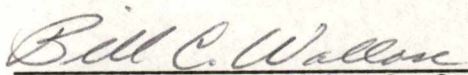
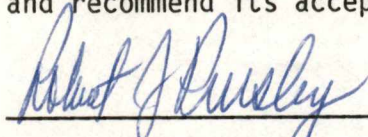


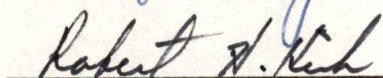
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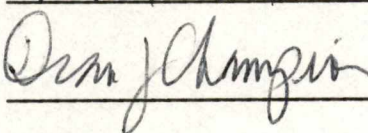
I am submitting herewith a dissertation written by Bonnie P. Strickland entitled "A Study to Estimate the Dental Needs and Costs of Adding Dental Care Service for the Ambulatory Elderly to Medicaid in the State of Tennessee." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Health Education.


Bill C. Wallace, Major Professor

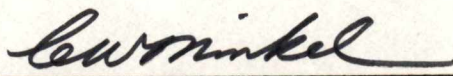
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The Graduate School

A STUDY TO ESTIMATE THE DENTAL NEEDS AND COSTS OF ADDING
DENTAL CARE SERVICE FOR THE AMBULATORY ELDERLY
TO MEDICAID IN THE STATE OF TENNESSEE

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Bonnie P. Strickland

August 1984

DEDICATION

This study is dedicated to my children, Jan, Karen, Jack, Doug, and David, for their love and devotion. Without their cooperation, this study would have not become a reality.

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ABSTRACT

The purpose of this study was to estimate the dental needs and costs of services if added to Medicaid in the state of Tennessee. The research objectives encompassed socioeconomic characteristics of the elderly; the kinds of dental services required by those persons selected for inclusion in the subsequent sample examined and what costs would accrue to the state for adding these dental services to the existing Medicaid program.

The data were collected using both an interview schedule and an oral inspection form. Both of these forms were devised by the researcher for information covering: 1) dental behavior of the elderly in the sample; 2) dental utilization of the elderly; 3) perceived dental care; and 4) actual condition of the oral cavity.

The population consisted of 313 elderly persons who attended three senior citizen's centers in Memphis, Nashville, and Greeneville. There were 119 males and 194 females. Of the 313 persons, 248 were white and 65 were black. Results of this study were presented by descriptive research methods and the use of chi square analysis, the t test, the analysis of variance F test, and the Scheffe procedure for determining significant differences between pairs of ordered means.

The results of the study showed no differences in the quality of oral health of the sample between the three centers tested. The findings indicated that more education and higher incomes were associated with better dental health and the majority of the persons covered by Medicaid were black and from among the lower socioeconomic

occupational categories, having yearly incomes of less than \$10,000. Only 16 percent of the respondents indicated a need for dental services that they could not obtain. This fact and the fact that most of the 313 respondents indicated a willingness to pay some of the dental costs would, in addition reduce the total expenditure to the state of Tennessee.

It was concluded that most of the respondents had fairly good dental health and that the dental problems of the elderly are much the same throughout the state. The primary problem confronting relatively few of the participants was their inability to afford needed dental services.

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CHAPTER I

INTRODUCTION

The elderly population consisting of persons 65 years of age or older is growing substantially every year in the United States. In 1981, for instance, the elderly made up approximately 12 percent of the population. From 1980 to 1982, the elderly population increased 9.1 percent compared with other age categories (U.S. Bureau of the Census, 1981). Gordon (1972) reveals that the elderly population has grown over 600 percent during this century. Current estimates place the number of elderly in our population at about 25 million persons. This aggregate is projected to reach 32 million persons by the year 2000 (Somers, 1981), and by the year 2030, it is estimated that as many as 53 percent of the population could be in the age 65 or over category (Clark, 1983).

Current demographic projects suggest that this growth rate will accelerate well into the twenty-first century (U.S. Bureau of the Census, 1977). The elderly are living longer. As we are faced with increasing numbers of elderly persons, new and different kinds of problems are confronting health personnel. There is much evidence to indicate that the general physical, mental, dental, and emotional health of the elderly is substantially different from the rest of the population to necessitate special consideration in the planning and delivery of health care services (American Dental Association, 1980).

Poor oral health is not an inevitable concomitant of aging,

although aging does exert several deleterious effects on a person's overall health. Much effort has been expended by many interest groups nationally to improve the general dental health of the American people through water fluoridation, improved restorative materials, and better dental health education. While the general aims of these programs and activities have focused on the young in the population, it is apparent that the general oral health of the elderly has been indirectly affected as well.

It is interesting to note that approximately 40 percent of the elderly population have retained most of their natural teeth compared with the elderly of previous decades. As more of the elderly population retain their natural teeth and are not edentulous (without teeth), there will be an accompanying increase in the demand for more complex restorative dental services among these persons. These services will be costly, and it is projected that many of the elderly seeking such services will be faced with a greater financial burden. Given the fact that for many of the elderly, they subsist on fixed incomes, the prospect of escalating dental costs is something many of them are or will be unable to bear. Within the context of the growing dental needs of the elderly in our society, the present study was formulated.

Available data suggest that the current level of utilization of dental services provided for the elderly is directly affected by the amount of their disposable income available (American Dental Association, 1977). For instance, it has been shown that elderly persons who earn less than \$10,000 annually have not visited a dentist for the

most recent three-year period (American Dental Association, 1977). In fact, many of these persons have not utilized the services of a dentist for over 10 years. It is clear that out-of-pocket expenses for dental care pose a significant obstacle to the elderly population. While these persons may be quite interested in seeking regular dental care and have positive orientations toward dental health, they often lack the necessary funds to acquire the needed dental services. One of the greatest ironies is that the elderly face the greatest risk of oral diseases at that stage of their lives when they are least able to afford proper preventive treatment (Kiyak, 1981).

In 1965, Congress reacted to the growing concern of health professionals and smaller legislative bodies for the health needs of our elderly by passing Title XIII, Medicare, an amendment to the Social Security Act. While many health benefits were extended to the elderly as a result of this Congressional action, these benefits were not evenly distributed to encompass all of their health needs. One major limitation of Title XIII pertained to dental care, the costs associated with routine dental treatment, and expenditures for dentures. Such services were not included within the scope of Medicare benefits. Medicare was specifically limited to oral surgical procedures, the reduction of jaw fractures, and other direct services performed in hospital settings.

One alternative to Medicare is Medicaid, a program designed for those individuals unable to afford regular medical services and financed jointly by both the state and federal government. This program contains certain dental benefits that are optional on a state

by state basis. Because many of the dental services needed by the elderly are not specifically covered by Medicare and are only optional under Medicaid depending on the state, it is not surprising that only 3 percent of the \$1.4 million spent on dental care for the elderly in 1978 was paid by public funds (Hehn, 1981). In 1982, only 29 of the 50 states extended limited dental services to the elderly (American Dental Association, 1983). Tennessee presently extends dental benefits through Medicaid only to those persons 21 years of age or younger. Some states provide dental care through programs such as "Senior Dent." This program enables the elderly to call a toll free number for referral to local dentists who will treat them at reduced fees. Illinois is only one of the states that now offers this program (Journal of the American Dental Association, 1983). However, no provisions currently exist for extending necessary dental services to the elderly in the state. This is true in spite of the fact that there are numerous elderly persons in Tennessee who would benefit greatly if dental services were made available through a supplementary dental insurance program such as either Medicaid or Medicare. Obviously, the future quality of dental care for the elderly in the state will largely depend upon the availability of financial resources and the extent to which such dental services are used by the elderly.

It is apparent that dental health is only one facet of total general health, but its significance is enhanced by its many benefits. For instance, good dental health influences one's phonetic quality in verbal communication. The aesthetic value of a healthy dentition has long been recognized as an essential component of the most pleasant of

human facial expressions--the smile. One's self-esteem derives in part from one's appearance. The presence or absence of unsightly teeth makes a considerable difference in one's social encounters. Other psychological effects of proper (or improper) dentition have long been recognized. Of course, gustatory pleasures can be enhanced by good dentition and complete mastication is essential for maintaining dining pleasure and enhancing one's nutrition (Gordon, 1972). Therefore, the advantages of good oral health associated with the prevention, detection, and restoration of the teeth are readily apparent. Dental health must be considered to be an important component of a total health care program for the elderly.

Several studies of the oral health conditions of elderly populations in other states reflect some of Tennessee's current problems. For instance, Banting (1972) studied the dental care, cost, time, and treatment requirements of the elderly living in Hamilton, Ontario, Canada. Also, Grabowski and Bertram (1975) and Rise and Heloe (1978) investigated the oral conditions of the elderly persons living in Denmark and Norway. Studies of the long-term care facilities for the elderly have consistently revealed a lack of dental care and services for these persons (Ketron, 1979; American Dental Association, 1980). Wilson's (1978) research also recognized the lack of dental treatment of many elderly persons in nursing homes. The American Dental Association conducted a study of 25 nursing homes in the United States and found that 10 percent of the elderly in these institutions desired or needed dental services but were unable to receive such services. In a related study of Vermont nursing home facilities, it was revealed that

about 66.7 percent of the residents who had a variety of oral problems indicated that they would accept dental services if provided (Taylor, 1980). A survey of nursing home residents in Dubuque found 61 percent who thought they needed dental care (Simpson, 1979).

During the period 1957 to 1961, the Division of Dental Public Health of the U.S. Public Health Service (in conjunction with Community Studies, Inc.) revealed that about 70 percent of the nursing home residents studied would accept dental treatment if offered; that persons under 75 years of age would accept treatment more frequently than people over 75 years of age (Kegeles, 1966).

Evidence from these and other researchers indicate that the dental and oral care of the elderly is poor and that many are in need of dental services. Like Tennessee, these various cities and counties fail to include the elderly in their programs designed to meet the dental needs of the general population.

The Vermont study mentioned earlier indicated through a survey that a large proportion of the residents of nursing homes in that state were edentulous, had fairly simple oral hygiene programs, and a majority had not visited a dentist recently. However, this group also indicated that they did not feel any real interest in or need for dental care (Taylor, 1980).

One measure of the cultural advancement of any society is how it provides for its elderly population. Some social systems recognize the need for investing in the health education of its youth who are destined to become the citizens of the future. But what about the elderly? Medical and biological achievements have extended the life

span. As people age, their frequency of diseases often increases. This results in a greater need for more extensive dental services and treatment.

In 1981, the White House Conference on Aging urged the expansion of both Medicare and Medicaid to include dental care. If these additional finances are not made available for the elderly, this segment of the population will continue to suffer from inadequate dental care.

A. PURPOSE OF THE STUDY

The purpose of this study was to provide an estimate of the need and costs for the state of Tennessee to add dental health services for the elderly through Medicaid.

B. STATEMENT OF THE PROBLEM

The dental health needs of all Tennessee residents are important. Current health programs in Tennessee do not make provisions for dental health services for the elderly. One reason for this is the "lack of accurate data" related to the actual dollar costs of such a program. As a result, the elderly of Tennessee continue to bear the burden of more expensive dental health services. Given their fixed incomes and growing oral health needs, the present study seeks to answer the following questions:

1. What types of dental services are needed by the elderly in Tennessee?
2. Do the oral health needs of the elderly in Tennessee vary

according to geographical location, education, race, or socioeconomic status?

3. What are the estimated costs to the state of Tennessee for adding the elderly to Medicaid coverage in order to provide adequate dental health for a "comfortable" and functional mouth? (Table 1 provides a breakdown of the number of persons who are currently eligible for Medicaid coverage according to sex and age.)

TABLE 1
NUMBER OF PERSONS ELIGIBLE FOR MEDICAID
ACCORDING TO SEX AND AGE

Sex	Age	Number of Persons Eligible
Male		140,822
Female		253,381
Unknown		5,869
	0-5	69,711
	6-20	109,293
	21-64	120,888
	65 and over	100,180

Source: Tennessee State Medicaid Statistics Summary, June 1983.

C. RESEARCH OBJECTIVES

This study is designed to achieve the following objectives:

1. To survey a cross-section of the ambulatory elderly in Tennessee to determine their socioeconomic characteristics and overall dental health needs.
2. To investigate and delineate differences in the ambulatory elderly from specified areas of Tennessee to determine whether or not different dental programs should be devised to meet potentially different dental needs.
3. To estimate the approximate cost to Tennessee of adding needed dental services for the elderly to existing Medicaid service programs.
4. To propose specific dental services to be added to Medicaid based on a survey of the ambulatory elderly and examinations of their current dental health conditions.

D. BASIC ASSUMPTIONS

This research makes the following assumptions:

1. Given a randomly selected number of senior citizen centers in three major geographical areas of Tennessee (East Tennessee, Middle Tennessee, and West Tennessee), it is assumed that the respondents selected for participation in this study will be representative of the noninstitutionalized elderly population in Tennessee at-large.
2. It is assumed that respondents who participate will reveal

reliable information about their socioeconomic status, educational level, and general physical condition. Routine examinations by the researcher will serve to corroborate responses from the respondents.

3. It is assumed that a real problem exists for the elderly in Tennessee regarding their oral health needs and that this study can contribute to alleviating it.

E. DELIMITATIONS

The major delimitations of the present study are:

1. The study was restricted to persons 65 or older living in Shelby County (Greater Memphis, the catchment area served by the Lewis Senior Citizen's Center), Davidson County (Metro Nashville), and the Greene County area (Greeneville).
2. The sample was further delimited to those individuals who utilized the services of Roby Fitzgerald Adult Center in Greeneville, Tennessee, the Knowles Center in Nashville, and the Lewis Senior Citizen Center in Memphis.

F. NEED FOR THE STUDY

The steady growth of the elderly population in Tennessee is apparent. From 1970 to 1980, the elderly increased to 517,524, constituting an 11 percent increase over the 1970 figure (Tennessee Department of Public Health, State Center for Health Statistics, 1981). In 1982, about one-fifth of these persons or about 100,000

were eligible for Medicaid (Tennessee State Medicaid Statistics Summary, 1983).

A large portion of these eligible persons in the state are in need of rather extensive dental services. Kiyak (1981) has made a similar discovery in her investigation of the dental health needs of Washington residents. The increased risk of periodontal disease, tooth and bone loss, caries and specific oral disease associated with chronic diseases is evident among this segment of the population.

Compared with other age groups in the population, the elderly have the least to spend for dental services, and their fixed incomes are often barely above the poverty level (Gift, 1979). Their fixed incomes must not only cover their basic needs for housing, food, and clothing, but they must also meet their dental needs. More often than not, this is not possible. For instance, a government-sponsored study in 1979 showed that the elderly spend a very small portion of their health dollars for dental care compared with other age groups (National Center for Health Statistics, 1977). Although Medicaid does provide some coverage for basic health services, it does not include dental treatment for the elderly. State assistance programs include only those rehabilitative dental procedures for those individuals under 21 years of age.

G. DEFINITION OF TERMS

The following terms were defined as they pertain to the present study:

1. Comfortable mouth--a mouth that is functionable and free of pain.
2. Dental caries--a disease of the calcified structure of the teeth characterized by decalcification of the mineral components and dissolution of the organic matrix.
3. Dental diseases--periodontal disease and dental caries.
4. Dental services--any diagnostic, preventive, or corrective procedures administered by or under the supervision of a dentist in the practice of his/her profession. Such services include treatment of the teeth and associated structures of the oral cavity, and of the disease, injury, or impairment which may affect the oral and/or general health of the individual.
5. Dentition--a term that is used to designate the general character and arrangement of the teeth taken as a whole.
6. Dentures--artificial teeth that replace the natural teeth.
7. DMFS--index for measuring decayed, missing, or filled surfaces of permanent teeth.
8. Edentulous--without natural teeth.
9. Elderly--age 65 or older.
10. Geriatric dentistry--that branch of dentistry that treats all dental problems peculiar to the elderly.
11. Geriatric population--those persons 65 years of age or older.
12. Medicaid--a program to reimburse health providers for services to patients unable to afford routine medical

services and financed jointly by the state and federal governments.

13. Medicare--A government insurance program to provide medical care to those 65 years of age or older.
14. OHI (Oral Hygiene Index)--a system for assessing debris and calculus in the oral cavity.
15. Periodontal diseases--ailments of the gingiva and other tooth supporting structures of the mouth.
16. PI (Periodontal Index)--a system for measuring periodontal diseases in the oral cavity.

H. SUMMARY

In this chapter, the dental needs of the elderly, persons in the population aged 65 and older, were reviewed. Growing numbers of elderly retaining their own natural teeth suggest greater utilization of the services of dentists for normal and routine dental care.

It was observed that Medicaid furnishes financial assistance to the elderly for many illnesses and maladies. But dental services are not included in Medicaid. The state of Tennessee participates in Medicaid and does not cover dental services in its insurance plan either. It was determined that it would be useful to a certain proportion of needy elderly to have dental services added to Medicaid. Therefore, the cost of adding dental services to Medicaid for Tennessee elderly was believed important to estimate.

A study to investigate the estimated cost of dental services was implemented, together with a survey of Tennessee's elderly and

their particular dental needs and quality. Relevant terminology were discussed to be used in subsequent research.

CHAPTER II

REVIEW OF THE LITERATURE

As we have seen, the elderly in our society are often the most socially deprived category compared with other age groups. Because of various diseases and physiological ailments that befall the elderly, many of them are considered as "special category" patients by various health programs. Dentistry plays a key role in meeting certain of their needs beyond the relief of pain and discomfort, and it encompasses services that enhance the morale, well-being, and social acceptability of these persons.

Dental disease is not necessarily a function of age, but it is found in all segments of the population. However, many diseases of the oral cavity have been recognized as primarily diseases of younger or middle-aged individuals. The elderly person has been largely excluded by various programs designed to improve our nation's level of dental well-being. Included in dentistry's many responsibilities is the treatment and maintenance of the older population. The need for comprehensive and uniform programs in geriatric dentistry is underscored by a long-standing and well-documented history of dental neglect in older patients (Drake, 1970; Evashwick, Conrad, and Lee, 1982). This neglect at almost every level of care is compounded when we examine the needs of the elderly over the next two decades.

More dental services must be provided to more people simply to meet and maintain minimal standards of dental health. Better dental

care is rapidly becoming a necessity for the aging person. A major criterion of successful aging is how well the individual maintains oral aesthetics and oral health, the ability to chew, the ability to talk, and satisfaction with oral health status (Taylor, 1980).

In contrast with the general population, the elderly generally experience a reduction of disposable income from peak earning years, accompanied by reduced expenses and a contraction of net assets which are drawn upon as sources of income (Ketron, 1979). One of the major implications of limited income in the later years is reduced health care. Services which are not covered by Medicare (particularly dental and preventive health care) are often ignored (Kiyak, 1981). Ninety-six percent of dental care to the elderly is paid out-of-pocket compared with less than 40 percent among the 18 to 50 years of age groups (Epstein, 1980). Because of this reduction in financial resources and the growing need for quality dental care, the elderly need greater access to dental services.

A. DENTAL NEEDS OF THE ELDERLY

The steady growth of the elderly population in the United States has important implications for today's society. For instance, the new philosophy that dental care is a "right" and not a "privilege" is causing more and more people to seek dental care. This includes the "forgotten people"--the elderly. Data from a national health survey have clearly indicated that although today's elderly know what good dental health care is and seek such care more frequently, the

majority of their dental needs are still not being met satisfactorily (National Center for Health Statistics, 1977).

Epstein (1980) has observed that oral health must be considered to be an integral part of the holistic health care concerned with the integrity, function, and physical and emotional well-being of the elderly person. The concept of keeping the natural teeth for a lifetime is an expectation of today's population.

A recent oral health survey in Iowa indicated that fewer people in that state are now edentulous (Iowa Survey of Oral Health, 1982). Ettinger and Beck (1982) note that this change is regarded as a positive indication that the population is increasingly concerned with their oral health. This trend is supported by the decline of edentulism in adults through the past two decades.

Lotzkar (1977) has found that elderly patients have oral needs and exhibit oral symptoms peculiar to and characteristic of aging tissue. Data from the U.S. Public Health Service (1966) for the adult civilian, noninstitutionalized population have revealed a relation between advancing age and the need for dental care. After age 44, the proportion of people with natural teeth that require dental care at an early date increases steadily. It was found that one-half of the men 55 years of age and older have an apparent need for dental care. These figures are similar for women 75-79 years of age as well. The elderly appear to have a higher frequency of oral health problems than any other age group. Epidemiological data show a strong linear association between age and scores on all major indices (American Dental Association, 1980).

In his study of nursing home patients, Kegeles (1966) has determined that of the 300 persons examined from 29 nursing homes, more than 70 percent accepted treatment for their diagnosed dental needs. By the same token, Gift (1979) has indicated that the oral needs of the elderly population were different enough to necessitate special consideration in planning and delivering health care services.

B. DENTAL DISEASES OF THE ELDERLY

Baum (1980) has stated that major generalizations about the effect of aging on the oral cavity can be listed as follows:

1. Atrophy of the oral mucosa.
2. Atrophy of the orofacial musculature.
3. Alteration in the amount and composition of saliva.
4. High prevalence of cervical caries.
5. Loss of teeth and periodontal disease.

Oral Mucosa

Atrophic changes occur. Shklar (1966) presented retrospective histologic data from 300 oral mucosal biopsy specimens. He suggested that significant differences exist between individuals younger than 16 years and those older than 60 years. Changes reported (with the older group) included thinner epithelium, more keratinization, and increased levels of epithelial carbohydrate. Stone (1953) has mentioned in his sample (institutionalized men 60 to 100 years of age), that an increase in mouth dryness and a loss of tongue elasticity were apparent. However, it is difficult to determine whether aging per se has

an effect on oral mucosal tissues. The problem reported could be due to disease, inadequate nutrition, or pharmacologic therapy.

Dental Caries

Dental caries among aged individuals are not a major oral health concern (Baum, 1980). Most available data focus on cervical caries and do not include information about coronal caries. Chauncey (1978) pointed out that if coronal caries prevalence (both new surface and recurrent) is considered by the number of teeth present, older individuals actually have a higher caries incidence than most adult age groups. Epidemiological data on cervical caries suggest a higher frequency of this condition in older individuals. Research by Sumney et al. (1973) examined 300 dentate subjects (having at least 20 natural teeth present), with good dental care, between the ages of 30 and 60. About one-half of those seen were affected by cervical caries. Banting et al. presented data on a small group of residents at a chronic hospital and found that more than two-thirds of those studied had root caries and the prevalence was significantly related to age. The American Dental Association, Bureau of Economic and Behavioral Research, Council on Dental Health stated because the population is aging and there is increased retention of teeth into later adult years, management of root caries will become an increasingly important clinical concern (American Dental Association, 1982).

Oral Motor Behavior

According to Baum, the orofacial musculature atrophies with increased age. Muscle tone is reduced and the function of the muscles

of mastication and deglutition is diminished. Very limited information is available on motor performance among substantially dentate, healthy persons (Baum, 1979). Feldman et al. (1980) conducted a study on masticatory performance in healthy men of different age groups. Among individuals with comparable dentitions, masticatory effort (ability to chew a food bolus) was unchanged with age. However, there was a significant change in chewing efficiency.

Salivary Glands and Saliva

There is also a diminution of salivary gland function with increased age. Quantitative and qualitative decremental changes in the salivary secretion result. Because of this, in part, older individuals frequently suffer from xerostomia (dry mouth). Bertram (1967) examined unstimulated whole saliva (collected by suction, not expectoration) in 111 persons (31 were younger than 65; 30 were 65 to 84 and were subjectively healthy; 50 were 65 to 91 years and seemed to be diseased). He found a decrease in average whole saliva output in older groups, much more so in the diseased population than in the healthy group.

Loss of Teeth

Many elderly patients are edentulous. In 1975, edentulism in those persons 65 years and older was 51 percent (American Dental Association, 1976). Data collected by the American Dental Association in 1975 indicated that an estimated 21 percent of a total civilian population of over 211 million persons wore some type of prosthetic restoration (American Dental Association, 1975). Nearly 60 percent of

the elderly population wore at least one oral prosthesis and more than 50 percent of these included a removable partial or complete denture.

An examination of 488 Finnish people over 65 years of age living in an old people's home has revealed that 60 percent of the men and 69 percent of the women were edentulous (Makila, 1977). In Nottingham, England, it was found that of 254 elderly people living at home, replacement of lost teeth was by far the most interesting observation (Smith and Sheiham, 1980). However, the acceptance of dentures depends practically upon adaptation to them by subjects and this skill appears to diminish with age (Fish, 1969).

Periodontal Disease

Periodontal disease attacks the soft tissues that surround the teeth and bone that support them. This disease is correlated with age and oral hygiene (Mason, 1966). Kutscher (1977) has found that oral tissue present certain clinical symptoms associated with aging such as occlusal attrition, erosion, apical migration of the periodontal pockets, increased mobility and migration of the teeth and an increase of periodontal pathology. In short, the incidence of periodontal disease among the elderly is quite high. The American Dental Association's Bureau of Economic Research and Statistics cites the incidence of periodontal disease as increasing with age by noting that almost 24 percent of the female patients 65 to 69 years of age were found to need extractions for periodontal disease (American Dental Association, 1966). Mason (1966) stated that in the geriatric patients, periodontal disease usually has a poor prognosis. The degeneration and

pathological processes associated with old age such as accelerated loss of teeth from periodontal disease and an increased need for operative treatment because of acute root caries tend to produce an above-average need for dental care (Evashwick, Conrad, and Lee, 1982). Periodontal disease is primarily responsible for the loss of the adult dentition and the necessity to fabricate artificial teeth for an increasingly large percentage of the American adult public.

C. LIMITED DENTAL SERVICES

The literature has shown that of all age groups, the elderly have the greatest amount of oral and dental problems requiring treatment (Gift, 1977; Ketron, 1979; and Price and Kiyak, 1981). Baum (1980) has indicated that although there has been an increased interest in geriatrics, certain disciplines such as dentistry have lagged behind in these activities. Lotzkar (1977) found that the elderly often have little or no mobility, limited financial resources, and greater social and psychological problems. Most dentists seem to be concerned only with a single service so often necessary for the elderly--dentures--even though 40 percent of this population are not edentulous (American Dental Association, 1980). Also, Kiyak (1981) found that health care for the elderly is often limited because of a significant reduction in income.

Reed and Kiyak (1978) have found that negative attitudes comprise the quality of care provided by the dentist to elderly patients. Lack of knowledge by the dental professional regarding the aging process limits the dental service to the elderly.

A major hurdle in effectively delivering dental care services to the institutionalized elderly is the lack of dentists possessing the training and experience to provide care for patients with long-term illness (Epstein, 1980). Only six dental schools have developed comprehensive curricula in gerodontology, and the situation in schools of dental hygiene is no better, if not worse. In terms of numbers, dentists alone will not be able to cope with the accumulated backlog of dental disease in our elderly population (Kamen, 1984). Dentists often have problems relating to and treating the elderly patient because of lack of communication with them. The patient's questioning attitude about the diagnosis, treatment plan, or the effectiveness of treatment aggravates this problem. Gordon (1972) has pointed out that the dentists' lack of motivation to accept their share of geriatric workload responsibility is another limitation to dental care delivery. Epstein (1981) stated that current dental school curricula generally contain little substantial material that is directly related to the aged person.

Another factor limiting dental health care delivery is that present dental practice models assume maximum functional and financial independence of the population as well as a health belief system for maintenance of oral health (Tryon, 1980). Practitioners must be knowledgeable of the biological and economic changes associated with aging and their influence on treatment planning. Dentists must bear a responsibility of understanding these factors that make dentistry for the elderly different than the relatively healthy patients.

It has been suggested by both Epstein (1981) and Tryon (1980) that courses in geriatrics and gerontology be included in dental education in an effort to overcome the dentist's lack of skills and knowledge in these areas (Kamen, 1984). Just as the physicians need the nurse practitioners to treat the medical problems of the elderly population, so dentists need dental hygienists and other auxiliaries in administration of care in problems of prevention, amelioration and remediation of oral diseases. Schools of dental hygiene must develop didactic programs and forge affiliations with nursing homes and related facilities if they are to give their students an adequate exposure to the special needs of the elderly.

Dental health care is a health service which must be available to all segments of the population. Dental health, as it pertains to nutritional, psychological, and physical health, needs to be accorded a position of importance in the overall health care of the elderly. According to Lotzkar (1977), training of future practitioners to accept responsibility for dental care of the aged needs to be more widespread and more comprehensive.

D. AFFORDABILITY AND ACCESSIBILITY OF DENTAL CARE SERVICES FOR THE ELDERLY POPULATION

The group of individuals with the least to spend for dental care is the retired elderly with a fixed income slightly above the poverty level, but below that required to meet all of their basic needs (Jacobs, Wood, and Prose, 1980). The elderly spend a smaller

share of their health dollar on dental care than any other health care (American Dental Association, 1980).

Recent data from the American Dental Association's Economic Research and Statistics Supplemental Report (1976) have indicated that dental visits are strongly associated with the ability to pay. Conrad (1983) found in his study that the relative prices of dental services influence the use of dental services by those over age 65. In contrast with other health services, 93 percent of the cost of providing dental care to the elderly (\$502 million) is paid by private funds.

The National Center for Health Statistics (1978) has shown that 30 percent of the elderly visit a dentist within a year's time compared with 50 percent in the entire population. However, this same population visits a physician almost five times as often as the younger population. In addition, Gift (1979) found that although the average income of the elderly is significantly less than that of the adult working population, only a small difference exists between the average out-of-pocket dental expenses of the elderly and those of the working population. An average expenditure of \$121 per year is reported by those elderly persons who have visited a dentist within the past year (American Dental Association, 1976). In short, the elderly are carrying a disproportionate burden of dental expenses compared with other age categories in the population.

In a comprehensive review of geriatric dentistry, Reed and Kiyak (1978) stated that the elderly population has the greatest oral health care needs of any segment of the American population and the lowest accessibility of utilization of dental care.

In addition, Gordon (1972) has found that 75 percent of the geriatric population need and receive some form of public support and about 50 percent live in a state of at least marginal poverty. Medicare has no dental benefits except for some types of oral surgery and the treatment for oral cancer. Tennessee does not extend Medicaid services for dental care for low income elderly citizens. Four out of every ten dollars spent on dental and/or physical health care for the elderly are paid by private health insurance. These premiums are paid by the elderly subscribers or directly by the patients themselves according to Hehn (1981). Lotzkar (1977) found that there is little in the way of adequate funding mechanisms to provide dental care to the elderly and Conrad (1983) found in his study that the relative prices of dental services did influence the use of dental services by those over 65.

The implementation of national health insurance or the availability of prepayment programs could also influence oral health status for the elderly. Although the American Dental Association has continued to work toward ways to extend group insurance to retirees and older persons, dental insurance for the elderly is still very limited (Special Issue, Journal of the American Dental Association, 1983). However, insurance companies, dental service corporations, and health maintenance organizations are reluctant to provide dental coverage to the elderly due to the substantial cost, lack of knowledge and experience in providing these services. Therefore, at a time in life when income may become restricted and special needs become greater, the availability and costs of dental care become considerable burdens.

The desire for more dental care from the elderly will likely increase. Dental diseases such as dental caries and periodontal diseases are declining because of various preventive services. Water fluoridation, various screening programs, dental health education programs, and educational programs via the mass media seem to be major reasons why people are retaining their natural teeth for longer periods of time. Although there have been few studies that have summarized the effectiveness of fluoride compounds and treatment methods in adults over 30 years of age, there exists strong clinical support of the beneficial effect of fluoride treatments for post-irradiation caries in adults (Swango, 1983). Since the majority will have some teeth, that desire will be for a wider range of services than in the past when emphasis was upon dentures. These elderly consumers will probably be healthier, better educated, more politically aware, more demanding of social services, and they will have greater economic security.

The problems of access to dental care are due to many factors. Included among these are:

1. Emotional and physical stresses concomitant with the aging process.
2. Complex physical and mental disabilities resulting from chronic disease.
3. Physical barriers to access to care due to geographical isolation.
4. A lack of specially designed health care facilities where necessary.

5. The financial restrictions inherent in low or fixed income situations, particularly when the fixed income is not supplemented with insurance benefits.

Gift (1979) has stated that levels of patient access to dental care should be measured by income, availability of financing, and availability of services. McDavid (1984) also pointed out that the most important barrier to dental treatment is the high cost. The American Dental Association's Council on Dental Health and Health Planning (1980) reported that insufficient dental benefits for Medicare and Medicaid have also been a factor in the inaccessibility of dental care for long-term patients. A review of current literature reveals that there is still much that needs to be done in providing adequate dental care for the elderly, particularly those whose access to private dental care is limited.

E. UTILIZATION OF DENTAL SERVICES BY THE ELDERLY POPULATION

Dental visits are perhaps the most meaningful measure of the utilization of dental care. Visits are generally indicative of the amount of dental care delivered. Dental utilization patterns differentiating the elderly from the rest of the population are rooted primarily in certain socioeconomic characteristics that differentiate the elderly from others.

Anderson (1968) stated that dental care is often viewed by the public as more "elective" and less "necessary" than many other health services. According to the Bureau of Economic Research and Statistics

of the American Dental Association (1980), perceptions such as this suggest that the most probable reasons for the low utilization of dental care by the elderly are related to the method of payment and their reduced earning power. However, limited research has been done on the utilization of dental services by the elderly. Existing evidence suggests that older people use services differently than younger persons (Elfenbaum, 1967). That is, the elderly utilize dental services more for a comfortable, affordable mouth rather than for one of extensive dental treatment that reflects the cosmetic effect of dentistry.

Between 1971 and 1975, the total number of dental visits a year by the elderly increased from 26 percent to 30 percent. However, 70 percent of the elderly population had no dental visits at all (American Dental Association, 1980; and Teitelbaum, Parham, and Shipman, 1983). Data from the National Center for Health Statistics show income as the strongest indicator of dental care use, with education of family head and race also strongly influential.

It is evident that the small disposable income available to most elderly persons does not tend to support frequent utilization of dental services. Sixteen percent of the elderly population are below the poverty threshold, including 1.5 million persons in families and over 2 million persons living apart from families (American Dental Association, 1980). Both utilization and income data tend to support the conclusion that dental services are underutilized by the elderly. However, data results seem to indicate that utilization of dental services by the elderly would increase if prepayment becomes

available. Conrad (1983) has stated that if dental insurance for the elderly were provided, the effects of the reduced out-of-pocket price for services would lead to an increased proportion of the elderly receiving restorative, prophylaxis, and oral examination service during the year. Kovar (1977) has stated that only 20 percent of the elderly with incomes under \$5,000 visit a dentist within a year in contrast to 50 percent of those with incomes of \$15,000 or more. Further indications were that dental services could improve the nutritional level of making it possible for the elderly to eat a wider variety of foods and also could improve their ability to socialize.

F. SUMMARY

The studies reported above generally show that the longevity of the population is increasing. Because people are enjoying a longer lifespan, a healthy mouth is not only desirable but necessary for the individual's morale, well-being, and social acceptability. Dentistry has a responsibility to treat and maintain the oral cavity of the older population also.

At the time in life when the elderly experience a reduction in income, the ability to maintain good oral health declines. However, with the emerging philosophy that dental care is a right and not a privilege, more and more people are seeking dental care. These studies have clearly revealed that the dental needs of the elderly are not being met. Some reasons for this failure seem to be the high rate of dental diseases among the elderly, the limited availability of

dental services, an inability to pay for dental services, and the lack of accessibility of these services.

Dental care is a health service which must be available to all segments of the population for a better quality of life. The elderly, retired, and those on fixed incomes must be able to afford dental services as the surveys have indicated. Dental visits were strongly correlated with one's ability to pay for such services.

The elderly have the highest oral health care needs compared with all other segments of the population, the lowest affordability, accessibility, and utilization of dental care. It is inconceivable to pay for treatment of some diseases but refuse payment for the treatment of oral diseases. Oral health is an important precursor to physical health and psychological well-being. Oral disease does considerable harm to nutrition, aesthetics, speech, and social functioning compared with so many other diseases. In order for the needs of the elderly population to be met, oral health must be considered as one of the important components of a healthy individual. Emphasis must be placed on the importance of continuance of oral health care for the elderly by making dental services available, affordable, and accessible to the elderly population.

CHAPTER III

DESIGN AND METHODOLOGY

A. THE SAMPLE

The sample selected for investigation was obtained through a dense sampling procedure utilizing large numbers of elderly who use designated senior citizen's centers. The Roby Fitzgerald Adult Center in Greeneville, Tennessee; the Knowles Center in Nashville, Tennessee; and the Lewis Senior Citizen's Center in Memphis, Tennessee, were chosen after consulting with the Director of the Dental Division of the state of Tennessee. These centers in three different geographical locations throughout Tennessee were believed to be representative of most other senior citizen's centers throughout the state.

Dense sampling used in this study is more efficient compared with random sampling. While it is not as costly as saturation sampling, it involves increasing the sampling fraction to 1/2 and taking a majority of respondents with specific traits or characteristics of interest to the research (Black and Champion, 1976, p. 309). This sampling method was selected primarily because it permits the researcher to draw relatively large numbers of people at minimal expense in time and money.

Demographic data were obtained including age, sex, race, years of education, income level, occupation/profession, and other socioeconomic information. These data were obtained by the researcher

through personal interviews with respondents and through the completion of a fixed-response interview guide.

B. INSTRUMENTATION

In order to estimate the costs of adding dental care services for the elderly through Medicaid, information was gathered by the following means:

1. An intra-oral examination form for all participants in the study.
2. An interview schedule for the elderly population.
3. A Medicaid Dental Health Services fee scale for 1982-83.

According to information provided by the Financial Officer of the Dental Division of the Tennessee Department of Health and Environment, costs associated with dental services were determined as follows:

There are two "fees" involved in Medicaid reimbursement. One is the current usual and customary fee of the provider, public or private, which he "charges" on his claim. The other is the actual amount he is reimbursed. The two can be, but are not necessarily, the same, as will be shown later.

The provider, public or private, should always claim current usual and customary fees in order to keep the fee schedule up-to-date with the fiscal agent (E.D.S. Federal).

As claims are submitted to the fiscal agent, the computer tabulates them and constructs a usual and customary fee schedule for each provider.

From these fee schedules the fiscal agent (E.D.S. Federal) constructs a fee profile for the whole state, which is stored in the computer for each year. This is why usual and customary fees are always claimed.

From this profile the fiscal agent determines the 75th percentile, which is that fee which covers the usual and customary fee for 75% of the providers.

Reimbursement: The fiscal agent reimburses in accordance with policy established by the Department of Health and

Environment. Ninety-five percent is paid of the usual and customary fees, or 95% of the 75th percentile of the 1980 profile, whichever is less.

Exception: In cases where a provider has not yet established a fee schedule, they pay 95% of his usual and customary fee as claimed (Newman, 1983).

These percentages and profile years are periodically adjusted by the Tennessee Department of Health and Environment. The oral examination form (see Appendix B) was modified from the Dental Division of the State of Tennessee Index of Dental Health, called the DMFS, OHI-S, and the PI. The modifications were made through the advice of the Director of Dental Health for the State of Tennessee.

Intra-oral Examination Form DMFS Index

The "D" component of the DMFS indices simply stands for any permanent tooth surface that is decayed and requires restoration. The carious lesions were categorized into two types: frank lesions and incipient lesions. Frank lesions were detected as gross cavitation and thus present few problems in diagnosis. Incipient lesions were subdivided into three categories according to location, each with special diagnostic considerations.

Pits and fissures on occlusal, buccal, or lingual surfaces.

These areas are carious when the explorer catches after insertion with moderate to firm pressure and when the catch is accompanied by one or more of the following signs of decay:

1. Softness at the base of the area.
2. Opacity adjacent to the areas providing evidence of undermining of demineralization.

3. Softened enamel adjacent to the area which may be scraped away with the explorer.

In other words, a deep pit or fissure per se in which the explorer catches was not sufficient evidence of decay; it was accompanied by at least one of the above-named signs of decay.

Smooth areas on labial, buccal, or lingual surfaces. These areas were carious if they were decalcified; if there was a white spot as evidence of substance demineralization, and if the area was found to be soft by:

1. Penetration with the explorer.
2. Scraping away the enamel with the explorer.

These areas were diagnosed as sound when there was visual evidence of demineralization, but no evidence of softness.

Proximal surfaces. For areas exposed to direct visual and tactile examination, as when there was no adjacent tooth, the criteria were the same as those just presented for smooth areas on facial or lingual surfaces. For areas not available to direct visual-tactile examination, the following criteria applied: a discontinuity of the enamel in which the explorer would catch was carious if there was softness. In posterior teeth, visual evidence of undermining under a marginal ridge was not acceptable evidence of a proximal lesion unless a surface break was entered with the explorer. In the anterior teeth, however, transillumination served as a useful aid in discovering proximal lesions. Transillumination was achieved by placing a mirror lingually and positioning the examination light so that it passes

through the teeth labio-lingually and reflects into the mirror. If a characteristic shadow or loss of translucency was seen on the proximal surface, then this was suggestive of a carious lesion present on that surface.

The "M" component of the DMFS Index represented those teeth that had been extracted as a result of caries. The "F" component stands for any tooth that has been filled with either a permanent or temporary filling as a result of carious involvement. The "S" is the number of teeth surfaces. The DMFS Index has proved to be a useful tool in dental health surveys to measure dental health conditions. Since needs are closely related to the occurrence of individual diseases or conditions, a quantitative expression of their frequency in the group surveyed can be used as an indirect measure of needs. The sum of decayed, missing, and filled permanent tooth surfaces for a given age class, divided by the total number of tooth surfaces, gives the average number of affected tooth surfaces per person, specified for age. The average figure is referred to as the DMFS rate.

Other general considerations regarding criteria include:

1. Stain and pigmentation alone was not regarded as evidence of decay since either can occur on sound teeth.
2. When a crown was destroyed by caries and only the root remains, this was recorded as "all surfaces carious."
3. When a tooth was carious and filled on the same surface, the surface was called carious. Caries took priority over a filling.

4. Erosion, abrasion, hypoplasia, attrition, fractures, mottled enamel, and certain enamel opacities on exposed hard surfaces were not classified as carious.
5. An effort was made to examine each subject in the same manner. For example, the examiner resisted the temptation to examine a subject more thoroughly who appeared highly susceptible to caries. As an aid to consistency, each quadrant was dried with a gauze square prior to examination in the following order: occlusal, lingual, buccal, mesial, and distal for the posterior teeth.

Simplified Oral Hygiene Index (OHI-S)

Greene and Vermillion's (1960) Oral Hygiene Index was used in classifying oral hygiene in this study. Selected surfaces of six teeth are used in making this estimation of oral hygiene status. For the purposes of this examination each surface that is used, buccal or lingual, is considered to encompass one-half of the circumference of the tooth. The buccal surface of a molar, for example, is considered to include one-half of the mesial surface and one-half of the distal.

The posterior teeth used for the assessment are the first fully erupted teeth distal to the bicuspid area on each side of each arch. In most cases this will be a first molar, but in others it may be a second or third molar. The buccal surfaces of upper molars and the lingual of lowers are examined. In the anterior portion of the mouth, the labial surfaces of the upper right central incisor and the

lower left central incisor are examined. When one or both of these teeth are missing, the adjacent central incisor is substituted.

Examining for oral debris. Oral debris is the soft foreign matter loosely attached to the teeth. It consists of mucin, bacteria, and food, and varies in color from greyish-white to green or orange. The surface areas of the teeth covered by debris were estimated by passing the side of an explorer along the tooth surface being examined. The occlusal or incisal extent of the debris was noted as it was removed and adheres to the explorer.

Scoring:

- 0 - No debris or stain present.
- 1 - (a) Soft debris covering not more than the gingival third of the tooth surface, or
(b) the presence of the extrinsic stains without debris regardless of surface area covered.
- 2 - Soft debris covering more than one-third but not more than two-thirds of the exposed tooth surface.
- 3 - Soft debris covering more than two-thirds of the exposed tooth surface.

Examining for oral calculus. Calculus is defined as a deposit of inorganic salts composed primarily of calcium carbonate and phosphate mixed with food debris, bacteria, and desquamated epithelial cells. There are two main types of dental calculus which are differentiated primarily by location on the tooth in relation to the free gingival margin: 1) supragingival calculus denotes deposits which are

usually white to yellowish-brown in color and coronal (or located coronally) to the free gingival margin; 2) subgingival calculus denotes deposits below the rest of the free gingival margin. These deposits usually are light brown to black in color due to the inclusion of blood pigments.

The surface areas of the teeth covered by subgingival calculus were estimated by using an explorer to probe for subgingival calculus.

Scoring:

- 0 - No calculus present.
- 1 - Supragingival calculus covering not more than one-third of the exposed tooth surface.
- 2 - Supragingival calculus covering more than one-third but not more than two-thirds of the exposed tooth surface, and/or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth.
- 3 - Supragingival calculus covering more than two-thirds of exposed tooth surface and/or a continuous heavy band of subgingival calculus around the cervical portion of the tooth.

Calculating the Index. The debris scores are totaled and divided by the number of surfaces scored to obtain the Simplified Debris Index. The Simplified Calculus is determined similarly. The debris and calculus scores are then added to give the Simplified Oral Hygiene Index.

Periodontal Index (PI)

Russell's Periodontal Index (1956) was used to assess the same preselected tooth surfaces as those used in the OHI-S. A numerical value was assigned to the severity and extent of gingival inflammation. It also places a value on the level of periodontal destruction.

This index was the index of choice based on the following:

1. The Index is sufficiently simple to be rapidly used in studies involving large samples.
2. It has had wide geographic utilization and is the only index which yields world-wide data.
3. Reproducibility among examiners is possible.
4. The most advanced state of pathology, where examiner agreement is highest, is assigned the highest scores.

Using this index, the condition of each tooth is assessed individually. The score for an individual patient is the arithmetic average of the scores for all teeth in the mouth. The population score is the arithmetic average of the individual scores of the people examined.

All six teeth were assessed for debris, calculus, and pocket depth. Starting with the maxillary right first molar then to the maxillary right central incisor, then to the maxillary left first molar, then to the mandibular left first molar, then to the mandibular left central incisor, and then finally to the mandibular right first molar.

Criteria for scoring:

- 0 - Negative. There is neither overt inflammation in the investing tissues nor loss of function due to destruction of supporting tissues.
- 1 - Mild gingivitis. There is an overt area of inflammation in the free gingival, but this area does not circumscribe the tooth.
- 2 - Gingivitis. Inflammation completely circumscribes the tooth, but there is no apparent break in the epithelial attachment.
- 6 - Gingivitis with pocket formation. The epithelial attachment has been completely broken and there is a pocket (not merely a deepening gingival crevice due to swelling in the free gingival). There is no interference with normal masticatory function, the tooth is firm in its socket, and has not dried.
- 8 - Advanced destruction with loss of masticatory function. The tooth may be loose; may have drifted; may sound dull on percussion with a metallic instrument; may be depressible in its socket.

Prosthetic requirements--removal appliance. The following criteria and the need for dentures apply to full, upper, or lower dentures:

- 1 - No denture required. The subject had either a complete or satisfactorily intact dentition, a satisfactory denture was

being worn, or the examiner believed that the subject would be unable to wear a denture because of his age or a physical or mental handicap.

- 2 - New denture required. A subject was edentulous or the remaining dentition was incomplete and the subject did not already have a denture, or the denture was unsatisfactory in terms of function, design, fit, occlusion, or appearance, or if the denture was damaging or potentially damaging the tissues.
- 3 - Repair, reline or remodel. The subject presented for examination a broken but reparable denture, with ill-fitting dentures that could be relined or remodeled.

C. DESIGN OF THE INTERVIEW

The interview schedule included information covering the following areas (see Appendix A).

1. Dental behavior of the elderly in the sample.
2. Dental utilization of the elderly.
3. Perceived dental care.

The interview schedule consisted of questions pertaining to oral health and sociodemographic characteristics of the sample. Since the interview schedule was not based on previously constructed instruments, it was presented to several health professionals for their critique and evaluation. These individuals regarded the instrument as reliable and certified its use in the present study. Other interview schedules prepared by other researchers were considered for use in the

present study, but these were rejected because they were not pertinent to the study's research objectives.

Planning and Administration of the Examination and Interview

Telephonic contact with the directors of the various centers selected was made by the researcher. The researcher explained the purpose of the study, and arrangements were made for oral examinations of the elderly at these centers. During a two-week interval, at each center, all of the elderly persons utilizing the center were requested to take part in the study. Personal interviews were conducted by the researcher prior to an oral examination. The researcher asked all questions and recorded all responses. The oral examination took place immediately following the oral interview in an examination room set aside for this purpose.

The researcher, a licensed dental hygienist, made a professional oral examination and evaluation of the dental condition and needs of each subject. The oral examination took place with the subject sitting in a portable dental chair. All sanitary safeguards consistent with dental office examinations were observed. As is usually the case with most epidemiological examinations, x-rays were not taken or available. An average of 20-minutes was spent with each subject that included both the personal interview and oral examination. Three hundred and thirteen respondents were examined over a six-week period.

D. MEDICAID FEE SCHEDULE

The Medicaid Fee Schedule and the intra-oral examination findings were used to determine each of the costs for dental services to the elderly. The Medicaid fees are presented in Appendix C.

E. STATISTICAL DESIGN

Data were collected from the intra-oral examination and the use of a personal interview. The oral examination provided information measured according to an interval scale. The demographic and socioeconomic information obtained yielded nominal, ordinal, and ratio-level data requiring a variety of statistical tests and measures. The Statistical Package for the Social Sciences (SPSS) was used to survey the information and analyze cross-tabulations of targeted variables of interest to the researcher.

The .05 level of significance was used as one of the decision rules governing all subsequent statistical tests conducted. Chi square was frequently employed as a means of ascertaining goodness of fit and whether or not the observations were statistically significant and the t test was used in determining significance of difference. Analysis of variance tests were conducted to determine if there was significance of difference between the three centers from which the sample was drawn.

F. SUMMARY

In this chapter the sample of Tennessee elderly was identified and the methods for obtaining the sample were discussed. The sample was selected from three senior citizen's centers located in Greeneville, Nashville, and Memphis. The type of sampling plan followed was dense sampling.

Instruments used included an Intra-Oral Examination Form DMFS Index, a Periodontal Index (PI), a Simplified Oral Hygiene Index (OHI-S), an interview guide including socioeconomic and demographic information and was compatible with the SPSS program. Tests of significance of difference included chi square and the t test, and various measures of association. The .05 level of significance was used in all hypothesis tests.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

A. INTRODUCTION

Briefly recapitulating the study's original research objectives, the study sought to: 1) survey a cross-section of the elderly in Tennessee to determine their socioeconomic characteristics; 2) investigate and determine differences in the elderly from various areas of Tennessee in an effort to determine whether differential programs would need to be implemented to meet varying dental needs of our selected sample; 3) to estimate the approximate costs of adding dental services to Medicaid coverage currently in existence for elderly recipients; and 4) to propose specific dental services to be added to Medicaid based on our survey of current dental conditions of the selected sample.

A brief discussion of the rationale guiding the selection of ambulatory elderly from various areas of Tennessee is in order. First, Tennessee has three major population concentrations. In the eastern part of Tennessee, cities include Knoxville, Chattanooga, Bristol, Greeneville, Kingsport, and Johnson City. Middle Tennessee includes the greater metropolitan area of Nashville. Western Tennessee, of course, centers around Memphis. According to the most recently available demographic estimates, these three population concentrations vary substantially by race. Memphis, for instance, has

a fairly high black population, while the other two population concentrations to the east have significantly lower black representation.

While this fact did not automatically mean that differences would be evident among the sample selected in terms of their variable dental needs, it did seem to be worthwhile to explore any potential variations in dental needs that might be attributable to the factor of race. It was also highly likely that a strong concomitant of racial differences from one area of the state to another would be income variations that were directly linked with one's ability to afford adequate dental services. In short, race and income would likely exhibit a high correlation.

In the event that observable differences were noted between blacks and whites in the sample of ambulatory elderly from one part of the state to the next, it seemed appropriate to assume that such differential needs reflected differential incomes and differential access to expensive dental services rather than factors related to biology or genetics.

B. A PROFILE OF THE SAMPLE ELDERLY

Three senior citizen's centers were chosen as the sites for conducting dental examinations of the ambulatory elderly by this researcher. These centers included Greeneville, Nashville, and Memphis. This researcher, a trained dental hygienist, performed oral examinations and visual inspections of 313 elderly persons in these centers over a period of several weeks. All persons were advised of the nature of the study being conducted and were offered the option of

participating or not participating in the dental examination and interview which included a questionnaire.

Table 2 shows a distribution of males and females as well as blacks and whites according to the samples examined in the three centers.

The sample sizes were fairly evenly divided between the three centers. Memphis respondents totaled an $N = 100$, Nashville subjects included an $N = 111$, and Greeneville elderly totaled an $N = 102$.

A total of 194 female subjects out of 313 were obtained at the three centers. These persons were distributed fairly evenly as shown in Table 2. Of the 313 respondents across the entire state, 248 were white while 65 were black. Table 2 illustrates the fact that a

TABLE 2
DISTRIBUTION OF RACE AND SEX WITHIN SENIOR CITIZEN'S CENTERS
IN MEMPHIS, NASHVILLE, AND GREENEVILLE

		Center						TOTALS	
		Memphis		Nashville		Greeneville			
		N	%	N	%	N	%	N	%
Race	White	53	53	99	89	96	94	248	79
	Black	47	47	12	12	6	6	65	21
Sex	Male	42	42	45	41	32	31	119	38
	Female	58	58	66	59	70	69	194	62

majority of the black respondents are concentrated in the Memphis center.

Ninety-nine percent of the respondents (N = 310) were Tennessee residents, lending credibility to subsequent generalizations made from sample observations to the Tennessee elderly population-at-large. The age range of the sample was 32 years, with the youngest respondent age 65 and the oldest respondent age 96.

About one-third of the respondents were married, while over one-half were either divorced or widowed. Only 35 respondents had never married. Table 3 illustrates income and educational differentials for the sample.

Nearly three-fourths of the sample had incomes of \$10,000 or less, placing them in the lower income bracket. This finding was consistent with that of Kiyak (1981) as well as research conducted by the American Dental Association. Briefly, the elderly seem to be largely concentrated in the lower income categories and are therefore least able to afford dental services. This would also coincide with the fact that retirement incomes of the elderly are generally lower, and access to proper dental treatment is therefore severely limited.

About one-third (34.8 percent) of the sample had attended elementary school, while the rest of the respondents were fairly evenly distributed throughout other educational categories. About 27 percent of the sample had either attended some college or would be classified as college graduates. An examination of the occupational distribution of the sample was in order as a follow-up to questions

TABLE 3

INCOME AND EDUCATIONAL DISTRIBUTIONS FOR THE SAMPLE

	N	%
<u>Income Level</u>		
\$10,000 or under	230	73.9
\$10,000-\$20,000	61	19.5
\$20,000-\$30,000	12	3.8
Over \$30,000	<u>10</u>	<u>3.2</u>
TOTAL	N = 313	100.0
<u>Education Level</u>		
K-Elementary School	109	34.8
Grades 9-12	75	24.0
High School Graduate	45	14.4
Some College	51	16.3
College Graduate	<u>33</u>	<u>10.5</u>
TOTALS	N = 313	100.0

concerning income and educational level. Table 4 shows the occupational distribution for the elderly respondents.

From the data presented in Table 4, it is evident that nearly one-third (28.7 percent) of the respondents were classed as professional, technical, or managerial, while the rest of the sample were distributed among categories of occupations associated with lower socioeconomic status.

TABLE 4

OCCUPATIONAL DISTRIBUTION FOR THE SAMPLE

Occupational Level	N	%
Professional	41	13.1
Technical	22	7.0
Managerial	27	8.6
Clerical	26	8.3
Sales	31	9.9
Craftsmen	6	1.9
Operatives	38	12.1
Service	43	13.7
Homemakers and Farmers	<u>79</u>	<u>25.2</u>
TOTALS	N = 313	100.0

C. THE DENTAL NEEDS OF THE ELDERLY

Hypothesis One

The first hypothesis set to be tested relates to the general level of dental health of respondents and whether this varies according to the region of the state. These hypotheses are as follows:

H_0 : There is no difference between respondents examined in three senior citizen's centers and the level of their dental health.

H₁: There is a difference between respondents examined in three senior citizen's centers and the level of their dental health.

P < .05 (two-tailed test).

In order to establish the general level of dental health of all respondents, visual examinations and inspections were conducted by the investigator. All 313 respondents were subjected to an oral examination. Using both the Simplified Oral Hygiene Index (OHI-S) and the Peridontal Index developed by Russell (1956), accurate estimates were made of each person's level of oral hygiene. Also included in such estimates were the number of decayed surfaces, filled surfaces (DMFS), missing teeth, the presence or absence of dentures, and any other evidence of infection or oral abnormality.

Based on averaging the raw scores for all respondents across the three centers, information was revealed concerning the numbers of missing teeth as well as the numbers of decayed teeth. Analysis of variance tests were conducted to determine the significance of difference between respondent groups in each of the three centers. Analysis of variance summaries are presented in Tables 5 and 6, respectively.

Table 5 revealed that no significant differences existed among the three centers regarding the average number of missing teeth among the respondents examined. The F ratio was 2.886 which is not significant at the .05 level.

Table 6 shows that no significant differences exist among the three centers regarding the average number of natural teeth and the

TABLE 5

AN ANALYSIS OF VARIANCE SUMMARY OF THE DIFFERENCES
BETWEEN THREE SENIOR CITIZEN'S CENTERS AND
THE NUMBER OF MISSING TEETH

Source of Variation	SS	df	MS	F
Between Groups	216.7	2	108.4	2.886*
Within Groups	<u>11642.6</u>	<u>310</u>	37.5	
TOTALS	11859.5	312		

*Not significant at .05.

TABLE 6

AN ANALYSIS OF VARIANCE SUMMARY OF THE DIFFERENCES BETWEEN
THREE SENIOR CITIZEN'S CENTERS AND THE AVERAGE NUMBER
OF NATURAL TEETH AND PRESENCE OF DECAY

Source of Variation	SS	df	MS	F
Between Groups	668.3	2	334.1	2.725*
Within Groups	<u>38005.6</u>	<u>310</u>	122.6	
TOTALS	38673.9	312		

*Not significant at .05.

presence of decay. The F ratio in this instance was 2.726 which failed to achieve significance at the .05 level.

In both instances, the Scheffe procedure was also conducted to determine whether or not differences existed between pairs of centers. Again, for the .05 level of significance, no differences were found to exist for both sets of data in Tables 5 and 6.

Given the fact that the amount of decay, the number of missing teeth, and other critical dimensions of oral hygiene appeared to be fairly similar from one center to the next across Tennessee, therefore, H_0 was not rejected. In conclusion, there were no differences between respondents examined in the three centers and the level of their general dental health. There was no variation in dental needs of the ambulatory elderly from one center to the next across Tennessee.

In addition to determining the number of missing or decayed teeth among the respondents, it was of equal concern to measure the extent to which the sample wore dentures or needed dentures. If it were determined that a substantial number of respondents did not wear dentures but needed them, this would add considerably to Tennessee's cost of providing such needed dental services. Large numbers of denture-wearers would signify less need for customary dental services such as filling the teeth, and extractions of decayed or abscessed teeth. The cost to the taxpayers of Tennessee would be reduced substantially as a result.

Accordingly, the sample across the state was surveyed concerning whether or not the persons examined wore dentures. Table 7

presents a breakdown of the number of elderly persons who wear dentures. An additional feature of Table 7 is the addition and cross-tabulation of income with denture-wearer or nondenture-wearer status.

It was apparent from the data presented in Table 7 that less than one-half (47 percent) of the respondents wore dentures. Furthermore, of the 147 people who wore dentures, about 83 percent (N = 122) had incomes under \$10,000. Of the nondenture-wearers, somewhat fewer (65 percent) had incomes less than \$10,000. There were about twice as many of the sample who did not wear dentures compared with those who did wear dentures with incomes of over \$10,000 (or 35 percent compared with 17 percent).

TABLE 7
DENTURE-WEARER/NONDENTURE-WEARER BY INCOME

Denture-Wearing Status	Income				TOTALS	
	Under \$10,000		Over \$10,000			
	N	%	N	%	N	%
Denture- Wearer	122	83	25	17	147	100
Nondenture- Wearer	<u>108</u>	65	<u>58</u>	35	<u>166</u>	100
TOTALS	230		83		N = 313	

When various aggregates of the ambulatory elderly were compared across the three senior citizen's centers, it was found that there were no significant differences concerning the number of persons wearing dentures from one center to the next.

A more crucial question was subsequently asked of the respondents. Focusing on all respondents, denture-wearers and nondenture-wearers alike, the question was raised, "Are you in need of either a lower or upper denture or some kind of denture work?" The data presented in Table 8 revealed an interesting fact. It was observed that regardless of whether the respondent possessed or did not possess dentures, over 90 percent of the respondents clearly did not need dentures or denture repair. Therefore, it was concluded that less than 10 percent of the sample surveyed made up the potential "patients to be served" for dentures if they were to be added to Medicaid. To the extent that this sample was representative of the entire Tennessee elderly population and manifests similar denture needs, approximately 10,000 persons on a state-wide basis would need dentures or repair of dentures by Medicaid. The actual costs of serving these persons will be dealt with in a subsequent section of this chapter.

It was important to ascertain how many persons in the sample were in need of general dental treatment and could not receive it. A key question for administrators of Medicaid to consider is how many persons would avail themselves of the opportunity of access to more of these dental services, provided such services became a regular part of the Medicaid program? Such a question was asked of the respondents. Table 9 presents data relevant to the question of dental treatment and

TABLE 8
PERSONS IN NEED OF DENTURES OR DENTURE-REPAIR ACROSS
THREE SENIOR CITIZEN'S CENTERS

Needs Dentures or Denture Repair	Senior Citizen's Center Location						TOTALS	
	Memphis		Nashville		Greeneville		N	%
	N	%	N	%	N	%		
Yes	13	4.2	12	3.8	6	1.9	31	9.9
No	<u>87</u>	27.8	<u>99</u>	31.6	<u>96</u>	30.7	282	<u>90.1</u>
TOTALS	100		111		102		N = 313	100.0

TABLE 9
INCOME BY NEED FOR DENTAL SERVICES

Dental Needs	Income			
	Under \$10,000		Over \$10,000	
	N	%	N	%
Do Not Need Dental Treatment	112	35.8	45	14.4
Wants Dental Treatment	71	22.7	36	11.5
Wants Dental Treatment, but Cannot Get It	<u>47</u>	<u>15.0</u>	<u>2</u>	<u>0.6</u>
TOTALS	230	100.0	83	100.0

if the treatment was available to the respondent. Again, these questions have been couched in the context of income differentials. It was observed that only 49 persons or 15.7 percent of the sample indicated that they needed dental services of any kind and could not obtain such services. About 85 percent of the sample either did not need dental services or if dental services were needed, they could be obtained. It appeared that for this sample of subjects, at least, their dental needs were not extensive.

Of legitimate concern to Medicaid officials was the extent to which potential recipients of Medicaid benefits would be willing to defray some of the additional costs of providing such services.

Therefore, a question was asked of the 313 respondents concerning their willingness to pay a portion of their dental costs.

The results were quite favorable. Over 90 percent of the respondents (N = 285) indicated that they would be willing to pay a portion of these costs for dental care. Only 28 persons (8.9 percent) said that they would not be willing to pay a portion of such costs.

An interesting follow-up question was asked concerning whether or not respondents would be more inclined to visit a dentist if a large portion of their dental bill was defrayed by a program such as Medicaid. Again, the response was favorable. Nearly 70 percent (N = 215) of the respondents indicated that they would be more apt to see a dentist provided that a portion of their dental costs was defrayed by an insurance program. If provisions were made to add the ambulatory elderly to a program such as Medicaid, for instance, the long-range benefits would be quite positive. More elderly persons would be more apt to visit dentists, presumably for check-ups, and their own oral hygiene awareness would be heightened to such a degree that the net result would be a potential reduction in oral hygiene problems among this segment of the population.

D. INSURANCE COVERAGE AND THE ELDERLY

A second set of general objectives concerned the extent to which the ambulatory elderly sampled in the three senior citizen's centers should have devised for them different dental programs reflecting their particular needs for such dental services.

It has already been shown that there were no real differences from one senior citizen's center to the next concerning oral hygiene level and general dental problems. Presumably, tailor-made programs for particular centers are not required. Again, this tentative conclusion rests on the assumption that the sample of 313 respondents surveyed is typical of the Tennessee elderly-at-large. While there is always the possibility that the present sample is in some respect atypical of other Tennessee elderly, no hard evidence presently exists to seriously challenge the original conclusion. This problem of generalizability will be examined in greater detail in a subsequent chapter.

If different dental programs are not required in view of earlier findings, what additional factors need to be considered to potentially differentiate between the senior citizen's centers across the state? In this section, we will briefly examine the nature of existing insurance coverage of the various respondents. First of all, are these persons insured? What kinds of insurance coverage do they possess? How many persons are on Medicaid at present?

The first question to be dealt with is whether or not the 313 subjects were covered by any sort of dental insurance. It was decided to raise this question and cross-tabulate it with income level. These data are presented in Table 10.

Based on the data provided in Table 10, only 32 respondents or 10.2 percent carried any sort of insurance coverage that applied to oral health problems or covered various dental services. There was no significance associated with the observed distribution of insured/

TABLE 10

INSURANCE COVERAGE FOR DENTAL SERVICES BY INCOME LEVEL

Insurance Coverage for Dental Problems	Income Level				TOTALS
	Under \$10,000		Over \$10,000		
	N	%	N	%	
Yes	19	8.3	13	15.7	32
No	<u>211</u>	<u>91.7</u>	<u>70</u>	<u>84.3</u>	<u>281</u>
TOTALS	230	100.0	83	100.0	N = 313

noninsured and income level. The important finding from this table was that 90 percent of the sample did not have dental health insurance coverage.

Hypothesis Two

A second question was asked concerning participation in Medicaid. Because of the concern for the potential unequal distribution of Medicaid members across the various centers studied in the state, the following hypothesis set was suggested:

H_0 : There is an equal proportion of Medicaid members across the state in the senior citizen's centers studied.

H_1 : There is an unequal proportion of Medicaid members across the state in the senior citizen's centers studied.

$P < .05$ (two-tailed test).

The data relevant to this hypothesis set have been illustrated in Table 11. In this particular instance, the distribution of Medicaid members across the different centers was unusual enough to achieve significance at .05. It should be noted that of the 313 respondents, 143 of them or 45.7 percent are Medicaid members while the remainder are not. Most of the Medicaid members were concentrated in Memphis and Nashville. Perhaps the clearest evidence of this unequal distribution can be found by examining those persons who do not belong to Medicaid. In Memphis, for instance, 27.1 percent do not belong to Medicaid. In Nashville, this figure rises to 32.4 percent. In Greeneville, the figure reaches the peak of 40.6 percent. As a result of these figures and findings, it was concluded that H_0 can be rejected and that there was an unequal proportion of Medicaid members across the state. This finding was significant at the .05 level.

TABLE 11

THE DISTRIBUTION OF MEDICAID MEMBERSHIP/NONMEMBERSHIP
ACROSS THREE SENIOR CITIZEN'S CENTERS
IN TENNESSEE

Medicaid Membership Status	Senior Citizen Center Location					
	Memphis		Nashville		Greeneville	
	N	%	N	%	N	%
Member	54	54	56	51	33	32
Nonmember	<u>46</u>	<u>46</u>	<u>55</u>	<u>49</u>	<u>69</u>	<u>68</u>
TOTALS	100	100	111	100	102	100

$$\chi^2 = 11.1, P < .05.$$

Since it was determined earlier that income and race appear to vary according to section of the state examined, it was deemed proper to cross-tabulate Medicaid membership/nonmembership with race and income. These figures are presented in Tables 12 and 13, respectively.

TABLE 12
MEDICAID MEMBERSHIP/NONMEMBERSHIP ACCORDING TO RACE

Medicaid Membership Status	Race				TOTALS
	Black		White		
	N	%	N	%	
Member	51	78.5	92	37.1	143
Nonmember	<u>14</u>	<u>21.5</u>	<u>156</u>	<u>62.9</u>	<u>170</u>
TOTALS	65	100.0	248	100.0	313

$$\chi^2 = 33.8, P < .01.$$

TABLE 13
MEDICAID MEMBERSHIP/NONMEMBERSHIP ACCORDING TO INCOME

Medicaid Membership Status	Income				TOTALS
	Under \$10,000		Over \$10,000		
	N	%	N	%	
Member	127	55.2	16	19.3	143
Nonmember	<u>103</u>	<u>44.8</u>	<u>67</u>	<u>80.7</u>	<u>170</u>
TOTALS	230	100.0	83	100.0	313

$$\chi^2 = 30.3, P < .01.$$

The figures in Tables 12 and 13 bear out earlier suppositions. For instance, it is apparent in Table 12 that a much larger portion of blacks were Medicaid members compared with whites. In fact, 78.5 percent of the blacks in the sample were Medicaid members compared with only 37.1 percent of the whites.

In Table 13, there is a similar pattern relating to income and Medicaid membership/nonmembership. Of those persons earning less than \$10,000 per year, 55.2 percent were Medicaid recipients. Of those persons earning more than \$10,000 per year, only 19.3 percent were Medicaid recipients. Of course, this is likely due to certain income limitations imposed by Medicaid that tend to affect higher income families more than lower income ones. Both tables have significant chi square values beyond the .05 level of significance.

Thus far, it has been determined that the only major differences from one senior citizen's center to the next relates to the matter of Medicaid coverage. More Medicaid members were located in Nashville and Memphis, and these areas were more heavily represented by persons who were black and/or had lower incomes. If Medicaid were to make distinctions between various areas of the state and allowances for Medicaid benefits, it would seem proper to make such distinctions such that those populations most in need are targeted for benefits more heavily. It does not necessarily follow from this study that if one is black or white, then one has less wealth or more wealth. But given the present distributions of race and income in the sample of 313 ambulatory elderly who have been examined by the researcher, the

likely beneficiaries of extended Medicaid coverage would be lower-income blacks.

There was no evidence to indicate that special programs need to be implemented in different areas of the state in spite of the unequal racial and socioeconomic distributions observed in the present research. All areas of the state appeared to be afflicted with fairly similar dental problems.

E. ORAL HEALTH PRACTICES AND SOCIOECONOMIC FACTORS

A third set of objectives pertains to the oral health and hygiene behaviors of the ambulatory elderly and certain socioeconomic and background factors. What are the current oral hygiene practices of the sample and do these behaviors vary according to income, education, race, and other pertinent variables?

First of all, it should be noted that for the present sample, at least, there was a strong correlation between education and income. This finding in and of itself is not remarkable as this factor was pointed out in the literature.

Table 14 presents information pertaining to the frequency of dental visits and years of education. The material presented clearly indicates that a definite pattern existed between educational level and the frequency of dental visits. For instance, among those persons possessing no more than an elementary school education, 70 percent had not visited a dentist in two or more years. This compares markedly with the college-educated group where only 14 percent had not visited a dentist in the same time frame. The significance associated with

TABLE 14

THE FREQUENCY OF DENTAL VISITS AND EDUCATION

Last Dental Examination	Educational Level						TOTALS
	Elementary		High		College		
	N	%	N	%	N	%	
One Year Or Less	33	30	61	51	72	86	166
Two or More Years	<u>76</u>	<u>70</u>	<u>59</u>	<u>49</u>	<u>12</u>	<u>14</u>	<u>147</u>
TOTALS	109	100	120	100	84	100	N = 313

$$\chi^2 = 58.9; P < .01.$$

this table according to the observed chi square value is less than .05.

It is interesting to note that when income level was compared with frequency of visits to a dentist, a similar finding emerged. Without placing this information in a table, suffice it to say that 56 percent of the "Under \$10,000" portion of the sample had not visited a dentist in two or more years compared with 21.7 percent of the "Over \$10,000" portion of the 313 elderly surveyed. Again, this finding bears out the close patterning of educational level and income with certain oral hygiene behaviors.

It might be concluded from Table 14 and the above discussion that awareness of good dental hygiene varies directly with income and/or educational level. This is not necessarily true, however. For

instance, when the sample of 313 elderly persons was asked whether or not a dental examination should be made once a year, 86 percent or 270 respondents agreed. There was no significant variation according to income level regarding this observation. In other words, roughly 85 percent or more of both the "Under \$10,000" and "Over \$10,000" groups agreed with the statement that yearly visits to the dentist are important.

A final set of observations is in order. It was decided to cross-tabulate race, income, and need for dental services. These data are presented in Table 15 below. A preliminary observation of this

TABLE 15
RACE, INCOME, AND NEED FOR DENTAL SERVICES

Need for Dental Service	Income							
	Under \$10,000				Over \$10,000			
	Black		White		Black		White	
	N	%	N	%	N	%	N	%
Do Not Need Treatment	21	34	91	54	3	100	42	52
Want Treatment, Can Get It	20	32	51	30	0	0	36	45
Want Treatment, Cannot Get It	<u>21</u>	<u>34</u>	<u>26</u>	<u>16</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>3</u>
TOTALS	62	100	168	100	3	100	80	100

$$\chi^2 = 32.4; P < .01.$$

information revealed that blacks compared with whites were fairly evenly distributed throughout the various dental need categories. Of particular interest was the fact that there were proportionately fewer whites earning less than \$10,000 per year who were in need of dental treatment and cannot get it compared with blacks. For example, only 15.5 percent of the whites under \$10,000 per year want treatment and cannot get it compared with 33.9 percent of their black counterparts. Again, this lends support to the contention that the sample of blacks were in the greatest need for Medicaid benefits that included dental services. This finding was significant at less than .01 according to an observed chi square value of 32.4 ($df = 6$).

F. THE COST OF ADDING DENTAL SERVICES TO MEDICAID IN TENNESSEE

The fourth and final objective of the present study was to arrive at reasonably accurate estimates of the additional costs of adding dental services to Medicaid as an extended benefit to the ambulatory elderly of Tennessee.

It was not sufficient merely to count decayed teeth, missing teeth, or figure the number of needed dentures in determining such costs. It must be taken into account such things as the number of persons who would most likely utilize these dental services if provided through Medicaid. Obviously, if this study was anywhere near an accurate portrayal of Tennessee elderly, only a small proportion of ambulatory elderly would be favorably affected by greater Medicaid benefits.

Also taken into consideration is the fact that most persons surveyed in the present research indicated a willingness to share some of the projected costs of dental treatments extended to them. Such costsharing would serve to offset the anticipated higher costs of implementing these dental services.

It must not be forgotten that each year the elderly are retaining more of their own teeth. At the same time, there is evidence to indicate that the elderly are practicing better oral hygiene which will decrease substantially the need for dental services to succeeding populations and generations of ambulatory elderly.

In the present study, the measures used to assess the level of oral health of the various respondents indicated that, generally, the sample of Tennessee elderly have reasonably healthy mouths. They are apparently taking better care of their teeth. This fact is attributable to a number of things including:

1. Better nutritional habits accompanying the increased knowledge of food and its effects on the body including the teeth.
2. The fact that the samples were obtained from senior citizen's centers where the elderly come for socialization and recreation; therefore, they want to look their best and this will cause them to make sure that their teeth are better cared for daily; this fact alone will greatly improve their personal hygiene.
3. The mass media such as television, radio, magazines, and the newspapers are continually acknowledging the older

generations through advertisements that a full life can be maintained regardless of one's age; again, this factor influences better care of the mouth.

4. The mobility of the elderly allows them to travel to other areas of interest through senior citizen's transportation, public buses, or their own private vehicles, and this in turn could influence their concern for better dental care.
5. A society that is changing their attitudes toward dating, sexual habits, and marriage of elderly individuals perhaps causes more of them to work harder at maintaining and improving their personal appearance.

The work of the public health dental hygienists who have for the past decade conducted educational programs in the senior citizen's center on preventative dental practices must not be ignored. This factor could act to improve the elderly's dental health.

With these various facts in mind, calculation of the average cost of specific dental services required by the sample of ambulatory elderly recently investigated was made. Using the visual oral inspection information, the Periodontal Index and other indicators, the frequency of occurrence of various dental problems was charted. This information has been categorized and arranged in Table 16.

Table 16 is constructed from the following information. First, various dental problems were noted including decayed teeth, extractions, needed dentures and partials, and other types of dental repair. Published and standardized costs associated with each of these

TABLE 16

THE COST OF DENTAL CARE FOR 313 AMBULATORY ELDERLY
IN THREE SENIOR CITIZEN'S CENTERS*

Type of Dental Problem	Customary Fee**	x	Frequency* of Occurrence	=	Total Cost
Decayed Teeth	\$31.00		547		\$16,957.00
Decayed and Filled	\$31.00		66		\$2,046.00
Extractions	\$20.00		200		\$4,000.00
Partial Dentures	\$235.00		37		\$8,695.00
Dentures (Upper and Lower)	\$240.00		69		\$16,560.00
Alveoloplasty	\$37.50		69		\$2,587.50
Repair Dentures	\$30.00		45		\$1,350.00
Oral Examination	\$12.00		166		\$1,992.00
X-ray	\$12.00		166		\$1,992.00
Prophylaxis	\$18.00		166		<u>\$2,988.00</u>
TOTAL					\$59,167.50

*Frequency of occurrence of each oral problem was visually determined by a trained dental hygienist.

**Division of Dental Health Services Fee Schedule, 1983.

services were then obtained from the existing Medicaid Dental Health Services fee schedule and multiplied by the frequency of occurrence of each oral malady (Appendix C).

The sum of products was obtained. This figure was \$59,167.50 as shown in Table 16. The number of respondents, 313, was then divided into this sum of products, yielding an average cost per person of $\$59,167.50 \div 313 = \189.03 .

It was formerly determined that there were approximately 100,180 eligible elderly persons in Tennessee for Medicaid benefits (Table 1, p. 8). However, it cannot be assumed that all of these eligible persons would utilize Medicaid services. The best estimate of the number of persons indicating that they would utilize such services if provided was taken from the interview questions. Table 9 (p. 58) revealed that 49 persons indicated that they wanted dental services but could not obtain them. Assuming that this figure is a reasonable representation of the proportion of Tennessee eligible elderly who would utilize such services if provided, multiply this proportion (15.7 percent) by the number of eligible persons, 100,180, or $(.157)(100,180) = 15,728$.

Finally, multiply this figure, 15,728, by the earlier determined costs of servicing the present sample of 313, or \$189 per person. This would yield the following: $(\$189)(15,728) = \$2,973,112.99$. This would be total costs and would not include federal government reimbursement to Tennessee of 70.66 percent of such costs.

If the government were to absorb 70.66 percent of such costs,

Tennessee would pay $(\$2,973,112.99)(29.34) = \$872,311.35$ as its share of adding dental services to Medicaid for the ambulatory elderly.

Furthermore, if the elderly who were to benefit from such services were to assist the state in defraying a portion of such costs, Tennessee's financial burden would be greatly alleviated. For example, if each beneficiary were to contribute a mere \$10 per year for the inclusion of dental services, this would add over \$1,000,000 to a Medicaid fund that would more than offset Tennessee's total costs in providing dental services. A \$25 fee per year would create a \$2.5 million accumulation of funds that would contribute immeasurably to benefits for the elderly as well as defray the costs of administering such a program on a state-wide basis. This serves to highlight the fact that if everyone who would benefit contributes only a token amount to the state to defray a portion of their costs, Tennessee would stand to lose little or nothing by adding dental services to Medicaid for the elderly.

G. SUMMARY

On the basis of dental examinations of 313 ambulatory elderly in Tennessee at three senior citizen's centers in Greeneville, Nashville, and Memphis, the following characteristics were determined. About two-thirds of the sample were female, and about 79 percent were white. Most black participants in the study were concentrated in the Memphis, Tennessee, area.

About 70 percent of the sample had incomes yearly of \$10,000 or less, and most respondents had attended elementary school and high

school. In addition, about two-thirds of the sample were represented in former occupations associated with the lower socioeconomic categories.

A statistical examination of the significance of difference between the three centers in different parts of Tennessee revealed no significant differences in mouth quality concerning the level of oral hygiene. The findings showed a high degree of consistency from one senior citizen's center to the next in terms of numbers of missing or decayed teeth and the proportion of elderly people who wear dentures.

Of considerable importance to the administrators of the Medicaid program is the fact that only about 16 percent of the sample indicated that they currently had any unmet need for dental services. About 86 percent indicated that they either had no serious dental problems, or if they did, they had provisions for securing necessary dental treatment to remedy their problems.

Most respondents indicated a willingness to share some of the additional expense for the inclusion of dental services to the Medicaid program, particularly if this would entitle them to greater dental benefits they normally would not have. It was also shown that respondents would actually visit dentists and seek dental assistance more regularly if greater dental services provisions were included in the Medicaid package.

It was shown that only about 10 percent of the people surveyed possess some sort of insurance coverage that includes dental benefits. The rest do not have such insurance coverage. Of the sample of 313 elderly, 143 persons were covered by Medicaid and 170 were not. It

was shown that there was an unequal distribution of Medicaid participants from one section of the state to the next. For instance, proportionately more recipients were centered in the Nashville and Memphis areas. It was also noted that these areas are also those containing larger concentrations of blacks and persons of lower socioeconomic status.

On the whole, the average condition of oral hygiene of the 313 participants in the present research was good. There were many elderly persons who wore dentures, although those who have their own teeth or have mouths in reasonably good condition are in large numbers as well (166 have their natural teeth compared to 147 who wore dentures). There appeared to be a genuine concern for good oral health among the respondents. Many believed that regular dental visits and inspections are necessary and desirable. However, many who desire such services cannot afford them.

In spite of the fact that those persons in the lower socioeconomic statuses and occupations had not visited dentists in two or more years, there appeared to be a strong willingness on their part to consult dental services and seek assistance if some provision could be made for defraying the costs associated with such services.

Each year the quality of oral hygiene among America's elderly appears to be increasing. This is due to many factors including heightened awareness of good dental hygiene practices, greater social activities involving the elderly, and greater exposure to educational lectures and services devoted to increasing the level of their dental health knowledge.

Considering the relatively few persons in the present sample who are interested in obtaining dental services of any kind but cannot afford them, the cost to the state for obtaining additional dental services in the Medicaid package offered to the elderly is not extensive. It was determined that the average cost per person per year would probably be \$189.03 and that this figure would result in a Tennessee assessment of three-quarters of a million dollars. However, a general willingness on the part of these senior citizens to defray some of these costs with sums as low as \$10 or \$25 would more than offset the cost to Tennessee in view of the 100,000 eligible elderly.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Chapter V of this study is divided into four sections. The first section contains a summary of the study, the second contains the findings, the third section contains the conclusions, and the chapter concludes with the recommendations.

A. SUMMARY

This study was originally conceived as a means of determining the approximate costs of adding the elderly to the Medicaid program in the state of Tennessee. Socioeconomic characteristics of 313 ambulatory elderly from three senior citizen's centers in Greeneville, Nashville, and Memphis were determined through questionnaires and interviews.

Oral exams were performed on these elderly by a trained dental hygienist and results were tabulated and analyzed using appropriate nonparametric procedures consistent with the SPSS statistical program. Instruments used included an Intra-Oral Examination Form, an interview guide, and a Medicaid fee schedule. The results were tabulated and discussed.

B. FINDINGS

The findings of this research are summarized as follows:

1. Most of the respondents (99 percent) were Tennessee

residents, one-third were married, and three-fourths were in the lower socioeconomic bracket (less than \$10,000 income per year).

2. About one-third of the respondents had attended elementary school, while the rest were about evenly divided among the other educational categories, including several college graduates.
3. About one-fourth of the respondents were professional and technical, while the rest were from among the lower socioeconomic occupations.
4. Based on scores received on the oral hygiene indices, there were no significant differences in the degree or types of dental problems of the sample among the senior citizen's centers tested.
5. Regarding the wearing of dentures, less than one-half the elderly surveyed wore dentures. These persons were largely in the less than \$10,000 income bracket.
6. No significant differences among senior citizen's centers and the number of persons wearing dentures was found.
7. Less than 16 percent of the 313 elderly needed dental treatment but could not afford it.
8. Ninety percent of the elderly surveyed indicated that they would pay a portion of dental costs for adding dental services to Medicaid.
9. About 10 percent of the sample carried insurance that included dental services of any kind.

10. Medicaid members were mostly concentrated in Memphis and Nashville with 73 percent and 68 percent, respectively.
11. Less than one-half (45.7 percent) of the total sample participates in Medicaid.
12. Medicaid membership varies according to race and income with 78 percent of the blacks and 37 percent of the whites participating in Medicaid, and 55 percent and 19.3 percent of the under \$10,000 and over \$10,000 income respectively participating.
13. There was a strong correlation between education and income of the study participants.
14. There was a positive correlation between educational level and frequency of visits to a dentist. More persons with higher educational level visited dentists more frequently.
15. Among those earning less than \$10,000 per year, fewer whites (15.5 percent) compared with blacks (33.9 percent) needed dental treatment but could not obtain it.
16. The estimated cost of adding dental services to Medicaid to the state of Tennessee was about \$872,311.35.
17. A \$10 charge to all elderly Tennessee residents per year would more than offset costs of adding dental services to Medicaid.

C. CONCLUSIONS

The conclusions arrived at are based on the responses of 313 elderly in three senior citizen's centers in three areas of Tennessee.

Based upon the findings, the following conclusions were drawn.

1. The dental health of Tennessee elderly is fairly good and the ambulatory elderly have similar dental needs in relation to other age segments of the population.
2. Sixteen percent of the sample is a reasonable basis for estimating the cost of dental services.
3. Only a small portion of persons need dental services and cannot afford them, and only a small portion of Tennessee's elderly would utilize Medicaid if dental services were included.
4. The cost of adding the elderly to Medicaid for Tennessee elderly would be about \$190 per person, given the types of oral problems possessed by the 313 elderly persons surveyed in the present study.

D. RECOMMENDATIONS

The following recommendations are based on the findings of the present research:

1. This study has demonstrated that dental problems among the elderly are fairly evenly distributed throughout the state, although those most in need of dental services appear to be centered in highly populated areas such as Nashville and Memphis. The state of Tennessee should adopt provisions for including dental services for the elderly in the general Medicaid program.

2. With proper funding, a much larger sample would be recommended for study if this research were to be replicated in the future. With the obvious benefits of greater generalizability and validity associated with a larger sample would accrue more convincing information about the dental needs for the elderly and a more precise estimate of the costs to the state for including dental services in Medicaid.
3. It is recommended that a trained dentist assist future researchers in their dental examinations of elderly patients. This would lend substantial credibility to study results, in spite of the fact that a trained dental hygienist is quite competent to make visual inspections of mouth conditions and report on such information. State administrators of the Medicaid program might be more persuaded by a dentist's endorsement of findings.
4. It is recommended that a pilot study be undertaken in the future as a means of pretesting questionnaires designed to acquire socioeconomic and dental information from elderly patients. More probing questions could be used to assess the willingness of participating Medicaid recipients to defray a portion of their dental costs.
5. Additional studies need to be conducted to determine how many persons would actually use the dental services under Medicaid. What specific kinds of services would be required beyond those identified in the present study?

Would there be trends reflecting reductions in particular oral disorders from one year to the next? Only more research will shed light on such questions.

6. Finally, if this study were to be repeated or replicated at a later date by a health professional, it would be advisable to include a sample of elderly from among the various nursing homes throughout the state. In this way, more meaningful cost comparisons could be made, and specific needs of different categories of elderly could be identified and targeted for dental treatment programs.

CHAPTER VI

EPILOGUE

One cannot reach the end of a study of this type without drawing certain conclusions and achieving deep impressions about the people surveyed and the ideas explored, especially if one is already conditioned to examine the area with strong interest.

An initial impression of these persons is that these elderly still consider themselves to be attractive and likewise attracted to members of the opposite sex. These elderly persons, although often regarded by the younger generations as "over-the-hill" and merely waiting to die are full of life and enjoy the socialization and companionship with others their age (e.g., dancing, socials, etc.) at these senior citizen's centers. The eagerness of these persons to participate in such social activities was refreshing.

Knowledge was gained not only about their personal dental habits and needs, but also a certain insight into their social and familial problems. Most of the respondents were anxious to share with others their experiences with relatives and other loved ones. Very few studies of this type have ever been conducted in the United States, let alone in Tennessee. Because persons are living longer and enjoy greater health, perhaps other definitive studies can be conducted to explore other dimensions of the problems they exhibit. Schuman (1982) stated that primary interest should be on the restoration of oral function first and aesthetics rated second.

Surprisingly, because of the cosmetic importance of teeth to these persons, there seemed to be a much greater desire to keep their own teeth for reasons other than the function of mastication.

Additionally, the elderly are raising many questions about how they can retain more of their natural teeth longer, and ways must be explored of informing them about such matters.

Another indication of the interest in the teeth of the elderly and their general oral health is the growing number of seminars and workshops in dental schools and universities relating to dental care for the elderly by dentists and various dental auxiliaries. Several new publications have emerged on the professional scene such as Special Care in Dentistry and Gerodontology to verify this growing interest for persons in this segment of our population.

Of course, other areas besides tooth quality and oral hygiene need to be explored more extensively. For instance, one of the serendipitous discoveries of this research is related to the need among the elderly for attention and socialization. Perhaps through subsequent, well-planned studies and investigations these goals can be accomplished and there will be a move toward deeper understanding of the elderly's needs.

This study was not specifically designed to gather data concerning the implications of socialization among the elderly. However, it is apparent that socialization plays an important role in modifying their behaviors related to oral hygiene. How is income related to the need for socialization? How are variables such as race, sex, geographic location, and education related to this phenomenon as well?

For future researchers, it will be important to investigate these concerns with more extensive aggregates of elderly. Certainly, it will be more beneficial for the general public to be made aware of their behaviors, outlooks, and expectations in social encounters as they advance in age.

The dental planners and health educators should find this study both interesting and useful. A practical application of these findings would be to make those persons responsible for dental program planning more aware of the needs of senior citizens in planned health programs. McDavid (1984) stated that perhaps the most important barrier to dental treatment is the high cost, therefore, more funds should be allocated for implementing dental programs at both federal and state levels. Grants and other financial assistance programs can be extended to include the training of dentists specifically for work among the elderly population.

There is considerable misunderstanding among persons in the dental profession concerning the nature and types of dental problems associated with the ambulatory elderly in senior citizen's centers and nursing homes. In spite of the fact that nursing home residents were not included in the present research, the responses of the current sample of ambulatory elderly indicated that their particular dental needs did not differ substantially from other segments of the population. Teeth need filling, replacing, and some denture work is needed. Most segments of the population exhibit such needs.

There seems to be a generalized fear among dental professionals that involvement in elderly dental service programs will mean markedly

different kinds of dental activities for them to perform on a generally unreceptive audience. This is simply not supported by the present study.

Actually, the elderly are interested in good oral hygiene, and their willingness to participate in educational and dental service programs to improve their own oral health is indicative of other age groups currently serviced by dental professionals. Also, the general condition of oral hygiene and dental health among the elderly is improving from year to year. The problems confronting the elderly are increasingly similar to other age groups in the population.

The formulators of programs to increase the utilization of dental services and develop both preventive and restorative dental services need to be acquainted with the fact that the elderly may be included as potential target audiences as well as other age categories nationally. Their particular needs are not that different, given the results of the present study. Their concern for good oral hygiene and degree of interest in participating in oral hygiene educational programs should be considered by planners of such programs. All age segments of the population should be included by our nation's dental health educators.

General health educators might seek to educate not only the public but the dental profession at-large concerning the needs of the elderly. As has been seen from this research, the ambulatory elderly are reasonably well-educated and receptive to becoming involved in Medicaid and similar programs if such programs can offset some of their medical expenses. There is a strong willingness on their part

to contribute nominal amounts to offset Tennessee's expenses by including dental services in the general Medicaid package.

Many dental professionals are unaware of the specific needs of the elderly and these misperceptions contribute to a general unwillingness on their part to participate in dental programs for the elderly. Health educators can spread the awareness of dental professionals by incorporating information about the dental needs of the elderly to curricula in graduate programs and upper-division undergraduate programs in colleges and universities. Many dental professionals are socialized in a health education milieu prior to embarking on their dental school training. Educating them at an earlier point in their dental school training may lead to a more rapid inclusion of the elderly into dental services programs such as Medicaid.

It is likely that among the prime beneficiaries of the results of this study will be the very dental schools training dental professionals. It would not be extraordinary to incorporate into their own curricula information about the dental condition and needs of the elderly to make service in this area more attractive to aspiring new dental professionals.

It is a common fallacy that most of our national elderly reside in nursing homes or in other medium- to maximum-care facility. The fact is that only about 5 percent of our elderly reside in such institutions where others must meet most, if not all, of their needs. Dental personnel usually anticipate working in so-called nursing homes if called upon to remedy oral hygiene problems of our senior citizens on Medicaid or other insurance programs. As a part of a continuing

effort to educate the dental professional and potential administrators of programs for our elderly, it should be made clear that about 95 percent of the so-called elderly are not only ambulatory but possess dental problems similar to the rest of our population.

Reed and Kiyak (1978) have continually emphasized that there are many negative attitudes that presently exist among the general population about the geriatric set. Cooperation between public health educators, community action agencies, and dental professionals could stimulate greater awareness as to the actual needs of the elderly and lead to the adoption of more positive programs designed to ameliorate their current oral hygiene plight.

In senior citizen's centers across the nation, it would be advisable to have on-call dental professionals in adjunct capacities to look after the elderly who frequent such centers. The dental needs of the elderly in such centers could be targeted effectively and quickly by dental professionals as a part of the work staffs, and it is not out of the question to make funding provisions for the inclusion of such professionals for these dental services. The role of a dental professional in a senior citizen's center would be primarily a preventive one. It has been shown in the present study that some persons do not seek the assistance of dental professionals because they cannot afford such services. Because of the infrequency of their visits to dental professionals, many senior citizens develop more severe and costly dental problems. If an early means of detecting oral problems were instituted by adding dental professionals to the staffs of senior citizen's centers, many potentially serious dental

problems could be avoided through early oral inspections. More elaborate dental services would thus be avoided, and the state would be spared the additional expenses accordingly.

One way of encouraging dental professionals to become involved in working in these centers would be to work out an internship program with local dental schools or schools located in the general vicinity. If this were not feasible, perhaps a voluntary program could be instituted, where dentists would donate so many hours per week in services to senior citizen's centers.

The presence of dental professionals in senior citizen's centers would also make the patients and members of such centers more aware of their own oral hygiene habits, and would contribute to a reduction of all types of oral hygiene problems associated with the onset of old age. Dental professionals would be available to make referrals of patients to various specialists in order to secure the appropriate dental treatment. Again, previous tax dollars would be saved by identifying and quickly remedying specific dental needs of the elderly.

Stress appears related at least partially to one's oral health. An improvement in one's oral hygiene and general dental health quality can lead to a general reduction in stress resulting from the worries people have about their dental health. Certainly, it can be argued effectively that the self-esteem of the elderly can be improved greatly by achieving greater awareness of the importance of good dental hygiene practices among this population.

A practical implication of this research concerns the overall

improvement of oral health quality among Tennessee's senior citizens. Perhaps some misconceptions have been laid to rest about the dental condition of the elderly, and hopefully fears have been alleviated that are often shared by administrators and dental professionals alike about the prohibitive financial burden on the state of adding dental services to Medicaid insurance provisions. More dental professionals should be more inclined over the next few decades to participate in dental treatment programs of the elderly.

As Clark (1983) pointed out, people are not only living longer, but they are remaining active longer and the older people today are expecting definitive studies and care that fill their needs more exactly than was demanded in the past. Dental care is one of these needs.

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APPENDICES

APPENDIX A

INTERVIEW SCHEDULE

Interview # _____

Date: _____

Sex: _____

Race: _____

I would appreciate it if you would help me by answering the following questions. Your name will not appear on the answer sheet.

DIRECTIONS: Please answer all the questions as best you can. The researcher will place an "X" by your response(s). You may give one or more answers if appropriate.

1. What is the date of your birth? _____

2. What is your marital status? ☐ Married ☐ Never Married
☐ Divorced ☐ Widowed

3. Are you a resident of the state of Tennessee? ☐ Yes ☐ No

4. Do you participate in Medicaid? ☐ Yes ☐ No

5. What is your profession or occupation? _____

6. What is your income per year:

☐ Under \$10,000
☐ \$10,000-\$20,000
☐ \$20,000-\$30,000
☐ \$30,000 or above

7. What was the highest grade level that you completed in school?

☐ K-elementary school
☐ 9-12 secondary school
☐ High school graduate
☐ Attended college
☐ College graduate

8. Are you covered by any insurance policy for dental health care?

☐ Yes ☐ No

9. When was your last dental examination?

☐ 6 months ago ☐ 2 years ago
☐ 1 year ago ☐ 3 years ago or longer

10. Do you have dentures? ☐ Yes ☐ No
11. If yes, then do you have a complete set of dentures?
☐ Yes ☐ No
12. Do you have an upper denture only?
☐ Yes ☐ No
13. Do you have a lower denture only?
☐ Yes ☐ No
14. Do you wear your dentures all the time?
☐ Yes ☐ No
15. Do you wear your dentures at night?
☐ Yes ☐ No
16. How often do you brush your teeth?
☐ Every day ☐ Occasionally ☐ Never
17. Do you think that a dental examination should be made at least once a year?
☐ Yes ☐ No
18. Would you pay a small percentage of the cost of dental care you may need?
☐ Yes ☐ No
19. Would you be more inclined to see a dentist if all the dental costs were paid by Medicaid or another agency?
☐ Yes ☐ No
20. How do you feel about the health of your mouth?
☐ Do not need dental treatment
☐ Need dental treatment
☐ Want dental treatment, but cannot get it
21. How do you feel about the dental care you have received during your lifetime?
☐ Excellent ☐ Fair ☐ Good ☐ Poor

APPENDIX B

ORAL INSPECTION FORM

ORAL INSPECTION

Date _____

Age _____ Sex _____ Race _____

No. Natural Teeth Present	No. Decayed Surfaces	No. Missing Surfaces	No. Filled Surfaces	No. DF Surfaces	No. Ext. Ind.	Total DMFS	No. Removable Partial Prosthesis Ind.

Oral Hygiene Index

Periodontal Index

TOTAL OHI SCORE _____

TOTAL PI SCORE _____

Complete Denture Present		Complete Denture Acceptable or Unacceptable		Complete Denture Needed		Complete Denture Needs Repair or Reline	
Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower

Suspicious Lesions

Comments

APPENDIX C

MEDICAID FEE SCHEDULE

PAYMENT CLASSIFICATION *			
CLASS	STATE	PATIENT	
A		Min. Fee	
B		Min. Fee	
C	70%	30%	
D	65%	35%	
E	60%	40%	
F	55%	45%	
G	50%	50%	
H	45%	55%	
I	40%	60%	
J	35%	65%	
K	30%	70%	
L	25%	75%	
M	20%	80%	
N	15%	85%	
P	10%	90%	
R	5%	95%	
S	0%	100%	

[illegible]

1. The patient will pay the minimum charge, or the percentage of the fee as listed on the fee schedule, whichever is greater.
2. Emergency patients will be charged as regular patients. Should the emergency patient not have sufficient funds then charge whatever he can pay.
3. Emergency patients who have no funds will be treated on a no charge basis.
4. Any dental procedure (except laboratory procedures or referrals) deemed necessary for relief of pain will be provided.
5. Any patient who presents themselves to the clinic for an emergency will be seen for
6. Fees listed on this fee schedule are not to be changed or altered in any way except

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CODE	PROCEDURE	CUSTOMARY FEE	MINIMUM FEE	LOW INCOME PROGRAM	MEDICAID W/O PRIOR APPROVAL	MEDICAID WITH PRIOR APPROVAL
<u>DIAGNOSTIC</u>						
00120	Oral examination (excluding radiography)	\$ 12.00	\$ 3.50	X	X	
00150	Oral survey (charted on record)	12.00	3.50		X	
00210	Radiographs - Intraoral (complete series including bitewings)	36.00	20.00	X	X	
00220	Radiographs - Intraoral peri-apical (single or first film)	7.00	3.00	X	X	
00230	Radiographs - Intraoral peri-apical (each additional film)	5.00	2.00	X	X	
00270	Radiographs - Intraoral bitewing (single or first film)	7.00	3.00	X	X	
00280	Radiographs - Intraoral bitewing (each additional film)	5.00	2.00	X	X	
00330	Radiographs - Panorex (<u>not</u> including bitewings)	38.00	20.00	X	X	
	Biopsy and Examination of oral tissue	40.00	20.00	X		
<u>PREVENTIVE</u>						
01110	Prophylaxis - adult and child	18.00	8.00	X	X	
01220	Topical fluoride application - stannous and other (excluding prophylaxis)	15.00	6.00	X	X	
01230	Dietary planning for control of dental caries	35.00	20.00	X		
01250	Sealant - Pit and Fissure/per tooth	3.00	1.50	X		
01510	Space maintainer - Fixed, unilateral band type (only when adjacent tooth does not require a steel crown).	70.00	42.00	X		X

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CODE	PROCEDURE	CUSTOMARY FEE	MINIMUM FEE	LOW INCOME PROGRAM	MEDICAID W/O PRIOR APPROVAL	MEDICAID WITH PRIOR APPROVAL
01511	Space maintainer - Fixed, lingual or palatal arch. Band type.	\$150.00	\$100.00	X		X
01515	Space maintainer - Fixed, uni-lateral. Steel crown type. (Laboratory procedure)	85.00	50.00	X		X
01516	Space maintainer - Fixed, uni-lateral. Steel crown type. (Office procedure)	60.00	30.00	X		
01520	Space maintainer - Removable, acrylic. (Laboratory procedure)	50.00	27.50	X		
<u>RESTORATIVE</u>						
02110	Amalgam - one surface, primary (including polishing)	20.00	7.00	X	X	
02120	Amalgam - two surface, primary (including polishing)	25.00	8.00	X	X	
02130	Amalgam - three or more surfaces, primary (including polishing)	30.00	10.00	X	X	
02140	Amalgam - one surface, permanent (including polishing)	25.00	8.00	X	X	
02150	Amalgam - two surface, permanent (including polishing)	29.00	10.00	X	X	
02160	Amalgam - three surface, permanent (including polishing)	33.00	12.00	X	X	
02161	Amalgam - four or more surfaces, permanent (including polishing)	44.00	15.00	X	X	
02162	Pins - one or more for retention of multi-surface plastic or amalgam filling (does not include restoration)	6.00 (\$40 max.)	2.00	X	X	
02310	Composite resin - one surface (silicate, acrylic, plastic or composite)	25.00	8.00	X	X	

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CODE	PROCEDURE	CUSTOMARY FEE	MINIMUM FEE	LOW INCOME PROGRAM	MEDICAID W/O PRIOR APPROVAL	MEDICAID WITH PRIOR APPROVAL
02312	Composite resin - two surface (silicate, acrylic, plastic or composite)	\$ 35.00	\$ 12.00	X	X	
02313	Composite resin - three or more surfaces (silicate, acrylic, plastic or composite)	45.00	15.00	X	X	
02341	Composite resin - one surface; acid-etch or nuva-type (anterior teeth)	30.00	10.00	X	X	
02342	Composite resin - two surface; acid-etch or nuva-type (anterior teeth)	40.00	15.00	X	X	
02343	Composite resin - three or more surfaces; acid-etch or nuva-type (anterior teeth)	50.00	20.00	X	X	
02350	Mastique Laminate Veneer	80.00	50.00	X		
02710	Crowns - plastic temporary crown	80.00	35.00	X		X
02750	Crowns - porcelain with metal (permanent anterior teeth only)	250.00	180.00	X		X
02830	Crowns - stainless steel, primary	40.00	15.00	X	X	
02835	Crowns - stainless steel, permanent	50.00	20.00	X	X	
02840	Crowns - porcelain	240.00	175.00	X		
02845	Crowns - acrylic	150.00	100.00	X		
02850	Crowns - acrylic with metal	200.00	140.00	X		
02855	Crowns - Gold full cast	275.00	200.00	X		
02860	Crowns - Gold 3/4 cast	250.00	185.00	X		
02891	Post and Core Build-up - Amalgam or composite resin (permanent teeth only)	50.00	20.00	X	X	
02893	Crown Post - Gold	100.00	60.00	X		

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CODE	PROCEDURE	CUSTOMARY FEE	MINIMUM FEE	LOW INCOME PROGRAM	MEDICAID W/O PRIOR APPROVAL	MEDICAID WITH PRIOR APPROVAL
02895	Recementation of Crown	\$ 20.00	\$ 7.00	X		
02897	Sedative Restoration	20.00	7.00	X		
<u>ENDODONTICS</u>						
03110	Pulp cap - direct	15.00	5.00	X	X	
03210	Pulpotomy - primary tooth	30.00	12.00	X	X	
03220	Pulpotomy - permanent tooth	35.00	15.00	X		X
03310	Root Canal Therapy - one canal/ tooth	140.00	75.00	X		X
03320	Root Canal Therapy - two canals/ tooth	170.00	90.00	X		X
03330	Root Canal Therapy - three or more canals/tooth	210.00	125.00	X		X
03340	Apicoectomy	75.00	40.00	X		
<u>PERIODONTICS</u>						
04100	Gingivectomy or gingivoplasty - per quadrant	85.00	30.00	X		
04110	Gingival curettage - per quadrant	25.00	10.00	X		
04120	Periodontal scaling and root planning - per quadrant	25.00	10.00	X		
04200	Periodontal surgery - only if there are related medical factors - per quadrant					X
04344	Preventive Periodontics, routine periodontal scaling, root planning, subgingival curettage - per quadrant	42.00 (\$150 F.M.)	10.00 (\$20 F.M.)	X		X
04400	Osseous surgery (including flap entry and closure) - per quadrant	80.00	40.00	X		

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CODE	PROCEDURE	CUSTOMARY FEE	MINIMUM FEE	LOW INCOME PROGRAM	MEDICAID W/O PRIOR APPROVAL	MEDICAID WITH PRIOR APPROVAL
04500	Occlusal adjustment (complete)	\$200.00	\$100.00	X		
<u>PROSTHODONTICS</u>						
05210	Partial Denture - Upper or lower, acrylic base without clasps.	195.00	110.00	X		X
05215	Partial Denture - Upper or lower, acrylic base with wrought wire clasps.	275.00	160.00	X		X
05220	Partial Denture - Upper or lower, with cast clasps and lingual or palatal strengthening bar.	425.00	260.00	X		X
05225	Partial Denture - Unilateral or one tooth. Acrylic base with cast clasps.	235.00	150.00	X		X
05230	Acrylic Denture - Upper or lower	240.00	150.00	X		
05235	Immediate Denture - Upper or lower	275.00	175.00	X		
05610	Repair broken partial denture, no teeth damaged	30.00	20.00	X	X	
05615	Repair of denture (upper or lower) no teeth damaged	30.00	20.00	X		
05620	Repair broken partial denture and replace one broken tooth	40.00	25.00	X	X	
05625	Repair of denture (upper or lower) and replace one broken tooth	42.00	25.00	X		
05630	Replace additional teeth on complete or partial denture - each tooth	12.00	8.00	X	X	
05640	Replace broken tooth on complete or partial denture - no other repairs	30.00	18.00	X	X	

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CODE	PROCEDURE	CUSTOMARY FEE	MINIMUM FEE	LOW INCOME PROGRAM	MEDICAID W/O PRIOR APPROVAL	MEDICAID WITH PRIOR APPROVAL
05650	Adding tooth to partial denture to replace extracted tooth (involving clasp or abutment tooth) - each tooth	\$ 65.00	\$ 45.00	X	X	
05660	Adding tooth to partial denture to replace extracted tooth (not involving clasp or abutment tooth) - each tooth	50.00	40.00	X		
05670	Reattaching undamaged clasp on partial denture	40.00	25.00	X	X	
05680	Replacing broken clasp with new clasp on partial denture	50.00	30.00	X	X	
05690	Reline of denture or partial denture (office reline)	37.50	25.00	X		
05692	Reline of denture or partial denture (laboratory reline)	55.00	40.00	X		
05694	Reline of denture - Treatment reline (Softone) (Office reline)	30.00	22.00	X		
05696	Reline of Denture - Treatment reline (laboratory reline)	55.00	40.00			
05698	Prosthesis Adjustment	15.00	10.00			
<u>ORAL SURGERY</u>						
07110	Routine Extraction - Primary tooth	15.00	7.00	X	X	
07120	Routine Extraction - Permanent tooth	20.00	8.00	X	X	
07130	Routine Extraction - Permanent tooth - requiring prosthetic replacement	20.00	8.00	X		X
07210	Surgical Extraction of primary or permanent tooth with complicating factors	40.00	18.00	X		X

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CODE	PROCEDURE	CUSTOMARY FEE	MINIMUM FEE	LOW INCOME PROGRAM	MEDICAID W/O PRIOR APPROVAL	MEDICAID WITH PRIOR APPROVAL
07220	Surgical Extraction of tooth with soft tissue impaction	\$ 50.00	\$ 20.00	X		X
07240	Surgical Extraction of tooth with complete bony impaction (90% of tooth in bone)	80.00	30.00	X		X
07250	Root recovery (surgical removal of residual root)	40.00	18.00	X		X
07260	Alveoloplasty for dentures - per quadrant	37.50	15.00	X		
07270	Surgical removal of cyst or tumor	60.00	30.00	X		
07280	Incision and drainage of abscess - intraoral	30.00	15.00	X		
07285	Incision and drainage of abscess - extraoral	100.00	50.00	X		
07290	Frenulectomy - separate procedure (frenectomy or frenotomy)	35.00	15.00	X		
<u>ORTHODONTICS</u>						
08110	Removable appliances for tooth guidance	150.00	80.00	X		
08150	Fixed or cemented appliances for tooth guidance	180.00	100.00	X		
08200	Minor interceptive orthodontics	85.00	50.00	X		
<u>ADJUNCTIVE GENERAL SERVICES</u>						
09920	Intravenous Sedation administered by licensed oral surgeon and pedodontist <u>only</u>					X
09930	Non-Conforming procedures or circumstances					X

APPENDIX D

PATIENT CONSENT FORM

PATIENT CONSENT FORM

CONSENT FORM FOR USE WITH STUDY: "A Study to Estimate the Dental Needs and Costs of Adding Dental Care Service for the Elderly to Medicaid in the State of Tennessee."

I certify that I have volunteered to participate in a research project which involves an oral examination and my answering 21 questions. This procedure has been explained, and I understand that this information is to be used by Bonnie Strickland, Registered Dental Hygienist for the Dental Division of the Tennessee Department of Health and Environment, in her preparation of her dissertation for The University of Tennessee at Knoxville. I also understand that this information will be published, but it will not be published in such a way that I will be identified. I have had an opportunity to ask questions about this program, and I have received acceptable answers. I understand that I may withdraw from this project at any time, for any reason I see fit.

Participant or Legally Authorized
Representative

Investigator

Date

Bonnie Strickland, RDH, MA
616 Willowood Drive
Johnson City, Tennessee 37601

VITA

Bonnie P. Strickland was born in Nashville, Tennessee, on January 10, 1932. She attended Jere Baxter Elementary School and was graduated from Isaac Litton High School in June 1952.

After the birth of her five children she entered college in 1969 and received an Associate Degree in Dental Hygiene from East Tennessee State University in 1971, the Bachelor of Science degree in Health Education from ETSU in 1974, and the Master of Arts degree in Educational Administration and Supervision from ETSU in 1975.

She has been employed as a dental hygienist for Drs. Don Hyatt and Jack Denton in Bristol, Tennessee. Since 1973, she has been employed as the State Public Health Dental Hygienist with the Dental Division of Tennessee Department of Health and Environment in Johnson City, Tennessee.

She received an educational training assistantship from the State of Tennessee and entered the doctoral program full-time at The University of Tennessee, Knoxville, in September 1982 and received the Doctor of Philosophy degree with a major in Health Education in August 1984. She is a member of the American Public Health Association, Tennessee Public Health Association, American Dental Hygienist Association, Tennessee Dental Hygienist Association, Phi Kappa Phi, and Kappa Delta Pi. She received the Dental Health Educator Award from the Academy of Health Education in 1981, and the Dental Health Education Award from the Tennessee Dental Hygienist Association in 1981.

She lives with her son, David, in Johnson City, Tennessee.