The University of Chicago
Graduate School of Business
Center for Health Administration Studies (CHAS)
1101 East 58th Street, Walker 111
Chicago, Illinois 60637
(312) 702-7104

WORKSHOP IN HEALTH ADMINISTRATION STUDIES

HELEN GIFT, Ph.D.
Chief, Health Promotion Section
National Institute of Dental Health
National Institutes of Health
Bethesda, Maryland

"Measuring and Understanding Social Inequalities in Oral Health"

for

Thursday, November 29, 1990

Rosenwald 405

3:30 - 5:00

DRAFT

Measuring and Understanding Social Inequities in Oral Health

Helen C. Gift, Ph.D.
Chief, Health Promotion Section
National Institute of Dental Research

November, 1990

MEASURING AND UNDERSTANDING SOCIAL INEQUITIES IN ORAL HEALTH

Introduction

Inequities in oral health have been investigated by studying oral health status, knowledge and attitudes, and behaviors, particularly oral hygiene behaviors and care-seeking behaviors. Traditional epidemiological studies have shown differences in oral health status among demographic, socioeconomic and racial/ethnic groups. These studies have indicated lower levels of oral health status, based on summary measures, among older individuals, as well as lower socioeconomic and minority status groups. Most epidemiological studies have been limited in the kinds and number of social variables included, however, limiting any ability to analyze why these associations might be occurring. Recent analyses, breaking down the summary epidemiological indices into component parts indicate that there is little evidence of differences in levels of diseases per se, but rather gaps in treatment. For example, analyses of the DMFT measure (decayed, missing, and filled) indicate that it is the missing and filled components of the index which are different for lower socioeconomic and minority groups. Multivariate analyses using the same data set reported in this presentation have shown increasing number of absent teeth among older, Black, poorly educated individuals with more limited economic access. Similarly individuals with more

1

perceived oral symptoms are poorly educated, with limited economic access, negative attitudes toward oral health and poor oral hygiene habits.

These findings on oral health status point to the importance of access to the dental delivery system, as it relates to differences in attitudes, knowledge, and social factors, all of which affect the availability and acceptance of oral hygiene and professionally provided treatments. The purpose of this presentation is to consider inequities in access to oral health care in more depth.

Background

Inequity in regular source of care appears to be more predictive of use of the system and health outcomes than actual need (andersen et al 1983). Having a usual source of medical care facilitates continuity and quality of care (Andersen et al 1986). It has been established in the medical care literature that persons with a usual source of care are more likely to make at least one physician visit during a given year (Andersen and Anderson, 1967; Andersen et.al., 1972,; Bice et al. 1973; Kasper; Richardson 1971).

Also persons with a usual source of care appear to experience a greater total amount of care (Andersen, 1968). There is some evidence that 'disadvantaged' persons with an illness episode (those near the poverty line and those with Medicaid type coverage,

those who have to pay out-of-pocket for most of their care and those with less education) are more likely to receive most of their care from a provider who is their usual source (Shortell, 1975). Other evidence suggests that Hispanics are less likely to have a regular source of care, and are more likely to use hospital clinics and emergency facilities for care (Andersen et al 1986). Thus, while ability to pay, source of payment, and other socioeconomic factors are often primary explanations of number of visits for an ill person, having a usual source of care has been demonstrated to be a very significant factor (Andersen et al 1986).

Research has demonstrated that the proportion of individuals having a usual source of health care has changed little over the past several decades. Although having a usual source of care has remained relatively stable, between 1963 and 1970, there was a decrease in the proportion of individuals naming a specific physician as that source of care (Andersen et al, 1976). The trend is true for all age groups and both genders. In both decades, young and middle-age adults appear most likely to report "no usual source of care". Not having a usual source of care was also more characteristic of those with lower income and education, nonwhites, those living in an inner city, persons without insurance, or the unemployed. Those with both a low income and an inner city residence were the most likely not to have a usual source of care (Aday and Andersen, Andersen et al, 1976). Reasons for absence of a usual source of medical care include: do not get sick (65%), go

to different places (21%), new to area (19%), source no longer available (12%) (kasper).

The changing health care delivery system may explain some of the dynamics in the reporting of a usual source of medical care. The availability of group practices, outpatient care in clinics, hospitals, HMOs, and other alternate sources creates a different physician/patient pattern for many with group insurance, and more access for the poor or those unfamiliar with the private practice system while still not increasing use of a specific physician.

These changes have not occurred in dentistry to the same extent, where services are still paid for largely by the patient, and provided predominantly in small private practices. The dental delivery system has different implications for access based on knowledge and ability to pay. Also, given the greater frequency of single-dentist practices, than is the case in medicine, having a usual source of care is more likely to mean the same dentist. The role that a usual source of care has on increased use of care and positive health outcomes has been reported in the dental literature (Rand, Gift, Newman and Andersen). Also, not having a usual source of care has been reported as a key correlate of work lost for dentally-related reasons (Cohen, 1985).

Use of dental services during a year is related to provider continuity, as well as sociodemographic characteristics, oral

4

health status (clinical and self reported), perceived health care, satisfaction with dental care and ability to pay (Ware et al, 1987). Individuals who are less likely to have used dental services have been found to be lower socioeconomic status, in poorer oral health, have less favorable attitudes, and less provider continuity. Also, individuals with less provider continuity spend significantly more on all dental services (Ware). These associations reported in the literature provide expected evidence that persons who go regularly to a dentist have increased opportunity to prevent disease or have it treated at early stages, while lack of regular care may result in extensive treatment need or such a severity of disease that only extraction (missing teeth) can be the outcome.

Conceptualization of Regular Source of Care

Access is a function of structural characteristics, availability of resources, the individual's knowledge of the system, the ability of the individual to use the system, and the individual's interest in using the system. Access has been conceptualized and measured in different ways in the research literature: 1) actual linkage with the system (realized access); 2) consumer perception that a source of care is available; and 3) satisfaction with care (Andersen et al 1983). In the literature, having a routine source of care has been measured by quantitative indicators: 1) realized access (interval since last visit, visit during the past 12 months,

5

the proportion of preventive to restorative services), and 2) perception of 'usual source of care', e.g., asking the individual a series of questions: "Is there a particular doctor/dentist or clinic you usually go to when sick, or for advice about health?" "Is that a clinic, regular family doctor, some type of specialist, or what?" "If clinic, do you go to a particular doctor at that clinic?" "What is the name of the doctor?" (Andersen et al, 1976). Asking an individual if he has a place he usually goes for care may be a measure of knowledge of the system as much as having a source of routine care (Andersen et al 1986).

Measures of 'routine care' reported in the literature represent a gap between the concepts for and measurements of access and utilization. As a single measure, visit reflects acting on a propensity or perceived need; having a 'usual source of care' is a perception that a useable resource is there if needed. As a multidimensional concept, access is envisioned as a combination of potential and realized access. A broader concept, **"regular source of care"**, is based on 1) a perception that one has a regular source of care and 2) actual contact with the system.

The purpose of this study is to improve understanding of inequities in oral health using a multidimensional measure ('regular care'). First, the value of this conceptual measurement in models, in contrast to other more traditional measures of routine care and usual source of care, will be evaluated. Then the differences

6

between individuals with a regular source of care and those without in terms of predisposing, enabling and need factors will be analyzed to describe social inequities which exist.

MATERIALS AND METHODS

Methodology

The data for these analyses were collected in 1981 as part of a U.S. household survey of Dental Health Outcomes Related to Dental Prepayment sponsored by Health Resources and Services Administration of the U.S. Public Health Service. This is the most comprehensive cross-sectional data base in dentistry, having sociodemographic, knowledge, attitudes and behavior, practice, payment and clinical information. The participants in the survey were selected using a multi-staged probability sample covering 48 states (excluding Alaska and Hawaii) and the District of Columbia. Persons living in institutions or in other group quarters were excluded from the study; however, military personnel and their families living off military reservations were part of the target population. The final sample consisted of 2,428 households with 7,078 individuals 2 years of age and older. The sample was stratified to create a balance of those with and without dental insurance. The sample selected was 52 percent female, 82 percent white, and 48 percent had dental insurance.

Personal interviews were conducted and self-administered questionnaires were completed with sampled families to obtain socio-demographic information including detailed accounting of all dental insurance plans, family income, and employment histories. In addition, information was also obtained concerning the number of dental visits during the previous two years, home dental health care behaviors, and preventive attitudes. For children ages 3 to 13, parents were asked to fill out the self-administered questionnaire.

At the interview, efforts were made to schedule the entire family for an oral health screening examination. The examinations were performed by examination teams in the homes of the respondents. Training and calibration were conducted (Brown, et. al.). Followup with dental practices and dental insurance plans were done to create additional data sets. Extensive analyses comparing nonrespondents to respondents were conducted. Nonresponse adjustment factors were calculated as appropriate and incorporated into the population weights.

Variables

Variables available to assess routine or usual care in this data base are 1) "did you visit a dentist (dental specialist, hygienist, dental technician) during the past 2 years?"; 2) "When was the last time you received any type of dental care--month and year?"; 3) "Do

8

you have a regular dentist, that is, a dentist you normally go to for routine dental care?" The distributions on these variables are in Table 1: approximately one third of the respondents had been to the dentist in 1980 (essentially within 12 months of the interview); 69 percent had been during the past two years; and three quarters had a dentist to whom they normally went.

For these analyses, two year visit and usual source of care were combined into a constructed variable representing both the perceptual and realized dimensions of **regular care**. Using the constructed variable--**Regular Source of Care**--63 percent have both a dentist they normally visit <u>and</u> have had a visit during the past two years, 17 percent had one or the other, while 20 percent had neither a usual source nor a visit (Table 2). For the purpose of the descriptive analyses, comparisons are made between those who had both or those who had neither. Preliminary stepwise linear regression were based on the four-point dependent variable. In the logistic regression those with both realized and perceived access were compared with all others groups in one category.

Other variables to assess the value of this conceptual approach to regular care were selected if they had been factors of significance in other studies of routine source of care or dental services utilization. Variables were selected to represent predisposing and enabling factors, oral hygiene behaviors, perceived health status, and actual oral health status. (See Figure 1)

9

Variables used in these analyses which represent direct reports from the individual are age, race/ethnicity, gender, total years of education, number of children in the household, marital status, location of residence (coded to SMSA status). Other variables (total 1980 family income, visits to dentist, presence of dental insurance) represent a calculation based on a series of questions. Attitudes and reported behaviors were developed into constructs as indicated in Figure 1. Three measures of treatment need were abstracted from the clinical file and used in these analyses to represent oral health status: Number of Permanent Tooth Surfaces Needing Restoration, Number of Teeth with Any Gingival Inflammation, Number of Permanent Teeth Present.

Data Analysis

The analyses presented in this paper are based on the basic screening interview, the self-administered questionnaire, and the clinical examination. (Each data file has a different base, depending on the overall response rate for each survey component (See Table 3). Bases for specific cross-tabulations and multivariate analyses are further reduced based on internal response rates.) Each person in the final sample is weighted to account for sample design, response rate, and the socio-demographic composition of the U.S. population in 1981. The data presented below have been analyzed both weighted and unweighted, and since

results are similar for both analyses, only weighted results are shown. Data presented here represent approximately 150 million Americans 3 years of age or older in the 1981 population.

RESULTS

Descriptive Comparison of Different Measures of Routine Care

Table 4 illustrates the comparisons of access (as defined by three different measures) with the construct, **regular care**. As can be seen the characteristics of respondents (classified by different measures of access) are nearly identical, indicating that the four measures reflect similar concepts, and perhaps conceptually could be used interchangeably. Very modest differences are seen in the smaller proportion of respondents who have 'been to the dentist during the past year' who are Black or have three or more children, and the slightly higher proportion with 'visits in the past year' who have no perceived symptoms, excellent attitude, excellent oral hygiene behavior, and no restorative needs, compared to the other measures of access. None of the observed differences, however, have practical significance sufficient to suggest that the variables are conceptually different.

Comparison of Those with Access and Those Without

The purpose of these analyses is to assess the equity characteristics of **Regular Care** versus **Non Regular Care**.

Individuals with **regular care** appear to be different than those without, as can be seen in Table 5. Individuals with a **regular source of care** are more likely than those without to be white, have high income, have dental insurance, have no cost barriers, no perceived symptoms, no fear of pain, and visit the dentist for checkups. Those with **no source of regular care** are more likely to have less than 12 years of education, be edentulous and go to the dentist because something hurts [reason for care]. Not surprisingly, given the large sample size, all of the reported cross tabulations are statistically significant at .001 or greater.

Other dimensions of equity and nature of access, and the interaction of the predisposing, enabling, and oral health status variables were considered. For example, the reason given for seeking care is a reflection of orientation toward dental services. As seen in Table 6, individuals who have good oral health status as indicated by absence of treatment needs or perceived symptoms are more likely to have visited the dentist most recently for a checkup; this is particularly the case for those individuals who are very satisfied with the way their teeth look.

Multivariate Analyses with Regular Care

To further improve understanding of inequities in access to oral health, multivariate analyses were pursued. Given the various types of measurements, several forms of multiple regression (linear stepwise, discriminant, GLM, logistic) were tested with different forms of **regular source of care** to determine the one most suitable. All forms resulted in similar fits. Initial linear stepwise (with the 4-point dependent variable), using SAS, resulted in a R^2 of .152. This compared with R^2's of .144 for 'visit in the past year', .119 for 'two year dental visit', and .134 for 'usual source of care'. These comparisons suggested that the model fit **regular care** as well if not better than those for the other measures of access (See Table 7).

Since this was an exploratory study, and since the dependent variable was suitable to a dichotomous split, logistic stepwise regression was performed and is reported here.

To test the relative importance of the variables in the overall model, the submodels were run sequentially, e.g. demographic variables model, predisposing variables model, enabling variables model, and the total variables model. Dummy variables were created for those independent variables not meeting the assumptions necessary for regression procedures. Variables left in the final equations each were statistically correlated with **regular care**.

Theoretically important variables were entered into the regression models from those illustrated in Figure 1:

Demographic Model: Age, Gender, 4 Dummy Variables for race/ethnicity--White, Black Other, Hispanic

Predisposing Model: Demographic Model Variables, Attitude Toward Oral Health, Perceived Symptoms, oral hygiene behavior

Enabling Model: Education, Number of Children, SMSA, Economic Access, 1980 Income, Covered (dental insurance)

Total Model: (with/without clinical) Predisposing Model Variables, Enabling Model Variables

Regular Care as Dependent Variable: Total Sample

Table 8 presents the logistic regression models for **regular care** as the dependent variable with the total sample as the base. Using the demographic model, white and age were the first variables entered into the equation. The model Chi Square was significant, at 461.88 with 4 degrees of freedom. (The limited dispersion of Hispanic and other may affect the analyses. Given the construction of the dummy variables for race and ethnicity, the four variables overlap conceptually, thus even though black/non-black drops out of the equation, race remains a key demographic factor as represented by the white dummy variable.)

The predisposing block of variables were entered into a logistic stepwise regression. This analysis included the demographic as

14

well as the attitude and behaviors variables. **Attitude toward oral
health and oral health care** was the first variable entered,
followed by white and fear of pain. Interestingly, age disappears
as a factor in the predisposing model and appears to be replaced
by attitude toward oral health.

With enabling factors alone, 1980 income is the first variable
entered into the equation, followed by having no problems with
economic access. Years of school completed and number of children
offer small but significant contributions to the explained
variance. The model Chi Square was significant, at 299.17 with 5
degrees of freedom.

The stepwise equation for the total model included variables from
all of the conceptual blocks. Using variables representing
predisposing and enabling factors, and clinical measures (with a
much reduced 'n') having no economic access problems is the first
variable which enters the equation, remaining significant in the
final equation with a Beta of .3108. Other variables entered into
the equation are represented in Table 8, with the most additional
variance being explained by income and oral hygiene behaviors.

A stepwise logistic regression was run with enabling plus
predisposing variables without the 'hispanic' and 'other' variables
to determine if the limited dispersion of these measures was
affecting analyses. Clinical variables were also removed. Given

that no clinical variables were significant in the total regression reported above, and the considerably reduced 'n' resulting when these variables are entered, it was thought that this final regression might be more sound. Economic access, income, attitude toward oral health, oral hygiene behavior and fear of pain were the most significant variables in this model. The model Chi Square was significant, at 197.84 with 7 degrees of freedom.

Table 9 shows the odds ratios based on the logistic models tested. In the way of an illustration, using the predisposing model, those with a negative attitude are almost three times more likely to have no regular source of care. In the predisposing model, being non-white, with a poor attitude and poor oral hygiene results in being 11.5 times more likely to have no regular source of care. Similarly, other comparisons are shown throughout the table.

In the total model (no clinical variables), those with no reported economic access problems are .295 as likely to have no regular source of care, compared to those with severe economic access problems. Having both poor attitudes and poor oral hygiene behaviors results in twice the likelihood of having no regular source of care.

SUMMARY AND CONCLUSIONS

Analyses suggest that **regular care**, a constructed variable representing both perceived and realized access to care, is a valuable measure of access, which to this point has been measured only by reported perception of usual source of care <u>or</u> visits to a dentist. In comparative analyses, **regular care** is correlated with the same predisposing, enabling, and oral health outcome variables as more traditional measures of usual source of care or visits. In multivariate analyses, the results suggest that **regular care** is a sensitive measure of access to care.

Almost two thirds of the population have a **regular source of care**, while 20 percent have none. In descriptive analyses individual with a regular source of care are more likely than those without to be white, have dental insurance, have no cost barriers, no perceived symptoms, no fear of pain and visit the dentist for checkups. Those with no source of regular care are more likely to have less than 12 years of education, be edentulous, and go to the dentist because something hurts.

Logistic regressions indicate that there is an increased probability of having a regular source of care if individuals have no economic access problems, higher income, report more oral hygiene behaviors, have positive attitudes toward oral health, no fear of pain, are white and female. The multivariate analyses

illustrate contribution from each part of the conceptual framework: predisposing, enabling, and oral health behaviors. Overall, this descriptive model suggests that individuals with resources in the form of financing and education, and a sense of self-efficacy as represented in oral hygiene behaviors and attitudes toward oral health have the greatest probability of having a regular source of care.

Considerably more research is needed on those groups of individuals with social inequity in oral health. Overall, oral health status in the U.S. is improving, yet key groups still suffer unnecessarily from oral diseases which are basically preventable. Given that these same groups suffer from many other social and medical burdens, relief from unnecessary oral diseases would be a considerable benefit. Yet, improved understanding of the groups which appear to have these social inequities is not as easy as it appears. Large scale social surveys such as the one reported here are few and costly, and often the data are limited in scope and depth. Beyond this, there are often insufficient numbers in the sample of the very individuals about whom we need to know more. For example, in the cross tabulations of these data there were nearly 800 Blacks and over 4800 whites. In descriptive analyses of Blacks versus whites at the national level the data are weighted to be representative. For more detailed analyses, which would be useful in assessing the heterogeneity within the Black population, the numbers in the sample quickly become a problem. For example,

in multiple cross tabulation considering race x gender x income x visits, there were only 9 Black males with income over $40,000 who had a visit. On the **high** end there were 96 Black females with less than $10,000 income without a visit. The Hispanic subsample presents the same problem. There are only 21 Hispanic males age 18-64 with under $10,000 income and under 12 years of education, and 7 Hispanic women, ages 18-64 with over 12 years of education and $20-30,000 income. Distribution problems are similar in cross tabulation using other social indicators thus affecting interpretation of any multiple-variable analyses of social indicators and oral health variables. (NHANES III which has an oral health component and a reasonable representation of social indicators will have much the same problem.)

A great deal of criticism has been directed toward presentations which report data that suggest that all older adults, all Blacks, or all Hispanics are the same. Large national surveys, such as the one reported here, designed to report national statistics, may not be the solution for providing the detailed understanding of groups with multiple social inequities. Small scale, targeted intervention research in key communities may be the best solution to further understanding of the social inequities in oral health. These also have the value of providing some health education or health promotion benefit at the same time as obtaining more information.

Table 1

<u>Measures of Routine Care</u>
1981

Last Time Received Dental Care Within Past Year	36%
Visit During Past Two Years	69
Have Dentist (Location) Normally Go To	75
Regular Source of Care	63

Table 2

Regular Source of Care

	%
Had Visit in Past Two Years/Have Dentist Normally Go To	36
Had Visit in Past Two Years/No Dentist Normally Go To	6
No Visit in Past Two Years/Have Dentist Normally Go To	11
No Visit in Past Two Years/No Dentist Normally Go To	20

FIGURE 1

VARIABLES IN STUDY

Predisposing

(used as reported)

Age
Race/Ethnicity
        White
        Black
        Hispanic
        Other
Gender

(constructs based on report)

Perceived symptoms: summary scale, presence of one or more symptoms (broken or chipped tooth that hurts when touched; gums that sometimes hurt, feel sore to touch or bleed for no apparent reason; any teeth that are sensitive to hot and cold liquids or foods; sores that sometimes develop on tongue, or on the inside of moth or cheeks; any teeth that ache or throb sometimes for no apparent reason; and any teeth that hurt when eating or drinking very sweet things. (high value--more symptoms)

Attitude Toward Oral Health/Care: summary scale based on a series of attitude (fatalism) statements, with a high value being a more positive attitude; e.g., some people are just born with good teeth and other are not--there's not much anyone can do about it.

Perceived reason for last dental visit (or series of visits): for checkup or cleaning, wanting work done or because something hurt. (low value--more preventive)

Fear of Pain: summary measure, the extent to which level of fear and expectation of pain associated with dental treatment is a barrier. (low value--no pain)

Oral Hygiene: summary scale measure representing the extent to which the individual reports oral hygiene behaviors including brushing, flossing, use of fluoride dentifrice, avoiding sweet snacks, use of wooden sticks. (higher value--more oral hygiene)

FIGURE 1 (continued)

Enabling

(used as reported)

Years of Education
Number of Children
Marital Status
SMSA

(Constructs based on a Series of Questions)

1980 Income (0 and up)
Dental Insurance Coverage (yes/no)

Economic Access: 4 point Guttman scale representing the extent to which cost of dental care is a barrier to use. (low value--no problem)

Oral Health Status (examination)

Permanent Teeth
Teeth Needing Restoration
Teeth with Gingivitis

Access

(as reported)

Visits in Past Two Years
Date of Last Visit (e.g. visit in 1980)
Source of Usual Care

Table 3

Bases for Components of Survey

	Base
Demographic Information	6732

Gender
  Male
  Female
Age 65+
White
Black
<12 Years
  Education
3+ Children
SMSA
Dental Insurance

Reasons for
Last Dental Visit
  Checkup
  Want Work Done
  Something Hurt

1980 Income ($29,000+)

	Base
Self Administered Questionnaire	3309

Cost Not
  Barrier
No Perceived
  Symptoms
Excellent Attitude
No Fear of Pain
Excellent Oral
  Hygiene Behavior

	Base
Clinical Exam	2619

No Permanent
  Surfaces Need
  Restoration
No Gingival
  Inflammation
No Permanent
  Teeth

	Base
Three Combined	2090

Table 4

Selected Characteristics of Dental Utilizers Across Definitions of Access (total sample)

	<1 Year Since Last Visit	Visit Past 2 Years	Have Dentist Normally Go To	Regular Source of Care
	%	%	%	%
Gender				
Female	52	52	52	52
Male	48	49	48	48
Age 65+	11	9	8	9
White	89	86	85	86
Black	5	9	8	8
<12 Years Education	38	39	40	38
3+ Children	20	23	25	24
SMSA	81	77	76	76
Dental Insurance	54	53	52	54
Cost Not Barrier	40	40	41	39
1980 Income ($29,000+)	37	38	37	39
No Perceived Symptoms	50	47	46	47
Excellent Attitude	42	36	35	38
Reasons for Last Dental Visit				
Checkup	51	48	48	50
Want Work Done	36	33	34	33
Something Hurt	13	19	18	17
Excellent Oral Hygiene Behavior	34	32	30	32
No Permanent Surfaces Need Restoration	55	52	51	52
No Gingival Inflammation	21	23	24	23
No Permanent Teeth	3	3	5	2

Table 5

Selected Characteristics of Those with Regular Source of Care and Those Without (total sample)

	Regular Source of Care %	No Regular Source %
Gender		
Male	48	44
Female	52	56
Age 65+	9	21
White	86	73
Black	8	18
<12 Years Education	38	57
3+ Children	24	24
SMSA	76	79
Dental Insurance	54	33
Cost Not Barrier	39	27
1980 Income ($29,000+)	39	13
No Perceived Symptoms	47	37
Excellent Attitude	38	19
No Fear of Pain	49	35
Reasons for Last Dental Visit		
Checkup	50	31
Want Work Done	33	46
Something Hurt	17	24
Excellent Oral Hygiene Behavior	32	19
No Permanent Surfaces Need Restoration	52	54
No Gingival Inflammation	23	43
No Permanent Teeth	2	30

Table 6

Actual and Perceived Treatment Need and
Reason for Last Dental Visit or Series

	No Permanent Teeth Need Restoration (clinical)	No Perceived Symptoms	Very Satisfied With Way Teeth Look
	%	%	%
Reason for Last Visit			
Checkup	47	55	59
Wanted Work Done	37	31	29
Something Hurt	16	14	12

Table 7

Squared Multiple Correlation Coefficients (R^2)
of Variables in the Demographic, Predisposing, Enabling,
Total Models Predicting Utilization Variables
Linear Stepwise (SAS)

Total Sample

	≤1 Year Since Last Visit	Visit Past 2 Years	Have Dentist Normally Go To	Regular Care (const.)
Demographic Model	.078	.047	.051	.062
Predisposing Model	.086	.075	.066	.089
Enabling Model	.101	.109	.115	.125
All Variables Model	.144	.119	.134	.152

Table 8

Logistic Stepwise Regression
Summary, Total Sample
Dependent Variable: Regular Care (0=Yes, 1=No)

Variable	Beta	Standard Error
Demographic Model		
Intercept	.2377	.1071
White	-1.1626	.0674
Age	.0194	.0013
Gender	- .2893	.0539
Other	- .8738	.2011

All Variables Significant .001
Model Chi Square= 461.88, 4 DF, P= 0.00,   R=23.3

Variable	Beta	Standard Error
Predisposing Model		
Intercept	.8611	.2614
Attitude	- .3368	.0564
White	- .9187	.1638
Fear Pain	.2250	.0473
Other	-1.7170	.5812
Oral Hyg Behaviors	- .1703	.0568

All Variables Significant .001
Model Chi Square= 125.44, 5 DF, P= 0.00,   R=.242

Variable	Beta	Standard Error
Enabling Model		
Intercept	.3916	.2702
1980 Income	- .1533	.0189
Economic Access	.3797	.0459
Grade	- .0925	.0165
Covered	.3680	.0980
# Children	- .1585	.0429

All Variables Significant .001
Model Chi Square= 299.17, 5 DF, P= 0.00,   R= .316

Table 8 (continued)

Total Model
<u>Clinical</u>

Intercept	- .3561	.4306
Economic Access	.3108	.0760
1980 Income	- .1593	.0304
Oral Hyg Behavior	- .2548	.0803
Fear Pain	.1959	.0682
Attitude	- .2068	.0791

All variables significant .001
Model Chi Square= 107.77 7 DF, P= 0.00,   R=29.7

Total Model
<u>No Clinical/No Hispanic, Other</u>

Intercept	1.3009	.3490
Economic Access	.4067	.0594
1980 Income	- .1459	.0238
Attitude	- .2415	.0622
Oral Hyg Behaviors	- .2003	.0632
Fear Pain	.2024	.0533
White	- .5673	.1710
Gender	- .3802	.1290

All Variables Significant .001
Model Chi Square= 197.84 7 DF, P= 0.00,   R=32.5

Table 9

Selected Odds Ratios
Logistic Regression
Regular Source of Care (0)/No Regular Source of Care (1)

Odds Ratios

Predisposing Model
  Attitude   2.746
  White   2.506
  Fear Pain   .859
  Other   5.570
  Oral Hygiene Behavior   1.667

  White/Attitude/Behavior   11.468

Enabling Model
  Income   2.915
  Economic Access   .320
  Grade   1.448
  Covered   .692
  Number of Children   1.608

Total Clinical
  Economic Access   .394
  1980 Income   3.049
  Oral Hygiene Behavior   2.147
  Fear Pain   1.798
  Attitude   1.859

Total No Clinical/No Hispanic
  Economic Access   .295
  1980 Income   2.773
  Attitude   2.060
  Oral Hygiene Behavior   1.823
  Fear Pain   .545
  White   1.763
  Gender   1.462

  White/Gender   2.579
  Behavior/Attitude   3.760
  Behavior/Attitude/
    Economic Access   1.111
  White/Gender/
    Economic Access   .758

DRAFT
3/25/90

Aday LA, Andersen RM. The National Profile of Access to Medical Care: Where Do We Stand? Am J Public Health 74: 1331-1339, 1984.

Aday LA, Fleming GV, Andersen RM. Access to Medical Care in the U.S.: Equity for Whom? Beverly Hills, CA: Sage Publications, 1980.

Andersen R. A Behavioral Model of Families' Use of Health Services. Research Series No. 25. Chicago: Center for Health Administration Studies, University of Chicago, 1968.

Andersen R and Anderson OW. A Decade of Health Services. Chicago: University of Chicago Press, 1967.

Andersen RM. Giachello AL, Aday LA. Access of Hispanics to health care and cuts in services: a state-of-the-art overview. Publ Hlth Rpts 101(3) 1986: 238-252.

Andersen R, Greeley RM, Kravits J, Anderson OW. Health Service Use National Trends and Variations, 1953-1971. DHEW pub. no. (HSM)73-3004 (October), 1972.

Andersen R, Lion J, Anderson IW. Two Decades of Health Services. Cambridge, Massachusetts: Ballinger Publishing Company, 1976. Bice TW, Rabin DL, Starfield BH White KT. Economic class and use of physician services. Medical Care 11 (July-August): 287-296, 1973.

Andersen RM, McCutcheon, Aday LA, Chiu GY, Bell R. Exploring dimensions of access to medical care. HSR 18:1, 49-74, 1983.

Brown LJ. Relation between the extent of caries and dental utilization. Poster Presentation at the 1990 Annual Meeting of the American Association of Dental Research.

Brown LJ, Oliver RC, Löe H. Periodontal Diseases in the U.S. in 1981. J. Periodontol 60(7) 1989: 363-370.

Cohen LK. Market and community responses to changing demands from the workplace. Community Health Studies, IX, 1:1985; 18s-24s.

Evashwick C, Rowe G, Diehr P, Branch L. Factors explaining the use of health care services by the elderly. Health Services Research 19(3) 1984:358-382.

Gift HC. Utilization of professional dental services. In Cohen LK, Bryant PS (eds.), Social Sciences and Dentistry. London: Quintessence Publishing Company, 1984, 202-266.

Kasper JA, Barrish G. Usual Sources of Medical Care and Their Characteristics. Data Preview 12. National Medical Care Expenditures Study. DHHS Publ. No (PHS)82-3324. US Gov Printing Office, Washington, DC 1982.

Newman JF, Anderson OW. Patterns of Dental Service Utilization in the United States: A Nationwide Social Survey. Research Series No. 30. Chicago: Center for Health Administration Studies, University of Chicago, 1972.

Richardson W. Ambulatory Use of Physicians' Services in Response to Illness Episodes in a Low Income Neighborhood. Research Series No. 29. Chicago: Center for Health Administration Studies, University of Chicago, 1971.

Shortell SM. The effects of patterns of medical care on utilization and continuity of services. In Equity in Health Services, Andersen R, Kravits J, Anderson OW (eds.). Cambridge, Mass: Ballinger Publishing Co, 1975. 191-216.

Ware JE, Davies AR, Allen HM, Manning WG, Holty S. Explaining dental utilization behavior. Final Report of the Rand Corporation to DHHS PHS OASH NCHSR & HCFA. June, 1987.