

14
HCSO

79-004C

LEVEL

(2)

**EFFECT OF THE ARMY ORAL HEALTH MAINTENANCE PROGRAM (AOHMP)
ON THE DENTAL HEALTH STATUS OF ARMY PERSONNEL.**

SUBTITLE: AOHMP EVALUATION STUDY

**PART III. DENTAL CARE REQUIREMENTS OF ACTIVE
DUTY ARMY PERSONNEL, 1978**

ADA 080536

10 LTC Richard V. Mayotte DC, US Army
COL Warren A. Parker DC, US Army
COL George P. Barnes DC, US Army
Health Care Studies Division
Academy of Health Sciences
Fort Sam Houston, Texas 78234

DDC
RECEIVED
FEB 8 1980
E

DDC FILE COPY

Final Report

June 79

116

APPROVED FOR PUBLIC RELEASE
DISTRIBUTION UNLIMITED

Prepared for:

UNITED STATES ARMY HEALTH SERVICES COMMAND
Fort Sam Houston, Texas 78234

408 188

NOTICE

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

Regular users of the services of the Defense Documentation Center (Per DOD Instruction 5200.21) may order directly from the following:

Defense Documentation Center (DDC)
ATTN: DDC-TSR
Cameron Station
Alexandria, VA 22314

Telephones: AUTOVON (108) 28-47633, 34, or 35
IDS 107-47633, 34, or 35
Commercial (202) 27-47633, 34, or 35

All other requests for these reports will be directed to the following:

US Department of Commerce
National Technical Information Services (NTIS)
5285 Port Royal Road
Springfield, VA 22161

Telephone: Commercial (703) 557-4650

ACKNOWLEDGEMENTS

The authors wish to express their appreciation to the personnel at the study sites for their cooperation during the data collection portions of the study. The study was also supported by many HCSD personnel other than the project officers. Many thanks to Major A. Schopper, MSC and Captain Terry Rauch, MSC, for their computer programming and data analysis support; to SP-5 Geraldine Bradford Gorman and Inez Scott for their help in the conduct of the data collection effort, and to Patricia Coe Gilbert and Patricia Twist for assistance in preparing and proofreading the report.

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DDC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/ _____	
Availability Codes	
Dist	Avail and/or special
A	

80 2 4 065

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER HCSD 79-004C	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) EFFECT OF THE ARMY ORAL HEALTH MAINTENANCE PROGRAM (AOHMP) ON THE DENTAL HEALTH STATUS OF ARMY PERSONNEL. SUBTITLE: AOHMP EVALUATION STUDY, PART III DENTAL CARE REQUIREMENTS OF AD ARMY PERSONNEL		5. TYPE OF REPORT & PERIOD COVERED Final Report 3 Jan 78 - 30 Jun 79
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Richard V. Mayotte, LTC, DC Warren A. Parker, COL, DC George P. Barnes, COL, DC		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Health Care Studies Division (HSA-CHC) Academy of Health Sciences, US Army Fort Sam Houston, Texas 78234		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE June 1979
		13. NUMBER OF PAGES 102
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Unlimited Distribution		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Dental Care Requirements, Treatment Time Requirements, Army Oral Health Maintenance Program, Rank Groups, Basic Branch/Career Management Field, Oral Health		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Army Oral Health Maintenance Program is an official Department of the Army program which is designed to determine the oral and dental health care needs of Army personnel and to provide those care needs. The purpose of this phase of the study was to determine the dental care requirements of active duty Army personnel by rank group (E1-4, E5-6, E7-9, W1-4, O1-3, O4-6), by basic branch/career management field (combat or combat support/combat service support, and by installation. Personnel were evaluated at ten Army		

installations, using the requirement for an annual dental examination as the impetus for bringing personnel to the dental clinic for the exam. In a period of one month, about 6000 persons reporting for their dental exam were evaluated and treatment plans were formulated which would satisfy the care needs of those persons. In addition, numbers and types of dental treatments needed have been converted to hours required to perform the care. Sample distributions were determined for nine treatment categories; 97.2 percent of the sample required some form of dental care, preventive or corrective.

The results of this study will be useful to compare with results of an earlier study in the same area and also to compare with results of future studies to be conducted. The results of this study will also aid planners in determining resource requirements based upon need rather than numbers of personnel and in determining future specialty training requirements.

SUMMARY

This study was requested by the Directorate of Dental Services, United States Army Health Services Command in February 1977. The Health Care Studies Division (HCSD), Academy of Health Sciences (AHS), was tasked to perform the study by the Commander, Health Services Command. The purpose of the study was to evaluate the Army Oral Health Maintenance Program (AOHMP) as the basis for improving the oral health status of Army personnel and as the principal patient input program for the Army dental care system.

The objectives of this portion of the study were to determine: (1) the dental care requirements of active duty Army personnel; and (2) what differences, if any, exist in the oral health of soldiers according to their rank and basic military duties, i.e., combat or combat support MOSs. Treatment time requirements to perform the needed care were also calculated. The dental services of ten Dental Activities (DENTAC) collected data for the survey. Sites were selected to give a balance of population size and mission. The Army Oral Health Maintenance Program, which requires an annual dental examination for all active duty personnel during their birth month anniversary, was the sample selection mechanism.

About 6000 persons were examined. Based upon their needs a treatment plan was developed for each person which would satisfy all of their care needs. The data obtained were reliable at the 95 percent confidence level. Distributions of the nine treatment variables and estimates of the treatment time requirements for each variable are provided for the total sample and also by rank group, basic career management field, and site. Analysis of variance tests were performed to test for significant differences between means and Duncan's Multiple Range testing was also applied to rank and site subgroups to determine where the significant differences occurred between the subgroup categories. Analysis of the data indicated that 97.8 percent of the sample required some form of dental care. The need for restorations and extractions was found to be greatest among the lower ranking enlisted personnel. The most common need, regardless of rank, status, duty, or location was for preventive care which was needed by 92.3 percent of the sample. More than 70 percent of the sample required one or more restorations.

The data obtained will aid planners in the determination of resource requirements based upon need rather than numbers of personnel. It will also aid in the determination of future dental specialty training requirements.

TABLE OF CONTENTS

SECTION	PAGE
SUMMARY	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	vii
LIST OF SUPPLEMENTAL TABLES	ix
LIST OF APPENDICES	xii
1. INTRODUCTION	1
a. Purpose	1
b. Background	1
2. OBJECTIVES	1
3. METHODOLOGY	2
a. Overview	2
b. Sample	2
c. Examination Procedure	3
d. Weighting Factors	3
e. Data Handling	3
4. FINDINGS	3
a. Sample Characteristics	3
b. Distribution Characteristics	4
c. Reliability of Data	4
d. Demographic Analysis	5
e. Care Requirements	5

SECTION	PAGE
5. DISCUSSION	7
a. Sample Characteristics	7
b. Severity of Need for Dental Care	9
c. Care Requirements by Rank Groups	9
d. Care Requirements by Basic Branch/Career Management Field	11
e. Care Requirements by Site	11
f. Time Requirements to Deliver Needed Care	12
6. CONCLUSIONS	14
7. RECOMMENDATIONS	15
8. REFERENCES	16
9. FIGURES	18
10. TABLES	23
11. APPENDIX A. Data Collection Form	53
12. APPENDIX B. Instructions for Use of Data Collection Form. .	56
13. APPENDIX C. Weighted Treatment Time Factors for Specific Dental Procedures	58
14. APPENDIX D. Supplemental Tables	60
15. DISTRIBUTION	102

LIST OF FIGURES

FIGURE		PAGE
1	Sample Population By Site Profile	18
2	US Army Rank Grouping Profile	19
3	US Army Basic Branch/Career Management Field Profile	20
4	Total Hours Needed To Deliver All Dental Care To 1000 Personnel By Rank Group	21

LIST OF TABLES

TABLE		PAGE
1	Sample Size By Rank Group.	23
2	Sample Size By Basic Branch/Career Management Field.	23
3	Sample Size By Site.	24
4	Ninety-Five Percent Confidence Intervals For Number Of Care Requirements By Type of Care Variable	25
5	Ninety-Five Percent Confidence Intervals For Time Required To Provide Needed Care By Type of Care Variable	26
6	Examinees' Dental Class At Time Of Examination	27
7	Dental Care Requirements: Descriptive Statistics For Each Treatment Variable For The Entire Sample.	28
8	Dental Treatment Time Requirements: Descriptive Statistics For Each Variable For the Entire Sample: In Hours	29
9	Distribution Of The Mean Need For Each Treatment Variable By Rank Group	30
10	Variable 01 - Restoration Needed, Absolute Frequencies And Cumulative Percentages	31
11	Variable 02 - Extractions Needed, Absolute Frequencies And Cumulative Percentages	32
12	Variable 03 - Number Of Teeth Requiring Endodontics, Absolute Frequencies And Cumulative Percentages.	33
13	Variable 04 - Crown And Bridge Needed (Units), Absolute Frequencies And Cumulative Percentages	34
14	Variable 05 - Full Dentures Needed, Absolute Frequencies And Cumulative Percentages	35
15	Variable 06 - Partial Dentures Needed, Absolute Frequencies And Cumulative Percentages	35
16	Variable 07 - Prophylaxis/Scaling Needed, Absolute Frequencies And Cumulative Percentages	36

LIST OF TABLES (cont)

TABLE		PAGE
17	Variable 08 - Quadrants Subgingival Curretage Needed, Absolute Frequencies And Cumulative Percentages.	36
18	Variable 09 - Quadrants Gingivectomy Needed, Absolute Frequencies And Cumulative Percentages	37
19	Variable 10 - Dental Appointments Required, Absolute Frequencies And Cumulative Percentages	38
20	Distribution Of The Mean Need For Each Treatment Variable By Basic Branch/Career Management Field	39
21	Distribution Of The Mean Need For Each Treatment Variable By Site	40
22	Distribution Of Treatment Time Requirements For Each Treatment Variable By Rank Group	41
23	Distribution Of Treatment Time Requirements For Each Treatment Variable By Basic Branch/Career Management Field . . .	42
24	Distribution Of Treatment Time Requirementd For Each Treatment Variable By Site	43
25	Treatments Required Per 1000 Personnel By Rank Group	44
26	Treatments Required Per 1000 Personnel By Basic Branch/ Career Management Field.	45
27	Treatments Required Per 1000 Personnel By Site	46
28	Time (In Hours) Required To Deliver Needed Treatment To 1000 Personnel By Rank Group	47
29	Time (In Hours) Required To Deliver Needed Care To 1000 Personnel By Basic Branch/Career Management Filed	48
30	Time (In Hours) Required To Deliver Needed Treatment To 1000 Personnel By Site.	49
31	Total Time (In Hours) Required To Deliver All Needed Care To 1000 Personnel By Rank Group.	50
32	Total Time (In Hours) Required To Deliver All Needed Care To 1000 Personnel By Basic Branch/Career Management Field. . . .	50
33	Total Time (In Hours) Required To Deliver All Needed Care To 1000 Personnel By Site.	51

SUPPLEMENTAL TABLES

TABLE		PAGE
1	Mean And Standard Deviations For Care Need Variables For The Six Rank Groupings.	60
2	Mean And Standard Deviations For Care Need Variables For The Two Basic Branch/Career Management Field.	61
3	Mean And Standard Deviations For Care Need Variables For The Ten Study Sites	62
4	Means And Standard Deviations For Time Requirements To Deliver Each Of The Care Need Variables To the Combined Six Rank Groupings.	63
5	Means And Standard Deviations For Time Requirements To Deliver Each Of The Care Need Variables To The Combined Basic Branch/Career Management Fields	64
6	Means And Standard Deviations For Time Requirements To Deliver Each Of The Care Need Variables To The Combined Ten Study Sites.	65
7	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirement For Restorations.	66
8	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirement For Extractions	67
9	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirement For Crown and Bridge.	68
10	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirement For Endodontics	69
11	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirement For Full Dentures	70
12	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirements For Partial Dentures	71
13	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirement For Prophylaxis/Scaling	72
14	Significance Matrix For Comparisons Of Differences Between Rank Groups For Requirements For Subgingival Curretage.	73

SUPPLEMENTAL TABLES (cont)

TABLE		PAGE
15	Significance Matrix For Comparison Of Differences Between Rank Groups For Requirement For Gingivectomy.	74
16	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Restorations	75
17	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Extractions.	76
18	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Endodontics.	77
19	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Crown and Bridge	78
20	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Full Dentures.	79
21	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Partial Dentures	80
22	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Prophylaxis/Scaling.	81
23	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Subgingival Curettage.	82
24	Significance Matrix For Comparison Of Differences Between Sites For Requirements For Gingivectomy	83
25	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Restoration .	84
26	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Extractions .	85
27	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Endodontics .	86
28	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Crown And Bridge.	87
29	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Full Dentures.	88

SUPPLEMENTAL TABLES (cont)

TABLE		PAGE
30	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Partial Dentures.	89
31	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Prophylaxis/Scaling	90
32	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Subgingival Curettage	91
33	Significance Matrix For Comparison Of Differences Between Rank Groups For Time Requirements To Deliver Needed Gingivectomy.	92
34	Significance Matrix For Comparison Of Differences Between Sites For Time Requirement To Deliver Needed Restorations	93
35	Significance Matrix For Comparison Of Difference Between Sites For Time Requirement To Deliver Needed Extractions.	94
36	Significance Matrix For Comparison Of Differences Between Sites For Time Requirements To Deliver Needed Endodontics	95
37	Significance Matrix For Comparison Of Differences Between Sites For Time Requirements To Deliver Needed Crown And Bridge. . .	96
38	Significance Matrix For Comparison Of Differences Between Sites For Time Requirement To Deliver Needed Full Dentures.	97
39	Significance Matrix For Comparison Of Differences Between Sites For Time Requirement To Deliver Needed Partial Dentures . . .	98
40	Significance Matrix For Comparison Of Differences Between Sites For Time Requirement To Deliver Needed Prophylaxis/Scaling	99
41	Significance Matrix For Comparison Of Differences Between Sites For Time Requirement To Deliver Needed Subgingival Curettage	100
42	Significance Matrix For Comparison Of Differences Between Sites For Time Requirement To Deliver Needed Gingivectomy	101

LIST OF APPENDICES

APPENDIX	PAGE
A. Data Collection Form	53
B. Instructions For Use Of Data Collection Form	56
C. Weighted Treatment Time Factors For Specific Dental Procedures	58
D. Supplemental Tables	60

1. INTRODUCTION.

a. Purpose.

(1) The purpose of this study was to evaluate the Army Oral Health Maintenance Program (AOHMP) as the basis for improving the oral health status of Army personnel and as the principal patient input program for the Army dental care system.

(2) For purposes of clarity, and because the study encompassed three significant though interrelated aspects of the oral health status of Army personnel, the scope of this report is limited. This report will discuss the oral and dental health care needs of the entire study population. It will not discuss the program as the principal patient input source for the Army dental care system. This aspect, along with a report on the overall participation rate by Army members in the program, will be addressed separately.

b. Background.

The AOHMP is the primary vehicle for the entry of military personnel into the Army's dental care system. The purpose of the program is primary prevention of oral disease, early diagnosis of dental needs, and provision of care on a regular and recurring basis. The program was instituted in an attempt to produce dentally fit soldiers who can perform their duties with the minimum loss of duty time resulting from dentally-related medical problems. Phase I of the program was initiated in 1968 and included only those active duty personnel who were 25 years of age or younger.¹ In 1971, Phase II of the program was initiated for active duty personnel over age 25.² The program continued as a two-phase effort until 1974 when Phase II was extended to include all active duty Army personnel and Phase I was essentially eliminated.³ At this time guidance for implementation of the program was forwarded to all Dental Activities (DENTAC) within the Army. In February 1975, US Army Health Services Command (HSC) issued informational and instructional guidance for the operation of the program at the local level.⁴ Since the inception of the expanded Phase II model of the program, no evaluation has been conducted, except for continuing updated reports on the percentage of eligible personnel who receive annual dental examinations, or who are under active dental care. Quarterly reports from the DENTACs to HSC indicate that there is a significant variation among the DENTACs as to the percentage of soldiers who participate in the program. These reports also show that with minor exceptions the DENTACs are meeting the participation goals set forth by HSC. It is important to know the oral health care needs of the Army population since the AOHMP is designed to be the primary means by which the individual Army member is introduced into the dental care system to receive care.

2. OBJECTIVES.

The objectives/purpose of this phase of the study were to:

- a. Determine the dental care requirements of Army personnel.
- b. Determine what differences, if any, exist in the oral health of soldiers according to their rank and basic military duties.
- c. Fulfill the recommendation of a previous study, published in 1976, that periodic surveys be conducted to obtain indicators of effectiveness of various Army dental programs and policies.⁵

3. METHODOLOGY.

a. Overview.

The data were obtained by means of a clinical survey conducted by dental services at ten DENTACs in CONUS, including dental services at two Army medical centers (MEDCENS). An individual treatment plan was developed for each patient at the time of the annual dental examination. The data collection phase extended over a one month period and included all persons who presented for their annual examination during that month. The data were submitted to the HCSD where data analysis was performed. Determinations were made of the dental care requirements of US Army active duty populations by rank group, by MOS (combat or combat support), and according to the installation to which they were assigned. Types of dental care required were obtained in numbers of treatments, in the percent of the sample requiring each specific type of care, in the number of appointments required to deliver that care, and in hours required to perform the care.

b. Sample.

(1) The population sample was comprised of active duty Army personnel stationed within CONUS. Ten DENTACs, including two MEDCENS, were involved in data collection in order to obtain a representative cross section of the active duty Army population. See Figure 1 for a graphic representation of the sample population profile. Six rank groups were selected as primary sub-populations for comparison and data analysis. Figure 2 compares the study sample rank groups with those same proportions Army-wide. Subjects were also divided into two major categories, regardless of rank. They were identified either as combat soldiers (Type 1) or combat support/combat service support personnel (Type 2), (See Figure 3). The rank groups were defined as follows:

- Group 1 - E1-E4
- Group 2 - E5-E6
- Group 3 - E7-E9
- Group 4 - W1-W4
- Group 5 - O1-O3
- Group 6 - O4-O6

(2) The Army Oral Health Maintenance Program (AOHMP) was the mechanism used to select personnel for inclusion in the study sample. The AOHMP is a Department of the Army approved program which required an annual dental evaluation during the individual's birth month anniversary.

Collection of study data at the annual examination minimized inconvenience to participants, both examiners and subjects, negated the need for additional dental resources, and did not disrupt the scheduling of routine dental treatment.

c. Examination Procedure.

(1) The basic guidance provided each examining officer consisted of the following instructions: "Your examination findings should result in the formulation of a treatment plan that you feel will restore the patient to reasonably optimal oral health." A copy of the data collection instrument and instructions are at Appendices A and B. The data collection form contained twenty-five dental care-related entries along with personal and administrative data.

(2) Examiners indicated the numbers of restorations, extractions, teeth needing endodontic therapy, units of crown and bridge, complete dentures, partial dentures, prophylaxis/scalings, quadrants of subgingival curettage and quadrants of gingivectomy needed. Each patient was classified according to the urgency of care required. Finally, an estimate was made by the examiner of the number of dental appointments needed to accomplish the requirements.

d. Weighting Factors.

(1) Treatment time weighting factors were applied to the raw care needs in order to obtain the hours of care required for each treatment variable. The weighting factors were formulated by the investigators based upon the dental treatment times reported by Cassidy et al.⁶

(2) The time factors found at Appendix C were entered into the computer program which was used for data tabulation and analysis. The factors were applied to the appropriate treatment need variables in order to provide time data that was useful in the generation of a variety of descriptive statistics. By converting the number of requirements to a time base (hours), a meaningful estimate can be made of the need for dental resources to provide the care.

e. Data Handling. Data collection forms were returned to HCSD where they were reviewed for completeness and correction of erroneous entries before being keypunched. Questionable data forms were reviewed by the project officers who made the final disposition of them. The computer program was designed to identify and reject improper entries. Incomplete or inaccurate completion of data collection forms did not constitute a significant problem.

4. FINDINGS.

a. Sample Characteristics.

(1) A total of 5,739 dental examinations and resulting "treatment plans" comprise the data base for this report.

(2) The distribution of the sample among rank groups is found in Table 1. The lower enlisted ranks comprised the largest group (3209 persons or about 56 percent of the total sample) as expected. The distribution of the sample by basic branch/career management field is presented in Table 2. Table 3 presents the distribution of the sample by site or installation.

b. Distribution Characteristics.

(1) The distributions of the variables for the number and hours required, other than prophylaxis/scaling, are all positively skewed and have a mode of zero. Positive skewness refers to the graphic interpretation of the distributions described and indicates that the high point on the vertical axis is located to the left side of the horizontal axis. In cases where the mode is zero, and negative values do not exist, a very positively skewed distribution is described. Such distributions do not fit the normal (bell-shaped) curve and therefore the mean, median, and standard deviation are not necessarily the most appropriate descriptors for such distributions. Therefore, the modal response was chosen to describe the distributions cited above. The mode is a measure of central tendency which describes the value that most frequently appears. For example, the mode for number of restorations needed is zero because more persons were reported to need zero restorations than any other number.

(2) Percentage distributions and cumulative percentages provide meaningful statistics for the number of treatments required for each treatment variable.

(3) The mean, in skewed distributions as described, is strongest in interpreting time or cost-related concerns. When a treatment time conversion factor is applied, the mean is of particular significance in predicting the treatment time requirement for specific population groups such as man-hours of dental care required per 1,000 individuals. Cost factors can also be applied to the means in order to predict population treatment costs.

(4) The distribution percentages completely describe the population in terms of practical significance. The use of mean values for such data, when used to facilitate computation of projected time consideration, is an appropriate method for estimating man-hour requirements.

c. Reliability of Data. Data reliability was determined by using the standard error of the mean to calculate the 95 percent confidence intervals for each variable ($\bar{x} \pm 2$ standard errors). Table 4 shows the 95 percent confidence intervals for the number of each type of treatment required for the study population. Table 5 indicates the 95 percent confidence intervals for the hours necessary to complete the care required. The 95 percent confidence intervals establish ranges within

which the means of subsequent samples from similar populations were expected to fall 95 percent of the time.

d. Demographic Analysis.

(1) Descriptive statistics for the dental treatment needs and time care requirements for the entire sample and for sample sub-groups were determined.

(2) Analysis of Variance (ANOVA) was used to test for significant differences between categories for each sub-group for number of treatments required, and for the time necessary to accomplish the required care. ANOVA findings for the sub-group categories by type of dental treatment variable and by weighted variable (hours required to complete the care) are found in the supplemental tables at Appendix D. Duncan's Multiple Range Tests were also applied to rank and site sub-groups to determine where the significant differences occurred between the subgroup categories. Results of the Duncan's tests for both the types of care needed and time required to deliver that care can also be found in the supplemental tables at Appendix D.

e. Care Requirements.

(1) Table 6 depicts the urgency of dental care needs of the population studied at the time of examination. In 2.8 percent of the sample no dental care was required. The survey indicates that 97.2 percent of the sample required definitive dental care, which includes preventive care such as dental prophylaxis and scaling, and that about 45 percent of the population sample required dental care for conditions that are likely to cause pain and emergency situations in the near future (Class 3).

(2) Summary descriptive statistics for each treatment variables are shown for the entire sample in Tables 7 and 8. Table 7 includes data concerning the number of each treatment variable required and Table 8 contains treatment time data. The descriptive statistics listed in these tables include the mean, median, mode, range, standard deviation, standard error of the mean, and skewness.

(3) The distribution of the mean need for each treatment variable by rank group is shown in Table 9. A summary of frequencies for the care need variables can be seen in Tables 10 through 19. A significant proportion of the sample needed no restorations (26.3 percent) while slightly more than half of the study population required two or less restorations. These figures take on added significance when compared to the fact that the lower ranking enlisted groups (E1-E4) and (E5-E6) had a mean need of 4.28 and 3.63 restorations respectively. The largest care need category was for a prophylaxis or scaling where 92.3 percent of the sample required this care. The smallest care need in terms of the proportion of the population requiring a particular dental treatment was for full dentures, where only one percent of the sample demonstrated that need.

The three largest care need categories were dental prophylaxis/scalings, restorations, and extractions. This finding was not unexpected. Analysis of Variance testing was performed to determine if there were significant differences among the rank groups. See Supplemental Table 1, Appendix D. In addition, Duncan's Multiple Range Test was done to determine where significant differences occurred between the rank groups. See Appendix D, Supplemental Tables 7 through 15.

(4) The distribution of the need for each treatment variable by basic branch/career management field is shown in Table 20. Analysis of Variance tests were performed to determine if there were significant differences between the means for each of the two types of Army member. The ANOVA tests showed that except for endodontics, complete dentures, partial dentures, and gingivectomy, there were highly significant differences between the two basic personnel categories for dental care needs. See Supplemental Table 2 in Appendix D for these data.

(5) The distribution of the mean need for each treatment variable by site is shown in Table 21. Though certain sites have a large proportion of their population fall into one of the basic branch/career management fields, no attempt was made to link these factors. ANOVA testing was performed on these results, as was Duncan's Multiple Range Test to determine where the significant differences occurred between the sub-group categories. These results are shown in Appendix D, Supplemental Tables 3 and 16 through 24.

(6) The distribution of the time requirements to deliver each of the care need variables is shown by rank group in Table 22. Analysis of Variance testing confirmed that the differences in time requirements among the rank groups for all categories of need are significant except for endodontics. See Appendix D, Supplemental Table 4 and 25 through 33. The confidence level used is 95 percent or greater.

(7) The distribution of the time requirements to deliver each care need variable for the two basic branch/career management categories is shown in Table 23. ANOVA tests performed on these data showed that except for the care categories of endodontics, complete dentures, partial dentures, and gingivectomy, there were no significant differences in the time requirement to deliver these types of care to the different groups. Conversely, ANOVA testing did show that there were significantly differing time requirements in the important areas of restorative care, extractions needed, and prophylaxis/scaling (at Supplemental Table 5, Appendix D). These three care categories have traditionally comprised the major share of care needs among the military population.^{5,6}

(8) The distribution of the time requirement by site to deliver each of the care need variables is shown in Table 24. ANOVA testing indicates that there were significant differences among the sites for each of the care variables except for complete dentures (at Appendix D, Supplemental Table 6). Duncan's Multiple Range Test was employed to determine if and where the significant differences occurred relative

to each specific site. Since a constant was applied to the care needs to arrive at the time requirement the reader can examine Supplemental Tables 34 through 42 in Appendix D to determine the position of one site versus each other site for the time requirement significance to deliver needed dental care.

(9) A summary of the number of each type of treatment required per 1,000 personnel by rank group is presented in Table 25. This same information by basic branch/career management field and by site is presented in Tables 26 and 27. The requirements per 1,000 active duty personnel were presented in terms of: (a) number of dental treatment procedures per 1,000 personnel for restorations, units of crown and bridge full dentures, partial dentures, quadrants of subgingival curettage, and quadrants of gingivectomy; (b) number of teeth requiring extraction and treatment for endodontics, and (c) persons requiring oral prophylaxis/dental scaling. Because different units of measure are required to depict these various services, the data presented in these tables cannot be summated nor can a mean be calculated. Each type of care requirement must be considered individually.

(10) Treatment needs are presented in terms of hours of care required per 1,000 personnel in Tables 28, 29, and 30, individually segregating this information by rank group, by basic branch/career management field, and by site. The hours required per 1,000 personnel for restorations and for prophylaxis/scaling stand out as the treatment needs which would place the greatest demands upon the dental care system.

(11) The total time (in hours) which would be needed to satisfy all the care requirements for 1,000 personnel is presented in Tables 31, 32, and 33, by rank group, basic branch/career management field, and by site. Also listed in Tables 31 and 33 are the deviations of these values from the mean for that group. Such information can give an indication of resource requirements for one site as compared to the other study sites. It is relevant also when comparing the needs of the combat soldier and the non-combat soldier since Army installations are often populated predominantly by soldiers who fall into one or the other of these basic groups.

5. DISCUSSION.

a. Sample Characteristics.

(1) The size of the study population is statistically adequate to describe the care requirements of the Army. The sample size is sufficiently large to permit 95 percent confidence limits for normally distributed data. The basis for determining the size of the study population was simply to evaluate every dental patient who reported for an annual dental examination during their birth month anniversary, as required by the Army Oral Health Maintenance Program. No goals or limits as to age, sex, or officer or enlisted status were set because it was felt that through the AOHP mechanism the study sample would

accurately reflect the Army as a whole. Table 1 and Figure 2, in fact, do indicate that this strategy was reasonably accurate.

(2) Of necessity the sample population varied widely among the study sites. The sites were chosen to represent typical Army installations according to size and mission. Furthermore, the variances in the method of conducting the annual dental examination program (AOHMP) at the various sites accounted for a higher or lower percentage of eligible personnel actually receiving the examination. As Figure 1 indicates, the range of the sample population as a proportion of the total study sample by site varied between two percent at Site 2, a small school-type post, to 20 percent at Site 5, a large training site. But as indicated above, the population sample very closely mirrors that of the Army as a whole.

(3) The study population was divided into two categories for the purpose of identifying participants as functioning in a combat role or in a combat support/combat service support position. Fifty-eight percent of the sample were identified as being in the combat category. Intuitively, it would be assumed that the bulk of the Army would be comprised of individuals so classified. However, it is extremely difficult to obtain accurate information on this subject for comparison of the study population and the Army as a whole. So none are made here. However, the two categories are discussed and compared in this report in terms of their dental care needs because such categorization can be useful to management authorities for resource planning purposes.

(4) Care requirements were determined as an integral part of this study because it is the most pertinent data upon which the program evaluation could be made. However, unlike the previous care requirements study,⁵ this was not the primary purpose of the study but was part of the study design for evaluation of an ongoing program. In the previous study, data were collected primarily for the purposes of determining the potential demand for services, and the resources in time and personnel required to satisfy that demand. Thus the data collection process was designed to that end.

In this study, care needs data were collected for the purpose of evaluating the rate at which the needs are being satisfied. The impact upon the resources of the Army dental care system was not the primary area of concern, except to consider the efficiency or efficacy of that system in responding to the demands of the AOHMP requirement. The emphasis here was on numbers of treatments needed rather than time requirements to deliver them because the more easily measurable variable was the former rather than the latter. In contrast to the previous study then, data collection was simplified and some types of treatments within certain categories were combined. Treatment times were also different because of this change in the way the data were collected. For these reasons then, the care requirements data presented in this study must be evaluated in the context of the purpose for which it was collected. Comparative evaluation of these data must be undertaken with caution since they are not directly comparable to previous study efforts.

b. Severity of Need for Dental Care at Time of Examination.

(1) Of the almost 6,000 soldiers examined, only 161 or approximately 2.8 percent, were found to have no need for dental care of any kind. Though not provable, it is reasonable to assume that a portion of these individuals were completely edentulous and were wearing dentures which required no attention. The proportion of the general population which requires a yearly dental prophylaxis is very high (in this study almost 93 percent), and by discounting the edentulous population the percentage would be higher.

(2) Almost 50 percent (49.5) of the study population was found to be in Class 2, defined as needing care of a non-emergent nature. Another 45.7 percent of the sample were judged to be in need of immediate care (Class 3). This is an important statistic because it infers that a large part of the Army is not in acceptable dental health and that there is a heavy immediate potential workload. It also infers that duty time lost because of dental emergencies could present a substantial problem were units deployed on short notice.

(3) Only two percent of the study sample was found to be in Class 4, meaning that they were in need of prosthetic replacements for missing teeth and supporting structures. This evaluation was borne out by the findings that only one percent of the population was in need of complete dentures and that only four percent needed one or more partial dentures. It is important to note here that a patient in need of a partial denture is not necessarily edentulous to the degree that mastication of food and normal function is impaired.

c. Care Requirements by Rank Groups.

(1) The mean requirement for the population sample for restorations was 3.68. The mean requirement for this same service for the lower ranking enlisted personnel was 4.28 restorations needed per individual. These statistics are very similar to those reported in the previous study⁵ wherein the population mean was 3.44 restorations needed and the mean need was 4.9 restoration for the age group comparable to the E1-E4 Rank group cited in this study. They differ somewhat from those reported by the Air Force for all grades (2.32 restorations per person) and for recruits (6.2 restorations per recruit).⁷ The need discrepancy does not seem to be large until the figure for Group 1 (E1-E4) is compared to that of the other rank groups. The need translates to 4,280 restorations per 1,000 persons, and is especially significant when it is considered that this rank group comprises 55.7 percent of the active Army. Rank Group 2, which is comprised of E5s and E6s, had a mean need for 3.63 restorations per individual. Though only 15 percent less, it is significantly less when considering the need per one thousand persons. Rank Group 1 comprises about 416,000 persons, which when multiplied by 4.28 totals almost 1.8 million restorations. By contrast, for Rank Group 2 (E5-E6) which includes about 188,000 persons, the total need would be about 682,000 or only one-third that of Rank Group 1.

As can be seen from Tables 9 and 25 the restorative need for higher ranking enlisted personnel and for officers declines dramatically from that for the lower ranking enlisted personnel.

Duncan's Multiple Range test confirmed that the lowest enlisted rank had a significantly greater need for restorations than any other rank group. Enlisted grades 5 and 6 also had a significantly greater need for restorations than the other rank groupings except for E1 through E4. In fact, the highest ranking enlisted group (E7-E9) had a need lower only than the two lowest enlisted groups, and an equal or greater need than the warrant officer and officer groups. This finding is a little surprising in view of the fact that the higher enlisted ranks usually are comprised of an age group where caries incidence rates are low. The need may be explained by the assumption that they have a significant need for repairs to or replacement of existing restorations.

(2) The two lower ranking enlisted groups (1 and 2) had a significantly greater need for extractions than the other rank groups. Again, the differences became more dramatic when the average need is translated into needs per one thousand individuals and when it is remembered that enlisted ranks E1 through E6 comprise about 80 percent of the active Army. The findings for need for extractions in the lower enlisted grades are also very similar to previously published specific Army data. The study also found that the lower ranking commissioned officer group (O1-O3) had a need for extractions which was significantly greater than that for the higher ranking officer group. A possible explanation might be that lieutenants and captains are in a younger age range where the removal of third molars is usually recommended.

(3) In the care need areas of endodontics, crown and bridge, and full dentures, there was very little significant difference among the rank groups. The overall need for each of these services was also slight in comparison to the needs for restorations, extractions, and prophylaxis. In the care need for partial dentures, one rank group stood alone as needing significantly more care than all other rank groups. The actual need was 190 partial dentures per 1,000 individuals for Rank Group 3 (E7-E9). The next greatest need was for Rank Group 2 (E5-E6) which needs 110 partial dentures per 1,000 persons. Both of these figures can be contrasted with Rank Group 5 (O1-O3) which demonstrated a need for only 30 partial dentures per thousand. Rank Group 3 (E7-E9) also stood out as needing significantly more periodontal care than the other rank groups, with only minor exceptions. This finding again is not too surprising because the higher ranking enlisted persons are usually in a more mature age group where there is a greater need for periodontal care. It was a little surprising to find, however, that the higher ranking officers did not also have a significantly greater need for this care than other rank groups. They too generally fall into the older age groupings. The findings discussed in this paragraph (endodontics, crown and bridge, removable prosthetics, and periodontal care needs) are substantially less than reported in 1975 for Army personnel.⁵ This difference may have resulted from either a true difference that has manifested itself

over the four year period between surveys or may have resulted from a change in the interpretation that examiners applied to the assessment criterion, i.e., "restore the patient to optimal oral health." The term "optimal" may have been interpreted more in terms of "realistic" since examiners knew there would be a follow-up records audit in approximately four months to determine care accomplishment rates. The area of periodontal needs was assessed in a totally different concept in this study as compared to previous Army studies. The current needs relate directly to specific procedures (subgingival curettage and gingivectomy). Earlier Army studies used criteria based on generalized severity of the disease rather than the procedures required to treat the disease.

(4) In view of the fact that it is generally assumed that virtually all dentulous people require a dental prophylaxis on an annual basis, it was surprising to find that there were significant need differences among the rank groups in this study. The four lower rank groupings showed a fairly consistent need, from 90 percent to 94 percent. By contrast the two officer rank groups showed a lesser need (87 and 88 percent). Duncan's Multiple Range Test generally confirmed this finding, except that Group 4 (Warrant Officers) showed no significant differences from the other rank groups.

d. Care requirements by Basic Branch/Career Management Field.

(1) The study sample was divided into two parts based upon whether or not the individual was in a combat or combat related position (Type 1) or in a combat support/combat service support role (Type 2). Though both are vital to the overall mission, the loss of the combat soldier because of a dental condition would be considered of greater consequence. Relating back to the important care areas of restorations and extractions it can be noted that the average Type 1 (combat) individual showed a significantly greater need for both types of care. The data translates to a need for 4220 restorations and 980 extractions per 1000 individuals as compared to 3220 restorations and 810 extractions per 1000 individuals in the Type 2 category. When both sets of figures are compared to the overall mean of 3686 restorations and 907 extractions needed per 1000 individuals, the figures take on added meaning.

e. Care Requirements by Site.

(1) Analysis of Variance testing showed that among the ten study sites there were significant differences in dental care requirements in all categories except for full dentures. A more in-depth analysis using Duncan's Multiple Range tests also showed that there were some significant differences when comparing one site to each of the other nine sites. Some sites should be discussed because they stand alone from the others in specific area.

(2) Sites 5, 8, and 9, all large installations with heavy training commitments, showed a consistently greater need for restorations as

compared to each of the other seven sites, Sites 3 and 7 showed a significantly lesser need than the other eight sites. Both of these posts are relatively small and have stable populations. In the area of extractions required, Sites 9 and 10, both large training posts, demonstrated significantly greater need than the other eight sites, and interestingly no difference as compared to each other. When compared to the other sites, Site 3 again showed a significantly lesser need for extractions.

(3) In the other care areas there are few definite trends among the ten sites. The one notable exception is in the need for prophylaxis/scaling. Site 7 clearly demonstrated a lesser need than the other nine sites in this area. At Site 7 it was customary to provide most of the examinees with a prophylaxis at the time of their AOHMP examination. Interviews with personnel at this site revealed that the prophylaxis was often done just prior to the dental examination. It is probable then that frequently this category was not recorded on the data sheet, even though the patient was in need of this service on the day of the examination.

f. Time requirements to deliver needed care.

(1) Considering the entire sample, 73.7 percent required at least one restoration. Except for preventive care this is the most prevalent care need found in the sample. This translates to a requirement of 2720 hours per 1000 personnel. The number of restorations required by the entire sample (3686 restorations per 1000 persons) compares quite evenly with the finding of a previous study which was 3442 restorations per 1000 persons.⁵ The findings of this study are significantly lower than that reported by Cassidy et al,⁶ which was 5.07 restorations per person, but the subjects in that study were all recruits. By projecting time requirements to this data the resources need to deliver this care would be greater than reported in the earlier study of the general Army population. The current restorative needs cannot be compared to the previous recruit study since incoming personnel were not included in the sample. But it may be useful in giving some indication of the rate at which the dental needs of these recruits is being met by the Army dental care system.

(2) Care needs for endodontics, crown and bridge, full and partial dentures, and periodontal therapy, account for about one-third of the time requirements for the corrective care categories of restorations and extractions. The mode for the entire sample for each of these variables was zero and so the time requirements to deliver the care is also significantly less than to deliver the needed corrective care of restorations and extractions.

(3) The need for oral prophylaxis/scaling was noted for about 92 percent of the population. This is higher than the findings of the previous study⁵ (89.4 percent) and translates to a time requirement of 535 hours to provide this care to 1000 persons.

(4) The treatment time requirement is of primary importance in the utilization of resources. Estimates of a population by hours of care required provides the means for the strategic allocation of scarce resources which would most effectively impact upon the overall prevalence of dental disease for the largest segment of the Army population.

Tables 31, 32, and 33 show the hours needed to deliver total care needs to 1000 persons according to rank group, basic branch/career management field, and site (installation to which assigned). Supplemental Table 4 indicates that except for endodontics there are significant differences in the hours required to deliver care to the six rank groups. Interestingly too, Supplemental Table 5 indicates that there are significant differences in the time requirements to deliver needed restorations, extractions, crown and bridge, prophylaxis/scaling, and subgingival curettage to each of the basic branch/career management groups.

As expected, and in line with other findings, the lowest rank group (E1-E4) showed consistently greater time requirements to receive restorations and extractions. The E5-E6 rank group also demonstrated a greater time requirement in these areas than the other rank groups, except the E1-E4 group. Not unexpectedly, the E7-E9 rank group showed a consistently higher time requirement in the areas of full dentures, partial dentures, and subgingival curettage. This again can be related to the age group into which many of these individuals fall.

As seen in Supplemental Table 6 there are no significant differences among the ten study sites in the time requirements to deliver any of the nine treatment variables, except for full dentures. But when Duncan's Multiple Range Test was applied to look for specific differences of one site in relation to each of the other nine sites some trends do occur. Site 5, a large training site, reported a consistently greater time requirement to deliver restorative care (fillings) than the other sites. Sites 3 and 7 were consistently lesser in this area. Both of these posts have relatively small and stable military populations, though their basic missions are not similar.

Sites 9 and 10, both large training posts, demonstrated a generally greater time requirement to provide needed extractions whereas the other eight sites were not significantly different in this area. Site 4, a school-type post with a relatively small and stable cadre, stood alone in reporting significantly greater time requirements to deliver needed crown and bridge and full and partial dentures.

In the previously reported study⁵ the total hours of care required per 1000 personnel, regardless of rank or MOS, was 8475. In this study, the total hours of care required for the entire sample, undivided, was 4409 hours per 1000 personnel. There is a decided discrepancy between the results of the two surveys, some of which can be readily accounted for. Other differences are not easily explained, except for the facts that today's Army is smaller, it has not been engaged in military hostilities for several years, and the overall dental health of the American populace has improved.

In the earlier study, plaque control was considered to be routinely needed care and it was estimated that every Army member would require about 1.5 hours of plaque control therapy or instruction. Though no less important today, plaque control does not receive the separate clinical emphasis which it did several years ago and it was not evaluated as an area of need in this study.

Also in the earlier study, it was estimated that about 1900 hours of periodontal therapy was needed for every 1000 Army personnel. In the present study the estimate was only about 440 hours per 1000 personnel. One possible reason for this large difference is that in the most recent study the examiners knew that the patients' records would be audited about four months post-exam. It is likely that, so forewarned, they tended to be somewhat more conservative in their estimates of periodontal needs and made projections more on the basis of what they expected could be accomplished in a reasonable amount of time.

Reference was made earlier to the fact that in general the oral health of Americans is improved over several years ago. Due to fluoridation and increased awareness of the need and desirability for good oral health Americans are keeping their natural teeth longer. This fact accounts for the lessened need for fixed and removable prosthetics and also endodontics. Conversely it may also account for a greater need for restorations since people are keeping their teeth longer thus having more teeth at risk to decay. By balancing the differences in hours required to deliver the various aspects of dental care in the two studies, the plaque control requirement stands alone as the key difference. In the present study, the need for restorations, extractions, and prophylaxis was greater by a total of 440 hours per thousand. In the prior study, 3050 more hours per thousand persons were required for endodontics, fixed prosthodontics, removable prosthodontics, and periodontics. By subtracting the difference between these two figures from the difference between the two grand totals, the remaining time is almost exactly that allotted to plaque control in the previous study.

6. CONCLUSIONS.

a. Dental care needs for active duty Army personnel have been determined, using the annual dental examination requirement as the vehicle for patient input and evaluation.

b. There were significant differences in the need for care among the various rank groups. The two lower enlisted rank groups required more restorations and extractions than other ranks, a finding even more striking because these groups comprise a large proportion of the active duty Army.

c. Combat-type soldiers demonstrated a significantly greater overall care need than did the combat support/combat service support personnel.

d. Evaluation of dental care requirements at the study sites showed that there were specific and significant differences in the care requirements of assigned personnel.

e. An evaluation of the clinical time required to deliver the needed care closely parallels the actual care need. Some variations do occur among ranks, types, and sites because of the population mix and the primary mission or missions of the installations.

f. The need for restorations, extractions, and preventive services closely parallel previous studies conducted with Army populations. However, the endodontics, crown and bridge, removable prosthodontics, and periodontal care needs reported were less compared to past studies.

g. The overall treatment time required has been determined to be 4419 hours per thousand personnel.

h. The overall care requirement does not represent the maximum estimation since it does not contain projections for treating traumatic and/or pain relieving dental emergency conditions, routine examinations, or other non-scheduled dental care which may be required.

7. RECOMMENDATIONS.

a. The results of this study should be made available to dental resource planners and managers.

b. Surveys of this type to determine care needs should be conducted as an integral part of a periodic evaluation of the Army Oral Health Maintenance Program.

8. REFERENCES.

1. Memorandum For All Dental Corps Officers, MEDDS-PD, 6 December 1968, Subject: Oral Health Maintenance Program.
2. Letter, AGDA-M (11 January 1971) MEDDS-P, 20 January 1971, Subject: Phase II Army Oral Health Maintenance Program.
3. Letter, DAAG-PAP-A (M) (DASG-DCM), 4 October 1974, Subject: Army Oral Health Maintenance Program.
4. HSC Dental Bulletin Number 2, 18 February 1975, Phase II Army Oral Health Maintenance Program.
5. Dental Care Requirements of Active Duty Army Personnel. Report HCSD-76-009R. Health Care Studies Division, Academy of Health Sciences, April 1976.
6. Cassidy, J.E.; Parker, W. A.; and Hutchins, D. W. "Dental Care Requirements of Male Army Recruits." Military Medicine, 138:25, January 1973.
7. Christen, A. G.; Park, P. R.; Graves, R. C.; Young, J. M.; and Rahe, A. J. "United States Air Force Survey of Dental Needs, 1977: Methodology and Summary of Findings." Journal American Dental Association, 98:726-30, May 1979.

FIGURES

Figure 1

SAMPLE POPULATION BY SITE PROFILE

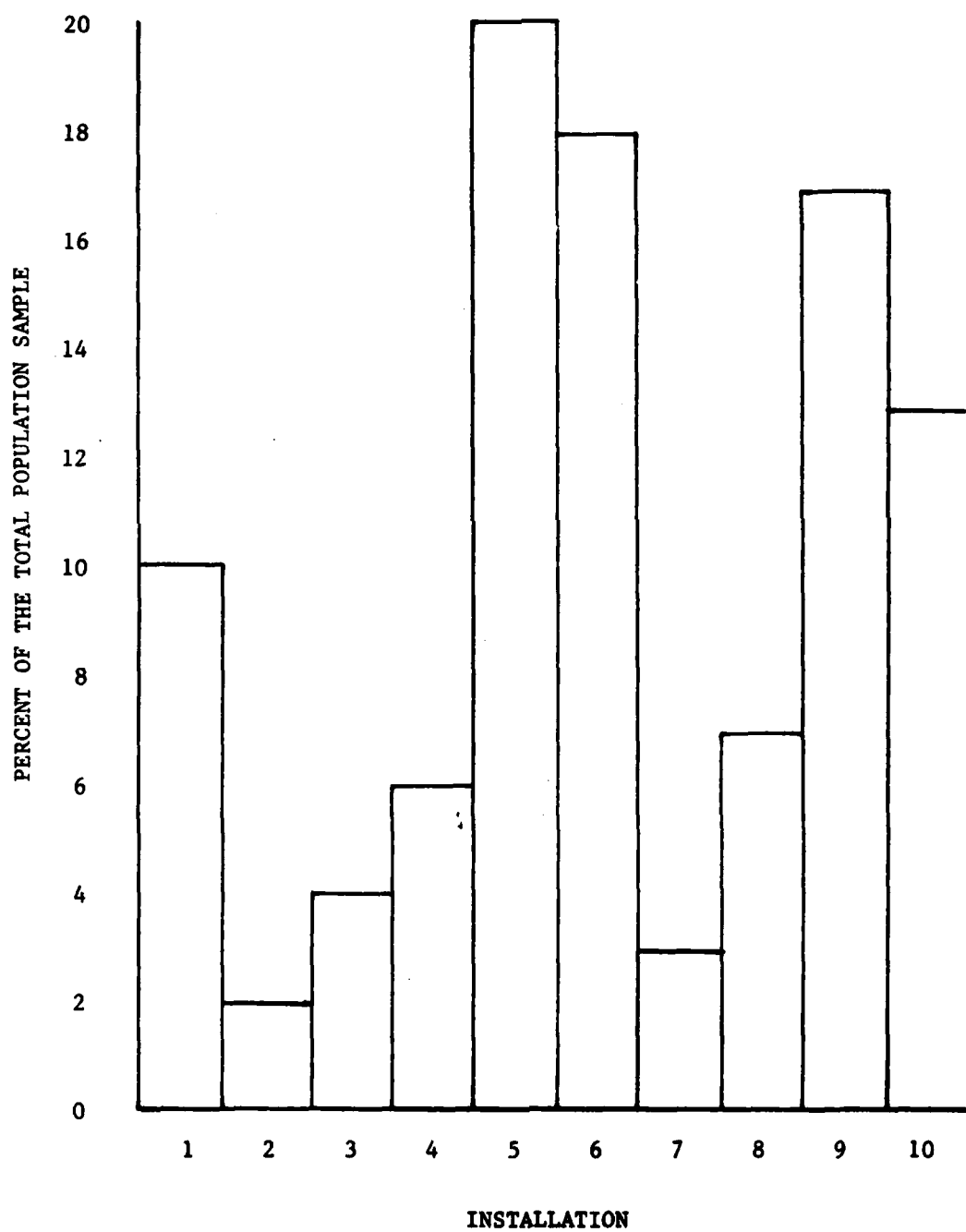


Figure 2

US ARMY RANK GROUPING PROFILE

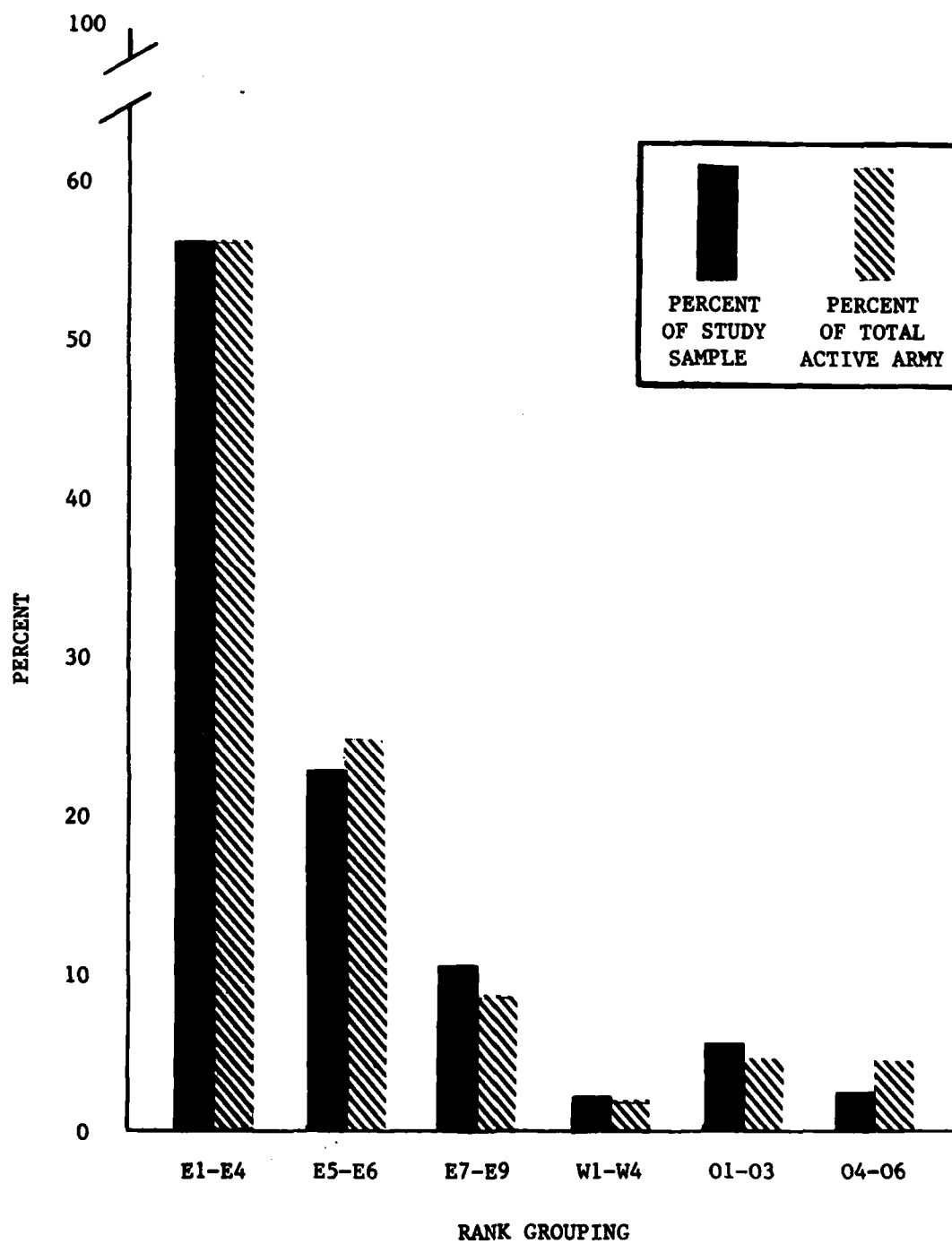


Figure 3

US ARMY

BASIC BRANCH/CAREER MANAGEMENT FIELD PROFILE

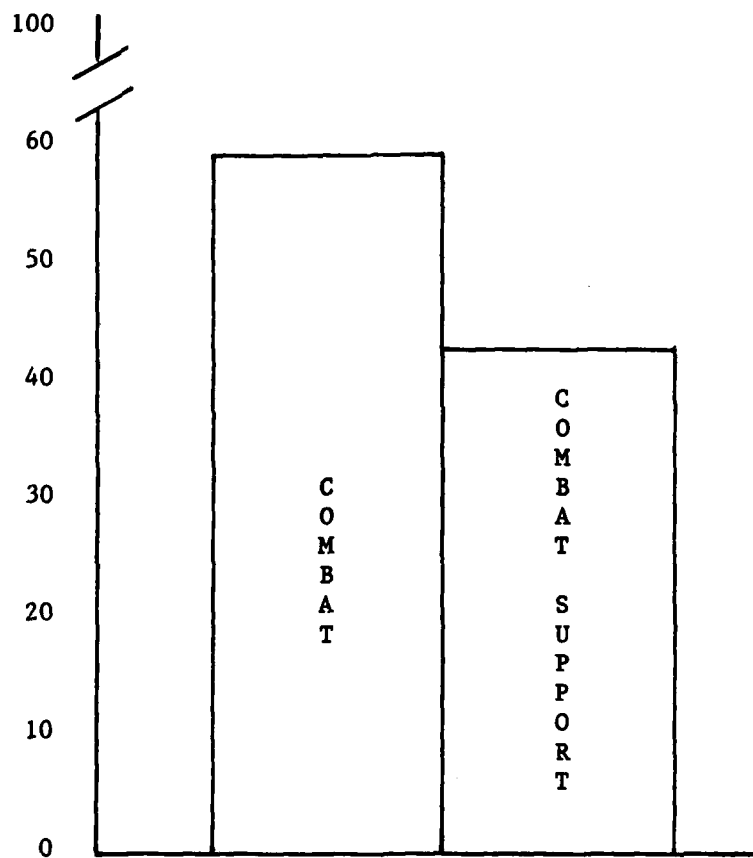
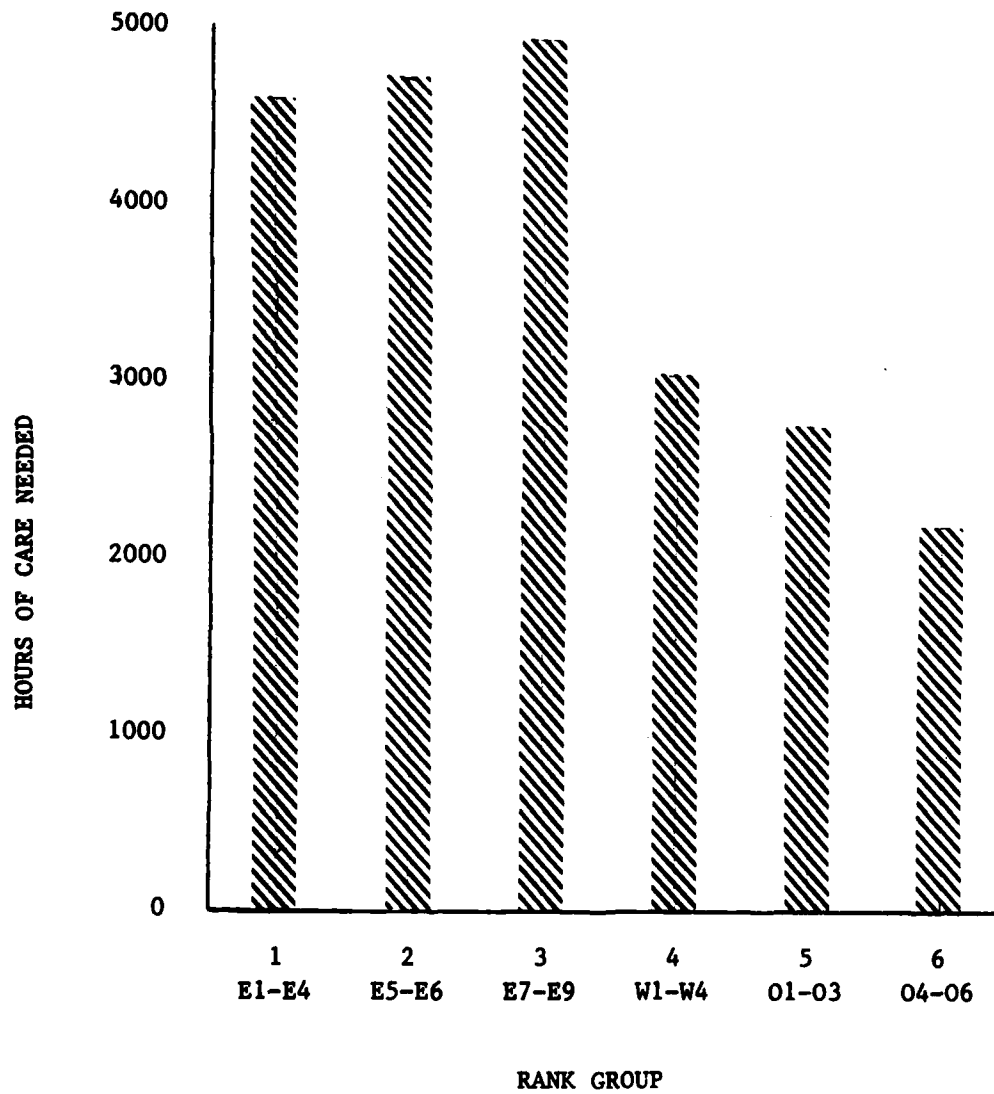


Figure 4

TOTAL HOURS NEEDED TO DELIVER ALL DENTAL
CARE TO 1000 PERSONNEL BY RANK GROUP



TABLES

Table 1

SAMPLE SIZE BY RANK GROUP

RANK GROUP	NUMBER PER GROUP	PERCENT OF TOTAL SAMPLE	GROUP PERCENT OF ACTIVE ARMY
E1 - E4	3209	55.7	(55.7)
E5 - E6	1282	22.3	(25.2)
E7 - E9	608	10.6	(8.3)
W1 - W4	103	1.8	(1.7)
O1 - O3	398	6.9	(4.8)
O4 - O6	144	2.5	(4.2)

Table 2

SAMPLE SIZE BY BASIC BRANCH/
CAREER MANAGEMENT FIELD

BASIC BRANCH/ CAREER FIELD	NUMBER PER GROUP	PERCENT OF TOTAL SAMPLE
Combat	3346	58.1
Combat Support/ Combat Service Support	2393	41.9

Table 3
SAMPLE SIZE BY SITE

SITE	NUMBER PER SITE	PERCENT OF TOTAL SAMPLE
1	571	10
2	110	2
3	228	4
4	335	6
5	1134	20
6	1054	18
7	157	3
8	416	7
9	980	17
10	774	13

Table 4

NINETY-FIVE PERCENT CONFIDENCE INTERVALS FOR NUMBER OF CARE REQUIREMENTS

BY TYPE OF CARE VARIABLE

TYPE OF CARE VARIABLE	MEAN	STANDARD ERROR OF THE MEAN	95% CONFIDENCE INTERVALS	
			LOWER	UPPER
Restorative	3.6871	.0550	3.5792	3.7949
Extractions	.9066	.0201	.8672	.9460
Endodontics (Teeth)	.0671	.0046	.0581	.0761
Crown and Bridge (Units)	.2493	.0138	.2222	.2763
Full Dentures	.0136	.0019	.0100	.0172
Partial Dentures	.0859	.0046	.0768	.0950
Prophylaxis/Scaling	.9289	.0037	.9216	.9363
Subgingival Curettage (Quadrants)	.2161	.0114	.1938	.2384
Gingivectomy (Quadrants)	.0689	.0063	.0566	.0812

Table 5

NINETY-FIVE PERCENT CONFIDENCE INTERVALS FOR TIME REQUIRED
TO PROVIDE NEEDED CARE BY TYPE OF CARE VARIABLE

TYPE OF CARE VARIABLE	MEAN	STANDARD ERROR OF THE MEAN	95% CONFIDENCE INTERVALS	
			LOWER	UPPER
Restorations	2.3597	.0352	2.2907	2.4287
Extractions	.2176	.0048	.2081	.2270
Endodontics	.1677	.0114	.1453	.1901
Crown and Bridge	.4910	.0272	.4378	.5443
Full Dentures	.0639	.0060	.0322	.0957
Partial Dentures	.1692	.0091	.1531	.1871
Prophylaxis/Scaling	.5202	.0021	.5161	.5243
Subgingival Curetage	.2701	.0142	.2422	.2976
Gingivectomy	.1722	.0157	.1414	.2029

Table 6

EXAMINEES' DENTAL CLASS AT TIME OF EXAMINATION *

CODE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY	CUMULATIVE FREQUENCY
1	161	2.8	2.8
2	2831	49.5	52.3
3	2611	45.7	98.0
4	113	2.0	100.0

* EXPLANATION OF CODES:

Code 1 - Requires no care

Code 2 - Requires routine care: Non-emergent

Code 3 - Requires early care to preclude loss
of teeth or prevent pain: Emergency care

Code 4 - Requires prosthetic care to restore missing
teeth and normal dental function

Table 7

DENTAL CARE REQUIREMENTS: DESCRIPTIVE STATISTICS FOR EACH TREATMENT VARIABLE FOR THE ENTIRE SAMPLE

TYPE OF TREATMENT	MEAN	MEDIAN	MODE	RANGE	STD DEV	STD ERROR	SKENNESS
Restorations	3.686	2.345	0	(0-29)	4.168	.0550	1.616
Extractions	.907	.265	0	(0-17)	1.526	.0201	2.053
Endodontics	.067	.027	0	(0-10)	.346	.0046	9.510
Crown and Bridge	.249	.054	0	(0-20)	1.044	.0138	7.110
Complete Dentures	.014	.005	0	(0-2)	.140	.0019	11.468
Partial Dentures	.086	.034	0	(0-2)	.351	.0046	4.350
Prophylaxis/Scaling	.928	.960	1	(0-1)	.284	.0037	- 1.988
Subgingival Curettage (Quad)	.216	.036	0	(0-4)	.861	.0114	3.974
Gingivectomy (Quadrants)	.069	.013	0	(0-4)	.475	.0063	7.477
***	*	*	*	*	*	*	*
Dental Appts Required	4.749	3.996	1	(0-35)	3.710	.0491	1.649

Table 8

DENTAL TREATMENT TIME REQUIREMENTS: DESCRIPTIVE STATISTICS FOR EACH VARIABLE
FOR THE ENTIRE SAMPLE: IN HOURS

TYPE OF TREATMENT	MEAN	MEDIAN	MODE	RANGE	STD DEV	STD ERROR	SKEWNESS
Restorations	2.359	1.501	0	18.560	2.668	.035	1.616
Extractions	.218	.063	0	4.080	.366	.005	2.053
Endodontics	.167	.066	0	25.000	.865	.011	9.510
Crown and Bridge	.490	.107	0	39.400	2.056	.027	7.110
Complete Dentures	.044	.017	0	6.460	.453	.006	11.468
Partial Dentures	.169	.066	0	3.940	.691	.009	4.350
Prophylaxis/Scaling	.520	.538	.560	2.240	.159	.002	- 1.988
Gingival Curetage (Quad)	.270	.045	0	5.000	1.077	.014	3.974
Gingivectomy (Quadrants)	.172	.032	0	10.000	1.186	.016	7.477

Table 9

DISTRIBUTION OF THE MEAN NEED FOR EACH TREATMENT VARIABLE BY RANK GROUP

TREATMENT VARIABLE	GROUP 1 E1 - E4	GROUP 2 E5 - E6	GROUP 3 E7 - E9	GROUP 4 W1 - W4	GROUP 5 O1 - O3	GROUP 6 O4 - O6
Restorations	4.28	3.63	2.76	1.93	1.91	1.12
Extractions	1.16	0.74	0.44	0.32	0.57	0.19
Endodontics (Teeth)	0.08	0.06	0.07	0.06	0.04	0.01
Crown and Bridge (Units)	0.22	0.33	0.26	0.17	0.19	0.27
Full Dentures	0.01	0.02	0.05	0.03	0.00	0.02
Partial Dentures	0.06	0.11	0.19	0.09	0.03	0.04
Prophylaxis/Scaling	0.94	0.92	0.94	0.90	0.87	0.88
Subgingival Curettage (Quad)	0.17	0.25	0.49	0.29	0.07	0.16
Gingivectomy (Quadrants)	0.04	0.08	0.23	0.04	0.05	0.03

Table 10

VARIABLE 01 - RESTORATIONS NEEDED
ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

NUMBER OF RESTORATIONS NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	1515	26.3	26.3
1	801	13.9	40.2
2	667	11.6	51.8
3	523	9.1	60.9
-	-	-	-
6	302	5.2	79.6
-	-	-	-
-	-	-	-
29	1	.0	100.0

N = 5761

Table 11

VARIABLE 02 - EXTRACTIONS NEEDED

ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

NUMBER OF EXTRACTIONS NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	3767	65.4	65.4
1	534	9.3	74.7
2	546	9.5	84.2
3	267	4.6	88.8
4	558	9.7	98.5
-	-	-	-
-	-	-	-
9	4	0.1	99.9

N = 5761

Table 12

VARIABLE 03 - NUMBER OF TEETH REQUIRING ENDODONTICS

ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

NUMBER OF TEETH REQUIRING ENDO	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	5649	95.0	95.0
1	224	3.9	98.9
2	53	0.9	99.8
-	-	-	-
4	4	0.1	99.9

N = 5761

Table 13

VARIABLE 04 - CROWN AND BRIDGE NEEDED (UNITS)
ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

UNITS OF CROWN AND BRIDGE NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	5197	90.2	90.2
1	262	4.5	94.8
2	98	1.7	96.5
-	-	-	-
-	-	-	-
10	7	0.1	99.9

N = 5761

Table 14

VARIABLE 05 - FULL DENTURES NEEDED

ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

FULL DENTURES NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	5695	99.0	99.0
1	42	0.7	99.7
2	18	0.3	100.0

N = 5761

Table 15

VARIABLE 06 - PARTIAL DENTURES NEEDED

ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

PARTIAL DENTURES NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	5395	93.7	93.7
1	235	4.1	97.8
2	129	2.2	100.0

N = 5761

Table 16

VARIABLE 07 - PROPHYLAXIS/SCALINGS NEEDED
ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

PROPHYLAXIS/SCALING NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	446	7.7	7.7
1	5315	92.3	100.0

N = 5761

Table 17

VARIABLE 08 - QUADRANTS SUBGINGIVAL CURRETAGE NEEDED
ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

QUADRANTS CURRETAGE NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	5371	93.2	93.2
1	61	1.1	94.3
2	58	1.0	95.3
3	8	0.1	95.5
4	261	4.5	100.0

N = 5761

Table 18

VARIABLE 09 - QUADRANTS GINGIVECTOMY NEEDED
ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

QUADRANTS GINGIVECTOMY NEEDED	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	5612	97.5	97.5
1	38	0.7	98.2
2	29	0.5	98.7
3	9	0.2	98.8
4	68	1.2	100.0

N = 5761

Table 19

VARIABLE 10 - DENTAL APPOINTMENTS REQUIRED
ABSOLUTE FREQUENCIES AND CUMULATIVE PERCENTAGES

APPOINTMENTS REQUIRED (ESTIMATE BY EXAMINER)	ABSOLUTE FREQUENCY	ADJUSTED FREQUENCY (PCT)	CUMULATIVE FREQUENCY (PCT)
0	175	3.0	3.0
1	904	15.7	18.7
2	740	12.8	31.6
3	739	12.8	44.4
4	648	11.3	55.7
5	625	10.8	66.5
6	511	8.9	75.4
-	-	-	-
13	40	0.7	97.0
-	-	-	-
17	13	0.2	99.0
-	-	-	-
-	-	-	-
27	3	0.1	99.9

N= 5761

Table 20

DISTRIBUTION OF THE MEAN NEED FOR EACH TREATMENT VARIABLE
BY BASIC BRANCH/CAREER MANAGEMENT FIELD

TREATMENT VARIABLE	TYPE 1 COMBAT	TYPE 2 COMBAT SUPPORT/ SERVICE SUPPORT
Restorations	4.02	3.22
Extractions	0.98	0.81
Endodontics (Teeth)	0.07	0.06
Crown and Bridge (Units)	0.22	0.29
Full Dentures	0.02	0.01
Partial Dentures	0.09	0.08
Prophylaxis/Scaling	0.94	0.91
Subgingival Curretage (Quad)	0.24	0.19
Gingivectomy (Quadrants)	0.06	0.08

Table 21

DISTRIBUTION OF THE MEAN NEED FOR EACH TREATMENT VARIABLE BY SITE

TREATMENT VARIABLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
Restorations	3.18	2.56	1.60	2.91	4.40	3.56	2.03	3.89	4.52	3.45
Extractions	0.57	0.72	0.27	0.63	0.91	0.94	0.70	0.60	1.22	1.26
Endodontics (Teeth)	0.07	0.12	0.03	0.05	0.06	0.09	0.08	0.03	0.05	0.10
Crown and Bridge (Units)	0.29	0.35	0.09	0.47	0.17	0.34	0.28	0.07	0.22	0.27
Full Dentures	0.01	0.03	0.00	0.03	0.02	0.01	0.01	0.01	0.02	0.02
Partial Dentures	0.06	0.16	0.03	0.13	0.06	0.07	0.13	0.06	0.13	0.10
Prophylaxis/Scaling	0.86	0.87	0.93	0.86	0.93	0.94	0.68	0.95	1.00	0.94
Subgingival Curettage (Quad)	0.22	0.18	0.12	0.30	0.13	0.28	0.20	0.14	0.35	0.13
Gingivectomy (Quadrants)	0.16	0.11	0.00	0.04	0.03	0.04	0.10	0.02	0.14	0.05

Table 22

DISTRIBUTION OF TREATMENT TIME REQUIREMENTS FOR EACH TREATMENT VARIABLE BY RANK GROUP *

TREATMENT VARIABLE	GROUP 1 E1 - E4	GROUP 2 E5 - E6	GROUP 3 E7 - E9	GROUP 4 W1 - W4	GROUP 5 O1 - O3	GROUP 6 O4 - O6
Restorations	2.74	2.32	1.77	1.24	1.23	0.72
Extractions	0.28	0.18	0.11	0.08	0.14	0.05
Endodontics	0.19	0.15	0.17	0.15	0.10	0.02
Crown and Bridge	0.44	0.65	0.52	0.34	0.38	0.53
Full Dentures	0.01	0.08	0.15	0.09	0.00	0.07
Partial Dentures	0.12	0.22	0.38	0.17	0.06	0.08
Prophylaxis/Scaling	0.53	0.52	0.53	0.51	0.49	0.49
Subgingival Curettage	0.21	0.31	0.62	0.36	0.09	0.20
Gingivectomy	0.10	0.20	0.57	0.10	0.11	0.09

* Figures presented are in hours and represent the time needed to deliver the particular needed care to the "average" individual in that group.

Table 23

DISTRIBUTION OF TREATMENT TIME REQUIREMENTS FOR EACH TREATMENT VARIABLE
BY BASIC BRANCH/CAREER MANAGEMENT FIELD *

TREATMENT VARIABLE	TYPE 1	TYPE 2
	COMBAT	COMBAT SUPPORT/ SERVICE SUPPORT
Restorations	2.57	2.06
Extractions	0.23	0.19
Endodontics	0.18	0.15
Crown and Bridge	0.44	0.57
Full Dentures	0.05	0.04
Partial Dentures	0.17	0.17
Prophylaxis/Scaling	0.53	0.51
Subgingival Curretage	0.30	0.23
Gingivectomy	0.16	0.19

* Figures presented are in hours and represent the time needed to deliver the particular needed care to the "average" individual in that group. It does not mean that every individual requires that much treatment time to satisfy his or her dental needs.

Table 24

DISTRIBUTION OF TREATMENT TIME REQUIREMENTS FOR EACH TREATMENT VARIABLE BY SITE *

TREATMENT VARIABLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
Restorations	2.04	1.64	1.02	1.86	2.82	2.78	1.30	2.49	2.89	2.21
Extractions	0.14	0.17	0.06	0.15	0.22	0.23	0.17	0.14	0.29	0.30
Endodontics	0.17	0.30	0.66	0.12	0.15	0.23	0.19	0.07	0.12	0.25
Crown and Bridge	0.57	0.68	0.17	0.92	0.33	0.68	0.55	0.15	0.44	0.53
Full Dentures	0.05	0.09	0.00	0.10	0.05	0.02	0.02	0.04	0.05	0.05
Partial Dentures	0.12	0.32	0.06	0.25	0.11	0.13	0.26	0.11	0.26	0.20
Prophylaxis/Scaling	0.43	0.48	0.52	0.48	0.52	0.52	0.38	0.53	0.56	0.53
Subgingival Curettage	0.27	0.23	0.15	0.37	0.16	0.35	0.25	0.17	0.44	0.17
Gingivectomy	0.39	0.27	0.00	0.09	0.08	0.11	0.24	0.05	0.34	0.13

* Figures presented are in hours and represent the time needed to deliver the particular needed care to the average individual at that installation. It does not mean that every individual at that site would require this much time to receive dental care.

Table 25

TREATMENTS REQUIRED PER 1000 PERSONNEL BY RANK GROUP

TREATMENT VARIABLE	GROUP 1 E1 - E4	GROUP 2 E5 - E6	GROUP 3 E7 - E9	GROUP 4 W1 - W4	GROUP 5 O1 - O3	GROUP 6 O4 - O6
Restorations	4280	3630	2760	1930	1910	1120
Extractions	1160	740	440	320	570	190
Endodontics (Teeth)	80	60	70	60	40	10
Crown and Bridge (Units)	220	330	260	170	190	270
Full Dentures	10	20	50	30	0	20
Partial Dentures	60	110	190	90	30	40
Prophylaxis/Scaling	940	920	940	900	870	880
Subgingival Curettage (Quadrants)	170	250	490	290	70	160
Gingivectomy (Quadrants)	40	80	230	40	50	30

Table 26

TREATMENTS REQUIRED PER 1000 PERSONNEL BY BASIC BRANCH/
CAREER MANAGEMENT FIELD

TREATMENT VARIABLE	TYPE 1	TYPE 2
	COMBAT	COMBAT SUPPORT/ SERVICE SUPPORT
Restorations	4020	3220
Extractions	980	810
Endodontics (Teeth)	70	60
Crown and Bridge (Units)	220	290
Full Dentures	20	10
Partial Dentures	90	80
Prophylaxis/Scaling	940	910
Subgingival Curettage (Quads)	240	190
Gingivectomy (Quadrants)	60	80

Table 27

TREATMENTS REQUIRED PER 1000 PERSONNEL BY SITE

TREATMENT VARIABLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
Restorations	3180	2560	1600	2910	4400	3560	2030	3890	4520	3450
Extractions	570	720	270	630	910	940	700	600	1220	1260
Endodontics (Teeth)	70	120	30	50	60	90	80	30	50	100
Crown and Bridge (Units)	290	350	90	470	170	340	280	70	220	270
Full Dentures	10	30	0	30	20	10	10	10	20	20
Partial Dentures	60	160	30	130	60	70	130	60	130	100
Prophylaxis/Scaling	860	870	930	860	930	940	680	950	1000	940
Subgingival Curettage (Quad)	220	180	120	300	130	280	200	140	350	130
Gingivectomy (Quadrants)	160	110	0	40	30	40	100	20	140	50

Table 28

TIME (IN HOURS) REQUIRED TO DELIVER NEEDED TREATMENT TO 1000 PERSONNEL BY RANK GROUP

TREATMENT VARIABLE	GROUP 1 E1 - E4	GROUP 2 E5 - E6	GROUP 3 E7 - E9	GROUP 4 W1 - W4	GROUP 5 O1 - O3	GROUP 6 O4 - O6
Restorations	2740	2320	1770	1240	1230	720
Extractions	280	180	110	80	140	50
Endodontics	190	150	170	150	100	20
Crown and Bridge	440	650	520	340	380	530
Full Dentures	10	80	150	90	0	70
Partial Dentures	120	220	380	170	60	80
Prophylaxis/Scaling	530	520	530	510	490	490
Subgingival Curettage	210	310	620	360	90	200
Gingivectomy	100	200	570	100	110	90

Table 29

TIME (IN HOURS) REQUIRED TO DELIVER NEEDED CARE TO 1000 PERSONNEL
BY BASIC BRANCH/CAREER MANAGEMENT FIELD

TREATMENT VARIABLE	TYPE 1	TYPE 2
	COMBAT	COMBAT SUPPORT/ SERVICE SUPPORT
Restorations	2570	2060
Extractions	230	190
Endodontics	180	150
Crown and Bridge	440	570
Full Dentures	50	40
Partial Dentures	170	170
Prophylaxis/Scaling	530	510
Subgingival Currtage	300	230
Gingivectomy	160	190

Table 30

TIME (IN HOURS) REQUIRED TO DELIVER NEEDED TREATMENT TO 1000 PERSONNEL BY SITE

TREATMENT VARIABLE	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5	SITE 6	SITE 7	SITE 8	SITE 9	SITE 10
Restorations	2040	1640	1020	1860	2820	2780	1300	2490	2890	2210
Extractions	140	170	60	150	220	230	170	140	290	300
Endodontics	170	300	660	120	150	230	190	70	120	250
Crown and Bridge	570	680	170	920	330	680	550	150	440	530
Full Dentures	50	90	0	100	50	20	20	40	50	50
Partial Dentures	120	320	60	250	110	130	260	110	260	200
Prophylaxis/Scaling	480	480	520	480	520	520	380	530	560	530
Subgingival Curetage	270	230	150	370	160	350	250	170	440	170
Gingivectomy	390	270	0	90	80	110	240	50	340	130

Table 31

TOTAL TIME (IN HOURS) REQUIRED TO DELIVER ALL NEEDED CARE
TO 1000 PERSONNEL BY RANK GROUP

<u>RANK GROUP</u>	<u>TOTAL HOURS</u>	<u>DEVIATION FROM MEAN</u>
Group 1 (E1-E4)	4620	+ 4.7%
Group 2 (E5-E6)	4630	+ 4.9%
Group 3 (E7-E9)	4820	+ 9.3%
Group 4 (W1-W4)	3040	- 31.1%
Group 5 (O1-O3)	2600	- 41.0%
Group 6 (O4-O6)	2250	- 48.9%

Overall Sample Rank Group Mean - 4415 hours per 1000
Personnel

N = 5744

Table 32

TOTAL TIME (IN HOURS) REQUIRED TO DELIVER ALL NEEDED CARE
TO 1000 PERSONNEL BY BASIC BRANCH/CAREER MANAGEMENT FIELD

<u>BASIC BRANCH/CAREER MANAGEMENT FIELD</u>	<u>TOTAL HOURS</u>	<u>DEVIATION FROM MEAN</u>
Type 1 (Combat)	4630	+ 4.9%
Type 2 (Combat Support/ Service Support)	4110	- 6.8%

Overall Sample by Type Mean - 4413 hours per 1000 personnel

N = 5739

Table 33

TOTAL TIME (IN HOURS) REQUIRED TO DELIVER NEEDED CARE
TO 1000 PERSONNEL BY SITE

SITE	TOTAL HOURS	DEVIATION FROM MEAN
1	4230	- 6.4%
2	4180	- 7.5%
3	2640	- 41.6%
4	4340	- 3.9%
5	4440	- 1.8%
6	5050	+ 11.7%
7	3360	- 25.6%
8	3750	- 17.1%
9	5390	+ 19.3%
10	4370	- 3.3%

Overall Sample Mean for all Ten Sites - 4520 hours per 1000 personnel.

N = 5759

APPENDIX A
DATA COLLECTION FORM

AOHMP STUDY

DENTAL CARE NEEDS AND TREATMENTS DATA

A. Participant Identifier _____ B. SSN _____
 C. (1) Post _____ D. Unit _____
 (2) Dental Clinic where record filed _____

	COLUMN	
E. Rank _____ (see code sheet)	<input type="checkbox"/>	1
F. Basic Branch/Career Management Field/Type of Assignment:		
(1) Infantry, Armor, Field Artillery, Air Defense, Engineer, <u>PLUS</u> all individuals <u>currently</u> assigned to Airborne, Ranger or Special Forces Units _____	<input type="checkbox"/>	2
(2) All other Personnel _____		
G. Length of Assignment to Present Post		
(1) Less than 12 Months _____	<input type="checkbox"/>	3
(2) 12 Months or More _____		
H. Data Collected at Time of AOHMP Examination:		
(1) Number of Restorations needed	<input type="checkbox"/> <input type="checkbox"/>	4,5
(2) Number of Extractions needed	<input type="checkbox"/> <input type="checkbox"/>	6,7
(3) Number of <u>Teeth</u> needing root canal therapy	<input type="checkbox"/> <input type="checkbox"/>	8,9
(4) Number of units of crown and bridge needed (to include single crowns and fixed bridges)	<input type="checkbox"/> <input type="checkbox"/>	10,11
(5) Number of full dentures needed	<input type="checkbox"/>	12
(6) Number of partial dentures needed	<input type="checkbox"/>	13
(7) Number of prophys/scalings needed (0 or 1)	<input type="checkbox"/>	14
(8) Number of quadrants subgingival currettage needed	<input type="checkbox"/>	15
(9) Number of quadrants gingivectomy/gingivoplasty needed	<input type="checkbox"/>	16
(10) Number of dental appointments needed in order to accomplish requirements listed in 1-9	<input type="checkbox"/> <input type="checkbox"/>	17,18
(11) Patient's Dental Classification _____	<input type="checkbox"/>	19

I. Data Collected Four Months Following AOHMP Examination:

(DO NOT COMPLETE THIS SECTION)

	COLUMN		
(1) Number of Fillings received since examination	<input type="checkbox"/>	<input type="checkbox"/>	20,21
(2) Number of Extractions received since examination	<input type="checkbox"/>	<input type="checkbox"/>	22,23
(3) Number of <u>Teeth</u> receiving root canal therapy since exam	<input type="checkbox"/>	<input type="checkbox"/>	24,25
(4) Number of units of Crown and Bridge recieved (to include single crowns and fixed bridges)	<input type="checkbox"/>	<input type="checkbox"/>	26,27
(5) Number of Full Dentures received		<input type="checkbox"/>	28
(6) Number of Partial Dentures recieved		<input type="checkbox"/>	29
(7) Number of Prophys/Scalings received (0 or 1)		<input type="checkbox"/>	30
(8) Number of Quadrants subginival curretage received		<input type="checkbox"/>	31
(9) Number of Quadrants gingivectomy/gingivoplasty received		<input type="checkbox"/>	32
(10) Number of Dental appointments received since exam	<input type="checkbox"/>	<input type="checkbox"/>	33,34
(11) Patient's Dental Classification		<input type="checkbox"/>	35
(12) If patient still needs treatment, is the patient actively receiving care? (Yes=1, No = 2)		<input type="checkbox"/>	36
(13) Number of broken appointments		<input type="checkbox"/>	37
(14) Number of cancelled appointments		<input type="checkbox"/>	38
(15) Number of days from start of treatment to finish	<input type="checkbox"/>	<input type="checkbox"/>	39-41
(16) Number of months from last appointment to AOHMP Examination	<input type="checkbox"/>	<input type="checkbox"/>	42,43
(17) Post, Clinic	<input type="checkbox"/>	<input type="checkbox"/>	44,45

APPENDIX B

**INSTRUCTIONS FOR USE OF DATA
COLLECTION FORM**

Instructions for Recording Data in Part I of the AOHMP Study

1. Be sure that all of the following questions are completely answered (A through H-11). Do NOT complete question I-1 through I-12.
2. Question A "Participants Identifier" - Print the patients name (first name, middle initial, last name).
3. Under questions C (2), enter the name/number of the dental clinic when the patient receives routine dental therapy.
4. Be sure to enter the patients unit in order that he can be found at a later date.
5. Question E concerning rank. In the box under column enter the proper number using the following code:

E 1 - E 4	= 1
E 5 - E 6	= 2
E 7 - E 9	= 3
W 1 - W 4	= 4
O 1 - O 3	= 5
O 4 - O 6	= 6
6. Question F and G. In the box under column enter 1 or 2 as appropriate.
7. Question H-1 through H-10, enter the appropriate number of dental treatment needed.
8. Question H-3, enter number of teeth needing root canal therapy. Disregard the number of canals.
9. Question H-4, enter total number of units of crown and bridge needed. Include single crowns plus units of fixed bridge therapy.
10. Questions H-8 and H-9. Enter number of Quadrants of therapy needed.
11. Question H-10, enter the number of appointments needed. This will be a best estimate of the examiner.
12. Question H-11, enter the patients dental classification in the blank behind the question. Do NOT enter it in the box under column.
13. At the end of each week, all completed AHS Forms 291 OT will be forwarded by the DDS to:

Health Care Studies Division
Academy of Health Sciences, US Army
Fort Sam Houston, Texas 78234

APPENDIX C

WEIGHTED TREATMENT TIME FACTORS FOR
SPECIFIC DENTAL PROCEDURES

WEIGHTED TREATMENT TIME FACTORS
FOR SPECIFIC DENTAL PROCEDURES

<u>TREATMENT</u>	<u>TREATMENT TIME IN HOURS</u>
Restoration	0.64
Extraction	0.24
Root Canal Therapy (per tooth)	2.50
Crown and/or Bridge (per unit)	1.97
Soft Tissue	3.23
Partial Denture	1.97
Prophylaxis and Scaling	0.56
Subgingival Curettage (per quadrant)	1.25
Gingivectomy/Gingivoplasty (per quadrant)	2.50

APPENDIX D
SUPPLEMENTAL TABLES

Supplemental Table 1

MEANS AND STANDARD DEVIATIONS FOR CARE NEED VARIABLES
FOR THE SIX RANK GROUPINGS *

CARE NEED	MEAN	S.D.	SIGNIFICANCE
1. Restorations	3.6878	4.1681	P < .00001
2. Extractions	.9084	1.5270	P < .00001
3. Endodontics	.0670	.3464	P < .1120 **
4. Crown and Bridge	.2494	1.0450	P < .0409
5. Full Dentures	.0136	.1403	P < .00001
6. Partial Dentures	.0858	.3513	P < .00001
7. Prophylaxis/Scaling	.9286	.2838	P < .00001
8. Subgingival Curretage	.2161	.8609	P < .00001
9. Gingivectomy	.0688	.4751	P < .00001

* Analysis of variance was performed to determine differences between means for the six rank groupings.

** No significant difference

Supplemental Table 2

MEANS AND STANDARD DEVIATIONS FOR CARE NEED VARIABLES
FOR THE TWO BASIC BRANCH/CAREER MANAGEMENT FIELDS*

CARE NEED	MEAN	S.D.	SIGNIFICANCE
1. Restorations	3.6871	4.1675	P < .00001
2. Extractions	.9066	1.5223	P < .00001
3. Endodontics	.0671	.3466	P < .2662 **
4. Crown and Bridge	.2493	1.0453	P < .0192
5. Full Dentures	.0136	.1403	P < .3873 **
6. Partial Dentures	.0859	.3514	P < .8450 **
7. Prophylaxis/Scaling	.9289	.2834	P < .0007
8. Subgingival Curettage	.2161	.8612	P < .0274
9. Gingivectomy	.0689	.4753	P < .3015 **

* Analysis of Variance was performed to determine differences between means for the two types.

** No significant difference

Supplemental Table 3

MEANS AND STANDARD DEVIATIONS FOR CARE NEED VARIABLES

FOR THE TEN STUDY SITES *

CARE NEED	MEAN	S.D.	SIGNIFICANCE
1. Restorations	3.6855	4.1682	P < .00001
2. Extractions	.9069	1.5256	P < .00001
3. Endodontics	.0669	.3460	P < .0005
4. Crown and Bridge	.2487	1.0437	P < .00001
5. Full Dentures	.0136	.1401	P < .2065 **
6. Partial Dentures	.0856	.3509	P < .00001
7. Prophylaxis/Scaling	.9285	.2840	P < .00001
8. Subgingival Curretage	.2162	.8613	P < .00001
9. Gingivectomy	.0686	.4745	P < .00001

* Analysis of variance was performed to determine differences between means for the ten sites.

** No significant difference

Supplemental Table 4

MEANS AND STANDARD DEVIATIONS FOR TIME REQUIREMENTS
TO DELIVER EACH OF THE CARE NEED VARIABLES
TO THE COMBINED SIX RANK GROUPS*

CARE NEED	MEAN	S.D.	SIGNIFICANCE
1. Restorations	2.3602	2.6676	P < .00001
2. Extractions	.2180	.3665	P < .00001
3. Endodontics	.1676	.8660	P < .1120**
4. Crown and Bridge	.4913	2.0586	P < .0409
5. Full Dentures	.0439	.4531	P < .00001
6. Partial Dentures	.1691	.6920	P < .00001
7. Prophylaxis/Scaling	.5200	.1589	P < .00001
8. Subgingival Curetage	.2701	1.0762	P < .00001
9. Gingivectomy	.1720	1.1878	P < .00001

* Analysis of variance was performed to determine differences between means for the six rank groupings.

** No significant difference.

Supplemental Table 5

MEANS AND STANDARD DEVIATIONS FOR TIME REQUIREMENTS
TO DELIVER EACH OF THE CARE NEED VARIABLES
TO THE COMBINED BASIC BRANCH/CAREER MANAGEMENT FIELDS*

CARE NEED	MEAN	S.D.	SIGNIFICANCE
1. Restorations	2.3597	2.6672	P < .00001
2. Extractions	.2176	.3654	P < .00001
3. Endodontics	.1677	.8664	P < .2662**
4. Crown and Bridge	.4910	2.0593	P < .0192
5. Full Dentures	.0439	.4533	P < .3873**
6. Partial Dentures	.1692	.6923	P < .8450**
7. Prophylaxis/Scaling	.5202	.1587	P < .0007
8. Subgingival Curretage	.2701	1.0766	P < .0274
9. Gingivectomy	.1722	1.1883	P < .3015**

* Analysis of variance was performed to determine differences between means for the two types.

** No significant difference.

Supplemental Table 6

MEANS AND STANDARD DEVIATIONS FOR TIME REQUIREMENTS
TO DELIVER EACH OF THE CARE NEED VARIABLES
TO THE COMBINED TEN STUDY SITES*

CARE NEED	MEAN	S.D.	SIGNIFICANCE
1. Restorations	2.3587	2.6676	P < .00001
2. Extractions	.2177	.3661	P < .00001
3. Endodontics	.1671	.8650	P < .0005
4. Crown and Bridge	.4900	2.0561	P < .00001
5. Full Dentures	.0438	.4525	P < .2065**
6. Partial Dentures	.1686	.6912	P < .00001
7. Prophylaxis/Scaling	.5199	.1590	P < .00001
8. Subgingival Curretage	.2702	1.0767	P < .00001
9. Gingivectomy	.1716	1.1863	P < .00001

* Analysis of variance was performed to determine differences between means for the ten sites.

** No significant difference.

SUPPLEMENTAL TABLE 7

SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR REQUIREMENT FOR RESTORATIONS

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	+	+	+	+	+
E5 - E6	2	-	0	+	+	+	+
E7 - E9	3	-	-	0	0	+	+
W1 - W4	4	-	-	0	0	0	0
O1 - O3	5	-	-	-	0	0	0
O4 - O6	6	-	-	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 8

SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR REQUIREMENT FOR EXTRACTIONS

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	+	+	+	+	+
E5 - E6	2	-	0	+	+	+	+
E7 - E9	3	-	-	0	0	0	0
W1 - W4	4	-	-	0	0	0	0
G1 - O3	5	-	-	0	0	0	+
O4 - O6	6	-	-	0	0	-	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 9

SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS FOR REQUIREMENT FOR CROWN AND BRIDGE

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	0	0	0	0
E5 - E6	2	0	0	0	0	0	0
E7 - E9	3	0	0	0	0	0	0
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	0	0	0	0
O4 - O6	6	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 10

SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR REQUIREMENT FOR ENDODONTICS

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	0	0	0	+
E5 - E6	2	0	0	0	0	0	0
E7 - E9	3	0	0	0	0	0	0
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	0	0	0	0
O4 - O6	6	-	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 11

SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS FOR REQUIREMENT FOR FULL DENTURES

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	-	0	0	0
E5 - E6	2	0	0	-	0	0	0
E7 - E9	3	+	0	0	0	+	0
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	-	0	0	0
O4 - O6	6	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 12
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR REQUIREMENT FOR PARTIAL DENTURES

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	-	-	0	0	0
E5 - E6	2	+	0	-	0	+	+
E7 - E9	3	+	+	0	+	+	+
W1 - W4	4	0	0	-	0	0	0
O1 - O3	5	0	-	-	0	0	0
O4 - O6	6	0	-	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 13
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR REQUIREMENT FOR PROPHYLAXIS/SCALING

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	0	0	+	+
E5 - E6	2	0	0	0	0	+	0
E7 - E9	3	0	0	0	0	+	+
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	-	-	-	0	0	0
O4 - O6	6	-	0	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 14
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR REQUIREMENT FOR SUBGINGIVAL CURRETAGE

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	-	0	+	0
E5 - E6	2	0	0	-	0	+	0
E7 - E9	3	+	+	0	+	+	+
W1 - W4	4	0	0	-	0	+	0
O1 - O3	5	-	-	-	-	0	0
O4 - O6	6	0	0	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 15
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR REQUIREMENT FOR GINGIVECTOMY

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	-	0	0	0
E5 - E6	2	0	0	-	0	0	0
E7 - E9	3	+	+	0	+	+	+
W1 - W4	4	0	0	-	0	0	0
O1 - O3	5	0	0	-	0	0	0
O4 - O6	6	0	0	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 16
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR RESTORATIONS

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	+	0	-	0	+	-	-	0
2	0	0	0	0	-	-	0	-	-	0
3	-	0	0	-	-	-	0	-	-	-
4	0	0	+	0	-	-	+	-	-	0
5	+	+	+	+	0	+	+	+	0	+
6	0	+	+	+	0	0	+	0	0	0
7	-	0	0	-	-	-	0	-	-	-
8	+	+	+	+	-	0	+	0	-	0
9	+	+	+	+	0	+	+	+	0	+
10	0	+	+	+	-	0	+	0	-	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 17
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR EXTRACTIONS

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	+	0	-	-	0	0	-	-
2	0	0	+	0	0	0	0	0	-	-
3	-	-	0	-	-	-	-	-	-	-
4	0	0	+	0	-	-	0	0	-	-
5	+	0	+	+	0	0	0	+	-	-
6	+	0	+	+	0	0	0	+	+	+
7	0	0	+	0	0	0	0	0	-	-
8	0	0	+	0	-	-	0	0	-	-
9	+	+	+	+	+	+	+	+	0	0
10	+	+	+	+	+	+	+	+	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 18
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR ENDODONTICS

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 19
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR CROWN AND BRIDGE

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	+	0	0
2	0	0	0	0	0	0	0	+	0	0
3	0	0	0	-	0	0	0	0	0	0
4	0	0	+	0	+	0	0	+	+	+
5	0	0	0	-	0	0	0	0	0	0
6	0	0	0	0	0	0	0	+	0	0
7	0	0	0	0	0	0	0	0	0	0
8	-	-	0	-	0	-	0	0	0	0
9	0	0	0	-	0	0	0	0	0	0
10	0	0	0	-	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 20
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR FULL DENTURES

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	-	0	0	0	0	0	0
4	0	0	+	0	0	+	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	-	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 21
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR PARTIAL DENTURES

SITE	1	2	3	4	5	6	7	8	9	10
1	0	-	0	-	0	0	-	0	-	-
2	+	0	+	0	+	+	0	+	0	0
3	0	-	0	-	0	0	-	0	-	-
4	+	0	+	0	+	+	0	+	0	0
5	0	+	0	+	0	0	+	0	+	0
6	0	-	0	-	0	0	-	0	-	0
7	+	0	+	0	+	+	0	+	0	0
8	0	-	0	-	0	0	-	0	-	0
9	+	0	+	0	+	+	0	+	0	0
10	0	0	+	0	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 22
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR PROPHYLAXIS/SCALING

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	-	0	-	-	+	-	-	-
2	0	0	0	0	-	-	+	-	-	-
3	+	0	0	+	0	0	+	0	-	0
4	0	0	-	0	-	-	+	-	-	-
5	+	+	0	+	0	0	+	0	-	0
6	+	+	0	-	0	0	+	0	-	0
7	-	-	-	-	-	-	0	-	-	-
8	+	+	0	+	0	0	+	0	-	0
9	+	+	+	+	+	+	+	+	0	+
10	+	+	0	+	0	0	+	0	-	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 23
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR SUBGINGIVAL CURETAGE

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	-	0	-	0	0	-	0
4	0	0	+	0	+	0	0	+	0	+
5	0	0	0	-	0	-	0	0	-	0
6	0	0	+	0	+	0	0	+	0	+
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	-	0	-	0	0	-	0
9	0	0	+	0	+	0	0	+	0	+
10	0	0	0	-	0	-	0	0	-	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 24
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR REQUIREMENTS FOR GINGIVECTOMY

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	+	+	+	+	0	+	0	+
2	0	0	0	0	0	0	0	0	0	0
3	-	0	0	0	0	0	0	0	-	0
4	-	0	0	0	0	0	0	0	-	0
5	-	0	0	0	0	0	0	0	-	0
6	-	0	0	0	0	0	0	0	-	0
7	0	0	0	0	0	0	0	0	0	0
8	-	0	0	0	0	0	0	0	-	0
9	0	0	+	+	+	+	0	+	0	+
10	-	0	0	0	0	0	0	0	-	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 25
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED RESTORATIONS

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	+	+	+	+	+
E5 - E6	2	-	0	+	+	+	+
E7 - E9	3	-	-	0	0	0	+
W1 - W4	4	-	-	0	0	0	0
O1 - O3	5	-	-	0	0	0	0
O4 - O6	6	-	-	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 26

SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS

FOR TIME REQUIREMENTS TO DELIVER NEEDED EXTRACTIONS

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	+	+	+	+	+
E5 - E6	2	-	0	0	0	0	+
E7 - E9.	3	-	0	0	0	0	0
W1 - W4	4	-	0	0	0	0	0
O1 - O3	5	-	0	0	0	0	+
O4 - O6	6	-	-	0	0	-	0

Duncan's multiple range test ($P < .05$) was performed

- + Significantly Greater
- Significantly Less
- 0 No Significant Difference

SUPPLEMENTAL TABLE 27

**SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED ENDODONTICS**

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	0	0	0	0
E5 - E6	2	0	0	0	0	0	0
E7 - E9	3	0	0	0	0	0	0
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	0	0	0	0
O4 - O6	6	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 28
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED CROWN AND BRIDGE

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	0	0	0	0
E5 - E6	2	0	0	0	0	0	0
E7 - E9	3	0	0	0	0	0	0
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	0	0	0	0
O4 - O6	6	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 29

**SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED FULL DENTURES**

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	-	0	0	0
E5 - E6	2	0	0	-	0	0	0
E7 - E9.	3	+	+	0	0	+	+
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	-	0	0	0
O4 - O6	6	0	0	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 30
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED PARTIAL DENTURES

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	-	0	0	0
E5 - E6	2	0	0	-	0	+	+
E7 - E9	3	+	+	0	+	+	+
W1 - W4	4	0	0	-	0	0	0
O1 - O3	5	0	0	-	0	0	0
O4 - O6	6	0	0	-	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 31
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED PROPHYLAXIS/SCALING

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	0	0	0	0
E5 - E6	2	0	0	0	0	0	0
E7 - E9	3	0	0	0	0	0	0
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	0	0	0	0
O4 - O6	6	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 32

**SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED SUBGINGIVAL CURETTAGE**

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	-	0	0	0
E5 - E6	2	0	0	-	0	0	0
E7 - E9.	3	+	+	0	+	+	0
W1 - W4	4	0	0	-	0	0	0
O1 - O3	5	0	0	-	0	0	0
O4 - O6	6	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 33
SIGNIFICANCE MATRIX FOR COMPARISONS OF DIFFERENCES BETWEEN RANK GROUPS
FOR TIME REQUIREMENTS TO DELIVER NEEDED GINGIVECTOMY

RANK GROUP		1	2	3	4	5	6
E1 - E4	1	0	0	-	0	0	0
E5 - E6	2	0	0	0	0	0	0
E7 - E9	3	+	0	0	0	+	0
W1 - W4	4	0	0	0	0	0	0
O1 - O3	5	0	0	-	0	0	0
O4 - O6	6	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 34

SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED RESTORATIONS

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	+	0	-	0	+	0	0	0
2	0	0	0	0	-	0	0	0	0	0
3	-	0	0	-	-	-	0	-	-	-
4	0	0	+	0	-	0	+	0	0	0
5	+	+	+	+	0	+	+	+	0	+
6	0	0	+	0	-	0	+	0	0	0
7	-	0	0	-	-	-	0	-	-	-
8	0	0	+	0	-	0	+	0	0	0
9	0	0	+	0	0	0	+	0	0	0
10	0	0	+	0	-	0	+	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 35
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED EXTRACTIONS

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	0	-	-
2	0	0	0	0	0	0	0	0	-	-
3	0	0	0	0	0	-	0	0	-	-
4	0	0	0	0	0	0	0	0	-	-
5	0	0	0	0	0	0	0	0	-	-
6	0	0	0	0	0	0	0	0	-	-
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	-	0	0	-	-
9	+	+	+	+	+	0	0	+	0	0
10	+	+	+	+	+	0	0	+	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 36
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED ENDODONTICS

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	+	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	+	0	0
7	0	0	0	0	0	0	0	0	0	0
8	-	0	0	0	0	-	0	0	0	-
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	+	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 37

SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED CROWN AND BRIDGE

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	-	0	0	0	+	0	0
2	0	0	0	0	0	0	0	+	0	0
3	0	0	0	-	0	0	0	0	0	0
4	+	0	+	0	+	+	+	+	+	+
5	0	0	0	-	0	0	0	+	0	0
6	0	0	0	-	0	0	0	+	0	0
7	0	0	0	-	0	0	0	0	0	0
8	-	-	0	-	0	-	0	0	0	0
9	0	0	0	-	0	0	0	0	0	0
10	0	0	0	-	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 38

SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED FULL DENTURES

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	-	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	-	0	0	0	0	0	0
4	+	0	+	0	+	+	+	+	+	+
5	0	0	0	-	0	0	0	0	0	0
6	0	0	0	-	0	0	0	0	0	0
7	0	0	0	-	0	0	0	0	0	0
8	0	0	0	-	0	0	0	0	0	0
9	0	0	0	-	0	0	0	0	0	0
10	0	0	0	-	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 39
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED PARTIAL DENTURES

SITE	1	2	3	4	5	6	7	8	9	10
1	0	-	0	-	0	0	0	0	0	0
2	+	0	+	+	+	+	+	+	+	+
3	0	-	0	-	0	0	0	0	0	0
4	+	-	+	0	+	+	+	+	+	+
5	0	-	0	-	0	0	0	0	0	0
6	0	-	0	-	0	0	0	0	0	0
7	0	-	0	-	0	0	0	0	0	0
8	0	-	0	-	0	0	0	0	-	0
9	0	-	0	-	0	0	0	+	0	0
10	0	-	0	-	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 40
SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED PROPHYLAXIS/SCALING

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	+	0	-	0
2	0	0	0	0	0	0	+	0	-	0
3	0	0	0	0	0	0	+	0	0	0
4	0	0	0	0	0	0	+	0	-	0
5	0	0	0	0	0	0	+	0	0	0
6	0	0	0	0	0	0	+	0	-	0
7	-	-	-	-	-	-	0	-	-	-
8	0	0	0	0	0	0	+	0	-	0
9	+	+	0	+	0	+	+	+	0	+
10	0	0	0	0	0	0	+	0	-	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 41

SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED SUBGINGIVAL CURETAGE

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

SUPPLEMENTAL TABLE 42

SIGNIFICANCE MATRIX FOR COMPARISON OF DIFFERENCES BETWEEN SITES
FOR TIME REQUIREMENT TO DELIVER NEEDED GINGIVECTOMY

SITE	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	0	0	0	0	0	0
2	0	0	+	0	+	+	0	+	0	+
3	-	-	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	-	-	0	0	0	0	0	0	0	0
6	-	-	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	-	0	0	0	0	0	0	0	0
9	0	-	0	0	0	0	0	0	0	0
10	0	-	0	0	0	0	0	0	0	0

Duncan's multiple range test ($P < .05$) was performed

+ Significantly Greater

- Significantly Less

0 No Significant Difference

15. DISTRIBUTION LIST:

Defense Documentation Center (2)

HQDA (DASG-DCA) (1)

Director, Joint Medical Library, Offices of The Surgeons General,
USA/USAF, The Pentagon, RM 1B-473, Washington, DC 20310 (1)

USA HSC (ATTN: HSDS) (2); (ATTN: HSCM-R) (5)

AHS, Stimson Library (1)