance also reflects and results in increased awareness of good oral health. Studies in developed countries, e.g. Ontario, Canada record high Attendance[18] whilst the opposite is true for developing countries[5], where dental visits are more often for pain relief[19] and other emergency treatment. In their study in Ghana, Addo- Yobo et al found that 90% of their subjects had never visited the dentist[5] . In another study, utilization rate of dental services in the Greater Accra region was found to be 1.6%[20]. Frequent dental visits have the tendency of increasing the filled component of the *DMFT* value. Many studies[21,12] have reported favourable effect of dental visits on caries experience.

In the rural areas of Ghana the chewing stick or sponge is the main implement for oral cleansing. The toothbrush is thought of by some as a sign of education and affluence [17]). In a study in Nigeria, no significant difference was found in the oral hygiene status between subjects using toothbrush and those using chewing stick[22] In developed countries, however where improvement in oral health has been attributed to increased expenditure on health education, use of the toothbrush and paste is the norm. In a study in Ontario,Canada[18] toothbrush usage was reported in 88% of the subjects. Addo Yobo et al[17] observed that neither the method nor frequency of tooth cleaning was found to be a significant predicator for good oral health.

Generally it is believed that decreases in caries levels experienced in the developed countries are due to a large extent to the use of fluorides (i.e. fluoridated water, topical application of fluorides and fluoridated toothpastes). Fluoridation is not present in Africa and prevalent poverty makes the wide use of toothbrushes and fluoride toothpastes low[22]. A study in a developed country reported claims of high home use of fluoridated

toothpaste among adolescents[19]. The findings of over a hundred (100) clinical trials indicate that the incidence of new caries lesions can be reduced by 20-30% (or greater) by routine use of fluoridated toothpastes.[2]

Several studies carried out in South Africa between 1973 and 1984 reported an apparent lack of association between caries and sugar consumption, implying that African populations were somehow immune genetically to caries. Recent review of these studies does not support such a conclusion[9]. From a study in Nigeria in 1981[23], marked changes from the traditional dietary habits and life styles (which have previously been associated with low caries experience) to increased consumption of imported sugar- containing products were found to have given to rapid increases in caries experience. Other studies in 1997[21] and 1998[24] found consumption of sugary foods to be amongst the most important variables in consideration of socio- behavioural risk factors in caries experience.

MALOCCLUSION

Malocclusion is generally difficult to quantify because of differing perceptions of what it constitutes. They range from insignificant deviations to severe and disfiguring mal-relationships. It is also difficult to achieve a sufficient degree of examiner consistency in the use of malocclusion indices.

A 1985 review of literature on the prevalence of malocclusions in the USA concluded that there was significant, 20-30%, departure from normal occlusion in children, and that the majority of them would benefit from orthodontic treatment.
In a study carried out amongst school children in Hungary in 2000, 23% were found to have moderate to severe malocclusion[26]. In a similar study in Papua New Guinea[27] in 1997, amongst 12- 15 yr olds, 3% were recorded as needing some form of orthodontic treatment.
In Ghana, studies among school children in the Brong Ahafo region in 1967[28] reported malocclusion scores of 38.6%, with anterior cross bite being most common. Similar findings were reported in another study two years later[29].

In another study in Ghana conducted in 1968 at Mampong[30] a mal-occlusion prevalence of 4.3% was found among 5-14yr old school children. In this study, over- crowding due to premature shedding of the deciduous teeth was found to be the most common contributory factor.

Relatively few children receive orthodontic care because of the complex, time consuming and expensive nature of the treatment. In a study of 9yr old immigrant children living in Sweden[31], 63% said they would like to have orthodontic treatment. 60% of the subjects were found to have moderate to urgent need for orthodontic treatment. 29% had low need. And 11% had no need at all. In a study of Zimbabwe students of mean age 13.9 yrs[32], only 15.8% reported dissatisfaction with the position of their teeth whereas, crowding or spacing in the upper and lower anterior jaw was recorded in 67.5% and 60.5% respectively.

CLEFT LIP AND PALATE.

Oral clefts result from a complete or partial failure in the developing embryo, of the right and left segments forming the lip and roof of the mouth to unite along a line beginning at the lip and extending through the hard and soft palate. The effect is to create a grotesque facial deformity and destroy the partition between oral and nasal cavities[33]. They are predominantly of genetic origin although some environmental factors also playa role. In 1968 a figure of 1 :700 was quoted for the prevalence of cleft lip and palate in the USA. Malaysia, which is similar to Ghana in environment and developmentally, recorded a rate of 1: 941 from a national survey conducted among school children in 2000[34]

CHAPTER THREE

RESEARCH METHODOLOGY

Study Population

This survey involved young adults from Dome (urban community of population 29,619) Fise (rural, population 498) and Amamole (rural, population 569). The target population was youth aged 15 yr: to 35yr. as of the day of the study.

Study Design

This was a cross-sectional descriptive study.

Sample size calculation

The population of young adults in the district was estimated as 350,646. In order to have adequate representation of all the conditions of interest, the condition of least prevalence was used in the determination of sample size- i.e. facial abnormalities, 11%.

Making an allowance of 5% for error, the recommended sample size was determined to be 411 at 99% confidence level. Power – 1.98. This was determined using the EPI INFO version 6.0 program.

Sampling Technique.

Sampling was done by a stratified random sampling method.
Sample sizes in each stratum were made proportional to the size in the population.
A list of all the communities and senior secondary schools in the district was obtained. The communities were divided into rural and urban- based on classification from statistical services as population size greater than 5,000 being urban. The SSS schools were then listed as rural or urban.

Only one school, Amasaman Secondary Technical School at Fise fell under the rural division, it was therefore selected. One of the remaining five schools (Presbyterian Boy's Secondary School, Legon) was disqualified as it was a boarding school and therefore attracted students from all over the country.

One school, St. John's Secondary School, Dome was then selected at random (by balloting) from among the remaining four schools as the urban representation.

Young adults in each school balloted for inclusion in the survey. They were interviewed and clinically examined in batches (school attending youth). The non- attending young adults from the communities that send young adults to the selected schools were invited from the crowd of onlookers that tended to form as soon as we arrived at the chosen location (Fise – building site, Amamole Chiefs house, Dome Community Park) and began to arrange our benches and set up our instruments.

They were assembled, interviewed and examined, till the required numbers were obtained. Where the required number was not attained (as occurred at Fise), the next community (Amamole) was entered and young adults were examined from that community.

Eventually the calculated sample size was exceeded because it was decided not to turn away youth who volunteered themselves for inclusion whilst the exercise was still going on.

SURVEY FORMS

The survey forms utilized were as follows:

Part I Interview Questionnaire used for interviews before the clinical examination -see appendix 1

Part II Oral Health Assessment Form, used by clinical examiners -see appendix I

CONDUCT OF THE SURVEY

The principal investigator assisted by eight final year dental students from the University of Ghana Dental School carried out the clinical examinations.
Four Community Health Nurses, from the Amasaman Health Center administered the questionnaires. One university student and two officers from the youth wing of the district assembly formed the supporting staff.

The assistant headmistress and senior prefects from each school also assisted with supervision and ensuring orderly conduct of the students. In the communities the youth leaders assisted us.

STANDARDIZATION AND CALIBRATION OF EXAMINERS

Training of the examiners and familiarization with the survey form was carried out at the dental school over a period of two days, this included a test calibration exercise at the Salvation Army School, Mamprobi.

On the first day of the survey, a calibration exercise was under-taken by examination of 10 selected youth by all 9 examiners before the actual survey began. This was also repeated at the beginning of the third /last day of data collection.

The objectives of these standardization/ calibration exercises were to achieve the following:

(i) Uniform interpretation, understanding and application of the recording instructions and criteria.

(ii) Reasonable consistency with minimal intra-examiner and inter-examiner variability.

(iii) Familiarization with the survey form, indices, field procedures and equipment to be used.

PRE TESTING OF THE INTERVIEW QUESTIONAIRE AND TRAINING OF INTER VIEWERS.

The questionnaire was pre-tested at the Salvation Army School, and at the Amasaman Health Center.

Five questionnaires were administered to students at each venue. The necessary adjustments were then made. The aim of this exercise was to:

1. Familiarize the nurses with the questionnaire.
2. Train the nurses on how to register the youth and how to administer the questionnaire (when and how to probe for further clarification etc.)
3. Make whatever changes/ adjustments as required on the questionnaire.

EXAMINATION METHOD

Registration and interview administration preceded clinical examination.

Examination of subjects was carried out under sun light, using plain mouth mirrors and periodontal probes. At the schools and at Amamole examinations were carried out in the library and in an uncompleted building respectively because of bad weather.

The subjects were seated but the examiners stood most often due to insufficient number of chairs (pictures may be seen in appendix 2). The examiners did their own recording. Examination of dental caries preceded that of periodontal conditions.

DIAGNOSTIC CRITERIA, COLLECTION & RECORDING OF DATA

The diagnostic criteria and recording instructions for dental caries and periodontal disease are in line with recommendations in. the WHO manual -Oral Health Surveys[3] . The interview questionnaires were filled before the clinical examinations. Each interviewer had a letter assigned to her. Each subject was assigned a number based on the letter of his interviewer and the order in which he was interviewed. Thus the sixth subject being interviewed by the second interviewer, for example, was assigned number B6. The name of the locality, name of subject, age, sex, ethnic group, whether in or out of school and date of interview were recorded.

CLINICAL EXAMINATION.

Dentition Status and Treatment Need.

The examination for dental caries was conducted with a plane mouth mirror. The examination proceeded in an orderly manner from one tooth to the adjacent tooth. A tooth was considered present in the mouth once any part of it was visible. Only permanent teeth were considered.

An entry was made in every box pertaining to coronal or root status (see appendix for survey form.) Code used for dentition status is given in the table below.

Crown	Root	Status
O	O	Sound
D	D	Decayed
F	F	Filled
X	X	Missing (unerrupted)
M	M	Extracted
T		Trauma (fracture)
9	9	Not recorded

The criteria for diagnosis and coding are:

O = Sound Crown / Root. When no evidence of treated or untreated clinical caries was seen.

D = Decayed Crown / Root Caries was recorded as present when a lesion in a pit or fissure on a smooth surface had an unmistakable cavity (i.e. frank cavitations). Where the crown

had been destroyed by caries leaving only the root, the caries was judged as having originated on the crown and was scored as coronal caries only. Where doubt existed, caries was recorded as absent.

F = Filled crown or Root. A crown or root was considered filled when one or more restorations were present and there was no other caries anywhere.

X This code was used for teeth judged to be congenitally absent, extracted for orthodontic reasons, periodontal disease or trauma.

M = this code was used for teeth extracted as a result of caries.

T = A crown was scored as fractured when some of its surface was missing as a result of trauma and there was no evidence of caries.

9 = Not recorded.

Treatment Need.

This was assessed immediately after assessment of each tooth. Codes used are as follows:

0= No treatment needed

P = Preventive, caries arresting care.

1 = One surface filling.

2 = Two surface filling.

X = Extraction.

Community Periodontal Index of Treatment Needs. CPITN .

Indicators. Four indicators of periodontal status were used for this assessment. Coding was as follows:

0= Healthy gingiva

1 = Gingival bleeding, observed directly shortly after probing.

2= Calculus without bleeding and

2+= Calculus with bleeding.

The mouth was divided into sextants defined by tooth numbers 17- 14, 13-23,24- 27, 37-34,33-43,44-47.

A sextant was examined only when there were two or more teeth present, which were not indicated for extraction.

Index Teeth.

The index teeth examined were:

17	16	11		26	27
47	46		31	36	37

When no index tooth was present in a sextant all the remaining teeth in the sextant were examined and the highest score recorded as the score for the sextant.

Sensing Bleeding and Calculus

To detect bleeding, each index tooth was probed by moving the probe gently along the gingival margins and returning to observe after a few minutes.

Prosthetic Status and Need.

The presence of prosthesis was recorded for each jaw. (See appendix for recording form).

Codes were as follows:

O = No Prosthesis

1 = Bridge

2 = Partial Denture

3 = Full Denture

9 = Not Recorded.

Prosthetic need.

A recording was made for each jaw on the perceived need for prosthesis.

O = No Prosthesis needed.

1 = One Unit Prosthesis

2 = Multi Unit Prosthesis

3 = Full Prosthesis

9 = Not Recorded.

Mal -occlusion.

Crowding.

Both upper and lower incisal segments were examined for crowding. In this condition the available space between the right and left canine teeth is insufficient to accommodate all four incisors in normal alignment. Teeth may be rotated or displaced out of alignment in the arch. Crowding was recorded as absent or present.

Spacing.

Where one or more incisor teeth had proximal surfaces without any contact, the segment was recorded as being spaced. Spacing was recorded as absent or present.

Anterior maxillary and mandibular over- jet and over- bite.

These were recorded as absent or present.

DATA ENTRY AND PROCESSING

Data from the completed forms was entered into the EPI INFO 6.0 software program after checking for blanks and botched entries. Quality was assured by checking /browsing through the entered data for wrong entries.

ETHICAL CONSIDERATIONS

1. Permission to carry out the study was sought and obtained from the following:
   - District Director of Health Services
   - District Chief Executive (DCE) -Ga District
   - Traditional Authorities
   - Assemblymen
   - District Director of Education -Ga District.
2. Permission was obtained from parents and head teachers of all school attending young adults involved. Permission was sought from young adults above 18years and youth leaders in each community who stood in for parents of youth under 18years.
3. Participants were compensated (for time lost and possible discomfort) with toothbrushes and sachets of Pepsodent Tooth Powder for non-attending young adults and pens and sachets of pepsodent toothpaste for school attending young adults.
4. Emergency care was provided, although it was not made use of.
5. Those who required attention were referred to Achimota or Ridge Hospital- see appendix 5 for referral form.

LIMITATIONS OF THE STUDY

I. Because of bad weather some of the examinations were done indoors while others were done out doors. No artificial light was used however.
2. Some degree of intra and inter examiner error was expected to be introduced into the study because of the number of examiners taking part and the fact of their different clinical experience (a dental practitioner and dental students). However intensive training was done in order to achieve reasonable consistency with minimum variability. Reliability testing was also carried out to determine the degree of agreement between examiners.
3. Difficulties were encountered in issues of finance, logistics and transportation.

FUNDING

The principal investigator provided funding for the study with support of: Government of Ghana bursary and an allowance from the School of Graduate Studies.

CHAPTER FOUR

RESULTS

A total of558 young adults with ages ranging between 15 yrs and 32yrs and mean age 19.7 yrs formed the study population.

6.1 Population Characteristics

Table I. Age group, sex, locality and Social class by school attendance.

	FREQUENCY					
	IN SCH.		OUT OF SCH.		TOTAL	
	N = 292	%	N = 266	%	N = 558	%
AGE GROUP (yrs)						
15 – 19	269	92.1	76	28.6	345	61.7
20 – 24	18	6.2	97	36.5	115	20.6
25 +	1	0.3	90	33.8	91	34.2
Missing	4	1.4	3	1.1	7	2.6
SEX						
Male	129	44.2	104	39.1	233	41.8
Female	163	55.8	162	60.1	325	58.2
LOCALITY						
Rural	79	27.0	101	38.0	180	32.3
Urban	213	72.9	165	62.0	378	67.7
*Father's Social Class						
Upper Class	28	13.0	5	1.9	43	7.7
Upper Middle	58	19.9	12	4.5	70	12.5
Lower Middle	83	28.4	56	21.1	139	24.9
Lower Class	113	38.7	193	72.6	306	54.8

292 (52.3%) of the young adults were in school and 266 (47.7%) were out of school. Majority of those who were in school (92.1%) were between 15- 19 years old, and majority of those who were out of school (70.3%) were older 20years and over. Females were more than males both in and out of School. The majority of young adults in the lower social class (according to father's occupation). Out of the young adults who were In school, 38.7% fell In the lower class whereas 72.6% of young adults who were out of school fell In the lower class.

6.2 Dental Caries Status.

Table 2. Distribution of mean DMFT and its components in and out of school by age group, sex and locality.

	MEAN DMFT AND COMPONENTS								Total DMFT
	IN SCH				OUT OF SCH,				
	Decay	Missing	Filled	Total	Decay	Missing	Filled	Total	
AGE GROUP (YRS)									
15 – 19	0.45	0.1	0.03	0.58	0.33	0.04	0.0	0.37	**0.53**
20 – 24	0.44	0.0	0.0	0.44	0.39	0.29	0.0	0.68	**0.64**
25+	0	0.0	0.0	0.0	0.73	0.33	0.0	1.06	**1.04**
SEX									
Male	0.44	0.1	0.1	0.64	0.53	0.14	0.0	0.67	**0.62**
Female	0.44	0.1	0.01	0.55	0.46	0.28	0.0	0.74	**0.64**
LOCALITY									
Rural	0.46	0.01	0.03	0.49	0.24	0.30	0.0	0.53	**0.52**
Urban	0.46	0.12	0.03	0.59	0.64	0.19	0.0	0.83	**0.69**
TOTAL	0.44	0.09	0.03	0.56	0.49	0.23	0.0	0.72	**0.63**

The mean *DMFT* for the whole population was 0.63, with a standard deviation of 1.2. The mean DMF value was higher in young adults who were out of school in all cases except among the 15 -19 yr olds, where caries experience was higher among young adults who were in school *(DMFT* =0.58) than those who were not (DMFT = 0.37).

Most significant was caries experience among urban young adults where caries experience was much higher in young adults who were out of school *(DMFT* =0.83) than in their counterparts who were in school *(DMFT*= 0.56).

Caries experience was higher out of school than in school although the difference was not statistically significant (p =0.64).

The decayed component of the mean DMFT was higher in all cases but particularly among the 25+ age group who were also out of school *(DMFT* = 0.73).

Generally, few fillings were observed among the young adults subjects, among the who were out of school there were none at all!

There were more missing teeth (due to extractions) among young adults who were out of school in all categories. The difference was found to be statistically significant (p=0.01)

Table 3. Caries Free Prevalence in and out of school by age group, sex and locality.

	CARIES FREE POPULATION					
	IN SCHOOL		OUT OF SCHOOL		TOTAL	
	N = 292	(%)	N = 266	(%)	N = 558	(%)
AGE GROUP (YRS)						
15 – 19	197	67.5	64	24.1	261	46.8
20 – 24	16	5.5	73	27.4	89	15.9
25+	1	0.3	51	19.2	52	9.3
Missing	4	1.4	3	1.1	7	1.3
SEX						
Male	96	32.9	73	27.4	169	30.3
Female	122	41.8	118	44.4	240	43.0
LOCALITY						
Rural	62	21.1	80	30.1	142	25.4
Urban	156	53.4	111	49.1	267	47.8

On the whole, the proportion of caries free young adults (DMFT= 0) was evenly distributed among those in school (74.7%) and those who were out of school (71.8%).

The highest proportion of caries free individuals (67.5%) was found ~ youth who were in school and between 15- 19 yrs of age. Only 24.1% young adults in the same age group who were out of school were caries free.

There was very little difference within each sex whether in school or out of school. Between the sexes, more females both in and out of school were free from caries than males. More urban (47.8%) than rural (25.4%) youth were also free from caries.

6.3 Periodontal Disease Status.

Table 4. Distribution of CPITN Scores in and out of school by age group, sex and locality.

	CPITN SCORES							
	N SCHOOL N = 292				OUT OF SCHOOL N = 266			
	0	1	2	2+	0	1	2	2+
AGE GROUP (YRS)								
15 – 19	52	2	194	16	6	0	53	16
20 – 24	0	0	17	1	5	0	74	18
25+	1	0	0	0	8	1	63	18
Missing	2	0	2	0	0	0	2	1
SEX								
Male	21	1	95	10	11	0	72	21
Female	34	1	119	7	8	1	120	32
LOCALITY								
Rural	9	1	62	7	9	0	76	16
Urban	46	1	152	10	10	1	116	37
TOTAL	55	2	214	17	19	1	192	53

There was a significant difference between young adults in and out of school with regards to periodontal disease and oral hygiene status (p = 0.0).

55 (18.8%) of those in school and 19 (7.2%) of those who were out of school had healthy mouths (i.e. CPITN = 0 / no calculus and no bleeding),

Out of those in school, more were females 34 (11.6%) than males 21 (7.2%) and out of those in school more young adults urban locality 15.8% had healthy mouths than young adults of rural localities 3.1 %.

Among those who were out of school locality did not seem to make any difference to periodontal disease and oral hygiene status.

6.4 Mal- occlusion Status

Table 5.Mal-occlusion Status by School attendance.

	In School		Out of School		Total	
	N = 292	%	N = 266	%	N = 558	%
Normal	270	92.5	242	91.0	512	91.8
Moderate	17	5.8	20	7.5	37	6.6
Severe	4	1.4	2	0.8	6	1.1
Missing	1	0.3	2	0.8	3	0.5

Table 6. Perception of badly arranged teeth by school attendance.

	In School		Out of School		Total	
	N = 292	%	N = 266	%	N = 558	%
No	280.0	95.9	259.0	97.4	539	96.6
Yes	8.0	2.7	3.0	1.1	11.0	2.1
Missing	4.0	1.0	4.0	2.0	8.0	1.4

Generally there was a low prevalence of mal- occlusion the population.

91.8% were normal, distributed evenly between young adults in school and those who were out of school. Perception of mal- occlusion was also low 2.1%, although it was higher in school attending youth (2.7%) than in those who do not attend (1.1 %).

This difference was not found to be statistically significant, however ($p = 0.16$).

6.5 Status of Fractured Anterior/Incisor Teeth

Table 7. Distribution of fractured teeth by school attendance.

	In School		Out of School		Total	
	N = 292	%	N = 266	%	N = 558	%
Absent	281	96.2	259	97.4	540	96.8
Present	10	3.4	5	1.9	15	2.7
Total	1	0.0	2	0.8	3	0.5

Table 8. Treatment Status of fractured teeth by school attendance

	In School		Out of School		Total	
	N = 10	%	N = 5	%	N = 15	%
Present, not treated and no problem	8	80.0	4	80.0	12	80.0
Present treated with no problem	0	0.0	0	0.0	0.0	0.0
Present not treated with problem	1	10.0	1	12.0	2	13.3
Present treated with problem	1	10.0	0	0.0	1	8.3

Only 2.7% of the young adults had fractured teeth i.e. 15 young adults, 80% of them had had no treatment and the teeth were not found to be visually problematic.

No young adults out of school had had treatment for fractured incisors. 10% of school attending young adults had had treatment.

6.5 Prosthetic Need and Status in the upper jaw.

	In School		Out of School		Total	
	N = 292	%	N = 266	%	N = 558	%
Pros. Need						
No	290	99.3	255	95.9	545	97.7
Yes	0	0.0	5	1.9	5	0.9
Missing	2	0.7	6	2.3	8	0.1
Pros. Status						
No	289	99.0	258	97.0	547	98.0
Yes	1	0.3	2	0.8	3	0.8
Missing	2	0.7	6	2.3	8	1.4

The need for prosthetic was low in young adults who were in school and out of school (0.9%). Few of them (0.8%) had been provided with prosthetic for their missing teeth.

6.6 Oral cleansing behaviour

6.6.1 Use of toothpaste

Table 10. Use of toothpaste by school attendance

	In School		Out of School		Total	
	N = 292	%	N = 266	%	N = 558	%
Toothpaste use						
No	3	1.0	20	7.5	23	4.1
Yes	289	99.0	246	92.5	535	95.9
Total	292		266		558	

Most young adults (95.9%) reported that they used toothpaste. 7.5% of young adults who were out of school said they did not use toothpaste. The difference was found to be statistically significant. (p=0.002).

The brands of toothpaste preferred were pepsodent, Close-Up and Anitadent. Pepsodent and Close-Up were preferred mostly by young adults who were in school, whereas the majority of young adults who preferred Anitadent (83%) were out of school.

6.6.2 Frequency of oral / tooth cleansing

Table 11: Frequency of Oral/Tooth Cleaning by School attendance

	In School		Out of School		Total	
Frequency of cleansing teeth	N = 292	%	N = 266	%	N = 558	%
More than twice a day	3	1.0	8	3.0	11	2.0
Twice a day	153	52.4	161	60.5	314	56.3
Once a day	120	41.1	95	35.7	215	38.5
Once a week	16	5.5	2	0.8	18	3.2
Total	292		266		558	

The difference in frequency of oral/tooth cleansing between school attending and non-attending young adults was statistically significant (p=0.002).

The majority of young adults (both in, 52.4% and out, 60.5% of school) cleaned twice a day. However more young adult in school (41.1%) cleaned once a day than those who were out of school (35.7%).

Table 12:frequency of Mouth Rinsing after food.

	In School		Out of School		Total	
Mouth rinsing	N = 292	%	N = 266	%	N = 558	%
Do not rinse mouth	142	48.6	86	32.3	228	40.9
Rinse mouth	147	50.3	179	67.3	326	58.6
Missing	3	1.0	1	0.4	4	0.7

58.6% claimed to rinse their mouth with water after food. 67.3% of them were out of school and 50.3% were in school.

6.7.3 Information on care of teeth

39% of the total population claimed to have obtained information on care of their teeth from their parents. Teachers were the next significant source of information, followed by radio and television and health personnel. Newspapers were generally not an important source of information on oral/dental care in this population. There was not much difference between young adults who were in school and out of school with regards to the source of information on oral / dental care.

6.8 Treatment seeking habits

6.8.1 Dental visits

Table 13 Frequency of Dental visits

	In School		Out of School		Total	
Dental visit	N = 292	%	N = 266	%	N = 558	%
No Dental visit	236	80.8	233	87.6	469	84.1
Had Dental Visit	55	18.8	32	12.0	87	15.6
No response	1	0.3	1	0.4	2	0.4

Only 15.6% of the total population had ever visited the dentist. Out of this number 6.4% had visited only once in their lifetime. Only 2.3% had visited this year. Most had visited Achimota Hospital, which is close to the Ga district. A significant larger ($p=0.02$) proportion of young adults in school (18.8%) had visited the dentist than those who were not in school (12.0%).

6.8.2 Treatment of toothache

Table 14. Frequency of various types of toothpaste treatment sought

	In School		Out of School		Total	
Type of treatment	N = 100	%	N = 94	%	N = 194	%
Nothing was done	28	28.0	40	42.6	68	35.1
Went to Hospital	41	41.0	19	20.2	60	31.0
Home/self treatment	31	31.0	35	37.2	66	34.0

Only 34.0% of the young adult who were reported ever having toothache. 42.6% of young adults who were out of school and 28.0% of those who were in school sought not treatment at all for their toothache.

6.9 Eating habits

Table 15. Frequency of Toffee and Chewing gum consumption by school attendance.

	In School		Out of School		Total	
	N = 292	%	N = 266	%	N = 558	%
TOFFEE						
Everyday	104	35.6	40	15.0	144	25.8
Once a week	67	23.0	83	31.2	150	26.9
More than once a week	47	16.1	30	11.3	77	13.8
Never or rarely	70	24.0	111	41.7	181	32.4
Missing	4	1.4	2	0.8	6	1.1
CHEWING GUM						
Everyday	107	36.6	67	25.2	174	31.2
Once a week	76	26.0	71	26.7	147	26.3
More than once a week	35	8.6	38	14.3	73	13.1
Never or rarely	83	28.4	85	32.0	168	30.1
Missing	1	0.3	5	1.9	6	1.1

35.6% and 36.6% of young adults who were in school consumed toffee and chewing gum respectively everyday, compared to 15.0% and 25.5% of young adults who were out of school. 24.0% and 28.4% who were in school reported that they rarely/never consumed toffee or chewing gum, where as 41.7& and 32.0% out of school reported rarely/never consuming toffee or chewing gum.

CHAPTER FIVE

DISCUSSION

Using the principal examiner as a gold standard, a reliability test was used to establish agreement between the ratings of each examiner from the calibration exercise. Using the left and right first lower molars a range of reliability coefficients kappa, of 0.62 to 1.00 was obtained (ref. Appendix 6). This signifies a high reliability or agreement between the examiners and the gold standard [35].

Dental Caries.

The present study reports low caries prevalence among young adults in the Ga district of the Greater Accra region. This is the pattern of caries experience in Ghana and most developing countries [10, 14]. The mean DMFT value of 0.63 -*Table2* -and caries free population of 73.3% -*Table* 3- is comparable to the value of 0.69 found by Addo- Yobo et al among urban children in Accra and Kumasi [5].

Generally caries experience was higher among non-school attending young adults than those who attended school. This may be due to the fact that the non- attending young adults were slightly older (mean age 22 years.) than those who were in school (mean age 17years). Caries prevalence generally, increases with age! The longer the teeth stay in the mouth the more susceptible they are to caries. Another explanation may be the fact that young adults in the older age groups tend to be excluded from any outreach programs that may be carried out in the district on oral care. This is because such programs are usually targeted at school children who are believed to be easier to assemble and organise. Being out of school, they are also less under the influence and supervision of their parents and teachers (who were found in this study to be the most prominent source of oral health care information). These explanations are corroborated by the fact that caries experience was found to be greater among young adults who were out of school than those who were in school. Another explanation could be that, young adults who are in school are influenced by their peers to a larger extent than those who are out of school. As they spend longer periods together fads and habits tend to spread more easily among school- going young adults.

As was expected the decayed component of the mean DMFT accounted for most of the caries experience -*Table* 2-. It was particularly high (0.73) among the over 25 years age group who were out of school.

Very little of the missing and even less of the filled component were found - *Table2*-. Among youth who were out of school no fillings at all were found. This is not surprising as there are

no dental services available to the inhabitants of the district! It was interesting to note that a significantly large -contribution by the missing component of the DMFT was found among the non-school attending young adults. This might indicate the presence "quacks".

Only 16% of the population, 19% of school going youth and 12% of out of school youth -*Table* 13- reported ever visiting a dentist! 34% of the study population reported ever having toothache. When questioned further to find out what type of treatment or remedy was sought for these toothaches, 34% reported having had some form of self- medication, 35% did nothing and 31% had orthodox medical/dental treatment -*Table* 14-. Achimota hospital, which has the nearest dental clinic, was attended most often. The majority of those who did nothing and those who had home/self-medication were out of school.41% of young adults in school and 20% of those out of school went to hospital. These observations may be explained by lack of awareness of the services available or funds to access them.

Caries prevalence is usually found to be lower among rural than urban populations [5], because of the lower consumption of refined carbohydrates in the rural areas [4] The caries prevalence, DMFT of 0.52 in the rural young adults was not significantly different from the value of 0.69 -*Table* 2- obtained for the urban young adults ($p = 0.15$). This could be due to the economic hardship of the past 25 years or so, which has caused many Ghanaians to resort to the less expensive local dishes, which have been shown to have little or no cariogenic potential. This makes the diet in rural and urban areas similar in content.

The higher prevalence of caries in females than males –*Table 2*- (although not statistically significant) is explained by the observation that tooth eruption in women occurs slightly earlier than in men. This added period of exposure in the mouth makes the teeth susceptible to caries.

An appreciable proportion of young adults reported rinsing their mouths with water after eating –*Table 12* -.This is a good habit although not always practicable (which probably explains why it was not as common in the young adults who were in school as those who were out). Rinsing the mouth after food reduces tooth decay by preventing food remnants from stagnating around the teeth. No relationship between the proportion of students who rinsed their mouths after eating and caries experience could be established.

Periodontal disease.

CPITN scores indicated poor state of oral hygiene among young adults in the district. The finding of 86% with calculus deposits and only 13% with healthy mouths -*Table* 4- is comparable with other studies in similar environments [4, 17]. Those in school had healthier mouths free from bleeding and calculus deposits (18%) than those out of school (7.2%).

The toothbrush was found to be the most common cleaning implement. This was different from the finding of Addo- Yobo et al [17], where only 46% of children attending government/public schools reported the use of toothbrushes. It was surprising however that more people did not report the use of the traditional tooth cleaning implements (chewing sticks and sponges) in a community that is so predominantly of low socio- economic status. The proximity to Accra (where most workers living in the district comminute to and from work everyday) might account for this departure from what is expected.

Pepsodent and Close -up were the most fayoured brands of toothpaste among young adults who were in school. This agrees with findings of an unpublished study conducted among student nurses by Bruce in 2002[31]. Anitadent toothpaste, which is a much cheaper brand, was used more commonly by 83% of young adults who were out of school.

About half the population (56%) claimed to clean their mouths twice a day – *Table 11* - This claim however was not found to have any significant effect on their oral hygiene status! However school-attending young adults tended to clean their mouths only once a day.

Females, in this study had more periodontal disease and poorer oral hygiene than males - *Table4* -. Although the difference was not statistically significant, this was not the finding of similar studies in Ghana [36, 4], as women are believed to take better care of their teeth than their male counterparts. Those in school fared only slightly better than those out of school. However when considering the few (about 9%) clean mouths with no deposits or bleeding at all, females (especially those in school) fared better than males.

Ninety-six percent (96%) of the total population maintained their full set of teeth, which is higher than the WHO goal of 85% in eighteen-year olds[2].

Prosthetic status and need was very low as few missing teeth were recorded in the first place -*Table* 2 – .Young adults who were out of school had more missing teeth although they had fewer dental visits, this might be explained by the fact that they report only when they are in extreme pain and there is no option but extraction.

Very few young adults were assessed with moderate or severe mal-occlusion. Perception of badly arranged teeth among the young adults themselves was even lower -*Table* 6-, which is not surprising considering that no dental services are available in the district and the fact of their low socio-economic status. Perception of badly arranged teeth was higher among school attending youth.

The low number of fractured anterior teeth (2.7%) –*Table 7* -recorded was also not surprising as a cursory look at the schools within the district revealed very few play grounds. With the introduction of the Junior and Senior Secondary School system much emphasis is placed on academic pursuits to the disadvantage of games and physical activities. When not in school many children engage in hawking, farming, sand winning etc to augment the family income this has reduced to a large extent the usual rough and tumble of children and youth. School attending young adults had more fractured anterior teeth, and treatment for fractured teeth was observed only in young adults who were attending school. This again might be because they can afford such treatment as they are still catered for by their parents, which is rarely the case for those out of school. In school, peers might tease one with a fractured or missing tooth whereas in those out of school it might be accepted or over-looked.

No cleft lip or palate was observed among the population of 558 young adults.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

This study clearly shows the Ga district as disadvantaged in terms of availability of oral health care to the young adults and the whole population at large. Young adults who do not go to school were found to be even more disadvantaged as they are unable to access the few outreach programs that may occasionally be carried out in the district by various organizations or private individuals.

Young adults who were involved mainly in learning trades or doing menial jobs are unable to afford oral health care services, which are available only in hospitals outside the district at e.g. Achimota or Ridge hospital.

This study shows that because they are no more solely under the supervision of parents and teachers their awareness of and access to services that are available is low.

This study provides valuable data on the oral health status of youth in the Ga district of the Greater Accra region. It should serve as a reliable source of information on which provision of oral health services to the region may be founded. It may also be used for comparison of the oral health status of young adults in other similar environments where WHO standard methods have been used in data collection.

Based on these findings, intervention programs focusing on primary oral health care and prevention are highly recommended for the Ga district in the short term. This must consist of:

1. Introduction of oral hygiene education (including the teaching of proper tooth cleaning techniques) at the community level i.e. ante natal clinics, child welfare clinics, outreach programs at schools and community meeting places. Teachers and community health nurses should be trained to initiate these programs as soon as possible.
2. Prophylaxis and plaque control (consisting of scaling and polishing). This would take a longer time to implement, as it would involve more intensive training of staff and acquisition of instruments and materials. These services can be provided eventually at the health centers and some outreach points.
3. Atraumatic restorative therapy could be utilized at the health centers and outreach points for filling of simple carious lesions. Here also, nurses could be trained to provide the service.

4. Oral health care is often expensive and beyond the reach of the majority of people of low Socio-Economic Status (SES). These services will therefore need to be subsidized.

In the medium and long term, plans to upgrade the Amasaman health center to a district hospital must be expedited. A dental clinic is expected to be established and dental staff employed as part of that plan. With the infrastructure in place the following services will be provided:

i. amalgam fillings can be provided at subsidized rates.
ii. dental extractions either of grossly carious teeth or from other causes.
iii. root canal therapy and cosmetic fillings.
iv. x-ray facilities would be required in the medium to long term.
v. a small dental laboratory is also visualized where acrylic dentures can be fabricated for replacement of missing teeth. Simple removable orthodontic appliances could also be fabricated as and when needed.

There must be collaboration between the Ga district Assembly and the District Health Management with non- government organizations and private dental practitioners who may be able to assist in providing services to improve the oral health status of the population. There must be continued monitoring of the oral health status of the population so that the programs instituted may be evaluated and modified as the need arises.

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APPENDIX ONE

SECTION A: Questionnaire

1. I. D. :..... Name.....
2. Sex: 1[M], 2[F]
3. Age:.....
4. Tribe.....
5. Name of School.....
6. Name of village/locality.....

7. What is the educational level of your father, stepfather or guardian?

[1]	PRIMARY SCHOOL	[5]	VOCATIONAL TRAINING
[2]	MIDDLE SCHOOL	[6]	NO SCHOOLING
[3]	SECONDARY SCHOOL	[7]	NO ADULT MALE IN THE HOUSE
[4]	TERTIARY EDUCATION		

8. What is his occupation / work?.....
9. What is the educational level of your mother?

[1]	PRIMARY SCHOOL	[5]	VOCATIONAL TRAINING
[2]	MIDDLE SCHOOL	[6]	NO SCHOOLING
[3]	SECONDARY SCHOOL	[7]	NO ADULT MALE IN THE HOUSE
[4]	TERTIARY EDUCATION		

10. What is her occupation / work? .....
11. Have you ever had toothache / pain from your teeth? [1] YES [2] NO

    If yes, what was done to stop the pain?

    [1] NOTHING [2] WENT TO HOSPITAL/HEALTH CENTER

    [3] TOOK SOME MEDICINE [4] PUT SOME MEDICINE ON THE TOOTH

    [5] PUT SOME HERBS ON THE TOOTH

    [6] RINSED MY MOUTH WITH SALT WATER/MEDICINE IN WATER/WARM WATER
12. Have you ever been to a dentist? [1] YES [2] NO
13. If yes where? .....
14. If yes when?.....

[1]	THIS YEAR	[2]	LAST YEAR
[3]	MORE THAN TWO YEARS AGO	[4]	DON'T REMEMBER

15. How many times have you been to a dentist within the past five years?

[1] ONCE [2] TWICE

[3] MORE THAN TWICE [4] DON'T REMEMBER

16. How often do you clean your teeth?

[1] NEVER [2] TWICE A DAY

[3] ONCE A WEEK [4] ONCE A DAY

[5] MORE THAN TWICE A DAY

17. What do you use to clean you teeth?

[1] CHEWING STICK [2] CHEWING SPONGE

[3] TOOTHBRUSH [4] PLANTAIN STALK

[5] COTTON PLANT LEAVES [6] ANY OTHER (Specify).....

18. Do you use toothpaste? [1] YES [2] NO

19. If yes what type / brand do you use?.....

20. How often do you eat any of these food? (tick)

	Everyday	**Once a week**	**More than once a week**	**Never**
1. Fresh fruit				
2. Coke or other soft drink/mineral				
3. Chewing gum				
4. Toffees				
5. Biscuit. Cakes etc				
6. Tea with sugar				

21. Do you rinse your mouth after eating? [1] YES [2] NO

22. From which of the following did you learn about taking care of your teeth? (Tick more than one if needed)

[1] FRIENDS [2] PARENTS [3] TEACHERS

[4] NURSE [5] DOCTOR [6] DENTIST

[7] TV / RADIO [8] NEWSPAPER / MAGAZINE

[9] OTHER (Specify).....

23. Do you avoid smiling because of your teeth? [1] YES [2] NO

24. To which ethnic group do you belong?.....

25. What is your religion?.....

THAN YOU VERY MUCH!!!!!!!!!!!!!!!!!!!!!!!!

ORAL HEALTH ASSESSMENT FROM FOR STUDY ON ORAL HEALTH NEEDS OF YOUTH IN GA DISTRICT.

SECTION B – Clinical Examination

Name.....

Sex: [M], [F]

I.D. .....

COMMUNITY PERIODONTAL INDEX

16/17	11	26/27
46/47	31	36/37

0= Healthy, 1=Bleeding, 2=Calculus, X=Excluded quadrant, 9=Not recorded

C. *DEFINITION STATUS AND TREATMENT NEED*

	18	17	15	14	13	12	11	21	22	23	24	25	26	27	28
Cr															
Rt															
Rx															

Cr – Crown, Rt – Root, Rx – Treatment

	48	47	45	44	43	42	41	31	32	33	34	35	36	37	38
Cr															
Rt															
Rx															

Primary Teeth Crown	Perm. Teeth Crown	Perm. Teeth Root	Status	Treatment
A	0	0	Sound	O – None
B	1	1	Decayed	P=Preventive caries arresting care
C	2	2	Filled with decay	F=Fissure sealant
D	3	3	Filled no decay	1=One surface filling
E	4		Missing as a result caries	2=Two or more surface filling
F	5		Missing, any other reason	3= Crown for any reason
G	6		Fissure sealant	4=Veneer or laminate
	7	7	Bridge abutment, special crown	5= Pulp care & restoration
T	T		Un-erupted tooth unexpected root	7= Need for other care, specify .....
	9	9	Trauma (fracture)	
			Not recorded	9=Not recorded

D. *PROSTHETIC STATUS*

Upper Lower

[0] No prosthesis [1] Bridge [2] More than one bridge

[3] Partial denture [4] Both bridge & partial denture prosthesis

[5] Full removable denture [9] Not recorded

E. *PROSTHETIC NEED*

Upper Lower

[0] No prosthesis needed [1] Need for one unit prosthesis

[2] Need for multi unit prosthesis [3] Need for a combination of on-&/or multi-unit

[4] Need for full prosthesis denture prosthesis [9] Not recorded

F: *HANDICAPPING DENTO-FACIAL ANOMALIES*

[0] Absent, [1] Present, treated, [2] Present, not treated

1= CLEFT PALATE

2= CLEFT LIP

G. *INJURIES TO INCISOR*

1. FRACTURED INCISOR

[1] Present [0] Absent

2. TOOTH / TEETH INVOLVED

[0] Absent

[1] Present, treated without problem

[2] Present, not treated, no problem

[3] Present, not treated, with problem, (sinus, abcess, discolourtion)

H. *MAL OCCLUSION*

[0] No anomaly or mal occlusion

[1] Slight anomaly e.g. one or more rotated or tilted teeth or slight crowding or spacing which disturbs the regular alignment of the teeth.

[2] More serious anomalies, specifically the presence of one or more of the following conditions of the four anterior incisors:- maxillary over-jet, anterior cross-bite equal to or greater than a full tooth depth

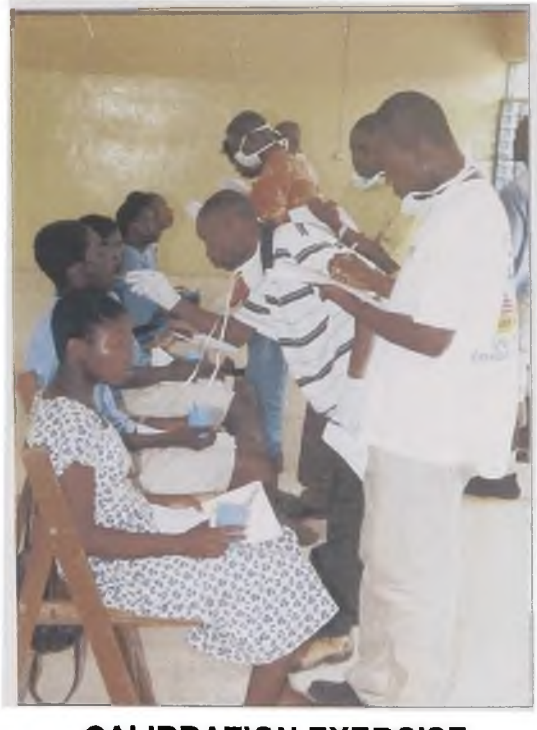
- open bite
- mid-line shift estimated to be more than 4mm; and
- crowding or spacing estimated to be more than 4mm.

APPENDIX TWO

SCENE AT DOME (OUT OF SCHOOL YOUTH)

SCENE AT AMASAMAN SECONDARY TECHNICAL SCHOOL

SCENE AT FISE (OUT OF SCHOOL YOUTH)



CALIBRATION EXERCISE

APPENDIX THREE

PERIOD OF FIELD STUDY AND WORK PLAN IMPLEMENTATION

Time	MAY										
AUG. Activity											
8 15 22 29 5 12											
Procurement of stationery etc.	←	→									
Submission of research proposal	←	→									
Consultation with Ga DHMT DA communities		←	→								
Standardization and calibration of examiners				←	→						
Training of recorders				←	→						
Pretesting of questionnaires				←	→						
Procuring of equipment, instruments etc.		←	→								
Clinical examinations and questionnaire administration					←	→					
Reliability testing							←	→			
Analysis of data					←	→					
Write up and dissemination								←	→		
Submission of dissertation											← →

Activity	
1. Procurement of stationery etc	May 29th – 5th June 2002
2. Submission of research proposal	May 26th , 2002
3. Consultation with Ga DHMT, DA & communities	June 3rd – 10th, 2002
4. Standardization and calibration of examiners	June 17th – 19th, 2002
5.. Training of recorders	June 20th, 2002
6. Pretesting of questionnaires	June 21st, 2002
7. Procurements of equipments and instruments	June 3rd – 21st, 2002
8. Clinical examinations and questionnaire administration	June 24th – July 5th 2002
9. Reliability Testing	July 15th, 2002
10. Analysis of data	June 24th – July 19th, 2002
11. Write up and dissemination	July 15th Aug. 19th, 2002
12. Submission of dissertation	Aug. 12th 2002

APPENDIX FOUR

GHANA EDUCATION SERVICE

In case of reply the number and date of this letter should be quoted

My Ref. No. GES/GD/2/45/Vol.3/38

Your Ref. No. .....

REPUBLIC OF GHANA

DISTRICT EDUCATION OFFICE
GA DISTRICT
P. O. BOX 80,
AMASAMAN.
13TH JUNE, 2002.

LETTER OF INTRODUCTION - DR. EMILY ONUOHA

The above-named student from the School of Public Health, Legon, is carrying out a study on the Oral Health Treatment Needs of Youth in the Ga District.

She will conduct a survey on the oral health status of students in your school.

It would, therefore, be appreciated if you could allow her to examine a section of the students in your school.

Thank you for your usual co-operation.

(JOANA OFORI (MS)
DIRECTOR OF EDUCATION
GA DISTRICT

1. THE HEADMISTRESS,
   ST. JOHN'S GRAMMAR SCHOOL,
   ACHIMOTA.
2. THE HEADMASTER,
   AMASAMAN SEC./TECH. SCHOOL,
   AMASAMAN.

APPENDIX FIVE

REFERRAL FORM

NAME:..... **AGE:**.....

DATE:..... **SEX:**.....

The above condition was detected during screening exercise held in the Ga District.

He /She is being referred to you for appropriate management.

Thank you.

District Director of Health
Ga District.

APPENDIX SIX

Calibration Exercise

Table 16. Kappa scores of examiners against the gold standard using the right lower first molar (T46) and the left first molar (T36) teeth.

Examiner	**Kappa Score**	**P-Value**
	N = 292	**%**
Using T46		
1	0.62	0.035
2	0.62	0.035
3	1.0	0.002
4	1.0	0.002
5	1.0	0.002
6	1.0	0.002
7	1.0	0.002
8	1.0	0.002
Using T36		
1	1.0	0.002
2	1.0	0.002
3	1.0	0.002
4	1.0	0.002
5	1.0	0.002
6	1.0	0.002
7	1.0	0.002
8	1.0	0.002

Agreement between the gold standard and all other examiners was high i.e. (Kappa = 0.62 – 1.00).

Agreement was found to be significant (i.e. p=0.002 – 0.035).