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1994 Tri-Service Comprehensive Oral Health Survey-
Active Duty Report

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This study explores the oral health status, dental treatment needs, dental readiness status, dental utilization, and perceived need for dental care of a random sample of 13,050 Army, Navy, Air Force and Marine active duty (AD) personnel (82% response rate). Clinical measures were collected by calibrated examiners; non-clinical data were collected from individual service members using self-administered questionnaires. Data collection occurred between April 1994 and January 1995. Data were weighted by age, sex, and race to reflect the entire AD population (1,699,662), and were analyzed using Stata and Survey Data Analysis (SUDAAN) statistical software. Where possible, oral health outcome measures for military personnel were compared to their employed civilian cohorts. Results show that compared to civilians, AD military personnel have a lower proportion of decayed teeth and a higher annual dental utilization rate. Nearly all (99.2%) AD military personnel have seen a dentist within the past two years and 55% perceive a need for dental care. Nearly all (92.4%) AD military personnel need some type of dental care with roughly 15% in DoD dental readiness class 3. Over four-fifths require 75 or fewer composite time values of dental care. Treatment needs, perceived need, and, to a lesser extent, dental utilization all vary across demographic characteristics.

oral health survey, active duty military service members, oral health status,
dental treatment needs, DoD dental classification, dental utilization, dental
perceived need

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Executive Summary

This report presents findings from an oral health survey of active duty U.S. military personnel. The survey was conducted from April 1994 to January 1995. Data on oral health status, dental treatment needs, DoD dental readiness classification, dental utilization, and perceived need for dental care were collected on active duty personnel at the following sites: Army - Ft. Knox, Ft. Lewis, Ft. Drum, Ft. Hood, Ft. Benning, Ft. Stewart, Ft. Bliss, Ft. Bragg, and Ft. Riley; Air Force - Cannon AFB, Davis-Monthan AFB, Eglin AFB, Ellsworth AFB, Holloman AFB, Kelly AFB, Kirtland AFB, Offutt AFB, and Wright-Patterson AFB; Navy/Marine Corps - Charleston Naval Base, NAS Jacksonville, NSB New London, NAS Miramar, NAS North Island, NAS Whidbey Island, Norfolk Naval Base, and Marine Corps Base Camp Lejeune. From a target sample of 15,924, drawn by the Defense Manpower Data Center, a survey sample of 13,050 was obtained, representing an 82% overall response rate. Prior to analysis, the sample was weighted to reflect the population of the active duty military for 1994 (1,699,662). Where possible, oral health measures on active duty personnel were compared to identical measures on employed civilian cohorts. Key findings from this survey are summarized below:

RESULTS

Oral Health Status

☞☞ Compared to their employed civilian cohorts, active duty (AD) military personnel have a statistically significant lower proportion of their decayed, missing, and filled index scores attributable to decay. This difference is largely attributable to dramatic improvements in the oral health status of AD blacks. AD whites, in contrast, show minimal, if any improvement in oral health status compared to white employed civilians.

☞ AD blacks have a significantly higher portion of their decayed, missing and filled indices attributable to decay than AD whites.

☞☞ Total edentulism is virtually non-existent in the AD military population. Partial edentulism is more common. Excluding third molars, 73.8% have no missing teeth, 15.1% have more than two missing teeth.

☞☞ Prevalence of soft tissue pathology in AD military personnel is under 7%.

Treatment Needs and DoD Dental Readiness Classification

✍ ✍ Nearly all (92.4%) AD military personnel need some type of dental care; roughly 15% are in DoD dental readiness class 3.

✍ ✍ Nearly all (91.3%) AD military personnel need an oral prophylaxis. Oral prophylaxis is the sole treatment need for only 14.2% of individuals.

✍ ✍ Restorative care (45.4%) ranks second to oral prophylaxis as the most common area of dental treatment need for AD military personnel. On average, those with restorative needs require 2.8 restorations.

✍ ✍ Among AD military personnel in DoD dental readiness class 3, most (96.9%) require treatment of class 3 conditions in one or two clinical disciplines.

✍ ✍ Roughly 86% of AD military personnel require 75 or fewer composite time values (CTV) of dental care.

✍ ✍ Based on CTV counts, periodontal and prosthodontic procedures account for nearly three-quarters of all dental treatment needs of AD military personnel.

✍ ✍ Analysis of CTV of treatment required by clinical-specific-discipline over years of military service reveals an explosive growth in need for periodontal and prosthodontic care.

✍ ✍ Different categories of dental treatment need, DoD dental class, and CTV counts were significantly affected by one or more of the following demographic variables: age, race, gender, education level, and paygrade.

Dental Utilization

✍

✍ ✍ Nearly all (99.2%) AD military personnel have seen a dentist within the past two years.

✍ ✍ For every valid statistical comparison that could be made between AD military personnel and their employed civilian cohorts, AD military have higher annual dental utilization rates than their employed civilian cohorts. Gaps in annual dental utilization between military personnel and civilians ranged from 17-87% depending on sex, race, and age.

✍

✍ ✍ Among AD personnel, within race some female age groups have significantly higher annual dental utilization than males. Across race, 40-44 year old non-black, non-white males have significantly higher annual dental utilization than other males.

✍ ✍ Examinations (79.9%) and oral prophylaxis (59.5%) were the dental services received by the greatest number of AD military personnel during the last year.

✍ ✍ Annual dental utilization of AD military personnel varies with self-perceived need for dental care and DoD dental classification.

Perceived Need

✍ ✍ About 55% of AD military personnel perceive a need for dental care. This mirrors the level of perceived need for dental care seen in the civilian population.

✍ ✍ Among AD military personnel, within race, there is no significant difference in perceived need for dental care between males and females. Across race, several minority male and female age groups express greater perceived need for dental care than whites.

✍ ✍ Among those AD military personnel who perceive a need for dental care, there is significantly greater perceived need for immediate dental care by blacks than by whites or non-white, non-blacks.

✍ ✍ Perceived need for dental care by AD military personnel varies with age, paygrade, race, DoD dental class, dental utilization, and presence of extensive decay or calculus.

CONCLUSIONS

✍ ✍ The finding that AD blacks have significantly better and that AD whites have substantially similar or minimally better oral health status than their employed civilian cohorts suggests that AD military dental care is targeted toward individuals with the greatest need for dental care. However, the additional findings that AD blacks still have a significantly greater portion of decayed teeth than AD whites and that improvements in oral health status for AD whites over their civilian cohorts generally do not occur until age 26 or higher suggests that the military dental health care system still faces a formidable dental health challenge.

✍ ✍ Results from this study document that although nearly all AD military personnel see a dentist regularly, nearly all (91.3%) need some type of dental care. Further, the explosive growth in CTV requirements for periodontal and prosthodontic care over time in service and the steep rise in the requirement for multiple extractions for individuals over 40 years of age suggests a need for an earlier, more intensive emphasis on preventive dentistry in the military population.

RECOMMENDATIONS

The Tri-Service Comprehensive Oral Health Survey (TSCOHS) is the first military oral health survey to be conducted on a tri-service level, the first to use a standardized protocol, the first to use an automated data collection form, and the first to collect an expansive scope of oral health information in one interconnected database.

These factors combine to give the TSCOHS many unique strengths including providing **a solid reference base to which future military oral health surveys may be compared to measure progress on military oral health policy objectives over time.**

Successful incorporation of a full-mouth charting of dental treatment needs into our automated data collection instrument demonstrates, in part, the potential of a computer-based dental patient record (CBDPR). Unlike paper records, data in a CBDPR is readily available for detailed analysis such as time trend analysis, intensity and mix of services consumed, measurement of oral health status and outcomes, and more.

✍ ✍ We recommend that a survey similar to the TSCOHS should be done on both active duty personnel and recruits on a periodic basis, at least every 5 years, in order to track trends in the oral health of the military population. Further, we recommend that future surveys capitalize on the benefits of electronic data collection as the TSCOHS did. By greatly reducing errors in data entry and thereby minimizing the need for data clean-up prior to analysis, the use of an automated data collection form enabled the TSCOHS principle investigators to analyze this data and prepare a final report with unprecedented speed. It took

less time for the TSCOHS analysis team to complete data analysis and write this report than it took previous military oral health survey analysis teams to complete pre-analysis data clean-up.

✍ ✍ We anticipate that the military dental services will eventually fully automate their dental patient records. However, until that time arrives, **we recommend** that to monitor the oral health of military personnel that the Tri-Service Dental Corps conduct **a periodic, automated, oral health survey (PAOHS) on the military population,** as follows. First, a PAOHS should be completed on every recruit or officer who enters the service. This will establish a baseline comprehensive examination database for all incoming military personnel. Second, to capture the active duty population, a PAOHS should be incorporated as a requirement of inprocessing for every permanent change of station (PCS) move. This will establish a baseline comprehensive examination database for service members already in the service as well as provide an update database for the approximately one-quarter of service members who move each year. The update database could be used for both cross-sectional and longitudinal time trend analysis. We are likely to ensure full compliance as well as make data collection more convenient by linking the PAOHS to PCS inprocessing than by using conventional survey methods of identifying select individuals to call in for dental examinations.

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✍ ✍ When DoD develops its computer-based dental patient record (CBDPR), we recommend that it incorporate data elements routinely collected on oral

health surveys. A CBDPR incorporating oral health survey data would offer several advantages over the current approach of conducting military oral health surveys every 7-10 years. First, a CBDPR would establish a continually updated database from which a random, representative, cross-sectional sample of military personnel could be drawn to profile the oral health of the military population at a given point in time as well as to track trends in population oral health measures over time whenever requested by military health policy makers. This would allow monitoring of oral health trends in the military population as events unfold, not at fixed 7-10 year intervals. In today's health care environment, managers and policymakers face ever increasing demands for current information on the health status of their catchment populations that only an automated database can reasonably provide. Second, for the first time, a CBDPR database will allow longitudinal dental studies on military personnel i.e. studies that can track oral health measures on individual service members over time. This will greatly enhance studies of outcomes assessment, enabling analysts to probe, for example, to what extent dental care provided in military dental clinics improves the oral health status of service members, the longevity of restorations placed in a patient, the intensity and mix of dental services consumed over time, and other issues.



We strongly recommend that the Tri-Service Dental Corps Chiefs create a tri-service health services research center. There are many health service and management information research issues aside from those addressed in this survey that need to be addressed

by a talented research team. Because these research issues are complex and require knowledge of many disciplines including, but not limited to, statistics, behavioral science, health policy, economics, law, epidemiology, and computer programming, the center should be staffed with individuals with advanced training and highly developed analytical and communication skills. Further, to ensure the efficiency and effectiveness of such a center, continuity in assigned personnel is essential.

1. BACKGROUND AND METHODS

Background

The most recent dental treatment needs studies were completed by the Army, Navy, and Air Force in the mid 1980's. Because the timing of these surveys was not synchronized and because, at times, each service has used different methods to assess oral health status and treatment needs, it is difficult to compare the results of past surveys with one another. The 1994 Tri-Service Comprehensive Oral Health Survey (TSCOHS) was undertaken to overcome this problem. Funding for TSCOHS was provided by the Office of the Assistant Secretary of Defense for Health Affairs in June 1993.

Three common perspectives for determining need for dental care are normative, perceived, and expressed. **Normative need** refers to requirement for care as determined by expert opinion. **Perceived need** refers to the individual's self-assessment of his or her oral health status and **expressed need** (or demand) refers to individuals actively seeking dental care. The TSCOHS explored all three perspectives. Previous military studies of dental treatment needs have focused almost exclusively on normative need. For most of these studies, the assessment of treatment needs did not use an index but was based on the examiner's best clinical judgment. To date, all military dental needs studies have employed simple descriptive statistics to summarize their findings. None have made use of more advanced statistical

methods, such as multiple or multivariate regression to control for potential confounders. Moreover, few have been able to compare their finding to comparable civilian cohorts because results were not stratified simultaneously for age, sex, and race. Because the methods used in sampling, collecting, and analyzing data have not been consistent, it is difficult to make comparisons over time.

The 1994 TSCOHS had a multifold purpose. First, it was designed to **overcome comparative limitations of previous military dental health surveys by providing standardized methods and simultaneous data collection for each military service**. Second, it was designed to be **more comprehensive in scope than previous military dental health surveys by including measures of perceived and expressed need rather than focusing solely on normative need**. Third, the TSCOHS was **designed so that results for military personnel could be compared with their employed, civilian cohorts**. Finally, by providing a **solid reference base to which the results of future oral health surveys on the military population can be compared**, the TSCOHS will enable military health policymakers to assess progress on oral health policy objectives over time.

Methods

1. Survey Instruments

This cross-sectional survey of active duty personnel and recruits involved collection of quantifiable data from individual airmen, sailors, and soldiers. Oral health status, dental treatment needs, dental utilization, and perceived need for dental care are inherently quantitative data.

Data collection was done using two forms: a clinical exam form and a patient questionnaire. Direct data entry onto notebook computers provided “paperless” data collection and transmission. Clinical exam data was completed by calibrated dental examiners and trained recorders. The computerized utilization and perceived need questionnaire was completed by each patient in the survey.

2. Clinical Examination

The clinical exam form is divided into five sections. The first section, patient demographic data, was collected by the dental examiner, questioning the patient as necessary to insure accuracy. The remaining sections of

the clinical exam collected data on oral health status and treatment needs including prevalence of soft tissue conditions, caries status, clinical-discipline-specific treatment needs, and DoD dental classification.

Examiners were instructed to record treatment which is needed to optimize the patient’s oral health, taking into consideration that patient’s individual circumstances, and assuming there are no barriers to providing care in the patient’s best interest. All clinical data were recorded first without radiographs and then separately with radiographs. Collecting data without radiographs was necessary to allow valid comparisons of the oral health status of military personnel versus their civilian cohorts because the comparison national civilian oral health survey did not use radiographs. However, diagnosis using current radiographs was also required to fully assess oral conditions, treatment needs, and DoD dental classification. Panoramic radiographs less than 5 years old and bite-wing radiographs less than 2 years old were considered current. Examiners were instructed to take new radiographs, as necessary, for thorough patient diagnosis.

3. Patient Questionnaire

Questions on dental utilization and perceived need were drawn from Oral Health of U.S. Employed Adults and Seniors: 1985-86; U.S. Department of Health and Human Services, National Institute of Dental Research, NIH Pub. No. 87-2868, 1987, Bethesda, MD. This survey is the most recent study of adult oral health by the National Institute of Dental Research. Using these questions allows direct comparison between the civilian and military populations on these measures.

4. Sampling Strategy

The population of interest for this study is all active duty airmen, sailors, and soldiers in the continental United States. The sampling strategy was developed by Molajo and Associates, Consultants in the Mathematical Sciences (a civilian firm specializing in survey sampling design). Personnel information was provided by the Defense Manpower Data Center (DMDC). Recruits were sampled using single stage, stratified, random sampling. Recruit sampling details are provided in the TSCOHS Recruit Report (June 1995).

Non-recruit personnel were sampled using two stage, stratified, random sampling. The sampling frame consisted of all Army, Air Force, Navy, and Marine bases located in the continental United States (CONUS) with populations of at least 4,000. This resulted in approximately 80% of the CONUS active duty military population being in the sampling frame. After stratifying by service, nine bases per service strata were randomly

selected with a probability of selection proportional to each base population. Next, each selected base population was stratified by gender, race (white, black, other), and military paygrade category (E1-E4, E5-E6, E7-E9, O1-O3, O4-O10). Finally, individuals to be examined were randomly selected from each strata. Because military members are predominantly white or black males, in order to sample sufficient numbers of females and other males to allow valid statistical comparisons of their outcome measures with other subgroups of the active duty population, we oversampled these groups. During analysis, data were weighted back to the proportional representation of each group in the actual population. The target sample size, for active duty (non-recruits), was 15,924, representing 1,699,662 military personnel. For all services combined, 13,050 examinations were completed for an overall, non-recruit, response rate of 82.0%. Questionnaire response rate was slightly lower (81.3%). Table 1.1 provides a breakout of the sample and estimated population by race, gender, and age interval.

5. Human Subject Use

The TSCOHS protocol was reviewed by the Army Human Use Review and Regulatory Affairs Division; the Human Use Review Board, Naval Health Sciences Education and Training Command; and the Air Force Surgeon General's Clinical Investigation Committee. The protocol was found to be in full compliance with human use guidelines defined in Title 45, Code of Federal Regulations, Part 46 (Protection of Human Subjects).

Table 1.1

**COMPOSITION OF SAMPLE AND ESTIMATED POPULATION
BY AGE INTERVAL, RACE, AND GENDER**

AGE INTERVAL	RACE	MALE		FEMALE		TOTAL	
		NUMBER IN SAMPLE	ESTIMATED POPULATION	NUMBER IN SAMPLE	ESTIMATED POPULATION	NUMBER IN SAMPLE	ESTIMATED POPULATION
18-19	WHITE	157	29,382	24	3,649	181	33,031
	BLACK	35	5,969	8	980	43	6,949
	HISPANIC	11	1,405	0	0	11	1,405
	ASIAN	4	293	1	65	5	358
	OTHER	3	237	1	69	4	306
	ALL GROUPS	210	37,286	34	4,763	244	42,049
20-24	WHITE	2,390	396,656	340	43,420	2,730	440,076
	BLACK	553	92,292	148	20,918	701	113,210
	HISPANIC	219	22,923	31	2,454	250	25,377
	ASIAN	39	3,362	7	639	46	4,001
	OTHER	49	3,861	9	835	58	4,696
	ALL GROUPS	3,250	519,094	535	68,266	3,785	587,360
25-29	WHITE	2,022	280,645	269	30,166	2,291	310,811
	BLACK	539	74,447	124	13,160	663	87,607
	HISPANIC	150	12,349	18	1,406	168	13,755
	ASIAN	60	4,484	7	633	67	5,117
	OTHER	29	2,582	7	493	36	3,075
	ALL GROUPS	2,800	374,507	425	45,858	3,225	420,365
30-34	WHITE	1,737	217,507	169	17,974	1,906	235,481
	BLACK	414	49,676	76	8,239	490	57,915
	HISPANIC	137	11,706	5	296	142	12,002
	ASIAN	44	3,004	6	843	50	3,847
	OTHER	27	2,393	3	389	30	2,782
	ALL GROUPS	2,359	284,286	259	27,741	2,618	312,027
35-39	WHITE	1,263	143,353	145	14,319	1,408	157,672
	BLACK	309	34,080	47	5,922	356	40,002
	HISPANIC	89	7,330	8	736	97	8,066
	ASIAN	38	2,965	1	17	39	2,982
	OTHER	19	1,540	3	236	22	1,776
	ALL GROUPS	1,718	189,268	204	21,230	1,922	210,498
40-44	WHITE	608	65,422	60	5,631	668	71,053
	BLACK	135	13,994	24	2,846	159	16,840
	HISPANIC	38	2,632	2	367	40	2,999
	ASIAN	43	3,309	2	85	45	3,394
	OTHER	15	1,136	5	277	20	1,413
	ALL GROUPS	839	86,493	93	9,206	932	95,699
> 44	WHITE	241	24,085	22	1,588	263	25,673
	BLACK	29	3,210	5	595	34	3,805
	HISPANIC	9	760	2	155	11	915
	ASIAN	10	859	1	12	11	871
	OTHER	5	400	0	0	5	400
	ALL GROUPS	294	29,314	30	2,350	324	31,664
TOTAL POPULATION		11,470	1,520,248	1,580	179,414	13,050	1,699,662

6. Comparative Sample

Where possible, results from this survey were compared with results from the Oral Health of U.S. Employed Adults and Seniors: 1985-86; U.S. Department of Health and Human Services, National Institute of Dental Research, NIH Pub. No. 87-2868, 1987, Bethesda, Maryland. In order to make these comparisons, the data from both samples was stratified simultaneously by age interval, gender, and race. Appendix (B) displays a breakout of the employed, civilian sample and estimated population by race, gender, and age interval.

7. Definition of Major Study Variables

Key Outcome Variables

Key outcome variables include dental utilization, perceived need for dental care, oral health status, and dental treatment needs. Dental utilization was determined by measuring the interval since last dental visit, as well as reason for last dental visit. Perceived need was assessed by asking patients whether they felt they needed dental care.

Assessment of oral health status involved using several indices. To measure cumulative caries experience, we used the DMF (decayed, missing, and filled) index. Both DMFT (teeth) and DMFS (surfaces) were determined. The index is a simple count of the number of decayed, missing, and filled teeth or surfaces for each patient.

Periodontal health status was assessed using the Periodontal Screening and Recording (PSR) index. The PSR combines data on periodontal probing depth, gingival bleeding, and the presence of calculus and other local factors of periodontal significance to determine the level of periodontal treatment required for individuals and populations.

A Department of Defense (DoD) dental classification was assigned to each tooth and for each clinical discipline. Teeth were classified as Class 1 (requiring no dental treatment), Class 2 (requiring treatment but not expected to become a dental emergency within the next 12 months), Class 3 (requiring treatment but likely to become a dental emergency within the next 12 months).

In addition to these indices, we collected prevalence data on certain dental conditions that generate treatment requirements, such as oral soft tissue lesions and edentulism.

Key Explanatory Variables

Because previous studies have shown that demographic variables are strong correlates with the outcome variables mentioned above, we collected age, gender, race, and education level on every subject. In addition, branch of service, rank, type of service unit, and number of years of active duty service were collected because these variables are of potential interest to military health policymakers.

8. Measurement Error and Bias

To minimize measurement error and bias during data collection, prior to the start of data collection, each examiner participated in a three-day training/calibration course. During this course, data collection rules were explained and examiners participated in training exercises to become familiar with the indices and the computerized examination instrument. Examiners were given calibration manuals so they could review what they were taught, as necessary, at a later date. Inter- and intra-examiner reliability was tested on the DMF (decayed, missing, filled) and PSR (Periodontal Screening and Recording) indices and brought to an acceptable level, determined through the calculation of Cohen's kappa statistics and intraclass correlation coefficients. To assure that consistency in measurement was being maintained, the principal investigators conducted site visits during the data collection period and performed additional calibration checks for all examiners. To assure that all examinations were conducted using consistent-quality diagnostic instruments, new dental explorers, front-surface mirrors, and World Health Organization-type periodontal probes were provided to each examiner. All data were collected in military dental clinics, under similar conditions and with proper lighting.

The survey data collection instrument was field tested by the Army Research Institute for the Behavioral and Social Sciences and recommended modifications were made. To avoid imparting bias to respondents who had inquiries about the survey questionnaire, examiners were instructed to respond to such inquiries in a value-neutral way.

That is, examiners were instructed that when explaining the contents of a question to a patient, they were to avoid implying that any specific answer was preferred. Instead, examiners were to counsel patients, "No single answer is correct. Just tell us what you think." Also, patients were assured that their responses were anonymous and confidential.

Use of fully computerized questionnaires for data collection provided several advantages. First, it allowed skip patterns in the questionnaire to be automated. This solved two problems commonly encountered when paper questionnaires are used. The automated questionnaire prevented respondents from getting lost and thereby failing to respond to appropriate questions as well as giving responses to inappropriate questions. Second, use of computerized questionnaires allowed us to limit response entry to legitimate values only, thereby eliminating entry of "nonsense" responses oftentimes encountered with paper questionnaires. A further advantage of using computers for data collection was that they were programmed to use input data to immediately calculate certain summary statistics for each study participant. For example, the computer was programmed to use examination data to calculate an individual's DMFS and PSR scores and frequency counts of specific dental procedures. Thus, an individual's data record contains raw examination and survey data, plus individual summary statistics. Later, during data analysis, individual records were combined to generate group summary statistics.

9. Data Analysis

Data were analyzed using Stata and Survey Data Analysis (SUDAAN) statistical software. Statistical significance was determined with an alpha of 0.05 for all analyses.

10. Limitations

This well-designed, high-response-rate study nonetheless has some limitations. First, because it is cross-sectional in design, it cannot prove causation or establish trends within the military population. Differences between age categories that may suggest a trend, for example, may actually be cohort effects. That is, differences between age groups may be due to generational differences between the compared groups rather than due to the effect of increasing age on the outcome variable. Second, despite efforts to oversample women and minorities, there were simply insufficient numbers of them in the sample to make

stable estimates for some low prevalence outcome measures while simultaneously controlling for age, gender, and race -- for example, perceived urgency for dental care for non-white, non-black females by age group. However, this was generally not a problem for most outcome measures in this survey. Third, because variance of the outcome measures reported in this survey depends ultimately on the sample size of the population subgroup being analyzed, the variance for subgroups represented by a large number of individuals in the sample is smaller and more stable than the variance for subgroups represented by a small number of individuals in the sample. This, in turn, may lead to small clinical differences between two large subgroups being statistically significant while large clinical differences between small subgroups may be statistically non-significant. ***The reader is urged to consider both statistical and clinical significance when reviewing the data, particularly data presented in graphical form.***

2. ORAL HEALTH STATUS

Oral Health Status

The TSCOHS evaluated oral health status of active duty military personnel using the standard epidemiologic measures of cumulative, lifetime caries experience - DMFT (decayed, missing and filled teeth) and DMFS (decayed, missing and filled surfaces). Mean and median DMFT are 8.79 and 9, respectively; mean and median DMFS are 19.43 and 15, respectively. Figure 2.1 shows mean DMFS and the decayed (D), missing (M), and filled (F) components for each race. Table 2.1 gives DMF scores stratified by gender and by race. As shown in Figure 2.1 and Table 2.1, Asians have experienced an extraordinarily high cumulative lifetime exposure to caries. Their mean

DMFS (27.41) and mean DMFT (10.51) clearly stand out from all others as does their (M) component. Also, compared to whites, blacks have significantly lower decayed and filled (DF) scores with a significantly higher (D) component. This relationship indicates lower utilization of dental services by blacks than by whites.

Table 2.1 also shows that **less than 1% of active duty military personnel have an edentulous maxilla or mandible**. Asians are significantly more likely to be edentulous in the maxillary arch than whites. No individual in the sample was totally edentulous in both arches.

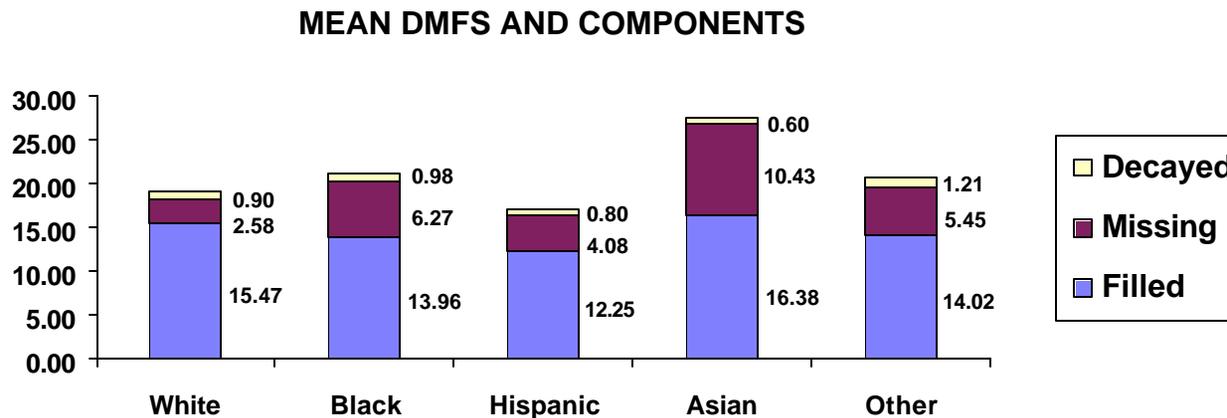


Figure 2.1

Table 2.1

MEAN AND MEDIAN DISTRIBUTION OF VARIOUS ORAL HEALTH STATUS MEASURES OF ACTIVE DUTY MILITARY PERSONNEL								
Oral Health Status Measure	Gender		Race					Total
	Male	Female	White	Black	Hispanic	Asian	Other	
Estimated Population	1,520,248	179,414	1,273,796	326,328	64,518	20,570	14,450	1,699,662
HARD TISSUE (TOOTH) STATUS								
Mean DMFT	8.76	8.98	8.79	8.88	* 7.69	* 10.51	8.76	8.79
95% CI (DMFT)	[8.64-8.88]	[8.66-9.30]	[8.65-8.93]	[8.62-9.14]	[7.25-8.13]	[9.71-11.31]	[7.68-9.84]	[8.67-8.91]
Median DMFT	8	9	8	9	7	10	8	9
Mean DMFS	19.30	* 20.58	18.95	* 21.21	* 17.14	* 27.41	20.68	19.43
95% CI (DMFS)	[18.94-19.66]	[19.48-21.68]	[18.55-19.35]	[20.37-22.05]	[15.74-18.54]	[24.55-30.27]	[17.12-24.24]	[19.09-19.77]
Median DMFS	15	16	15	18	13	23	16	15
Mean DFT	8.06	8.24	8.26	* 7.60	* 6.85	8.37	7.64	8.08
95% CI (DFT)	[7.96-8.16]	[7.96-8.75]	[8.14-8.38]	[7.40-7.80]	[6.47-7.23]	[7.73-9.01]	[6.70-8.58]	[7.98-8.18]
% D / DFT	8.3	6.4	7.7	* 9.3	8.7	5.7	11.8	8.1
Mean DFS	15.86	* 16.91	16.38	* 14.94	* 13.06	16.99	15.26	15.97
95% CI (DFS)	[15.58-16.14]	[16.09-17.73]	[16.04-16.72]	[14.42-15.46]	[12.08-14.04]	[15.37-18.61]	[12.82-17.70]	[15.69-16.25]
% D / DFS	5.2	3.8	4.8	* 6.1	5.5	3.9	7.7	5.1
% totally edentulous maxilla	0.50	0.36	0.50	0.50	0.10	* 2.00	1.10	0.49
% totally edentulous mandible	0.006	0.00	0.008	0.00	0.00	0.00	0.00	0.005
% totally edentulous in both arches	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* statistically significant p<0.05

Each race compared to white, male compared to female

Tables 2.2(a-c) and 2.3(a-c) provide mean decayed and filled (DF) statistics stratified by race, age group, and gender for military and their employed civilian counterparts. Civilian statistics are taken from the National Institute of Dental Research (NIDR) survey, Oral Health of United States Adults (1985-86). Civilian totals in Tables 2.2a and 2.3a are adjusted to the active duty military population to allow for valid comparisons. Table 2.2a shows the mean DFS and percent (D) of DFS are 15.97 and 5.7 for active duty military personnel. These same measures are 18.00 and 10.6 for civilians. Figure 2.2 graphically depicts these differences for decayed and filled surfaces. **Overall, the active duty military population has lower DF scores and a significantly lower (D)ecayed component than**

their employed civilian cohorts indicating less unmet restorative needs among active duty military personnel. However, closer inspection of the data reveals that the overall difference between the two populations is largely attributable to dramatic improvements in the oral health status of blacks across all age levels. Whites, in contrast, show minimal, if any, gains across all age levels. These findings, combined with the fact that active duty blacks have a significantly higher decayed component than active duty whites suggests that military dental care is being targeted toward individuals with greater needs but that the military dental health system still faces a formidable dental health challenge.

DISTRIBUTION OF DECAYED AND FILLED SURFACES

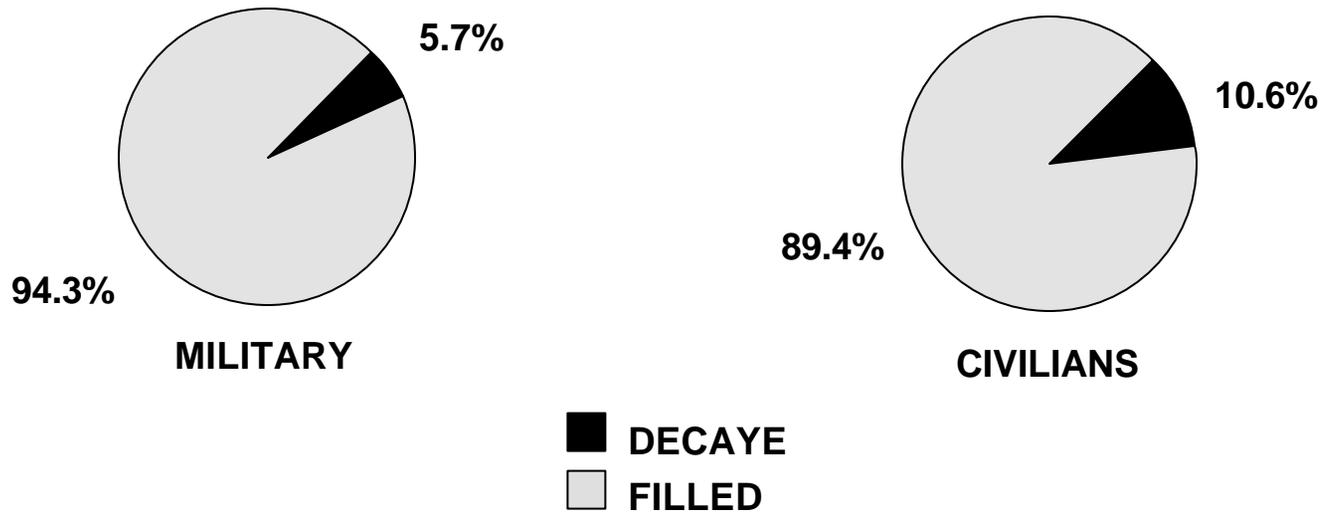


Figure 2.2

Table 2.2a

Percent components of decayed (D) and filled (F) tooth surfaces (S) MALES AND FEMALES COMBINED (Active Duty Military compared to Civilian)								
WHITE								
Military					Civilian *			
AGE	Mean DFS	St Dev	% D	% F	Mean DFS	St Dev	% D	% F
18-19	7.79	9.42	17.3	82.7	12.04	8.50	10.3	89.7
20-24	11.09	10.38	11.5	88.5	14.51	11.96	10.2	89.8
25-29	14.11	11.94	5.5	94.5	18.08	13.38	8.7	91.3
30-34	19.72	14.22	3.5	96.5	22.50	15.51	5.8	94.2
35-39	24.33	15.76	2.2	97.8	27.32	17.14	2.7	97.3
40-44	28.87	18.07	1.8	98.2	32.05	19.79	3.3	96.7
>44	31.47	19.16	2.3	97.7	33.35	21.01	2.9	97.1
All Ages	16.38	14.28	5.5	94.5				
BLACK								
18-19	11.18	10.89	14.3	85.7	10.40	9.25	42.4	57.6
20-24	10.51	8.43	12.8	87.2	12.19	9.84	23.4	76.6
25-29	15.03	11.49	6.0	94.0	15.13	12.22	18.9	81.1
30-34	17.81	11.72	4.1	95.9	13.49	11.16	16.1	83.9
35-39	20.43	12.85	3.1	96.9	14.24	11.59	15	85
40-44	22.35	14.19	1.9	98.1	19.23	14.20	10.8	89.2
>44	17.50	12.80	2.3	97.7	15.01	14.64	17.9	82.1
All Ages	14.94	11.59	6.6	93.4				
BOTH BLACK AND WHITE								
18-19	8.27	9.63	16.1	83.9	11.96	8.56	11.8	88.2
20-24	10.94	10.01	11.9	88.1	14.05	11.72	11.7	88.3
25-29	14.29	11.80	5.6	94.4	17.50	13.31	9.7	90.3
30-34	19.23	13.76	3.5	96.5	21.30	15.27	6.6	93.4
35-39	23.17	15.22	2.4	97.6	25.52	17.10	3.6	96.4
40-44	26.89	17.31	1.9	98.1	30.25	19.71	3.8	96.2
>44	29.02	18.78	2.2	97.8	30.85	21.25	3.7	96.3
All Ages	15.97	13.69	5.7	94.3	18.00 **	not avail.	10.6 **	89.4 **

*Civilian data taken from the National Institute of Dental Research Survey:
ORAL HEALTH OF UNITED STATES ADULTS (1985-86)

**Civilian totals are adjusted by age, race, and gender to the military population

Table 2.2b

Percent components of decayed (D) and filled (F) tooth surfaces (S)								
MALES ONLY								
(Active Duty Military compared to Civilian)								
WHITE								
Military					Civilian *			
AGE	Mean DFS	St Dev	% D	% F	Mean DFS	St Dev	% D	% F
18-19	7.94	9.69	17.9	82.1	10.90	7.41	10.5	89.5
20-24	11.04	10.36	12.0	88.0	14.01	12.40	13.7	86.3
25-29	13.95	11.88	5.7	94.3	16.74	12.99	13	87
30-34	19.57	14.04	3.6	96.4	21.92	15.76	7.4	92.6
35-39	24.01	15.51	2.3	97.7	27.39	17.59	3.5	96.5
40-44	28.44	18.19	2.0	98.0	30.69	18.95	4.3	95.7
>44	30.74	18.80	2.5	97.5	32.36	21.15	3.9	96.1
All Ages	16.27	14.17	5.7	94.3				
BLACK								
18-19	10.94	11.37	15.6	84.4	12.58	9.53	54.6	45.4
20-24	10.53	8.55	13.6	86.4	11.60	8.17	23.3	76.7
25-29	14.88	11.41	6.1	93.9	15.40	12.95	20.2	79.8
30-34	17.33	11.56	3.9	96.1	12.53	9.43	18.5	81.5
35-39	19.63	12.30	3.2	96.8	14.49	10.38	20.1	79.9
40-44	21.80	12.92	1.9	98.1	18.69	14.03	9.4	90.6
>44	16.55	12.92	2.9	97.1	16.85	16.26	20.2	79.8
All Ages	14.74	11.37	6.7	93.3				
BOTH BLACK AND WHITE								
18-19	8.29	9.89	16.8	83.2	11.00	7.58	13.4	86.6
20-24	10.89	10.02	12.4	87.6	13.38	11.89	14.9	85.1
25-29	14.14	11.74	5.8	94.2	16.36	12.92	13.7	86.3
30-34	19.05	13.63	3.6	96.4	20.78	15.45	8.2	91.8
35-39	22.82	14.95	2.4	97.6	25.69	17.38	4.7	95.3
40-44	26.51	17.30	2.0	98.0	29.19	19.00	4.6	95.4
>44	28.39	18.54	2.4	97.6	29.98	21.31	4.9	95.1
All Ages	15.98	13.69	5.9	94.1				

* Civilian data taken from the National Institute of Dental Research Survey:
ORAL HEALTH OF UNITED STATES ADULTS (1985-86)

Table 2.2c

Percent components of decayed (D) and filled (F) tooth surfaces (S) FEMALES ONLY (Active Duty Military compared to Civilian)								
WHITE								
AGE	Military				Civilian *			
	Mean DFS	St Dev	% D	% F	Mean DFS	St Dev	% D	% F
18-19	6.63	6.91	11.8	88.2	13.19	9.33	10.1	89.9
20-24	11.54	10.56	7.6	92.4	15.04	11.44	6.7	93.3
25-29	15.62	12.34	4.0	96.0	19.78	13.67	4	96
30-34	21.44	16.28	2.1	97.9	23.27	15.14	3.8	96.2
35-39	27.46	17.86	1.6	98.4	27.21	16.54	1.6	98.4
40-44	33.89	15.93	0.3	99.7	33.76	20.67	2.2	97.8
>44	42.54	21.29	0.3	99.7	34.70	20.73	1.6	98.4
All Ages	16.27	14.17	3.7	96.3				
BLACK								
18-19	12.63	7.87	7.9	92.1	7.81	8.18	19	81
20-24	10.42	7.90	9.3	90.7	12.70	11.05	23.5	76.5
25-29	15.83	11.95	5.7	94.3	14.82	11.34	17.2	82.8
30-34	20.74	12.33	5.3	94.7	14.36	12.48	14.2	85.8
35-39	25.03	14.96	2.6	97.4	14.01	12.63	10.0	90
40-44	25.04	19.37	2.1	97.9	19.72	14.33	12.0	88
>44	22.64	12.06	0.0	100.0	12.99	12.32	14.7	85.3
All Ages	16.00	12.67	5.7	94.3				
BOTH BLACK AND WHITE								
18-19	8.07	7.40	10.1	89.9	12.94	9.35	10.3	89.7
20-24	11.32	9.89	8.2	91.8	14.77	11.48	8.5	91.5
25-29	15.57	12.22	4.7	95.3	18.89	13.64	5.3	94.7
30-34	21.05	14.92	3.0	97.0	21.97	15.01	4.7	95.3
35-39	26.29	17.20	1.8	98.2	25.31	16.74	2.3	97.7
40-44	30.46	17.12	0.8	99.2	31.53	20.48	2.9	97.1
>44	36.82	20.31	0.2	99.8	32.03	21.10	2.2	97.8
All Ages	16.98	14.53	4.3	95.7				

*Civilian data taken from the National Institute of Dental Research Survey:
ORAL HEALTH OF UNITED STATES ADULTS (1985-86)

Table 2.3a

Percent components of decayed (D) and filled (F) teeth (T)								
MALES AND FEMALES COMBINED								
(Active Duty Military compared to Civilian)								
WHITE								
AGE	Military				Civilian *			
	Mean DFT	St Dev	% D	% F	Mean DFT	St Dev	% D	% F
18-19	4.71	4.56	22.5	77.5	7.37	4.32	12.8	87.2
20-24	6.44	4.49	15.4	84.6	7.99	4.70	12.9	87.1
25-29	7.71	4.60	8.1	91.9	9.16	4.95	10.1	89.9
30-34	9.70	4.89	5.5	94.5	10.27	4.99	7.9	92.1
35-39	10.90	4.81	3.9	96.1	11.42	5.28	3.9	96.1
40-44	11.53	5.20	3.4	96.6	12.20	5.67	5.1	94.9
>44	12.11	5.37	3.3	96.7	12.17	5.85	4.5	95.5
All Ages	8.26	5.07	8.5	91.5				
BLACK								
18-19	5.80	4.32	20.4	79.6	5.59	3.43	52.3	47.7
20-24	6.04	4.03	17.2	82.8	6.73	4.20	26.5	73.5
25-29	7.76	4.53	9.1	90.9	7.72	5.05	23.5	76.5
30-34	8.78	4.43	6.5	93.5	6.69	4.58	20.8	79.2
35-39	9.47	4.47	5.6	94.4	7.10	4.97	18.4	81.6
40-44	9.52	4.53	3.3	96.7	8.41	5.22	14.5	85.5
>44	7.69	3.97	4.7	95.3	6.18	5.15	22.3	77.7
All Ages	7.60	4.52	10.0	90.0				
BOTH BLACK AND WHITE								
18-19	4.86	4.49	21.3	78.7	7.28	4.30	14.4	85.6
20-24	6.34	4.39	15.8	84.2	7.78	4.70	14.6	85.4
25-29	7.70	4.58	8.3	91.7	8.87	5.00	11.6	88.4
30-34	9.46	4.80	5.6	94.4	9.81	5.08	8.9	91.1
35-39	10.47	4.82	4.2	95.8	10.81	5.43	5.1	94.9
40-44	10.95	5.09	3.4	96.6	11.65	5.79	5.9	94.1
>44	11.41	5.40	3.3	96.7	11.34	6.12	5.7	94.3
All Ages	8.08	4.95	8.8	91.2	8.69 **	not avail.	13.7 **	86.3 **

*Civilian data taken from the National Institute of Dental Research Survey:
ORAL HEALTH OF UNITED STATES ADULTS (1985-86)

** Civilian totals are adjusted for age, race, and gender to the military population

Table 2.3b

Percent components of decayed (D) and filled (F) teeth (T)								
MALES ONLY								
(Active Duty Military compared to Civilian)								
WHITE								
Military					Civilian *			
AGE	Mean DFT	St Dev	% D	% F	Mean DFT	St Dev	% D	% F
18-19	4.76	4.67	23.5	76.5	7.02	4.04	12.9	87.1
20-24	6.42	4.50	15.9	84.1	7.75	4.82	17.4	82.6
25-29	7.66	4.62	8.3	91.7	8.50	4.98	14.4	85.6
30-34	9.67	4.89	5.7	94.3	10.02	5.23	9.8	90.2
35-39	10.86	4.82	3.9	96.1	11.32	5.41	4.9	95.1
40-44	11.47	5.28	3.7	96.3	11.94	5.69	6.5	93.5
>44	11.92	5.34	3.6	96.4	11.82	5.94	6.0	94.0
All Ages	8.24	5.08	8.8	91.2				
BLACK								
18-19	5.68	4.51	22.4	77.6	6.29	2.58	71.2	28.8
20-24	6.05	4.05	18.3	81.7	6.50	3.52	25.9	74.1
25-29	7.71	4.53	9.2	90.8	7.79	5.25	25.4	74.6
30-34	8.59	4.42	6.2	93.8	6.25	3.83	22.8	77.2
35-39	9.31	4.46	5.5	94.5	7.20	4.76	22.6	77.4
40-44	9.56	4.39	3.1	96.9	8.04	5.19	13.4	86.6
>44	7.57	4.08	5.6	94.4	6.58	5.75	22.8	77.2
All Ages	7.56	4.51	10.3	89.7				
BOTH BLACK AND WHITE								
18-19	4.85	4.61	22.5	77.5	6.97	3.98	15.9	84.1
20-24	6.32	4.41	16.4	83.6	7.47	4.71	18.7	81.3
25-29	7.65	4.59	8.5	91.5	8.33	4.99	15.6	84.4
30-34	9.41	4.81	5.7	94.3	9.58	5.24	10.8	89.2
35-39	10.43	4.82	4.2	95.8	10.77	5.49	6.2	93.8
40-44	10.93	5.14	3.6	96.4	11.42	5.84	7.1	92.9
>44	11.27	5.38	3.6	96.4	11.02	6.22	7.2	92.8
All Ages	8.11	4.98	9.0	91.0				

* Civilian data taken from the National Institute of Dental Research Survey:
ORAL HEALTH OF UNITED STATES ADULTS (1985-86)

Table 2.3c

**Percent components of decayed (D) and filled (F) teeth (T)
FEMALES ONLY
(Active Duty Military compared to Civilian)**

WHITE								
AGE	Military				Civilian *			
	Mean DFT	St Dev	% D	% F	Mean DFT	St Dev	% D	% F
18-19	4.31	3.58	13.5	86.5	7.73	4.56	12.7	87.3
20-24	6.62	4.36	11.0	89.0	8.25	4.56	8.4	91.6
25-29	8.21	4.42	6.0	94.0	9.99	4.79	5.5	94.5
30-34	10.05	4.88	3.7	96.3	10.60	4.64	5.5	94.5
35-39	11.29	4.72	3.3	96.7	11.55	5.10	2.7	97.3
40-44	12.19	4.19	0.7	99.3	12.53	5.62	3.5	96.5
>44	14.97	5.18	0.7	99.3	12.66	5.68	2.7	97.3
All Ages	8.24	5.08	8.8	91.2				
BLACK								
18-19	6.52	3.03	9.3	90.7	4.75	4.07	22.4	77.6
20-24	6.03	3.93	12.4	87.6	6.93	4.69	26.9	73.1
25-29	8.05	4.56	8.7	91.3	7.65	4.82	21.3	78.7
30-34	9.91	4.31	8.0	92.0	7.09	5.14	19.2	80.8
35-39	10.39	4.47	5.8	94.2	7.00	5.16	14.4	85.6
40-44	9.30	5.24	4.2	95.8	8.74	5.22	15.4	84.6
>44	8.31	3.66	0.0	100.0	5.75	4.35	21.7	78.3
All Ages	7.84	4.57	8.9	91.1				
BOTH BLACK AND WHITE								
18-19	4.87	3.54	12.0	88.0	7.58	4.58	13.0	87
20-24	6.47	4.24	11.5	88.5	8.11	4.67	10.5	89.5
25-29	8.10	4.50	7.0	93.0	9.54	4.93	7.3	92.7
30-34	9.99	4.67	4.8	95.2	10.10	4.85	6.7	93.3
35-39	10.85	4.80	3.9	96.1	10.87	5.35	3.8	96.2
40-44	11.16	4.59	1.6	98.4	11.93	5.71	4.5	95.5
>44	13.15	5.46	0.6	99.4	11.79	5.96	3.8	96.2
All Ages	8.26	4.84	7.0	93.0				

*Civilian data taken from the National Institute of Dental Research Survey:
ORAL HEALTH OF UNITED STATES ADULTS (1985-86)

Figure 2.3 shows the percentage of active duty military personnel by the number of missing teeth, for each race and overall. Results show **73.8% [ci ±0.9%] have no missing teeth while 3.5% [ci ±0.3%] have more than four missing teeth**. These percentages do not include

third molars. No individual in the survey sample was totally edentulous. **Whites have significantly fewer and Asians have significantly more missing teeth compared to all other races.**

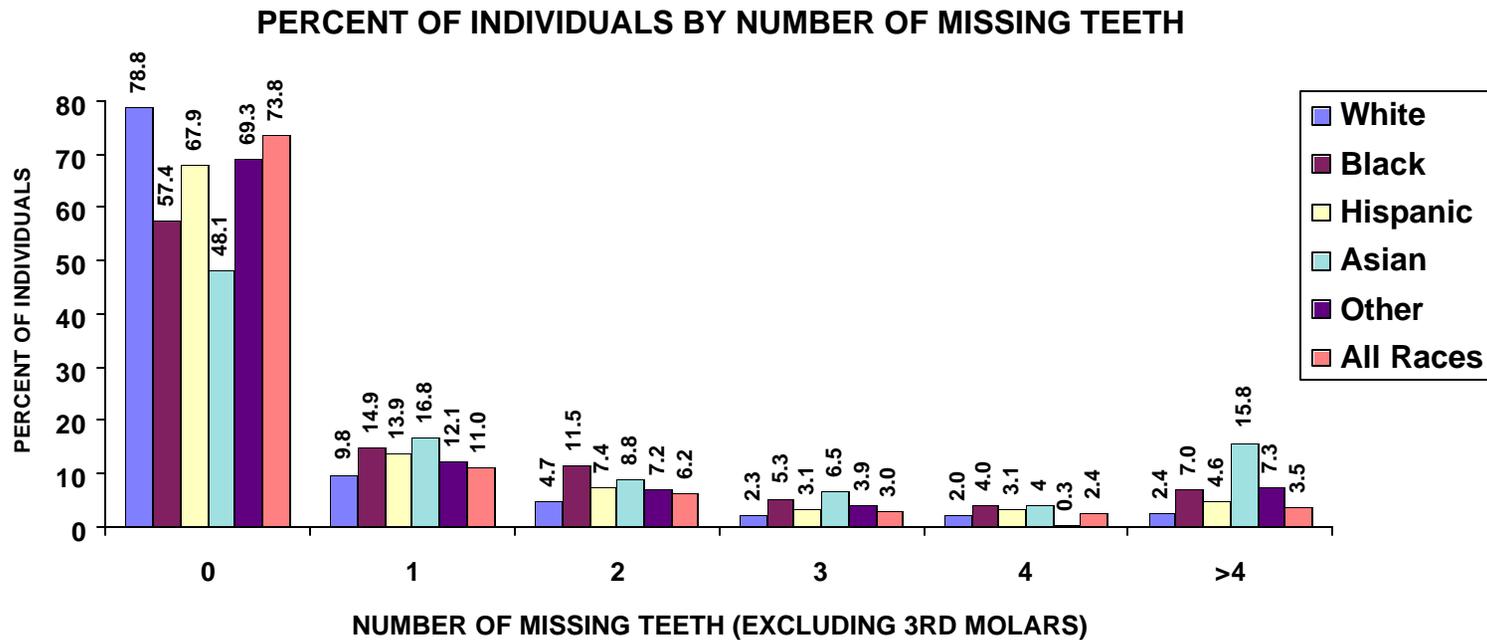


Figure 2.3

In addition to hard tissue (tooth) status, the TSCOHS collected examiner assessments of the prevalence of oral soft tissue lesions, severe temporomandibular dysfunction (TMD), and severe orthodontic malocclusion. **Overall, the prevalence of soft tissue lesions is as follows: ANUG (0.4%), aphthous ulcer (1.5%), active herpetic lesion (0.6%), tobacco lesion (6.2%), pericoronitis (1.3%), and other lesion requiring referral (1.9%).** Table 2.4 shows the percentage of active duty military personnel with each condition surveyed, stratified by gender and by race. Logistic regression analysis identifies statistically significant differences between the following groups: **Blacks have less occurrence of aphthous ulcer and greater occurrence of pericoronitis compared to whites; oral tobacco lesions are more common in males compared to females and in whites compared to other races.** Females are significantly less likely to have

other soft tissue lesions requiring referral for further evaluation than males.

The prevalence of oro-facial pain or limited mandibular movement sufficient to require referral and/or treatment for TMD is significantly greater in females (5.7%) than in males (2.2%).

Severe orthodontic malocclusion was defined as “severe malocclusion interfering with proper function sufficiently to require referral for orthodontic evaluation”. **The prevalence of this condition is significantly greater in blacks (4.1%) compared to whites (3.0%).**

No other significant differences were found based on age, race, or gender.

Table 2.4

PERCENT DISTRIBUTION OF VARIOUS ORAL HEALTH STATUS MEASURES FOR ACTIVE DUTY MILITARY PERSONNEL								
Oral Health Status Measure	Gender		Race					Total
	Male	Female	White	Black	Hispanic	Asian	Other	
Estimated Population	1,520,248	179,414	1,273,796	326,328	64,518	20,570	14,450	1,699,662
ORAL SOFT TISSUE LESIONS STATUS								
anug	0.5	0.2	0.5	0.3	0.4	0.0	0.0	0.4
aphthous ulcer	1.6	1.4	1.7	** 0.9	1.0	1.5	2.8	1.5
active herpetic lesion	0.6	0.7	0.7	0.3	0.6	0.1	0.3	0.6
tobacco lesion	6.8	** 0.5	7.7	** 1.2	** 2.2	** 1.1	* 2.6	6.2
pericoronitis	1.3	1.1	1.0	** 2.2	1.4	1.6	2.0	1.3
other lesion requiring referral	2.0	* 1.0	2.0	1.4	1.9	0.4	1.5	1.9
TEMPOROMANDIBULAR DYSFUNCTION STATUS								
oro-facial pain or limited mandibular movement sufficient to require referral and/or treatment for TMD	2.2	** 5.7	2.7	2.4	2.7	2.0	3.0	2.6
ORTHODONTIC STATUS								
severe malocclusion interfering with proper function sufficiently to require referral for orthodontic evaluation	3.2	3.7	3.0	** 4.1	4.8	1.3	2.1	3.3

* statistically significant p<0.05 ** statistically significant p<0.01

Each race compared to white, male compared to female

3. DISTRIBUTION OF DOD DENTAL CLASSIFICATION

Distribution of DoD Dental Classification

During the examination, the overall DoD dental classification and the dental classification within each clinical discipline were recorded for each person examined. The criteria for assigning DoD dental classification is provided in Appendix (C). Figure 3.1 shows the percentage of all individuals in each DoD dental classification by clinical discipline. **Among all active duty service members, 7.6% are class 3 due to restorative treatment needs, 2.8% due to oral surgical needs, 3.2% due to endodontic needs, and 5.3% for periodontal reasons. With all disciplines combined, only 7.6 percent are class 1 while 77.9**

percent are class 2 and 14.5 percent are class 3.

Table 3.1 gives the DoD dental class stratified by gender, by race, by age category, by education, and by military paygrade. **Concerning the likelihood of being in DoD Class 3**, logistic regression analysis reveals the following significant findings: **Males are more likely than females; individuals with no college are more likely than those with some college or college degrees; enlisted are more likely than officers; and individuals forty years of age and older are more likely compared to the 20-24 year reference category.**

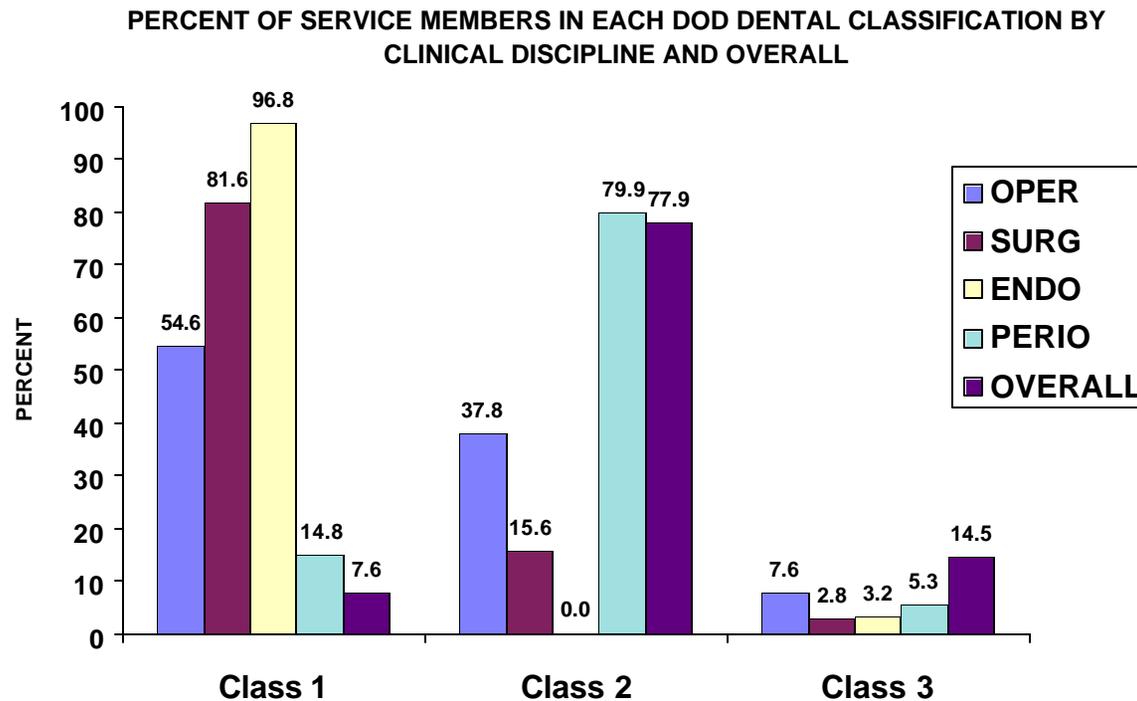


Figure 3.1

Table 3.1

PERCENT DISTRIBUTION OF DOD DENTAL CLASSIFICATION				
	Estimated Population	DoD Dental Class		
		1	2	3
Gender				
Male	1,520,248	7.0	78.1	14.9
Female	179,414	12.6	75.5	11.9
Race				
White	1,273,796	8.2	77.8	14.0
Black	326,328	5.0	78.4	16.7
Hispanic	64,518	7.2	79.4	13.4
Asian	20,570	7.8	76.3	15.9
Other	14,450	14.2	68.6	17.2
Age Category				
18 - 19 years	42,048	4.0	77.5	18.5
20 - 24 years	587,359	6.3	78.7	15.0
25 - 29 years	420,366	8.5	78.1	13.4
30 - 34 years	312,028	8.2	79.4	12.4
35 - 39 years	210,497	7.9	77.2	14.9
40 - 44 years	95,699	10.1	70.8	19.1
> 44 years	31,665	10.5	68.7	20.9
Education				
No College	658,519	5.1	76.3	18.6
Some College	708,713	6.7	79.2	14.1
College Graduate	217,546	13.4	77.9	8.7
Beyond College	114,884	16.4	78.5	5.1
Paygrade				
E1 - E4	773,974	5.7	78.8	15.5
E5 - E6	533,446	6.6	77.2	16.3
E7 - E9	178,304	7.5	75.5	17.0
O1 - O3	161,065	17.6	78.5	4.0
O4 - O7	52,873	16.0	77.4	6.6
All Active Duty	1,699,662	7.6	77.9	14.5
95% Confidence Interval (±%)		0.5	0.9	0.8

Insight into the level of treatment need among DoD dental class 3 individuals is provided in Figure 3.2. Treatment level is defined as the number of clinical disciplines in which each individual requires class 3 dental treatment. **Most (78.4%) class 3 patients require treatment of a class 3 condition in only one clinical discipline; nearly all (96.9%) require treatment of a class 3 condition in either one or two clinical disciplines.** An

individual requiring class 3 treatment in three or more clinical disciplines is considered to require complex care. **Among class 3 patients, 3.1% require complex dental treatment.** Logistic regression analysis found no significant differences in the likelihood of needing complex dental treatment based on gender, race, age, educational level, or military paygrade.

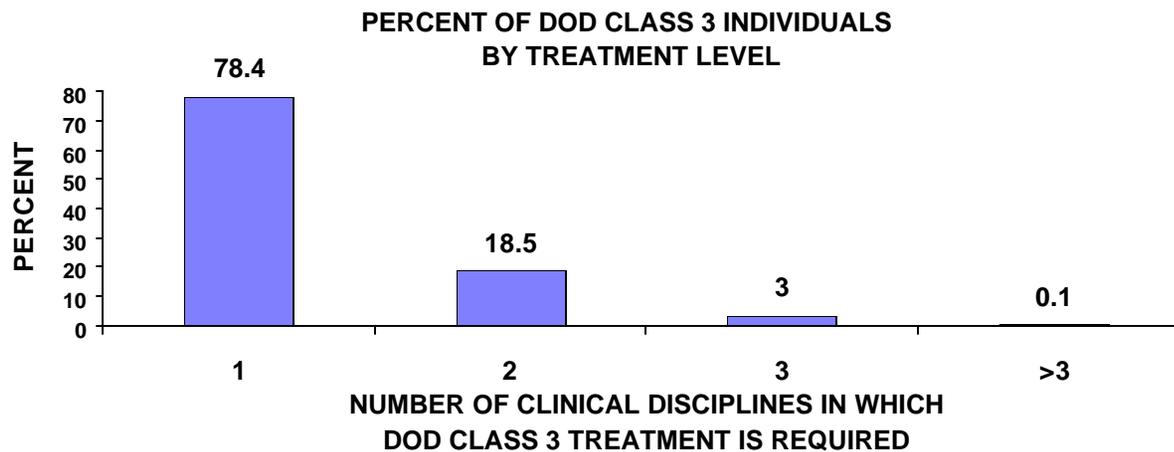


Figure 3.2

Figure 3.3 shows that **restorative and periodontal conditions are the leading reasons individuals are in DoD dental class 3**. The criteria for determining DoD dental classification are provided in Appendix (C).

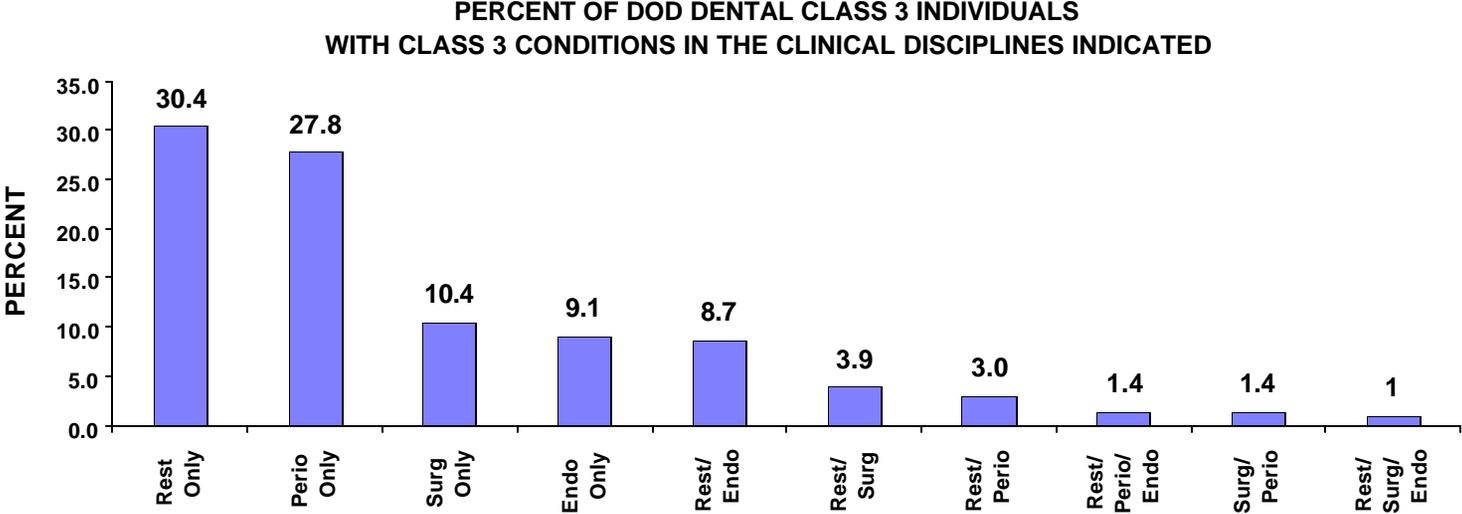


Figure 3.3

4. TREATMENT REQUIREMENTS EXPRESSED AS COMPOSITE TIME VALUES (CTV)

Treatment Requirements Expressed as Composite Time Values (CTV)

Figure 4.1 shows the mean and median number of CTV for each clinical discipline for all active duty service members. **The CTV counts represent the number of CTV that would be generated when the needed treatment is delivered, including ancillary procedures.** Appendix (A) provides a full description of procedure codes used to calculate CTV for each type of

dental treatment. **The mean number of CTV of treatment required is 38.0; the median is 25.6.** Figure 4.2 gives the percentage of the total number of CTV of treatment need contributed by each clinical discipline. A more detailed presentation of active duty treatment needs for each clinical discipline is presented in later sections of this report.

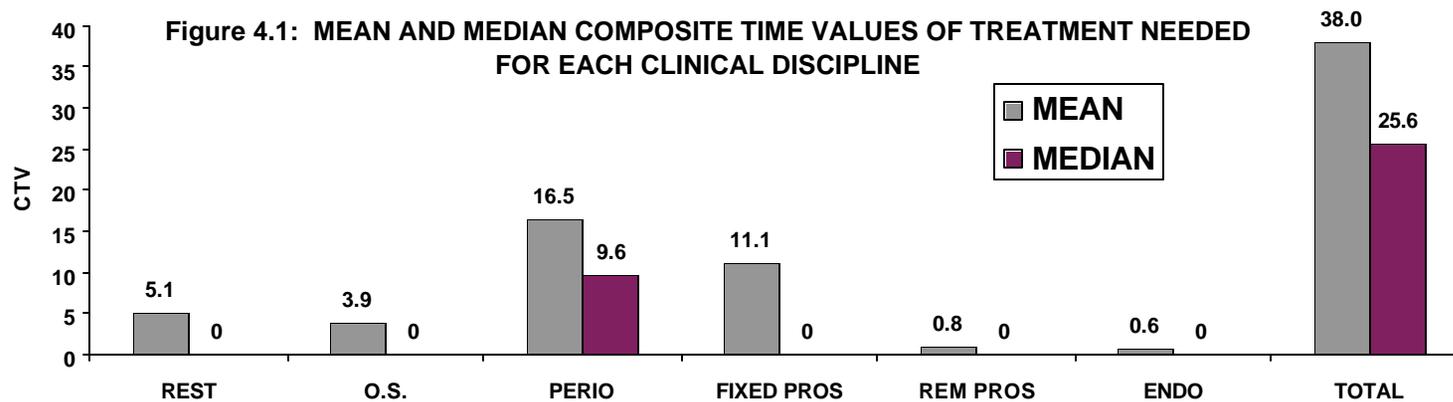


FIGURE 4.2: PERCENT OF TOTAL CTV CONTRIBUTED BY EACH CLINICAL DISCIPLINE

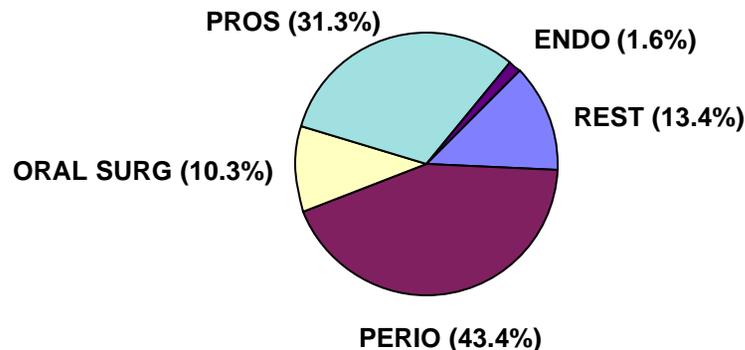


Table 4.1 shows the mean CTV for each clinical discipline stratified by gender, by race, by education, by age category, and by paygrade. Statistically significant differences in the mean **total number of CTV of treatment need** are as follows: **Males require more treatment than females; all non-white races require more than whites; individuals with no college require more than college graduates; enlisted require more than officers; and after remaining flat from 18-29 years of age, CTV of treatment need increase with age.** Table 4.1 also shows the following trends: CTV of treatment need in all clinical disciplines tend to decrease with increasing education and are fewer for officers than enlisted; and restorative and surgical CTV decrease while periodontal and prosthodontic CTV increase with increasing age.

TABLE 4.1

MEAN COMPOSITE TIME VALUES (CTV) FOR EACH CLINICAL DISCIPLINE FOR ALL ACTIVE DUTY MILITARY								
	ESTIMATED POPULATION	REST	PERIO	ENDO	ORAL SURG	FIXED PROS	REM PROS	MEAN TOTAL
Gender								
Male	1,520,248	5.1	17.1	0.6	4.0	10.9	0.8	38.5
Female	179,414	4.9	12.0	0.5	2.9	12.8	0.8	33.9
Race								
White	1,273,796	5.0	15.2	0.6	3.7	9.6	0.5	34.6
Black	326,328	5.6	21.0	0.8	4.5	16.0	1.9	49.8
Hispanic	64,518	4.7	17.5	0.5	4.9	12.4	0.7	40.7
Asian	20,570	3.6	18.1	0.4	2.6	19.2	4.3	48.2
Other	14,450	6.5	19.8	1.4	4.2	13.4	1.8	47.1
Age Category								
18 - 19 years	42,048	5.7	10.4	0.5	10.6	4.2	0.1	31.5
20 - 24 years	587,359	6.1	13.1	0.6	7.1	6.9	0.1	33.9
25 - 29 years	420,366	4.7	15.5	0.6	2.9	9.8	0.4	33.9
30 - 34 years	312,028	4.5	18.1	0.6	1.4	13.3	0.9	38.8
35 - 39 years	210,497	4.5	22.2	0.6	1.1	18.3	1.9	48.6
40 - 44 years	95,699	3.9	24.4	0.8	0.5	18.8	3.0	51.4
> 44 years	31,655	3.3	24.7	0.3	1.9	21.3	6.4	57.9
Education								
No College	658,519	5.9	17.6	0.7	5.2	10.3	0.7	40.4
Some College	708,713	5.3	17.1	0.6	3.5	13.0	1.0	40.5
College Graduate	217,546	3.6	14.0	0.5	2.5	9.5	1.0	31.1
Beyond College	114,884	2.4	10.9	0.3	0.9	6.8	0.6	21.9
Paygrade								
E1 - E4	773,974	6.3	14.3	0.6	6.4	8.7	0.3	36.6
E5 - E6	533,446	4.7	20.0	0.6	2.0	13.9	1.2	42.4
E7 - E9	178,304	4.5	24.1	0.8	1.2	19.5	2.7	52.8
O1 - O3	161,065	2.4	9.2	0.3	2.1	4.1	0.3	18.4
O4 - O7	52,873	2.6	11.0	0.1	0.4	10.2	0.3	24.6
MEAN TOTAL	1,699,662	5.1	16.5	0.6	3.9	11.1	0.8	38.0
95% Confidence Interval		[4.9-5.3]	[16.2-16.8]	[0.5-0.7]	[3.7-4.1]	[10.5-11.7]	[0.7-0.9]	[37.2-38.8]
% of Mean Total CTV								
95% Confidence Interval (+ %)		13.4	43.4	1.6	10.3	29.2	2.1	100.0
		0.6	0.8	0.2	0.6	0.8	0.2	
MEDIAN TOTAL		0.0	9.6	0.0	0.0	0.0	0.0	25.6

Composite Time Values for Active Duty Service Member Treatment Needs

Figure 4.3 shows the percentage of individuals with total treatment needs represented by each CTV range. ***Ninety-five percent of active duty service members require dental treatment and 26.4% require more than 50 CTV of treatment.***

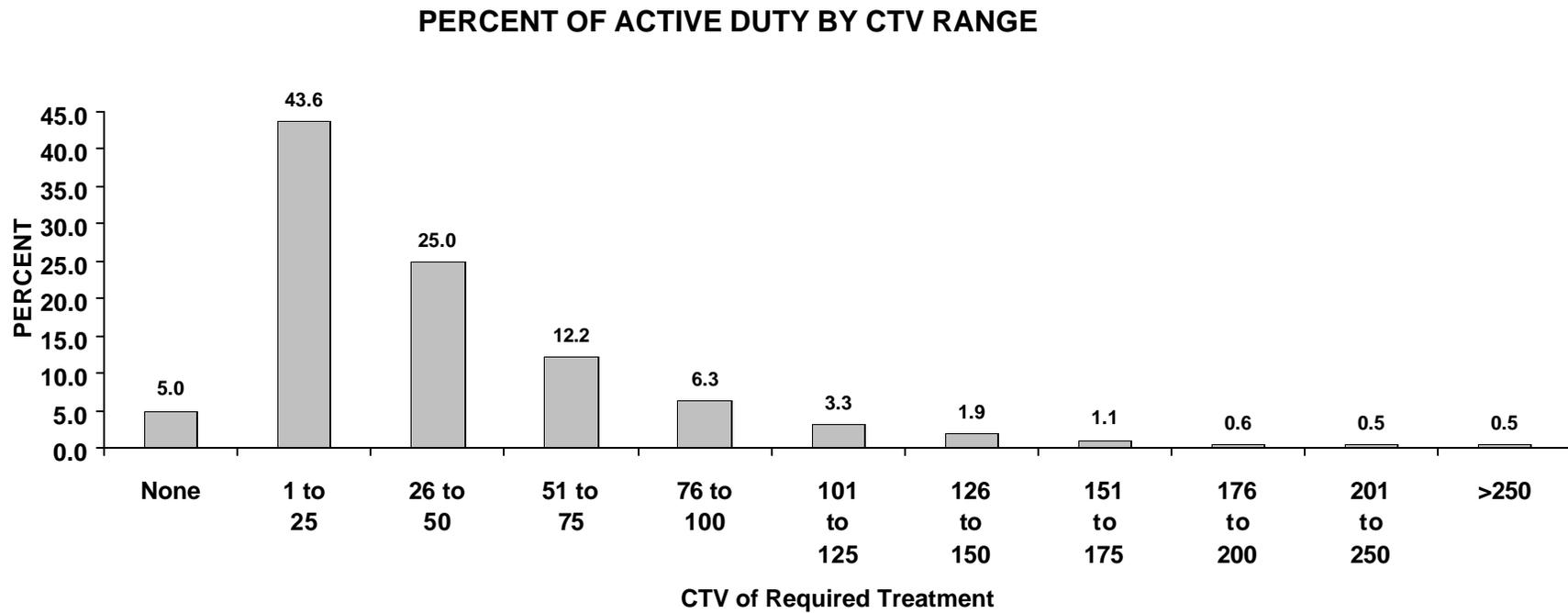


Figure 4.3

Table 4.2 gives the percentage of individuals in each CTV range stratified by gender, by race, by education, by age category, and by paygrade. Concerning the **likelihood of requiring no dental treatment: females are more likely than males, whites are more likely than blacks, those with any college are more likely than those with no college, and officers are more likely than enlisted.** The race category “other” is significantly more likely to require no dental treatment compared to whites.

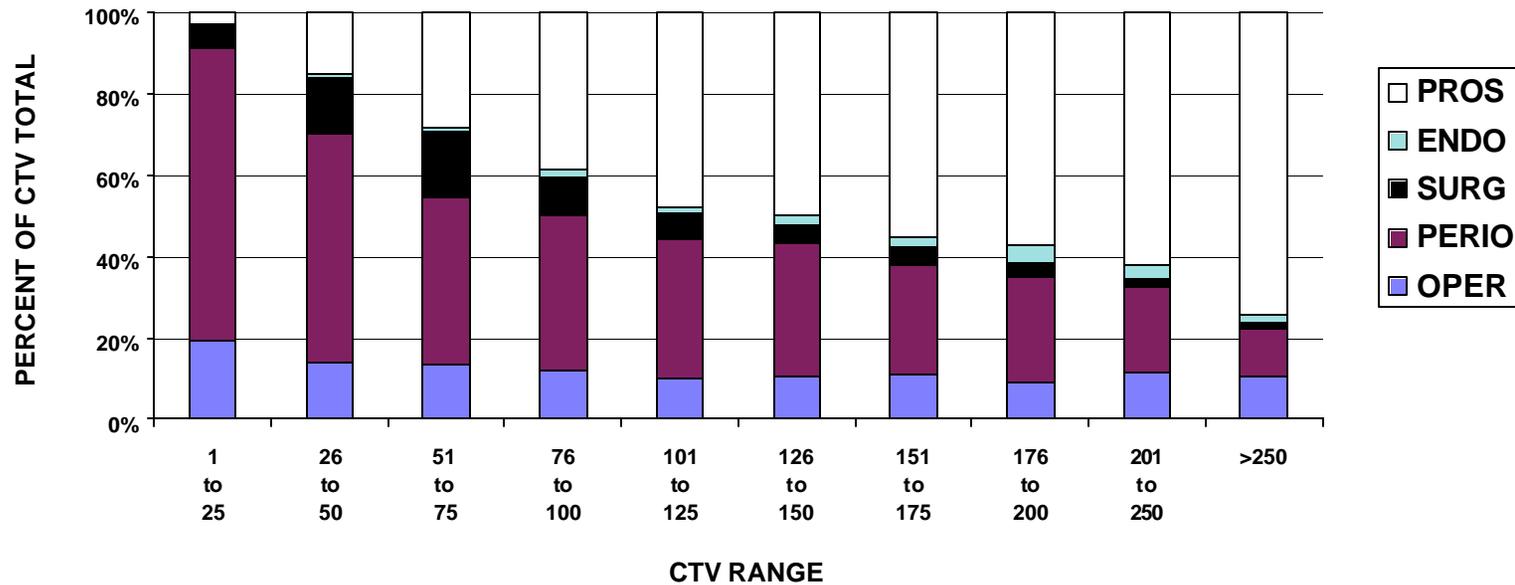
TABLE 4.2

PERCENT DISTRIBUTION OF COMPOSITE TIME VALUES (CTV)												
	Estimated Population	Percent of Active Duty Personnel in Each CTV Range										
		None	1-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-250	>250
Gender												
Male	1,520,248	4.6	43.2	25.5	12.5	6.3	3.4	1.9	1.1	0.6	0.4	0.5
Female	179,414	8.4	47.4	21.3	10.2	6.1	2.7	1.5	0.9	0.5	0.6	0.4
Race												
White	1,273,796	5.6	47.2	24.8	10.8	5.2	2.4	1.6	1.0	0.5	0.4	0.5
Black	326,328	2.4	32.4	25.5	16.8	10.1	6.5	2.9	1.6	0.7	0.7	0.4
Hispanic	64,518	4.5	37.8	27.3	14.3	8.0	4.3	2.6	0.5	0.2	0.2	0.3
Asian	20,570	4.9	30.4	26.7	17.8	10.0	4.4	2.2	0.6	1.7	1.1	0.2
Other	14,450	11.9	29.7	22.9	14.5	10.0	3.1	0.9	2.9	1.4	2.3	0.4
Age Category												
18 - 19 years	42,048	3.2	49.3	28.2	11.4	4.7	1.9	0.7	0.1	0.0	0.3	0.2
20 - 24 years	587,359	4.6	44.5	27.2	13.7	5.4	2.2	1.1	0.6	0.3	0.2	0.2
25 - 29 years	420,366	5.6	47.1	24.2	10.9	5.7	3.2	1.6	0.8	0.4	0.3	0.2
30 - 34 years	312,028	5.2	43.8	24.6	11.0	6.1	3.8	2.4	1.3	0.9	0.6	0.3
35 - 39 years	210,497	4.7	37.7	23.9	12.5	7.9	4.8	2.8	2.2	1.1	1.1	1.3
40 - 44 years	95,699	5.7	35.5	20.5	12.0	11.5	5.3	4.1	2.4	1.1	0.7	1.2
> 44 years	31,655	5.7	36.3	17.7	15.3	7.2	7.0	3.3	1.6	1.3	0.8	3.8
Education												
No College	658,519	3.4	40.0	27.6	13.6	7.5	3.6	1.9	1.1	0.5	0.4	0.4
Some College	708,713	4.5	42.1	25.0	13.0	6.4	3.7	2.2	1.2	0.6	0.6	0.7
College Graduate	217,546	8.9	50.3	21.5	9.0	4.1	2.3	1.5	1.0	0.6	0.4	0.4
Beyond College	114,884	9.9	61.2	17.3	5.8	3.1	1.2	0.7	0.3	0.3	0.0	0.2
Paygrade												
E1 - E4	773,974	4.2	42.9	27.3	13.9	5.6	2.8	1.4	0.9	0.5	0.3	0.2
E5 -E6	533,446	4.1	40.3	26.0	12.3	7.5	4.0	2.6	1.3	0.7	0.6	0.6
E7 - E9	178,304	4.6	34.6	22.0	12.7	10.8	6.3	3.3	2.2	1.0	0.9	1.6
O1 - O3	161,065	11.3	63.0	16.2	5.7	1.7	1.0	0.6	0.3	0.1	0.1	0.0
O4 - O7	52,873	9.4	60.5	19.5	4.7	2.2	1.3	0.7	0.1	0.4	0.7	0.5
All Active Duty												
	1,699,662	5.0	43.6	25.0	12.2	6.3	3.3	1.9	1.1	0.6	0.5	0.5
95% Confidence Interval (+ %)												
		0.4	1.0	0.9	0.6	0.4	0.4	0.3	0.2	0.1	0.1	0.1

Figure 4.4 shows how the treatment needs of individuals in each CTV range are distributed among the clinical disciplines. Moving toward higher CTV ranges, the

percentage of prosthodontic treatment need progressively increases, while the percentage of periodontal treatment need decreases.

PERCENT CONTRIBUTION OF EACH CLINICAL DISCIPLINE TO THE TOTAL CTV OF TREATMENT REQUIRED IN EACH CTV RANGE



	1-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-250	>250
RESTORATIVE	19.5	14.1	13.6	11.9	9.8	10.4	10.9	9.1	11.5	10.5
PERIODONTICS	71.6	55.8	41.0	38.4	34.5	33.1	27.2	25.9	20.9	11.7
SURGICAL	5.8	14.1	16.0	9.0	6.2	4.1	4.1	3.6	2.1	1.5
ENDODONTIC	0.3	0.8	1.3	1.9	1.8	2.6	2.6	4.2	3.3	1.9
PROSTHODONTIC	2.8	15.2	28.1	38.8	47.7	49.8	55.2	57.2	62.2	74.4

Figure 4.4

Table 4.5 depicts the change in mean CTV of treatment need for each clinical discipline by years of military service. Recruit data shown are from the 1994 Tri-Service Comprehensive Oral Health Survey Recruit Report, NDRI Report No. PR-9502, June 1995. Definite patterns are apparent. **While oral surgical needs appear to decline rapidly with increasing years of military service, restorative needs decline sharply during the first three years and then only slightly thereafter. Endodontic treatment need appears to remain constant after an initial decline during the first three years of service. In contrast, periodontal and prosthodontic treatment needs appear to vigorously increase with increasing years of military service.**

**Mean CTV of Treatment Need for Each Clinical Discipline
By Years of Military Service**

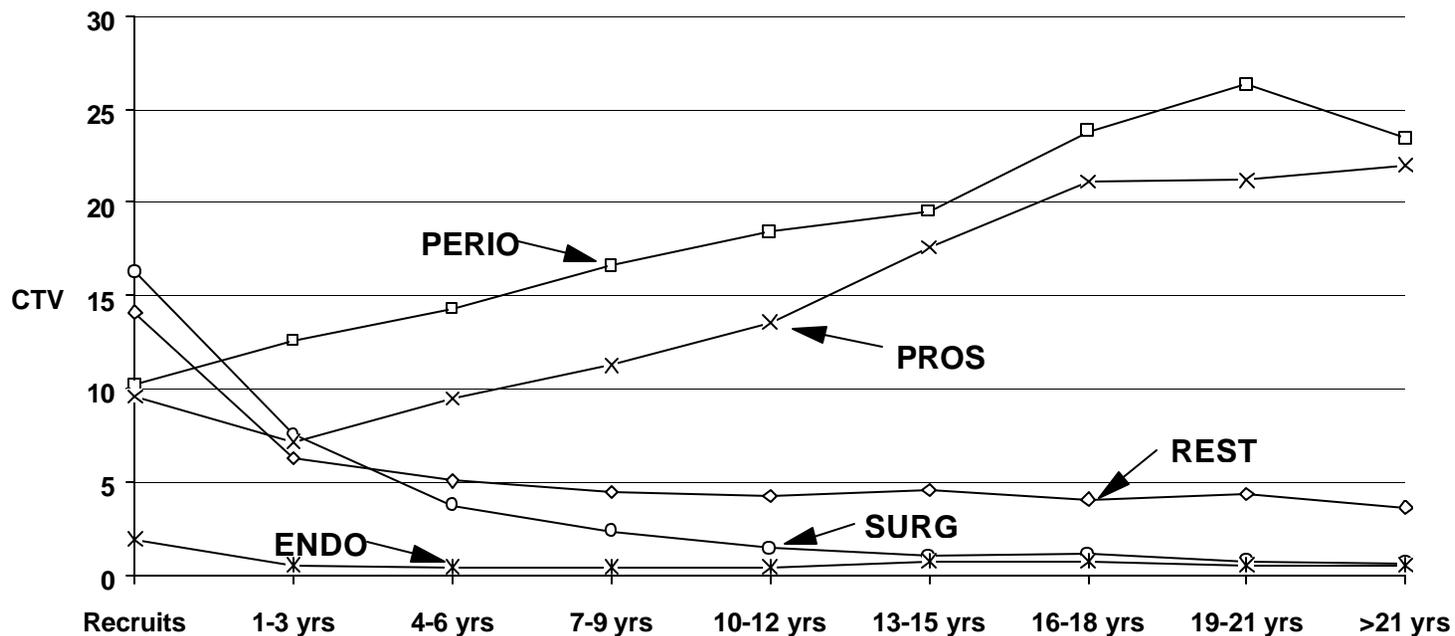


Figure 4.5

5. RESTORATIVE TREATMENT NEEDS

Restorative Treatment Needs (RTN) and Dental Classification based on RTN

1. Method of Restorative Data Collection

Survey examiners assessed the health status and treatment needs of each surface of each tooth using standardized mirrors and explorers and current radiographs. Examiners used the DMFS index and associated criteria for diagnosing dental caries in this assessment.

2. Restorative Treatment Needs for the Active Duty Military Population

Table 5.1 and Figure 5.1 show details about the intensity of restorative treatment needs for active duty service members stratified by gender, by race, by age category, by education level, and by paygrade.

Among all active duty personnel, over half have no restorative needs, while roughly one-third need 1 to 3 restorations. The remaining 11.2% need 4 or more restorations. The mean number of restorations needed per person is 1.25. Ordered logistic regression analysis showed significantly **more restorations** are needed by blacks compared to whites; whites and blacks compared to Asians; persons without college degrees compared to those with a college degree or higher; and enlisted persons compared to officers. After remaining flat from 18-24 years of age, the number of restorations needed decrease with increasing age.

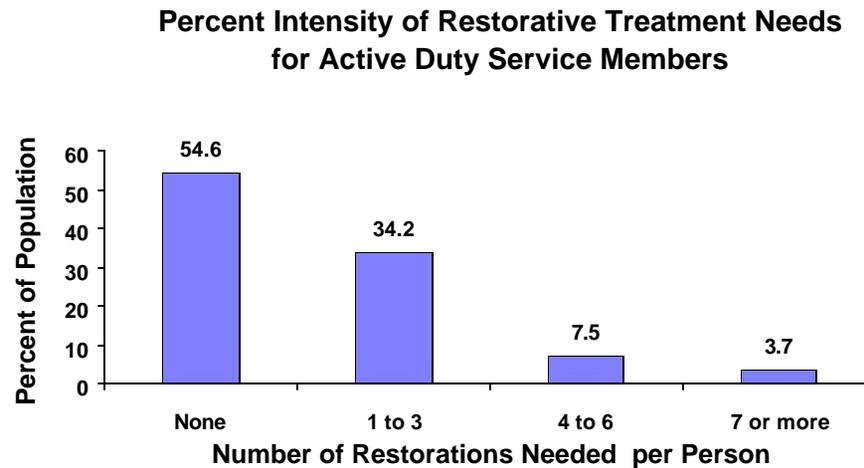


Figure 5.1

Table 5.1

PERCENT, MEAN, AND MEDIAN INTENSITY OF RESTORATIVE TREATMENT NEEDS							
	Estimated Population	# of Restorations needed				Mean # of Rests. Needed	Median # of Rests. Needed
		None	1 to 3	4 to 6	7+		
Gender							
Male	1,520,248	54.4	34.3	7.5	3.8	1.26	0
Female	179,414	56.1	33.5	7.3	3.1	1.17	0
Race							
White	1,273,796	55.8	33.3	7.3	3.6	1.22	0
Black	326,328	49.3	38.6	8.1	4.0	1.38	1
Hispanic	64,518	54.7	34.1	8.3	2.9	1.18	0
Asian	20,570	65.2	26.5	5.4	2.9	0.90	0
Other	14,450	57.0	29.6	6.7	6.7	1.53	0
Age Category							
18 - 19 years	42,048	52.5	33.9	8.6	5.0	1.42	0
20 - 24 years	587,359	50.6	34.2	10.3	4.9	1.53	1
25 - 29 years	420,366	56.4	33.8	6.4	3.4	1.16	0
30 - 34 years	312,028	56.0	35.0	6.0	3.0	1.09	0
35 - 39 years	210,497	56.6	35.3	5.2	2.9	1.05	0
40 - 44 years	95,699	59.6	33.4	4.6	2.4	0.92	0
>44 years	31,665	64.6	29.5	5.2	0.7	0.79	0
Education							
No College	658,519	51.0	34.9	9.3	4.8	1.46	1
Some College	707,713	52.7	36.3	7.4	3.6	1.28	0
College Graduate	217,546	61.4	32.4	4.5	1.7	0.87	0
Beyond College	114,884	74.4	21.3	3.0	1.3	0.56	0
Paygrade							
E1 - E4	773,974	49.4	35.6	9.9	5.1	1.55	1
E5 - E6	533,446	55.5	35.1	6.5	2.9	1.12	0
E7 - E9	178,304	54.6	37.5	5.2	2.7	1.07	0
O1 - O3	161,065	70.4	25.3	3.2	1.1	0.60	0
O4 - O7	52,873	72.8	22.7	3.5	1.0	0.59	0
All Active Duty	1,699,662	54.6	34.2	7.5	3.7	1.25	0
95% Confidence Interval (\pm %)		1.0	1.0	0.5	0.4	[1.21-1.29]	

3. Restorative Treatment Needs Among Those Needing Restorative Care

Table 5.2 on the facing page and Figure 5.2 below show details about the intensity of restorative treatment needs among active duty service members who require restorative care. Of this group, 75.4% need 1 to 3 restorations, 16.5% need 4 to 6 restorations, and 8.1%

need 7 or more restorations. The mean number of restorations needed per person is 2.75. Heaviest concentrations of restorative treatment needs (7 or more) reside in “other” races, 18-19 year olds, the non-college educated, and the lowest enlisted ranks.

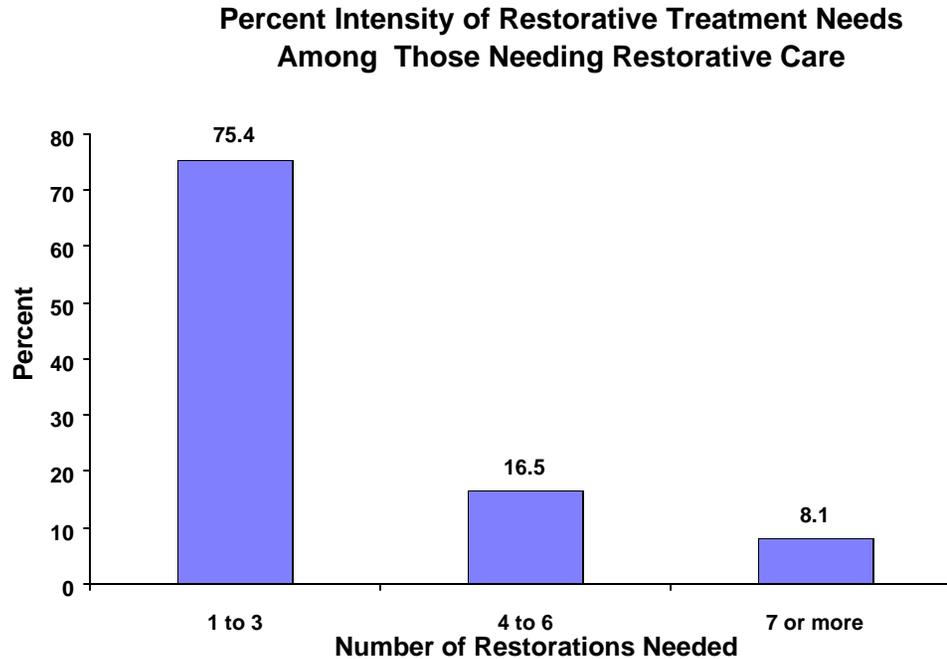


Figure 5.2

Table 5.2

PERCENT, MEAN, AND MEDIAN INTENSITY OF RESTORATIVE TREATMENT NEEDS (AMONG THOSE NEEDING RESTORATIVE CARE)						
	Estimated Population	1 to 3	4 to 6	7+	Mean # of Rests. Needed	Median # of Rests. Needed
Gender						
Male	693,001	75.3	16.4	8.3	2.76	2
Female	78,746	76.3	16.7	7.0	2.68	2
Race						
White	563,508	75.3	16.5	8.2	2.76	2
Black	165,599	76.1	16.0	7.9	2.72	2
Hispanic	29,262	75.3	18.4	6.3	2.60	2
Asian	7,158	76.0	15.7	8.3	2.59	2
Other	6,220	68.8	15.6	15.6	3.55	2
Age Category						
18 - 19 years	19,962	71.3	18.1	10.6	2.98	2
20 - 24 years	290,210	69.3	20.9	9.8	3.09	2
25 - 29 years	183,214	77.5	14.7	7.8	2.67	2
30 - 34 years	137,191	79.5	13.7	6.8	2.49	2
35 - 39 years	91,280	81.3	11.9	6.8	2.43	2
40 - 44 years	38,697	82.7	11.4	5.9	2.27	1
>44 years	11,192	83.4	14.5	2.1	2.23	1
Education						
No College	322,943	71.2	18.9	9.9	2.97	2
Some College	335,335	76.6	15.7	7.7	2.71	2
College Graduate	84,013	84.1	11.6	4.3	2.25	2
Beyond College	29,455	83.3	11.8	4.9	2.19	1
Paygrade						
E1 - E4	391,377	70.3	19.5	10.2	3.07	2
E5 - E6	237,275	78.9	14.5	6.6	2.52	2
E7 - E9	80,944	82.5	11.4	6.1	2.37	2
O1 - O3	47,742	85.2	11.0	3.8	2.04	1
O4 - O7	14,409	83.6	12.7	3.7	2.18	1
Total Population						
	771,747	75.4	16.5	8.1	2.75	2
95% Confidence Interval (\pm %)		1.2	1.1	0.8	[2.67-2.83]	

4. **Types of Restorations Needed by All Active Duty Service Members and by Those with Restorative Needs**

As shown by Figure 5.3 below and Table 5.3 on the opposite page, the majority of restorations needed are one- or two-surface types. Among all active duty service members, the mean number of 1.25 restorations needed per person comprises means of 0.64 one-surface restorations, 0.37 two-surface restorations, 0.14 three-surface restorations, 0.06 four-surface restorations, and

0.04 five-surface restorations. Among those who need restorative care, a similar overall pattern prevails. The mean number of restorations required is 2.75 per person, comprising means of 1.40 one-surface restorations, 0.81 two-surface restorations, 0.31 three surface restorations, 0.13 four-surface restorations, and 0.09 five-surface restorations.

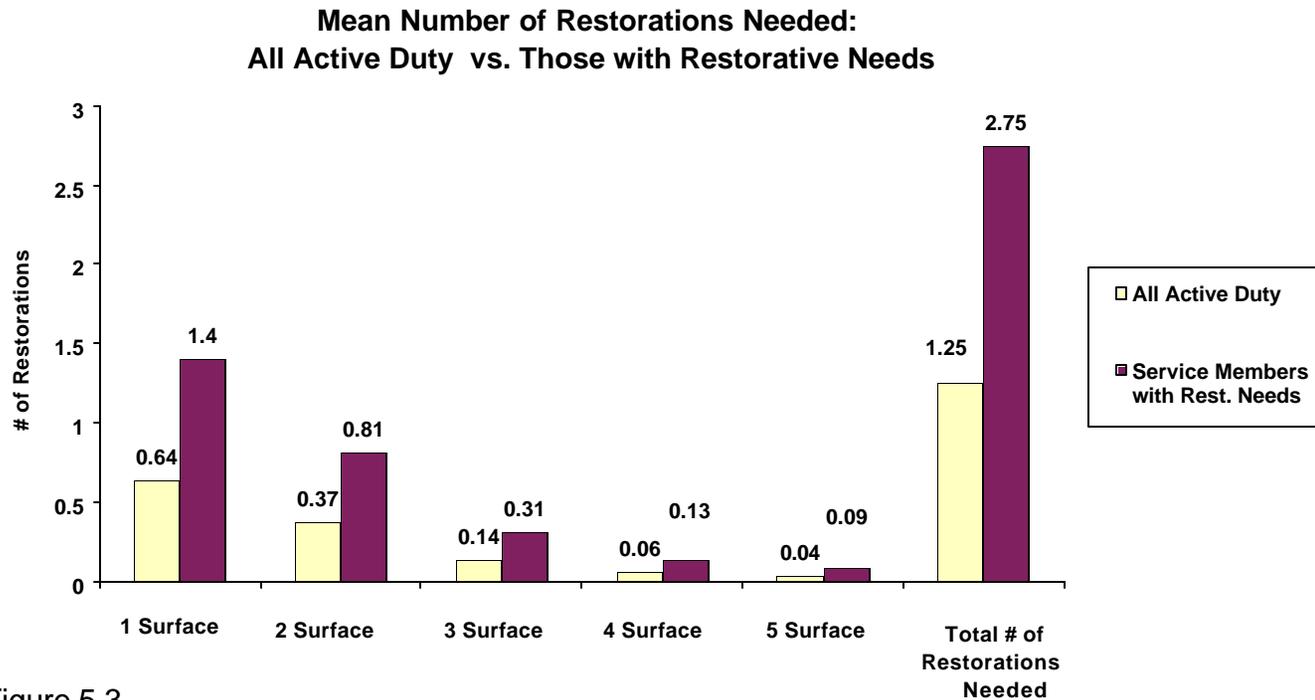


Figure 5.3

Table 5.3

MEAN AND MEDIAN NUMBER OF TYPES OF RESTORATIONS NEEDED				
TYPE OF RESTORATION	Among All Active Duty		Among Those Needing Rest. Care	
	Mean	Median	Mean	Median
1 surface restoration	0.64	0	1.40	1
95% Confidence Interval	[0.62-0.66]		[1.36-1.44]	
2 surface restoration	0.37	0	0.81	0
95% Confidence Interval	[0.35-0.39]		[0.77-0.85]	
3 surface restoration	0.14	0	0.31	0
95% Confidence Interval	[0.13-0.15]		[0.29-0.33]	
4 surface restoration	0.06	0	0.13	0
95% Confidence Interval	[0.05-0.07]		[0.11-0.15]	
5 surface restoration	0.04	0	0.09	0
95% Confidence Interval	[0.03-0.05]		[0.07-0.11]	
TOTAL	1.25	0	2.75	2
95% Confidence Interval	[1.21-1.29]		[2.67-2.83]	

5. **Distribution of DoD Dental Classification Based Only on Restorative Treatment Needs**

Based only on restorative conditions, 54.6% of all active duty service members are in dental Class 1, 37.8% are in Class 2, and 7.6% are in Class 3 (Figure and Table 5.4). Logistic regression analysis shows a significantly greater likelihood of being in dental Class 3 for the following groups: whites compared to blacks and Hispanics; those with no college experience compared to those with any college experience; and enlisted service members compared to officers.

Table 5.4

Percent Distribution of DoD Dental Classification Based Only on Restorative Treatment Needs for All Active Duty Service Members

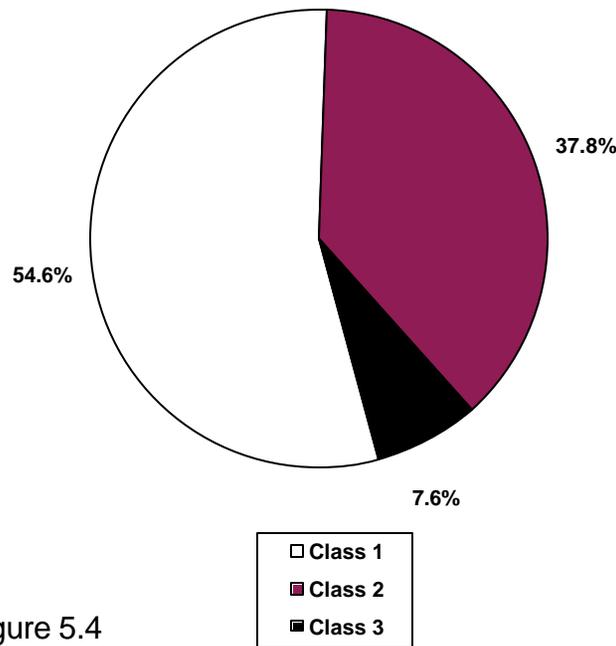


Figure 5.4

PERCENT DISTRIBUTION OF DOD DENTAL CLASSIFICATION BASED ONLY ON RESTORATIVE TREATMENT NEEDS				
	Estimated Population	DoD Dental Class		
		1	2	3
Gender				
Male	1,520,248	54.4	37.9	7.7
Female	179,414	56.1	37.0	6.9
Race				
White	1,273,796	55.8	36.2	8.0
Black	326,328	49.3	44.0	6.7
Hispanic	64,518	54.6	41.0	4.4
Asian	20,570	65.2	27.7	7.1
Other	14,450	57.0	32.7	10.3
Age Category				
18 - 19 years	42,048	52.5	39.4	8.1
20 - 24 years	587,359	50.6	40.9	8.5
25 - 29 years	420,366	56.4	36.2	7.4
30 - 34 years	312,028	56.0	37.7	6.3
30 - 39 years	210,497	56.6	35.7	7.7
40 - 44 years	95,699	59.6	32.5	7.9
>44 years	31,665	64.6	30.3	5.1
Education				
No College	658,519	51.0	39.3	9.7
Some College	707,713	52.7	39.8	7.5
College Graduate	217,546	61.4	34.0	4.6
Beyond College	114,884	74.4	23.3	2.3
Pavgrade				
E1 - E4	773,974	49.4	42.1	8.5
E5 - E6	533,446	55.5	35.9	8.6
E7 - E9	178,304	54.6	37.7	7.7
O1 - O3	161,065	70.4	27.8	1.8
O4 - O7	52,873	72.8	24.2	3.0
All Active Duty	1,699,662	54.6	37.8	7.6
95% Confidence Interval (± %)		0.8	0.8	0.4

Among active duty service members with restorative treatment needs, 83.2% are in Class 2 and 16.8% are in Class 3, based only on restorative status (Figure and Table 5.5).

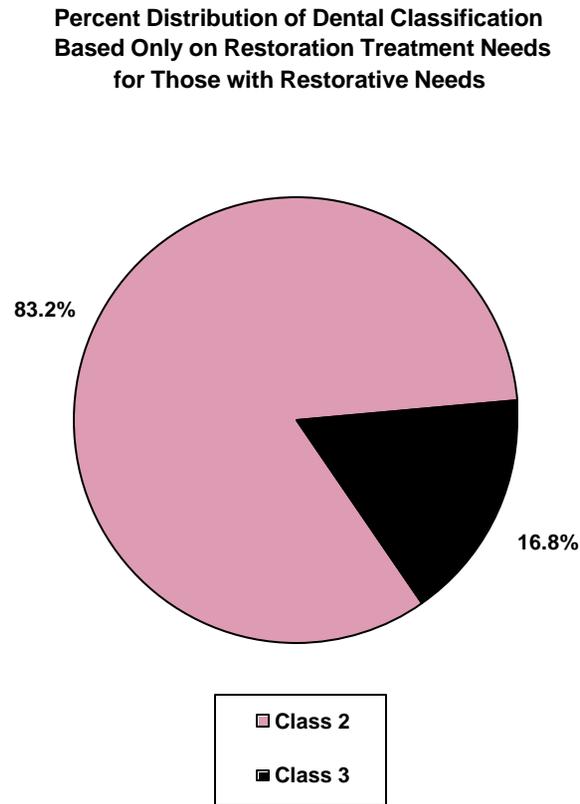


Figure 5.5

Table 5.5

PERCENT DISTRIBUTION OF DOD DENTAL CLASSIFICATION BASED ONLY ON RESTORATIVE TREATMENT NEEDS (AMONG THOSE NEEDING RESTORATIVE CARE)			
	Estimated Population	2	3
Gender			
Male	693,001	83.1	16.9
Female	78,746	84.4	15.6
Race			
White	563,508	81.9	18.1
Black	165,599	86.8	13.2
Hispanic	29,262	90.4	9.6
Asian	7,158	79.5	20.5
Other	6,220	75.9	24.1
Age Category			
18 - 19 years	19,962	83.0	17.0
20 - 24 years	290,210	82.7	17.3
25 - 29 years	183,214	83.0	17.0
30 - 34 years	137,191	85.8	14.2
35 - 39 years	91,280	82.3	17.7
40 - 44 years	38,697	80.5	19.5
>44 years	11,192	85.6	14.4
Education			
No College	322,943	80.2	19.8
Some College	335,335	84.2	15.8
College Graduate	84,013	88.1	11.9
Beyond College	29,455	90.9	9.1
Paygrade			
E1 - E4	391,377	83.3	16.7
E5 - E6	237,275	80.7	19.3
E7 - E9	80,944	83.0	17.0
O1 - O3	47,742	93.8	6.2
O4 - O7	14,409	89.1	10.9
All Active Duty Air DOD recruits			
	771,747	83.2	16.8
95% Confidence Interval (± %)		0.8	0.4

6. **Distribution of Number of Teeth per Person in Dental Class 3 (based only on Restorative Needs)**

Of those persons in dental class 3 for restorative reasons, ***nearly two-thirds have only one class 3 tooth and 83.7% have just one or two class 3 teeth*** (Figure 5.6).

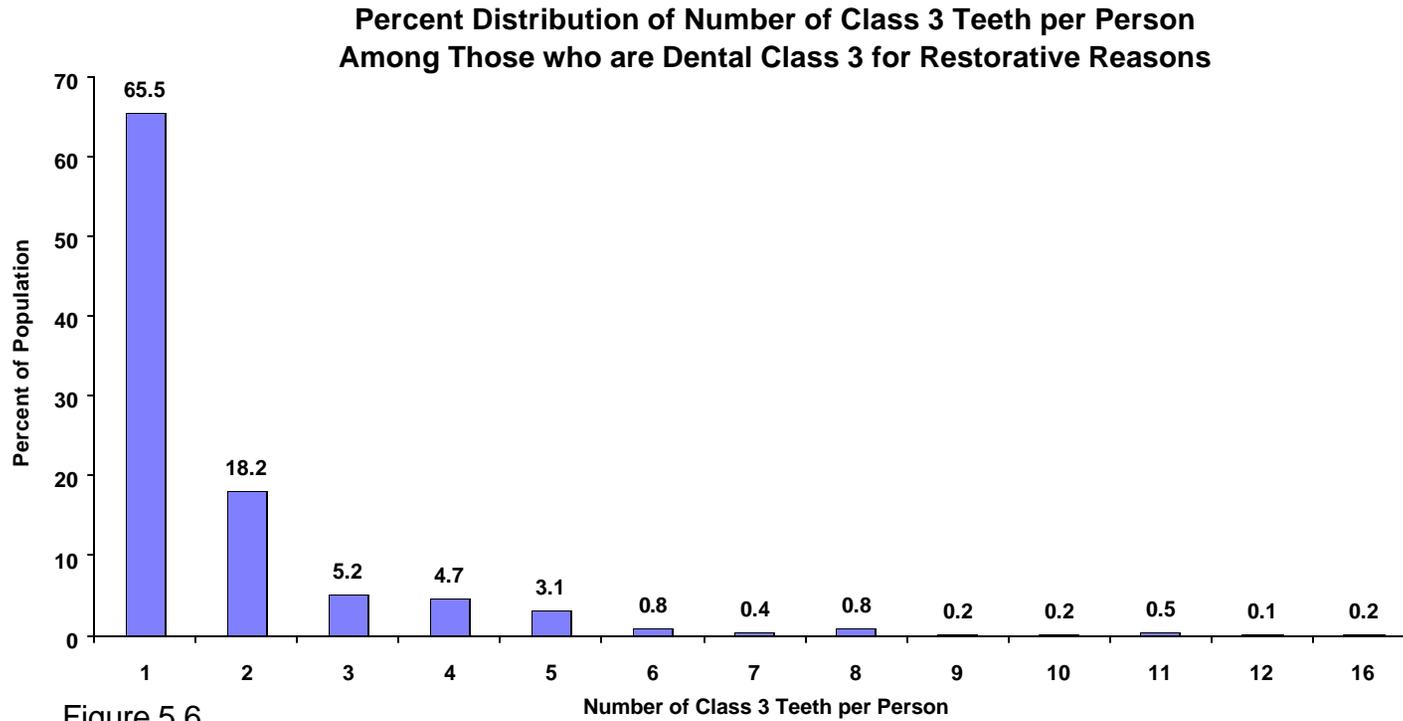


Figure 5.6

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7. Composite Time Values for Restorative Treatment Needs

Appendix A provides a full description of the procedure codes used to calculate CTV for each type of dental treatment. Table 5.6 shows that for all active duty (AD) service members the mean CTV for restorative care is 5.0 and the median is 0. Figure 5.7 shows **that most AD service members (83.2%) need 10 or fewer CTV of restorative treatment. Over half (54.6%) need no**

restorative treatment. As illustrated in Figure 5.8 below, **the 16.8% of the population requiring >10 CTV of dental care accounts for 70.1% of the total restorative CTV**, while the 83.2% of the population with 10 CTV or less of need account for only 29.9% of total restorative CTV.

Percent Distribution of Restorative CTV

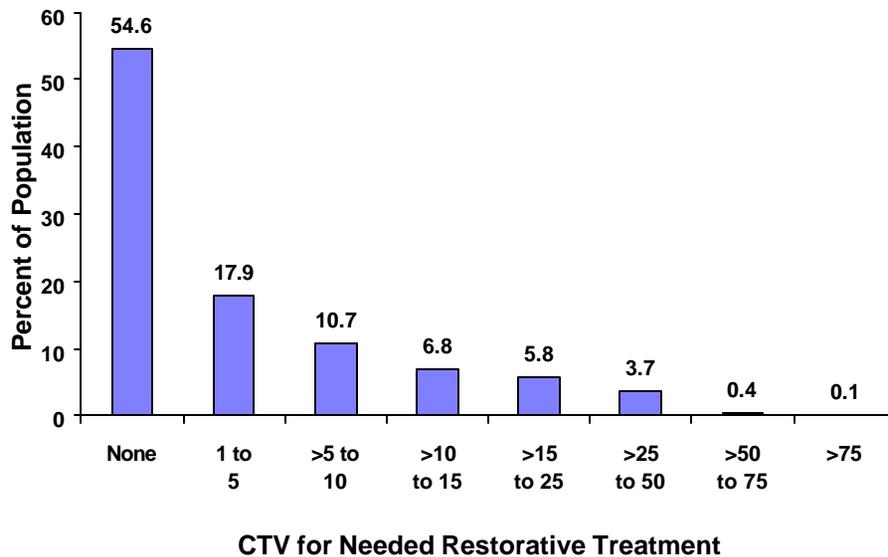


Figure 5.7

Percentage of Total Restorative CTV

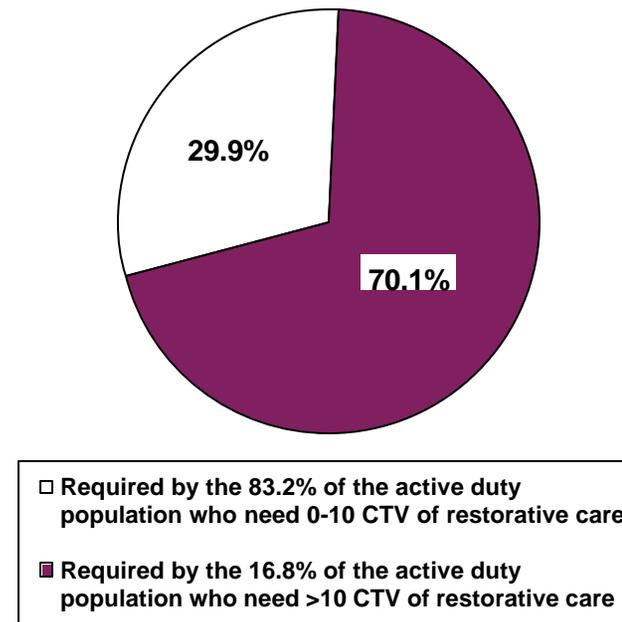


Figure 5.8

Table 5.6

PERCENT DISTRIBUTION OF RESTORATIVE COMPOSITE TIME VALUES (CTV)											
	Estimated Population	None	1-5	Percent in Each CTV Category						Mean Rest. CTV	Median Rest. CTV
				6-10	11-15	16-25	26-50	51-75	>75		
Gender											
Male	1,520,248	54.4	18.0	10.8	6.8	5.8	3.7	0.4	0.1	5.1	0
Female	179,414	56.1	17.4	9.5	7.6	5.6	3.3	0.4	0.1	4.8	0
Race											
White	1,273,796	55.8	17.8	10.3	6.4	5.6	3.6	0.4	0.1	4.9	0
Black	326,328	49.2	18.9	12.4	8.8	6.3	4.0	0.4	0.0	5.5	4
Hispanic	64,518	54.6	18.9	9.1	7.7	6.4	3.2	0.1	0.0	4.7	0
Asian	20,570	65.2	12.7	11.8	3.3	4.3	2.6	0.1	0.0	3.6	0
Other	14,450	57.0	16.4	7.5	7.1	4.7	5.1	1.8	0.4	6.3	0
Age Category											
18 - 19 years	42,048	52.5	14.1	13.6	8.3	6.2	5.3	0.0	0.0	5.5	0
20 - 24 years	587,359	50.6	17.1	10.8	8.1	8.0	4.6	0.6	0.2	6.0	4
25 - 29 years	420,366	56.4	17.6	10.1	7.4	4.8	3.2	0.4	0.1	4.7	0
30 - 34 years	312,028	56.0	19.7	10.1	5.9	4.6	3.4	0.2	0.1	4.5	0
35 - 39 years	210,497	56.6	19.5	11.3	5.0	4.1	2.9	0.4	0.2	4.5	0
40 - 44 years	95,699	59.6	17.5	12.8	3.2	3.8	2.9	0.2	0.0	3.9	0
>44 years	31,665	64.6	17.2	6.6	5.9	4.9	0.5	0.0	0.3	3.3	0
Education											
No College	658,519	51.0	18.3	11.1	7.2	7.3	4.5	0.5	0.1	5.8	4
Some College	707,713	52.7	18.6	10.9	8.0	5.5	3.8	0.4	0.1	5.2	0
College Graduate	217,546	61.4	17.3	10.6	4.9	3.7	1.9	0.1	0.1	3.5	0
Beyond College	114,884	74.4	13.2	6.8	1.7	2.2	1.5	0.1	0.1	2.4	0
Paygrade											
E1 - E4	773,974	49.5	17.6	11.2	8.5	7.6	4.9	0.6	0.1	6.2	4
E5 - E6	533,446	55.5	18.9	10.7	6.7	4.9	3.0	0.2	0.1	4.6	0
E7 - E9	178,304	54.6	19.2	12.8	5.5	4.2	3.4	0.3	0.0	4.5	0
O1 - O3	161,065	70.3	16.4	6.6	2.7	2.5	1.4	0.1	0.0	2.4	0
O4 - O7	52,873	72.8	13.8	7.1	2.1	3.0	1.0	0.0	0.2	2.5	0
All Active Duty	1,699,662	54.6	17.9	10.7	6.8	5.8	3.7	0.4	0.1	5.0	0
95% Confidence Interval (+ %)		1.0	0.8	0.6	0.5	0.5	0.4	0.1	0.0	[4.8-5.2]	

6. ORAL SURGERY TREATMENT NEEDS

Oral Surgery Treatment Needs (OSTN) and Dental Classification based on OSTN

1. Method of Oral Surgery Data Collection

Examiners assessed oral surgical treatment needs using standardized exam instruments and current bitewing and panoramic radiographs.

2. Oral Surgery Treatment Needs for the Total Active Duty Population

Table 6.1 and Figure 6.1 detail the intensity of oral surgery treatment needs for active duty service members stratified by gender, by race, by age category, by education, and by paygrade. Among all active duty personnel, about four-fifths have no oral surgery

treatment needs, one-tenth need 1 or 2 teeth removed, and the remaining tenth need 3 or more teeth removed. The mean number of teeth needing removal per person is 0.47 and the median is 0. Ordered logistic regression analysis shows that the following groups ***need significantly more teeth removed: males compared to females; blacks and Hispanics compared to whites; those with no college compared to those with some college experience; and those in paygrades E1-E4 compared to all other active duty personnel. Likewise, the number of tooth removals needed decreases with increasing age***, with the exception of individuals over 44 years of age who are more likely to require more than 4 teeth removed than any other age group.

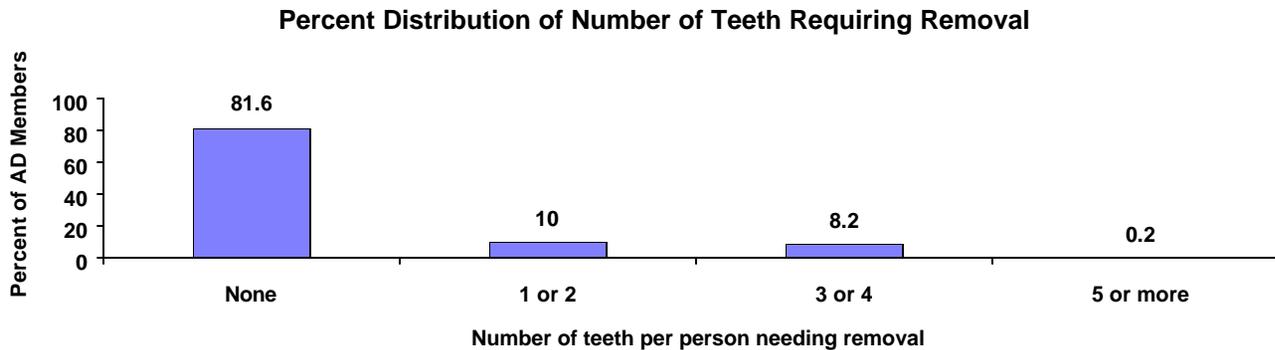


Figure 6.1

Table 6.1

PERCENT, MEAN, AND MEDIAN INTENSITY OF ORAL SURGERY TREATMENT NEEDS

	Estimated Population	Number of Extractions needed				Mean Number of Extractions Needed	Median Number of Extractions Needed
		None	1 or 2	3 or 4	5+		
Gender							
Male	1,520,248	81.1	10.2	8.5	0.2	0.48	0
Female	179,414	85.8	8.3	5.9	0.0	0.35	0
Race							
White	1,273,796	82.8	9.4	7.6	0.2	0.44	0
Black	326,328	78.0	11.3	10.4	0.3	0.57	0
Hispanic	64,518	76.9	13.2	9.7	0.2	0.58	0
Asian	20,570	86.0	8.1	5.9	0.0	0.33	0
Other	14,450	78.1	14.7	7.2	0.0	0.51	0
Age Category							
18 - 19 years	42,048	63.3	12.5	23.9	0.3	1.12	0
20 - 24 years	587,359	69.3	15.1	15.4	0.2	0.83	0
25 - 29 years	420,366	84.8	8.9	6.2	0.1	0.37	0
30 - 34 years	312,028	90.6	6.6	2.7	0.1	0.19	0
35 - 39 years	210,497	92.6	5.6	1.6	0.2	0.15	0
40 - 44 years	95,699	95.8	3.4	0.6	0.2	0.08	0
>44 years	31,665	89.4	8.1	0.6	1.9	0.29	0
Education							
No College	658,519	75.3	13.3	11.2	0.2	0.63	0
Some College	707,713	83.5	8.9	7.3	0.3	0.43	0
College Graduate	217,546	87.6	6.9	5.5	0.0	0.31	0
Beyond College	114,884	95.1	3.3	1.5	0.1	0.11	0
Paygrade							
E1 - E4	773,974	71.9	13.7	14.1	0.3	0.76	0
E5 - E6	533,446	88.4	7.8	3.7	0.1	0.25	0
E7 - E9	178,304	91.7	6.5	1.4	0.4	0.17	0
O1 - O3	161,065	89.9	5.6	4.5	0.0	0.25	0
O4 - O7	52,873	96.9	2.5	0.4	0.2	0.06	0
All Active Duty	1,699,662	81.6	10.0	8.2	0.2	0.47	0
95% Confidence Interval (± %)		0.8	0.6	0.5	0.1	[0.45-0.49]	

3. Oral Surgery Treatment Needs Among Those Needing Oral Surgery Care

Table 6.2 and Figure 6.2 detail the intensity of oral surgery treatment needs among those active duty service members who have OS needs. Of this group, over half need one or two teeth removed, and most of

the others need 3 or 4 teeth removed. Only 1.1% need five or more teeth removed. The mean number of teeth needing removal for the entire group is 2.55 and the median is 2.

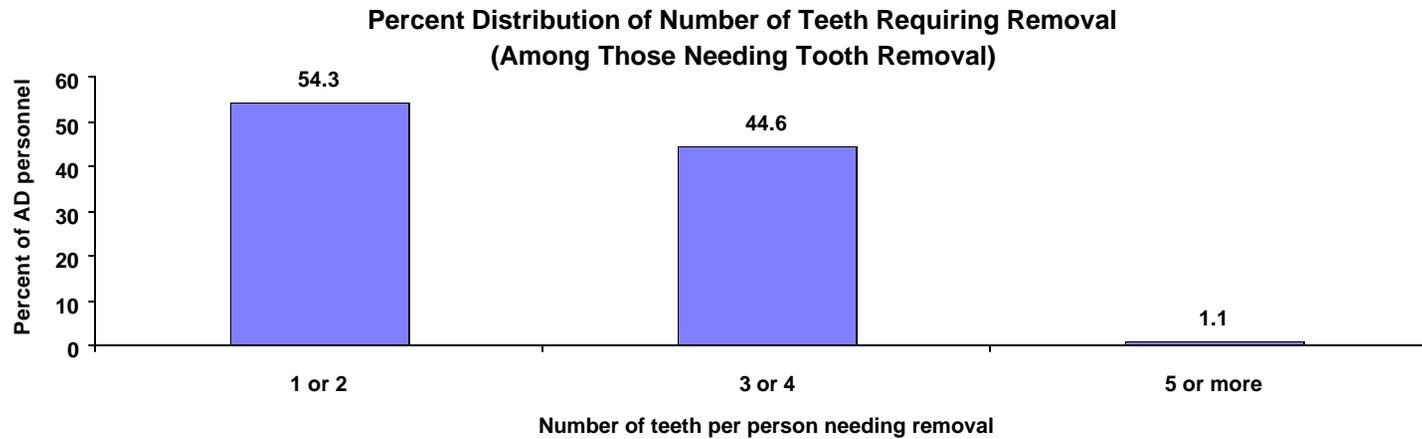


Figure 6.2

Table 6.2

**PERCENT, MEAN, AND MEDIAN INTENSITY OF ORAL SURGERY TREATMENT NEEDS
(AMONG THOSE NEEDING ORAL SURGERY)**

	Estimated Population	Number of Exts. Needed			Mean Number of Extractions Needed	Median Number of Extractions Needed
		1 or 2	3 or 4	5+		
Gender						
Male	286,719	54.0	44.9	1.1	2.56	2
Female	25,409	58.1	41.9	0.0	2.46	2
Race						
White	219,471	54.9	44.2	0.9	2.54	2
Black	71,732	51.4	47.1	1.5	2.60	2
Hispanic	14,876	57.2	42.1	0.7	2.51	2
Asian	2,889	57.7	42.3	0.0	2.33	2
Other	3,160	67.1	32.9	0.0	2.31	2
Age Category						
18 - 19 years	15,429	34.0	65.2	0.8	3.05	4
20 - 24 years	180,632	49.2	50.1	0.7	2.70	3
25 - 29 years	63,761	58.3	40.9	0.8	2.41	2
30 - 34 years	29,454	69.8	29.2	1.0	2.02	2
35 - 39 years	15,481	76.7	21.3	2.0	2.01	2
40 - 44 years	4,005	81.0	13.1	5.9	1.84	1
>44 years	3,365	76.6	5.9	17.5	2.75	2
Education						
No College	162,497	53.7	45.5	0.8	2.55	2
Some College	117,062	54.2	44.2	1.6	2.59	2
College Graduate	26,971	55.4	44.3	0.3	2.48	2
Beyond College	5,598	68.3	29.9	1.8	2.19	2
Paygrade						
E1 - E4	217,218	48.8	50.4	0.8	2.70	3
E5 - E6	62,135	66.8	32.0	1.2	2.18	2
E7 - E9	14,829	78.5	17.3	4.2	2.06	2
O1 - O3	16,309	55.6	44.4	0.0	2.47	2
O4 - O7	1,637	81.3	12.6	6.1	1.97	1
Total Population						
	312,128	54.3	44.6	1.1	2.55	2
95% Confidence Interval (+ %)		2.3	2.3	0.4	[2.49-2.61]	

4. Types of Oral Surgical Procedures Needed for Persons with OS Treatment Needs

Table 6.3 shows there is no significant variation in the mix of oral surgical treatment needs across gender, race, education, and paygrade among active duty military personnel with OS treatment needs. Compared to other age categories, 18-19 year olds are more likely to need removal of impacted teeth and 40+ years olds are more likely to require simple tooth removals. Figure 6.3 and Table 6.3 show the majority of OS procedures needed

(over 60%) are classified as impactions. Among active duty personnel who need OS, the mean number of tooth removals needed per person is 2.6, comprising means of 0.8 simple procedures, 0.2 complex procedures, and 1.6 impaction procedures. (Procedure classification follows guidelines described in DoD Instruction 6410.2, Standardization of Code on Dental Procedures, February 13, 1992).

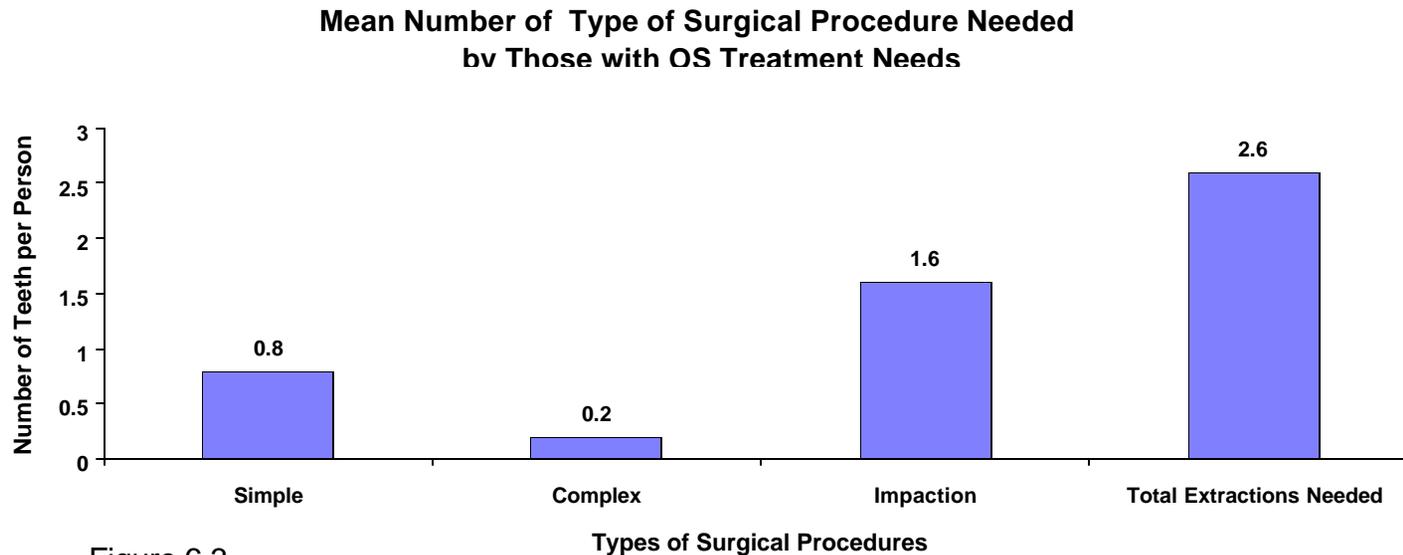


Figure 6.3

Table 6.3

MEAN NUMBER OF SIMPLE, COMPLEX, AND IMPACTION SURGERIES NEEDED PER PERSON (AMONG THOSE NEEDING ORAL SURGERY)						
	Estimated Population	Mean Number of Ea. Surg. Type			Mean Number of Extractions Needed	Median Number of Extractions Needed
		Simple	Complex	Impact.		
Gender						
Male	286,719	0.8	0.2	1.6	2.56	2
Female	25,409	0.7	0.2	1.6	2.46	2
Race						
White	219,471	0.7	0.2	1.6	2.54	2
Black	71,732	0.9	0.3	1.4	2.60	2
Hispanic	14,876	0.7	0.2	1.6	2.51	2
Asian	2,889	0.9	0.1	1.3	2.33	2
Other	3,160	0.6	0.3	1.4	2.31	2
Age Category						
18 - 19 years	15,429	0.3	0.2	2.5	3.05	4
20 - 24 years	180,632	0.7	0.2	1.8	2.70	3
25 - 29 years	63,761	0.8	0.3	1.3	2.41	2
30 - 34 years	29,454	0.8	0.2	1.0	2.02	2
35 - 39 years	15,481	0.9	0.2	0.9	2.01	2
40 - 44 years	4,005	1.3	0.1	0.5	1.84	1
>44 years	3,365	1.4	0.5	0.8	2.75	2
Education						
No College	162,497	0.7	0.2	1.6	2.55	2
Some College	117,062	0.8	0.3	1.5	2.59	2
College Graduate	26,971	0.7	0.2	1.5	2.48	2
Beyond College	5,598	0.8	0.0	1.4	2.19	2
Paygrade						
E1 - E4	217,218	0.7	0.3	1.7	2.70	3
E5 - E6	62,135	0.8	0.2	1.1	2.18	2
E7 - E9	14,829	1.0	0.2	0.8	2.06	2
O1 - O3	16,309	0.8	0.1	1.6	2.47	2
O4 - O7	1,637	1.0	0.0	1.0	1.97	1
Total Population	312,128	0.8	0.2	1.6	2.55	2
95% Confidence Interval (± %)		[0.7-0.9]	[0.1-0.3]	[1.5-1.7]	[2.49-2.61]	

5. **Distribution of DoD Dental Classification Based Only on Oral Surgery Treatment Needs**

Based only on oral surgical treatment needs, about four-fifths of all active duty personnel are in class 1, just over fifteen percent are in class 2, and less than three percent are in class 3 (Figure 6.4 and Table 6.4). Logistic regression analysis shows that the following groups are significantly **more likely to be class 3 due to oral surgical treatment requirements**: males compared to females; those with no college experience compared to those with some college experience; and junior enlisted (E1-E4) compared to junior officers (O1-O3). Also, the likelihood of being class 3 due to oral surgical treatment need decreases with increasing age from 18-34 years of age, with no significant change thereafter.

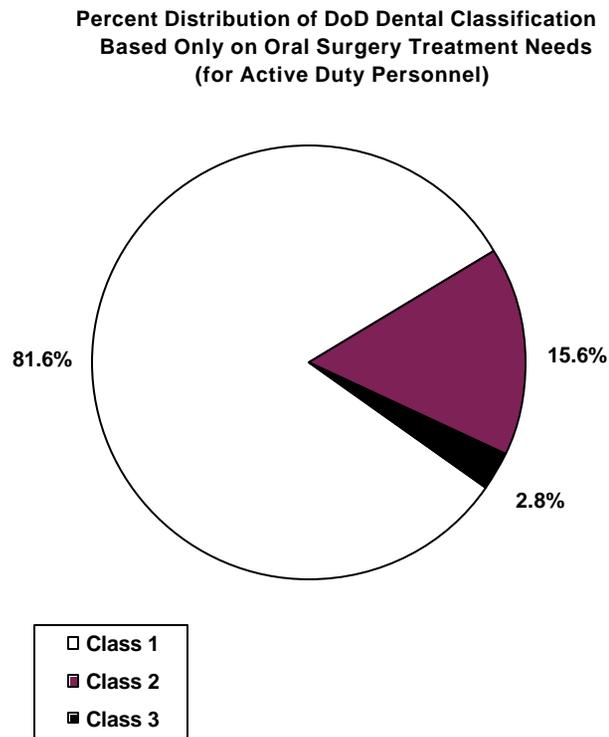


Figure 6.4

Table 6.4

PERCENT DISTRIBUTION OF DOD DENTAL CLASSIFICATION BASED ONLY ON ORAL SURGICAL TREATMENT NEEDS				
	Estimated Population	DoD Dental Class		
		1	2	3
Gender				
Male	1,520,248	81.2	15.9	2.9
Female	179,414	85.8	12.8	1.4
Race				
White	1,273,796	82.8	14.6	2.6
Black	326,328	78.0	19.0	3.0
Hispanic	64,518	76.9	19.6	3.5
Asian	20,570	86.0	12.5	1.5
Other	14,450	78.1	16.9	5.0
Age Category				
18 - 19 years	42,048	63.3	26.7	10.0
20 - 24 years	587,359	69.3	26.0	4.7
25 - 29 years	420,366	84.8	12.9	2.3
30 - 34 years	312,028	90.6	8.5	0.9
35 - 39 years	210,497	92.7	6.6	0.7
40 - 44 years	95,699	95.8	3.3	0.9
>44 years	31,665	89.4	9.4	1.2
Education				
No College	658,519	75.3	20.4	4.3
Some College	707,713	83.5	14.4	2.1
College Graduate	217,546	87.6	11.1	1.3
Beyond College	114,884	95.1	4.7	0.2
Paygrade				
E1 - E4	773,974	71.9	23.6	4.5
E5 - E6	533,446	88.4	9.7	1.9
E7 - E9	178,304	91.7	7.5	0.8
O1 - O3	161,065	89.9	9.8	0.3
O4 - O7	52,873	96.9	2.5	0.6
All Active Duty	1,699,662	81.6	15.6	2.8
95% Confidence Interval (± %)		0.8	0.7	0.4

Among active duty service members with oral surgical treatment needs, most (85%) are dental class 2, based only on oral surgery status (Figure 6.5 and Table 6.5).

Table 6.5

Percent Distribution of Dental Classification Based Only on Oral Surgery Treatment Needs for Those Needing O.S. Care

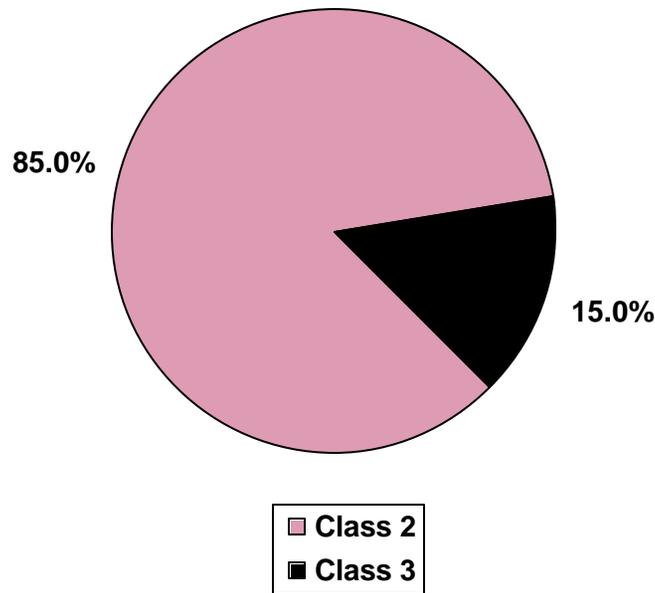


Figure 6.5

PERCENT DISTRIBUTION OF DOD DENTAL CLASSIFICATION BASED ONLY ON ORAL SURGICAL TREATMENT NEEDS (AMONG THOSE NEEDING ORAL SURGERY)			
	Estimated Population	2	3
Gender			
Male	286,719	84.5	15.5
Female	25,409	90.1	9.9
Race			
White	219,471	84.5	15.5
Black	71,732	86.4	13.6
Hispanic	14,876	84.9	15.1
Asian	2,889	89.1	10.9
Other	3,160	77.1	22.9
Age Category			
18 - 19 years	15,429	72.7	27.3
20 - 24 years	180,632	84.7	15.3
25 - 29 years	63,761	85.1	14.9
30 - 34 years	29,454	90.6	9.4
35 - 39 years	15,481	90.1	9.9
40 - 44 years	4,005	78.5	21.5
>44 years	3,365	88.1	11.9
Education			
No College	162,497	82.4	17.6
Some College	117,062	86.9	13.1
College Graduate	26,971	89.7	10.3
Beyond College	5,598	95.2	4.8
Paygrade			
E1 - E4	217,218	84.2	15.8
E5 - E6	62,135	83.5	16.5
E7 - E9	14,829	90.1	9.9
O1 - O3	16,309	96.7	3.3
O4 - O7	1,637	81.0	19.0
Total Population	312,128	85.0	15.0
95% Confidence Interval (± %)		1.6	1.6

6. Composite Time Values for Oral Surgery Treatment Needs

Appendix A shows the computation of CTV for each dental procedure. For all active duty service members, the mean CTV for needed oral surgery care is 3.9 and the median is 0. Figure 6.6 and Table 6.7 show that **no oral surgery treatment is needed by over four-fifths of AD**

personnel, and another 7.4% need between 1 and 15 CTV of treatment. Most of these individuals need one tooth removed. The remaining 11% of personnel need between 15 and 70 CTV of treatment, reflecting multiple and/or more complicated surgical procedures.

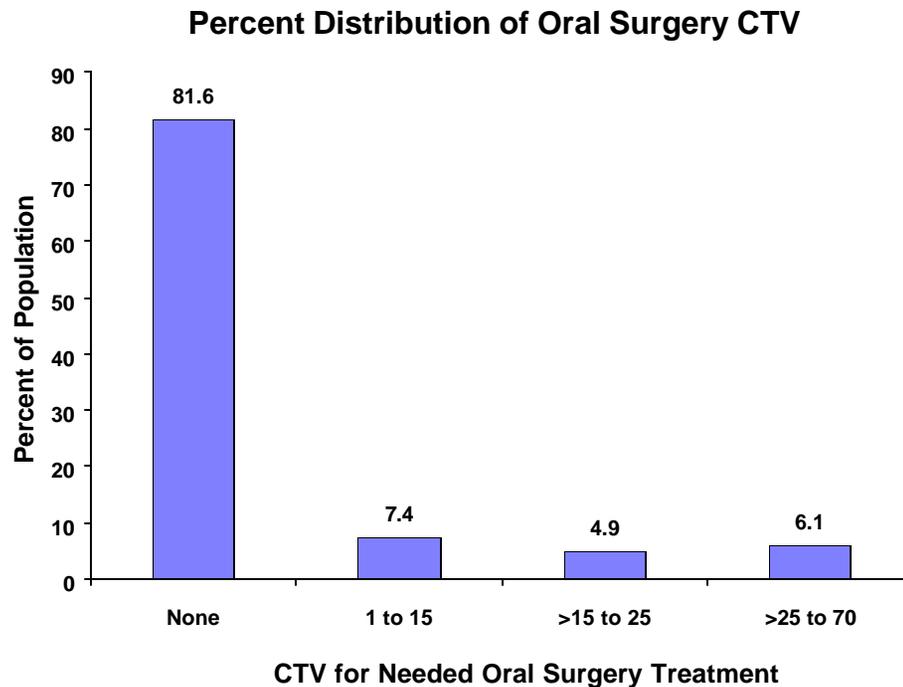


Figure 6.6

**Distribution of Oral Surgery CTV
Across the Active Duty Population**

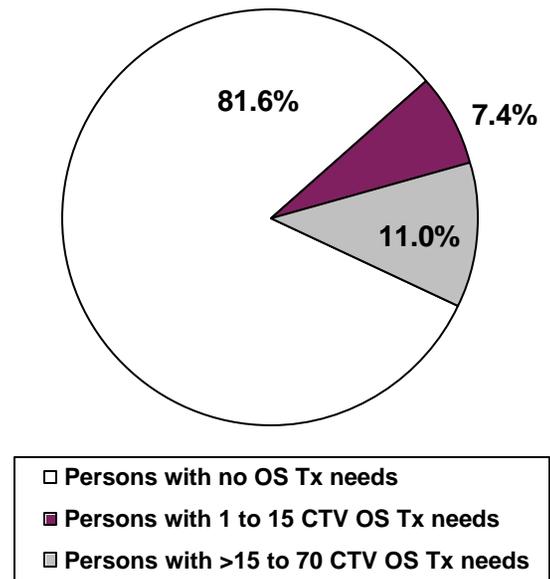


Figure 6.7

Table 6.6

PERCENT DISTRIBUTION OF ORAL SURGERY COMPOSITE TIME VALUES (CTV)							
	Estimated Population	% in Each CTV Category				Mean OS CTV	Median OS CTV
		None	1-15	>15-25	>25-70		
Gender							
Male	1,520,248	81.1	7.7	4.9	6.3	4.0	0
Female	179,414	85.8	5.6	4.4	4.2	2.9	0
Race							
White	1,273,796	82.8	6.8	4.6	5.8	3.7	0
Black	326,328	78.0	9.6	5.5	6.9	4.5	0
Hispanic	64,518	76.9	8.4	7.4	7.3	4.9	0
Asian	20,570	86.0	7.5	3.1	3.4	2.6	0
Other	14,450	78.1	8.4	8.0	5.5	4.2	0
Age Category							
18 - 19 years	42,048	63.3	8.5	5.8	22.4	10.6	0
20 - 24 years	587,359	69.3	10.0	9.0	11.7	7.1	0
25 - 29 years	420,366	84.8	7.1	4.2	3.9	2.9	0
30 - 34 years	312,028	90.6	5.9	2.0	1.5	1.4	0
35 - 39 years	210,497	92.6	5.0	1.3	1.1	1.1	0
40 - 44 years	95,699	95.8	3.4	0.4	0.4	.5	0
>44 years	31,665	89.4	6.1	2.4	2.1	1.9	0
Education							
No College	658,519	75.3	10.1	6.1	8.5	5.2	0
Some College	707,713	83.5	6.5	4.6	5.4	3.5	0
College Graduate	217,546	87.6	5.1	4.0	3.3	2.5	0
Beyond College	114,884	95.1	2.5	1.1	1.3	.9	0
Paygrade							
E1 - E4	773,974	71.9	9.5	7.8	10.8	6.4	0
E5 - E6	533,446	88.4	6.5	2.8	2.3	2.0	0
E7 - E9	178,304	91.7	5.7	1.4	1.2	1.2	0
O1 - O3	161,065	89.9	4.2	3.2	2.7	2.1	0
O4 - O7	52,873	96.9	2.3	0.2	0.6	.4	0
All Active Duty							
	1,699,662	81.6	7.4	4.9	6.1	3.9	0
95% Confidence Interval (\pm %)		0.8	0.6	0.5	0.5	[3.7-4.1]	

7. PERIODONTAL HEALTH STATUS AND TREATMENT NEEDS

Periodontal Health Status, Treatment Needs, and DoD Dental Classification

1. Method of Periodontal Data Collection

Periodontal status and treatment needs were assessed using the Periodontal Screening and Recording (PSR) index, a rapid and effective way to screen patients for periodontal diseases. PSR is an adaptation of the Community Periodontal Index of Treatment Needs (CPITN), which is endorsed by the World Health Organization. PSR is recommended by the American Dental Association and the American Academy of Periodontology for all patients as an integral part of oral examinations.

Survey examiners recorded the deepest probing depth for each sextant of the mouth using the CPITN-E periodontal probe. Examiners also recorded the presence or absence of gingival bleeding and local factors (calculus/defective

restoration margins) for each sextant. PSR scores were calculated electronically, based on this information.

2. Periodontal Health Status

A patient's deepest periodontal probing depth is one measure of periodontal health status. **Among all service members, 44.6% have no probing depth greater than 3 mm while 45.9% have at least one probing depth in the 4 to 5 mm range. A probing depth of 6mm or greater is found in 9.5% of the population. Among all individuals 82.8% have bleeding on probing and 79.3% have calculus or local factors** (Figure 7.1). Table 7.1 provides detailed information on these periodontal health status measures stratified by gender, by race, by age category, by education, and by paygrade.

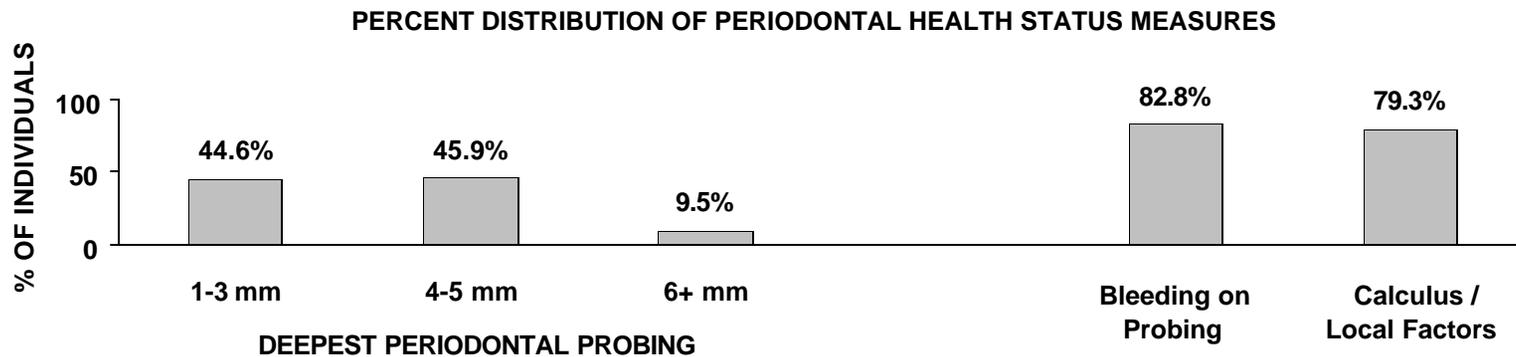


Figure 7.1

Logistic regression analyses were conducted to determine if statistically significant differences exist based on gender, race, age, education level, and paygrade (officer versus enlisted) on three measures of periodontal health.

Likelihood of Probing Depth of Greater than 3mm

- Blacks and Hispanics are significantly more likely than whites
- Males are significantly more likely than females
- The likelihood increases significantly as age increases
- Individuals with any college are significantly less likely compared to those with no college
- Overall, enlisted persons are significantly more likely to have a probing depth greater than 3mm than officers. However, this difference is largely attributable to greater probing depths in middle and senior level enlisted personnel. There is no significant difference between the enlisted paygrades E1-E4 and officers on this measure.

Likelihood of Calculus and Local Factors Present

- Blacks and Hispanics are significantly more likely than whites
- Males are significantly more likely than females
- Individuals with any college are significantly less likely compared to those with no college
- Enlisted personnel are significantly more likely than officers_

Likelihood of Bleeding on Probing Present

- Males are significantly more likely than females
- The likelihood decreases significantly as age increases
- Individuals with any college are significantly less likely compared to those with no college
- Enlisted personnel are significantly more likely than officers

Table 7.1

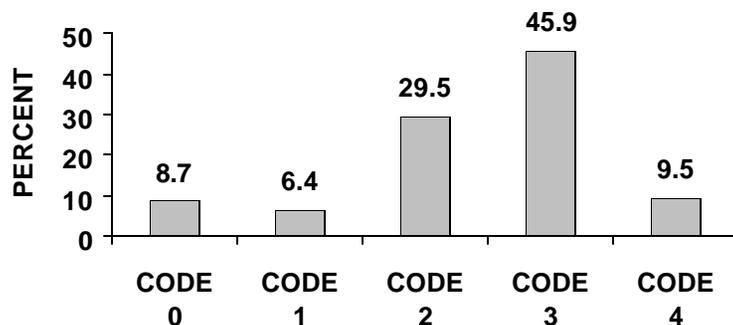
PERIODONTAL HEALTH STATUS						
	Estimated Population	Deepest Perio. Probing (%)			Bleeding on Probing (%)	Calculus/local Factors (%)
		1-3 mm	4-5 mm	6+ mm		
Gender						
Male	1,520,248	43.5	46.6	9.9	83.7	80.8
Female	179,414	53.5	40.3	6.2	75.0	66.3
Race						
White	1,273,796	47.5	44.9	7.6	82.8	78.7
Black	326,328	34.2	49.7	16.1	83.8	81.1
Hispanic	64,518	41.4	48.1	10.5	83.1	83.3
Asian	20,570	41.0	45.3	13.7	75.1	74.5
Other	14,450	44.1	43.6	12.3	74.9	77.3
Age Category						
18 - 19 years	42,048	59.7	38.8	1.5	88.4	77.5
20 - 24 years	587,359	51.3	45.3	3.4	85.8	79.8
25 - 29 years	420,366	44.8	47.1	8.1	83.0	78.6
30 - 34 years	312,028	41.5	46.5	12.0	80.5	80.1
35 - 39 years	210,497	34.2	48.0	17.8	80.5	80.9
40 - 44 years	95,699	31.3	43.8	24.9	78.6	75.8
> 44 years	31,655	36.1	39.4	24.5	67.7	74.0
Education						
No College	658,519	41.5	49.2	9.3	87.6	83.3
Some College	708,713	44.3	45.0	10.7	82.6	79.4
College Graduate	217,546	49.8	41.8	8.4	73.8	71.0
Beyond College	114,884	53.9	41.1	5.0	73.4	71.5
Paygrade						
E1 - E4	773,974	49.1	45.8	5.1	85.9	80.6
E5 - E6	533,446	35.7	50.3	14.0	84.3	81.9
E7 - E9	178,304	33.7	44.0	22.3	79.1	78.4
O1 - O3	161,065	63.9	33.5	2.6	71.3	67.5
O4 - O7	52,873	46.7	48.5	4.8	70.2	73.1
All Active Duty	1,699,662	44.6	45.9	9.5	82.8	79.3
95% Confidence Interval (\pm %)		1.0	1.0	0.6	0.7	0.8

3. Periodontal Screening and Recording Results

Figure 7.2 shows the percentage of individuals in each PSR code. Table 7.2 provides the same information stratified by gender, by race, by age category, by education, and by paygrade. Ordered logistic regression analysis finds that **males have significantly higher PSR scores than females; blacks and Hispanics have higher PSR scores compared to whites; individuals with no college experience have higher PSR scores than those with college experience; enlisted personnel have higher PSR scores than officers; and PSR scores increase significantly as age increases.** Listed below is a brief description of the periodontal

therapy recommended for each PSR code. All therapy required by those in codes 0, 1 and 2 can be accomplished by auxiliary dental personnel. Therapy for those in PSR code 3 involves direct patient contact with a general dentist. Code 4 individuals require complex periodontal treatment involving direct treatment by a periodontist. **Accordingly, 44.6% of needed periodontal treatment can be accomplished by auxiliary dental personnel, 45.9% requires direct patient contact with a general dentist, and 9.5% requires direct patient contact with a periodontist. Only 14.2% of active duty personnel require a dental prophylaxis as their sole dental treatment need.**

PERCENT DISTRIBUTION OF PSR CODE



<u>PSR CODE</u>	<u>THERAPY INDICATED</u>
0	Appropriate preventive care
1	OHI, plaque removal
2	OHI, plaque-calculus removal, correct restoration margins
3	Comprehensive perio. exam, OHI, plaque-calculus removal, correct restoration margins, re-evaluate
4	Complex periodontal treatment including all treatment under code 3, surgery as indicated, long term periodontal maintenance

Figure 7.2

Table 7.2

PERCENT DISTRIBUTION OF PERIODONTAL SCREENING AND RECORDING (PSR) CODE (FOR ALL ACTIVE DUTY PERSONNEL)						
	Estimated Population	% WITH EACH PSR CODE				
		CODE 0	CODE 1	CODE 2	CODE 3	CODE 4
Gender						
Male	1,520,248	8.0	5.8	29.7	46.6	9.9
Female	179,414	15.1	10.9	27.5	40.3	6.2
Race						
White	1,273,796	9.0	6.8	31.7	44.9	7.6
Black	326,328	7.3	5.3	21.6	49.7	16.1
Hispanic	64,518	7.4	4.4	29.6	48.1	10.5
Asian	20,570	12.5	5.3	23.2	45.3	13.7
Other	14,450	14.0	5.3	24.8	43.6	12.3
Age Category						
18 - 19 years	42,048	8.1	9.9	41.7	38.8	1.5
20 - 24 years	587,359	7.8	7.7	35.8	45.3	3.4
25 - 29 years	420,366	9.2	6.6	29.0	47.1	8.1
30 - 34 years	312,028	8.9	5.4	27.2	46.5	12.0
35 - 39 years	210,497	8.1	4.7	21.4	48.0	17.8
40 - 44 years	95,699	11.1	3.2	17.0	43.8	24.9
> 44 years	31,655	15.4	2.4	18.3	39.4	24.5
Education						
No College	658,519	6.3	5.7	29.5	49.2	9.3
Some College	708,713	8.6	6.6	29.1	45.0	10.7
College Graduate	217,546	14.0	6.2	29.6	41.8	8.4
Beyond College	114,884	13.8	8.3	31.9	41.0	5.0
Paygrade						
E1 - E4	773,974	7.5	7.2	34.4	45.8	5.1
E5 - E6	533,446	7.6	5.0	23.1	50.3	14.0
E7 - E9	178,304	8.9	4.6	20.2	44.0	22.3
O1 - O3	161,065	16.5	9.4	38.0	33.5	2.6
O4 - O7	52,873	13.8	5.0	27.9	48.5	4.8
All Active Duty						
	1,699,662	8.7	6.4	29.5	45.9	9.5
95% Confidence Interval (\pm %)		0.6	0.5	0.9	1.0	0.6

4. Composite Time Values for Periodontal Treatment Needs

PSR includes suggested guidelines for appropriate patient management based on individual PSR score. Following the guidance of a group of advisory military periodontists, we converted PSR treatment guidelines into dental procedure codes and composite time values (CTV). Appendix (A) provides the breakout of dental procedure codes for each PSR coded sextant and an explanation of the conversion to CTV. Table 7.3 gives a breakout of CTV stratified by gender, by race, by age category, by education, and by paygrade. Ordered logistic regression analysis demonstrates that ***males compared to females, blacks compared to whites, and enlisted compared to officers require significantly more CTV of periodontal treatment. Also, required CTV of periodontal treatment increases as age increases and decreases as educational level increases.***

Table 7.3 also shows a difference between the mean (16.5) and median (9.6) number of periodontal CTV needed among all active duty personnel. This difference is due to an increase in the mean caused by a small number of individuals requiring a large amount of periodontal treatment. One half of all individuals require periodontal treatment representing 9.6 or fewer CTV. Figure 7.3 shows the percentage distribution of active duty personnel requiring periodontal treatment by specified CTV range. ***While 6.0% of individuals require more than 50 periodontal CTV, 51.3% require 10 or fewer periodontal CTV of treatment, including 8.7% who require no periodontal treatment.***

PERCENT OF INDIVIDUALS IN EACH PERIODONTAL CTV RANGE

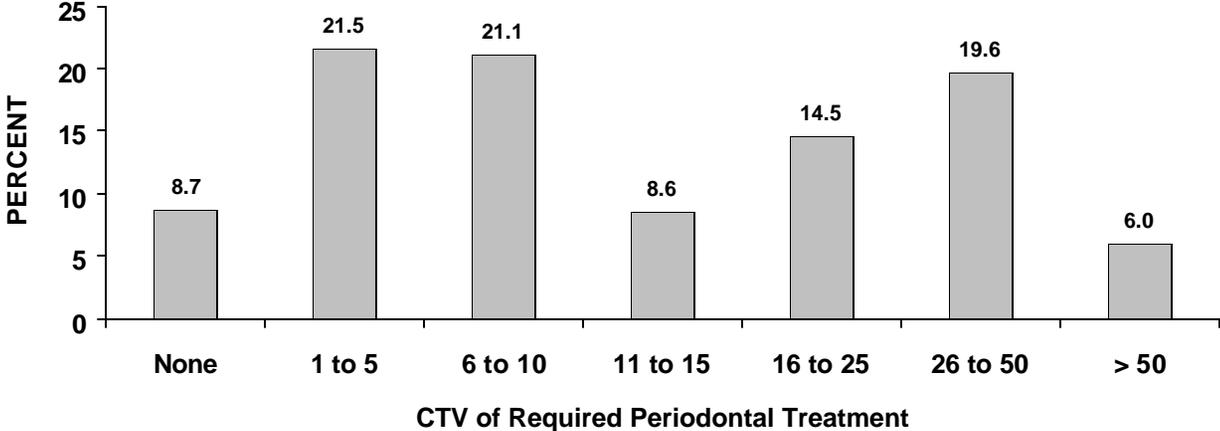


Figure 7.3

Table 7.3

PERCENT DISTRIBUTION OF PERIODONTAL COMPOSITE TIME VALUES (CTV)										
	Estimated Population	Percent in Each CTV Category							Mean Perio. CTV	Median Perio. CTV
		None	1-5	6-10	11-15	16-25	26-50	> 50		
Gender										
Male	1,520,248	8.0	24.0	19.2	8.5	15.7	18.3	6.3	17.0	10
Female	179,414	15.2	30.5	17.0	7.8	13.4	13.6	2.5	12.0	6
Race										
White	1,273,796	9.0	26.8	19.4	8.6	14.5	16.8	4.9	15.2	7.6
Black	326,328	7.3	17.1	17.6	7.9	18.9	21.3	9.9	21.0	15.6
Hispanic	64,518	7.4	23.0	18.0	8.6	17.3	19.7	6.0	17.5	11.6
Asian	20,570	12.5	19.0	18.6	6.3	14.7	20.0	8.9	18.1	10.4
Other	14,450	14.0	19.0	16.3	9.8	12.6	20.2	8.1	19.8	11.2
Age Category										
18 - 19 years	42,048	8.1	33.8	26.7	7.7	13.8	8.9	1.0	10.4	6.8
20 - 24 years	587,359	7.8	28.7	21.3	9.0	15.3	15.9	2.0	13.1	7.2
25 - 29 years	420,366	9.2	25.1	19.0	7.5	15.9	18.8	4.5	15.5	8.8
30 - 34 years	312,028	8.9	22.5	17.5	8.3	15.1	20.2	7.5	18.1	10.8
35 - 39 years	210,497	8.1	19.0	16.0	8.4	16.8	19.9	11.8	22.2	14.4
40 - 44 years	95,699	11.2	15.8	14.4	10.5	13.8	18.7	15.6	24.4	14
> 44 years	31,655	15.4	17.5	13.0	8.7	14.2	13.3	17.9	24.7	12
Education										
No College	658,519	6.3	22.3	19.7	9.0	16.9	19.7	6.1	17.7	11.6
Some College	708,713	8.6	25.0	18.1	7.9	15.2	18.6	6.6	17.1	9.6
College Graduate	217,546	14.0	26.7	19.2	7.6	13.6	14.3	4.6	14.1	7.2
Beyond College	114,884	13.8	32.0	20.3	10.4	12.1	8.9	2.5	10.9	6
Paygrade										
E1 - E4	773,974	7.5	26.9	20.9	8.7	15.6	17.3	3.1	14.3	7.2
E5 - E6	533,446	7.5	19.7	16.8	8.6	17.3	21.2	8.9	20.0	13.6
E7 - E9	178,304	9.0	17.8	16.2	7.2	14.8	20.3	14.7	24.1	15.2
O1 - O3	161,065	16.5	36.8	19.9	6.5	9.1	9.9	1.3	9.2	4.8
O4 - O7	52,873	13.8	27.9	19.1	14.1	15.4	8.0	1.7	11.0	7.2
All Active Duty										
	1,699,662	8.7	21.5	21.1	8.6	14.5	19.6	6.0	16.5	9.6
95% Confidence Interval (+ %)		0.6	0.8	0.9	0.6	0.7	0.8	0.5	[16.1-16.9]	

5. DoD Dental Classification Based Only on Periodontal Treatment Needs

During the periodontal examination, the DoD dental classification, **based only on periodontal treatment needs**, was recorded for all dentition sextants of each individual examined. Figure 7.4 shows that only **14.8 percent of individuals are class 1 for periodontal reasons while 79.9 percent are class 2 and 5.3 percent are class 3**. Table 7.4 gives the periodontal DoD dental classification stratified by gender, by race, by age category, by education, and by paygrade.

Concerning the likelihood of being periodontal dental class 3, logistic regression finds: males are more likely than females; blacks and Hispanics are more likely than whites; and enlisted are more likely than officers. Also, the likelihood of being periodontal dental class 3 increases as age increases and decreases with increasing level of education.

Percent Distribution of Periodontal DoD Dental Classification

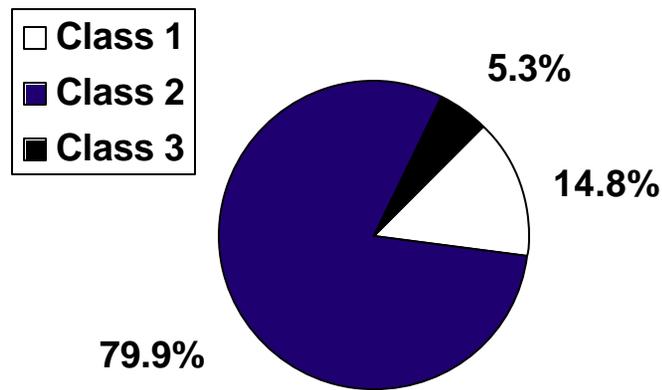


Figure 7.4

Table 7.4

**PERCENT DISTRIBUTION OF DOD DENTAL CLASSIFICATION
BASED ONLY ON PERIODONTAL TREATMENT NEEDS**

	Estimated Population	DoD Dental Class		
		1	2	3
Gender				
Male	1,520,248	13.6	80.8	5.6
Female	179,414	24.8	72.1	3.1
Race				
White	1,273,796	15.1	80.5	4.4
Black	326,328	12.9	78.4	8.7
Hispanic	64,518	13.7	80.2	6.1
Asian	20,570	21.8	72.0	6.2
Other	14,450	19.3	74.4	6.3
Age Category				
18 - 19 years	42,048	11.1	87.1	1.8
20 - 24 years	587,359	12.9	83.4	3.7
25 - 29 years	420,366	16.0	79.6	4.4
30 - 34 years	312,028	15.5	78.6	5.9
35 - 39 years	210,497	14.9	78.1	7.0
40 - 44 years	95,699	18.1	70.0	11.9
>44 years	31,655	21.2	63.0	15.8
Education				
No College	658,519	11.4	82.1	6.5
Some College	708,713	14.4	80.2	5.4
College Graduate	217,546	22.3	74.9	2.8
Beyond College	114,884	22.5	74.9	2.6
Paygrade				
E1 - E4	773,974	12.3	83.3	4.4
E5 - E6	533,446	14.0	79.2	6.8
E7 - E9	178,304	14.4	76.2	9.4
O1 - O3	161,065	26.3	72.3	1.4
O4 - O7	52,873	23.5	73.3	3.2
All Active Duty	1,699,662	14.8	79.9	5.3
95% Confidence Interval (± %)		0.6	0.8	0.4

Figure 7.5 shows that, ***among individuals in periodontal DoD dental class 3***, a mean of 2.5 sextants are in class 3 condition, 3.2 sextants are in class 2 condition, and 0.3 are in class 1 condition.

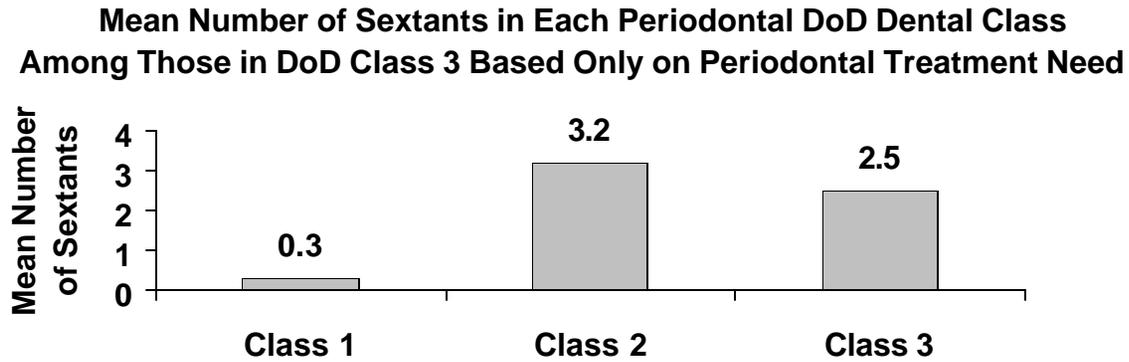


Figure 7.5

Figure 7.6 shows that, ***among individuals in periodontal DoD dental class 2***, a mean of 4.6 sextants are in class 2 condition and 1.4 are class 1 condition.

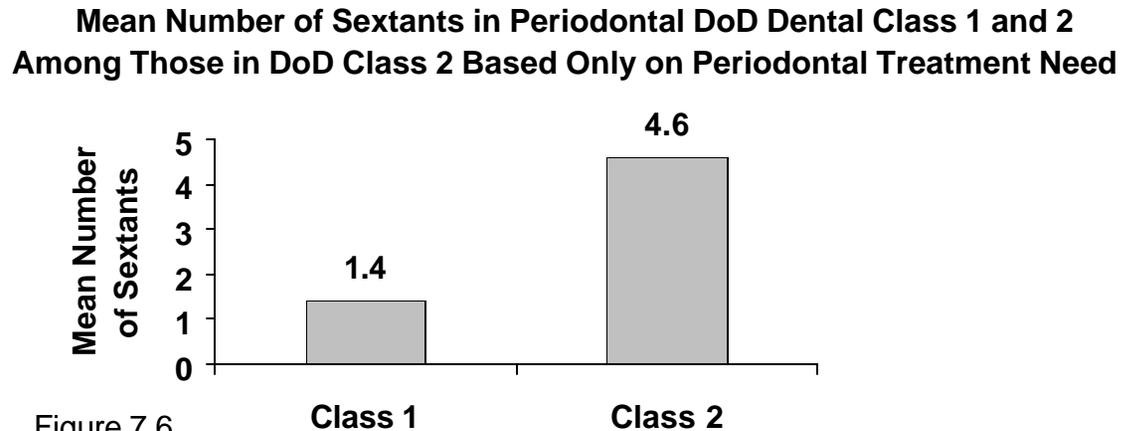


Figure 7.6

8. PROSTHODONTIC TREATMENT NEEDS

Prosthodontic Treatment Needs (ProsTN) and Dental Classification based on ProsTN

1. Method of Prosthodontic Data Collection

Survey examiners assessed the number of missing teeth and/or teeth requiring removal for each patient and determined whether or not to replace missing teeth using fixed or removable prostheses. Current use of partial or complete removable prostheses was assessed along with the need for their replacement or repair.

2. Removable Prosthodontic Treatment Needs for the Total Active Duty Population

Less than one-half percent of active duty service members are completely edentulous or require full-mouth extractions, therefore the ***need for complete denture treatment is almost non-existent in this population.***

Figure 8.1 on the facing page illustrates the number of missing teeth per person (excluding third molars) seen in the active duty population. Nearly three-quarters of active duty personnel have no missing teeth, 11.0% have only one missing tooth, and 15.1% have 2 or more missing teeth. Table 8.1 shows that 1.3% of active duty members need a maxillary removable partial denture (RPD) and 2% need a mandibular RPD. ***Of those who need RPDs, about one-in-ten need both maxillary and mandibular RPDs.*** Logistic regression analysis shows the following statistically significant differences ***in the likelihood of needing an RPD: Asians and blacks are more likely than whites; senior enlisted (E7-E9) are more likely than all other paygrades; and after remaining flat from 18-29 years of age, the likelihood of needing an RPD increases as age increases.***

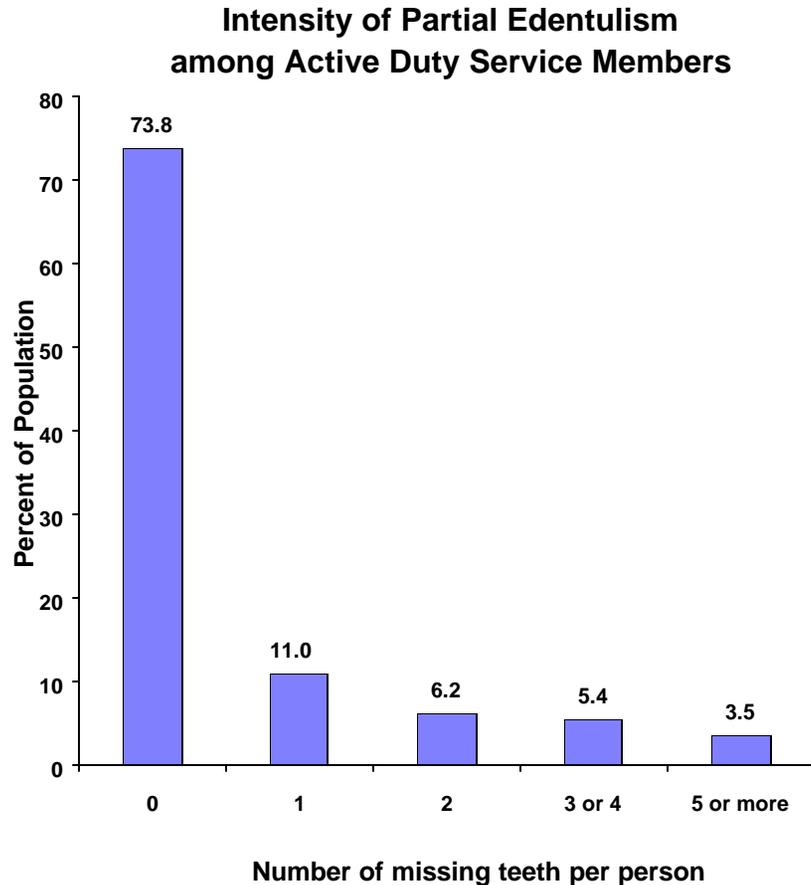


Figure 8.1

Number of missing teeth per person
(excluding third molars)

Table 8.1

DISTRIBUTION OF REMOVABLE PROSTHODONTIC TREATMENT NEEDS			
	Estimated Population	% Needing RPDs	
		Maxillary	Mandibular
Gender			
Male	1,520,248	1.3	2.0
Female	179,414	1.3	2.1
Race			
White	1,273,796	0.8	1.2
Black	326,328	3.1	4.6
Hispanic	64,518	0.7	2.5
Asian	20,570	6.4	11.1
Other	14,450	1.8	3.0
Age Category			
18 - 19 years	42,048	0.0	0.7
20 - 24 years	587,359	0.3	0.4
25 - 29 years	420,366	0.7	1.1
30 - 34 years	312,028	1.7	2.2
35 - 39 years	210,497	2.8	4.9
40 - 44 years	95,699	4.8	6.6
>44 years	31,665	5.5	12.4
Education			
No College	658,519	1.0	1.7
Some College	707,713	1.7	2.3
College Graduate	217,546	1.2	2.4
Beyond College	114,884	0.7	1.3
Paygrade			
E1 - E4	773,974	0.6	0.8
E5 - E6	533,446	2.0	3.0
E7 - E9	178,304	3.2	6.0
O1 - O3	161,065	0.3	0.7
O4 - O7	52,873	0.1	1.0
All Active Duty			
	1,699,662	1.3	2.0
95% Confidence Interval (± %)		0.3	0.3

3. Fixed Prosthodontic Treatment Needs for the Total Active Duty Population

Table 8.2 details the intensity of fixed prosthodontic (FP) treatment needs for all active duty personnel stratified by gender, by race, by age category, by education level, and by paygrade. Figure 8.2 shows that 78.9% of all active duty personnel have no FP needs; 9.6% need one or two units; and 11.5% need three or more units of FP. The mean number of fixed units needed is 0.71 and the median is 0.

Ordered logistic regression analysis finds the following groups ***need significantly more fixed crown and bridge units: all races compared to whites; non-college graduates compared to college graduates; and enlisted compared to officers. The number crown and bridge units needed tends to increase as age increases.***

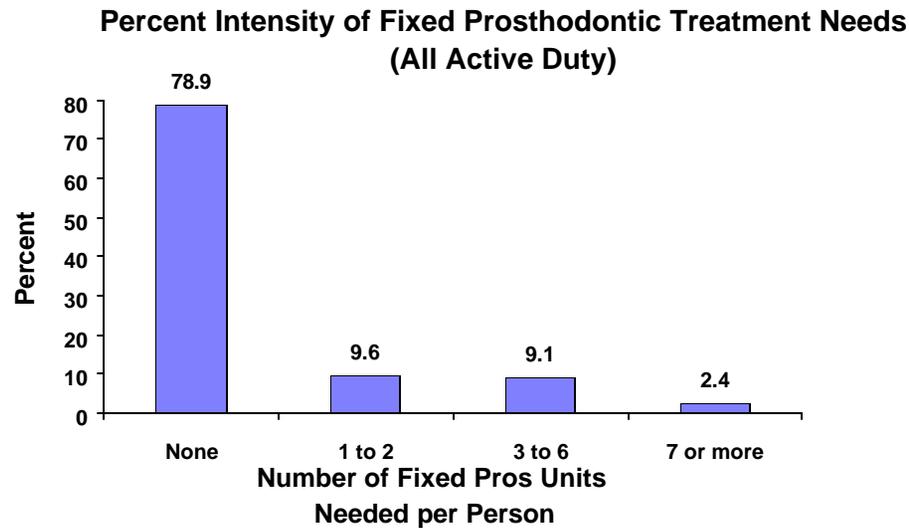


Figure 8.2

Table 8.2

PERCENT, MEAN, AND MEDIAN INTENSITY OF FIXED PROSTHODONTIC TREATMENT NEEDS (FOR ALL ACTIVE DUTY)							
	Estimated Population	% Needing Given # of Fixed Units				Mean # of Fixed Units Needed	Median # of Fixed Units Needed
		None	1 to 2	3 to 6	7 +		
Gender							
Male	1,520,248	79.1	9.6	9.0	2.3	0.69	0
Female	179,414	77.3	9.8	9.8	3.1	0.82	0
Race							
White	1,273,796	81.7	9.3	7.1	1.9	0.58	0
Black	326,328	69.6	10.4	16.0	4.0	1.15	0
Hispanic	64,518	75.1	9.8	12.3	2.8	0.85	0
Asian	20,570	66.3	10.3	17.6	5.8	1.43	0
Other	14,450	74.5	11.4	10.6	3.5	0.87	0
Age Category							
18 - 19 years	42,048	89.4	6.3	3.8	0.5	0.25	0
20 - 24 years	587,359	84.8	7.7	6.5	1.0	0.44	0
25 - 29 years	420,366	79.6	9.6	9.2	1.6	0.63	0
30 - 34 years	312,028	75.2	10.9	10.4	3.5	0.87	0
35 - 39 years	210,497	70.3	12.4	12.2	5.1	1.17	0
40 - 44 years	95,699	69.1	11.6	15.3	4.0	1.15	0
>44 years	31,665	67.9	12.6	12.6	6.9	1.42	0
Education							
No College	658,519	79.6	9.1	9.2	2.1	0.67	0
Some College	707,713	76.1	10.7	10.2	3.0	0.83	0
College Graduate	217,546	82.5	7.9	7.7	1.9	0.60	0
Beyond College	114,884	85.4	8.8	4.9	0.9	0.40	0
Paygrade							
E1 - E4	773,974	82.0	8.7	7.7	1.6	0.56	0
E5 - E6	533,446	74.4	11.1	11.4	3.1	0.89	0
E7 - E9	178,304	68.4	11.7	14.4	5.5	1.27	0
O1 - O3	161,065	89.6	6.1	3.8	0.5	0.26	0
O4 - O7	52,873	81.2	10.9	5.8	2.1	0.57	0
All Active Duty	1,699,662	78.9	9.6	9.1	2.4	0.71	0
95% Confidence Interval (\pm %)		.8	0.6	0.6	0.3	[0.67-0.75]	

4. Fixed Prosthodontic Treatment Needs Among Those Needing Fixed Prosthodontic Care

Table 8.3 and Figure 8.3 detail the intensity of fixed prosthodontic (FP) treatment needs **among active duty personnel who need FP care**. Of those needing FP care, 45.5% need one or two units, 43.2% need three to

six units, and 11.3% need seven or more units of fixed prostheses. The mean number of fixed units needed is 3.36 and the median is 3.

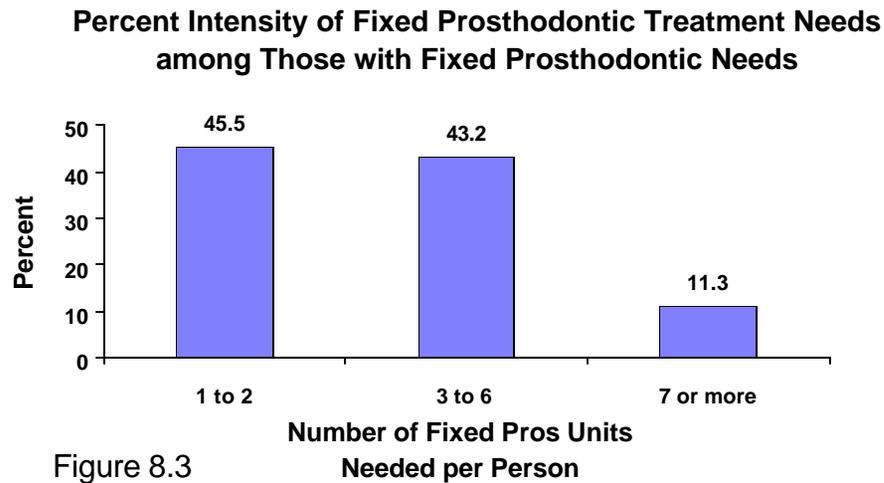


Table 8.3

PERCENT, MEAN, AND MEDIAN INTENSITY OF FIXED PROSTHODONTIC TREATMENT NEEDS (AMONG THOSE NEEDING FIXED PROSTHODONTIC CARE)						
	Estimated Population	% Needing Given # of Fixed Units			Mean # of Fixed Units Needed	Median # of Fixed Units Needed
		1 to 2	3 to 6	7 +		
Gender						
Male	316,903	45.8	43.2	11.0	3.33	3
Female	40,536	43.1	43.2	13.7	3.62	3
Race						
White	232,033	51.1	38.6	10.3	3.16	2
Black	98,893	34.5	52.5	13.0	3.78	3
Hispanic	15,969	39.3	49.3	11.4	3.40	3
Asian	6,877	30.6	52.2	17.2	4.24	3
Other	3,667	44.7	41.5	13.8	3.41	3
Age Category						
18 - 19 years	4,430	59.6	35.4	5.0	2.36	2
20 - 24 years	88,780	50.6	42.6	6.8	2.91	2
25 - 29 years	85,365	47.0	45.2	7.8	3.11	3
30 - 34 years	77,052	44.1	42.0	13.9	3.49	3
35 - 39 years	62,345	41.8	41.0	17.2	3.92	3
40 - 44 years	29,370	37.5	49.6	12.9	3.74	3
>44 years	10,097	39.2	39.4	21.4	4.43	3
Education						
No College	133,879	44.9	45.0	10.1	3.28	3
Some College	168,934	44.7	42.6	12.8	3.48	3
College Graduate	37,941	44.9	44.2	11.0	3.43	3
Beyond College	16,685	60.4	33.2	6.4	2.72	2
Paygrade						
E1 - E4	138,719	48.4	42.8	8.8	3.10	3
E5 - E6	136,070	43.5	44.4	12.1	3.49	3
E7 - E9	56,045	37.1	45.6	17.3	4.01	3
O1 - O3	16,754	59.0	36.0	5.0	2.53	2
O4 - O7	9,851	58.1	30.9	11.0	3.06	2
Active Duty w/ Fixed Pros Tx Needs						
	357,439	45.5	43.2	11.3	3.36	3
95% Confidence Interval (± %)		2.1	2.1	1.4	[3.24-3.48]	

5. Composite Time Values for Prosthodontic Treatment Needs

Appendix A provides the calculation of CTV for each dental procedure. Table 8.4 on the facing page shows the demographic details of prosthodontic CTV distribution. For all active duty personnel, the mean number of CTV needed for prosthodontic care is 11.9 and the median is 0. As shown by Figure 8.4 below, **over three-quarters of individuals need no prosthodontic treatment and another 11.4% need fewer than 41 CTV** (no more than 1 unit of removable or 3 units of fixed prosthodontics). The remaining 11.1% need 41 to 545 CTV (corresponding to multiple units of fixed and/or removable prosthodontics).

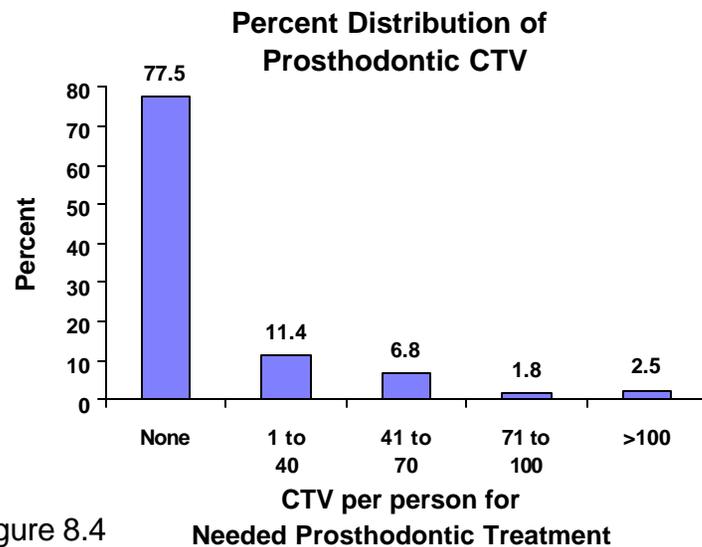


Figure 8.4

The prosthodontic workload is heavily concentrated in a small portion of the population. As Figure 8.5 depicts, the 11.4% of individuals who need 1 to 40 CTV require 23.1% of the total amount of prosthodontic care; 6.8% of individuals who need 41 to 70 CTV require 30.6% of the total amount of prosthodontic treatment; and 4.3% of individuals who need over 70 CTV require 46.3% of total prosthodontic treatment. Thus, **the 11.1% of active duty personnel with greatest prosthodontic treatment needs account for more than three-quarters (76.9%) of the total amount of prosthodontic care needed by the entire active duty population.**

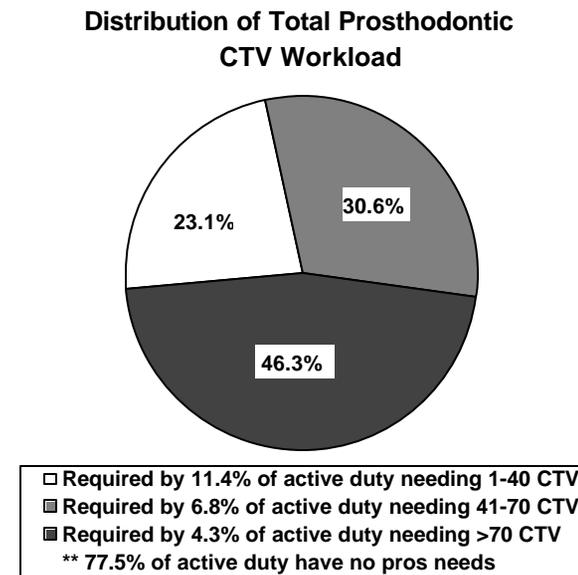


Figure 8.5

Table 8.4

PERCENT DISTRIBUTION OF PROSTHODONTIC COMPOSITE TIME VALUES (CTV) (All Active Duty)								
	Estimated Population	Percent in Each CTV Category					Mean Pros. CTV	Median Pros. CTV
		None	1-40	41-70	71-100	>100		
Gender								
Male	1,520,248	77.7	11.4	6.7	1.8	2.4	11.7	0.0
Female	179,414	76.0	11.3	7.1	2.0	3.6	13.6	0.0
Race								
White	1,273,796	80.8	10.2	5.3	1.5	2.2	10.1	0.0
Black	326,328	66.6	15.5	11.6	2.7	3.6	17.9	0.0
Hispanic	64,518	74.3	12.4	9.0	2.3	2.0	13.1	0.0
Asian	20,570	57.0	20.5	13.9	3.4	5.2	23.5	0.0
Other	14,450	71.1	11.8	10.9	3.0	3.2	15.1	0.0
Age Category								
18 - 19 years	42,048	89.0	8.4	2.1	0.0	0.5	4.3	0.0
20 - 24 years	587,359	84.7	9.2	4.3	0.7	1.1	7.0	0.0
25 - 29 years	420,366	78.9	11.6	6.1	1.7	1.7	10.2	0.0
30 - 34 years	312,028	74.0	12.2	7.8	2.4	3.6	14.2	0.0
35 - 39 years	210,497	66.8	14.1	10.7	3.3	5.1	20.3	0.0
40 - 44 years	95,699	63.5	15.5	12.3	3.8	4.9	21.9	0.0
>44 years	31,665	56.6	16.7	14.9	4.1	7.7	27.6	0.0
Education								
No College	658,519	78.6	11.1	6.6	1.8	1.9	11.0	0.0
Some College	707,713	74.3	12.8	7.4	2.2	3.3	14.0	0.0
College Graduate	217,546	81.0	9.3	6.0	1.2	2.5	10.5	0.0
Beyond College	114,884	84.1	9.1	4.8	0.5	1.5	7.4	0.0
Paygrade								
E1 - E4	773,974	81.5	10.4	5.3	1.1	1.7	9.0	0.0
E5 - E6	533,446	72.5	13.1	8.3	2.7	3.4	15.2	0.0
E7 - E9	178,304	63.4	14.7	12.7	3.7	5.5	22.1	0.0
O1 - O3	161,065	89.1	6.8	3.1	0.4	0.6	4.4	0.0
O4 - O7	52,873	80.5	12.5	3.9	0.4	2.7	10.5	0.0
All Active Duty	1,699,662	77.5	11.4	6.8	1.8	2.5	11.9	0.0
95% Confidence Interval (\pm %)		0.8	0.6	0.5	0.1	0.2	[11.3-12.5]	

9. ENDODONTIC TREATMENT NEEDS

Endodontic Treatment Needs (ETN) and Dental Classification based on ETN

1. Method of Endodontic Data Collection

Survey examiners assessed the potential need for endodontic therapy using radiographs and visual inspection. Definitive vitality testing for all teeth was beyond the scope of this survey. However, if the examiner believed a tooth would require endodontic care following extensive restorative procedures, it was counted as needing endodontia. (It should be remembered that a large portion of overall endodontic treatment needs likely arise over time, diagnosed as acute problems, rather than occurring passively and being diagnosed on surveys such as this).

Table 9.1 and Figure 9.1 detail the intensity of endodontic treatment needs for all active duty personnel. **Among all individuals, 96.8% have no current need for endodontic therapy**, 2.7% need one tooth treated endodontically, and 0.5% have two or more teeth in need of endodontic therapy. The mean number of endodontia needed is 0.04, and the median is 0. Using logistic regression analysis, statistically significant differences in likelihood of needing endodontic care are as follows: **blacks and the race category designated as “other” are more likely than whites and enlisted personnel are more likely than officers.**

2. Endodontic Treatment Needs

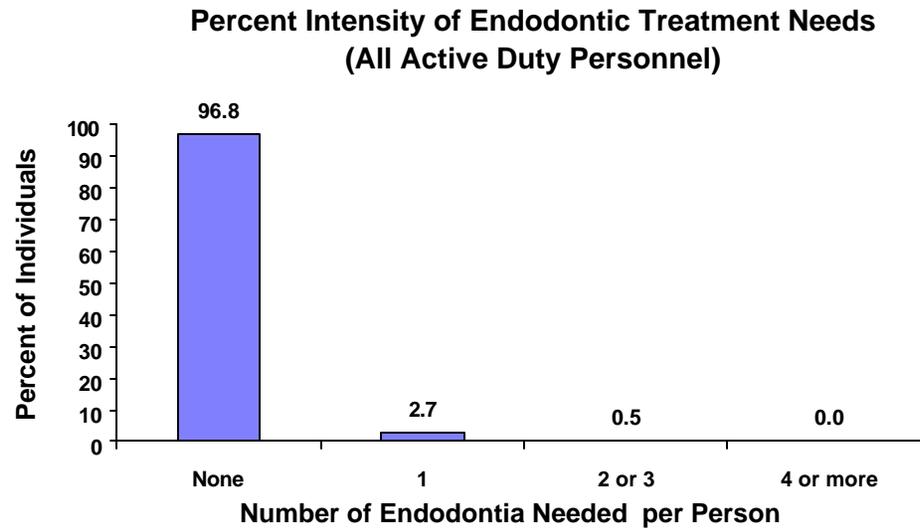


Figure 9.1

Table 9.1

PERCENT AND MEAN INTENSITY OF ENDODONTIC TREATMENT NEEDS						
	Estimated Population	% Needing this Number of Endo.				Mean Number of Endo. Needed
		None	1	2 or 3	4 +	
Gender						
Male	1,520,248	96.7	2.8	0.5	0.0	0.04
Female	179,414	97.3	2.1	0.6	0.0	0.03
Race						
White	1,273,796	97.1	2.4	0.5	0.0	0.04
Black	326,328	95.5	3.8	0.7	0.0	0.05
Hispanic	64,518	97.4	2.2	0.4	0.0	0.03
Asian	20,570	97.5	2.3	0.2	0.0	0.03
Other	14,450	91.8	7.2	1.0	0.0	0.09
Age Category						
18 - 19 years	42,048	96.9	3.1	0.0	0.0	0.03
20 - 24 years	587,359	96.7	2.8	0.5	0.0	0.04
25 - 29 years	420,366	97.1	2.5	0.4	0.0	0.04
30 - 34 years	312,028	96.9	2.4	0.6	0.1	0.04
35 - 39 years	210,497	96.6	2.9	0.4	0.1	0.04
40 - 44 years	95,699	95.8	3.7	0.5	0.0	0.05
> 44 years	31,665	98.3	1.5	0.2	0.0	0.02
Education						
No College	658,519	96.4	3.1	0.5	0.0	0.04
Some College	708,713	96.7	2.7	0.6	0.0	0.04
College Graduate	217,546	97.5	2.0	0.5	0.0	0.03
Beyond College	114,884	98.5	1.4	0.1	0.0	0.02
Paygrade						
E1 - E4	773,974	96.7	2.7	0.6	0.0	0.04
E5 - E6	533,446	96.5	2.9	0.6	0.0	0.04
E7 - E8	178,304	95.8	3.6	0.6	0.0	0.05
O1 - O3	161,065	98.6	1.2	0.2	0.0	0.02
O4 - O7	52,873	99.1	0.9	0.0	0.0	0.01
All Active Duty						
	1,699,662	96.8	2.7	0.5	0.0	0.04
95% Confidence Interval (\pm %)		0.4	0.3	0.1	0.0	[0.03-0.05]

3. Endodontic Treatment Needs Among Those Needing Endodontic Care

Table 9.2 and Figures 9.2 and 9.3 detail the intensity of endodontic treatment needs among individuals **who need endodontic care**. Of this group (3.2% of the total population), 26.2% need at least one anterior tooth treated endodontically, 16.8% need at least one premolar treated, and 62.4% need at least one molar treated. The mean number of anterior teeth requiring endodontia per person is 0.32 (indicating about 1 in 3 persons who need endodontic

treatment have anterior tooth involvement). The mean is 0.18 premolars per person (indicating about 1 in 5 people who need endodontic treatment have premolars involved). Molars are the most frequently involved teeth, with nearly three-quarters (mean=0.71) of those who need endodontic care requiring molar endodontia. **The mean number of involved teeth per person requiring endodontic care is 1.21.**

**Distribution of Type of Endodontic Treatment Needs
(Among Those Needing Endodontic Care)**

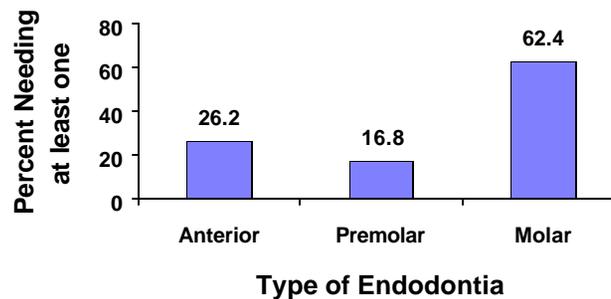


Figure 9.2

**Intensity of Endodontic Treatment Needs
(Among Those Needing Endodontic Care)**

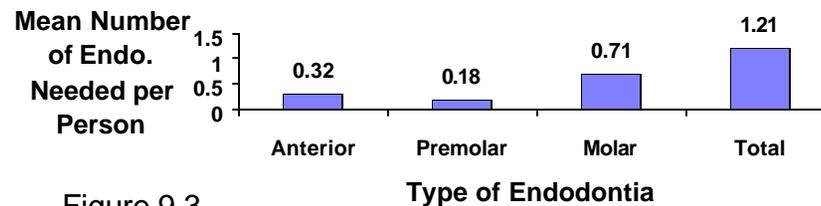


Figure 9.3

Table 9.2

DISTRIBUTION OF ENDODONTIC TREATMENT NEEDS (AMONG THOSE NEEDING ENDODONTIC CARE)								
	Estimated Population	% Needing at Least One			Mean Number of Endo. Needed			
		Anterior	Premolar	Molar	Anterior	Premolar	Molar	Total
Gender								
Male	49,975	27.6	15.7	62.3	0.33	0.17	0.71	1.21
Female	4,839	11.7	28.4	63.8	0.19	0.29	0.75	1.23
Race								
White	36,756	31.3	15.8	58.5	0.38	0.17	0.68	1.23
Black	14,675	16.3	17.3	70.5	0.20	0.19	0.80	1.19
Hispanic	1,701	25.3	8.2	74.7	0.30	0.08	0.82	1.20
Asian	509	7.9	27.0	73.0	0.08	0.27	0.73	1.08
Other	1,173	0.0	49.6	62.1	0.00	0.50	0.62	1.12
Age Category								
18 - 19 years	1,318	29.1	7.4	63.5	0.29	0.08	0.63	1.00
20 -24 years	19,552	20.2	20.0	66.4	0.24	0.23	0.76	1.23
25 - 29 years	12,396	32.5	15.4	58.3	0.38	0.16	0.67	1.21
30 - 34 years	9,745	28.5	16.3	60.0	0.39	0.16	0.72	1.27
35 - 39 years	7,213	29.9	11.8	63.2	0.37	0.12	0.71	1.20
40 - 44 years	4,055	23.2	18.2	60.6	0.25	0.23	0.66	1.14
>44 years	535	19.6	23.4	57.1	0.19	0.23	0.69	1.11
Education								
No College	24,088	23.4	16.6	66.3	0.28	0.19	0.75	1.22
Some College	23,510	25.8	18.1	61.2	0.32	0.20	0.70	1.22
College Graduate	5,515	39.1	13.6	51.2	0.50	0.14	0.61	1.25
Beyond College	1,701	27.7	11.7	60.6	0.28	0.12	0.68	1.08
Paygrade								
E1 - E4	25,779	25.0	19.3	62.9	0.30	0.21	0.71	1.22
E5 - E6	18,708	27.8	16.0	60.0	0.33	0.17	0.69	1.19
E7 - E9	7,582	28.4	14.4	62.6	0.37	0.16	0.69	1.22
O1 - O3	2,291	21.9	5.5	72.6	0.22	0.06	0.90	1.18
O4 - O7	454	10.7	8.7	80.6	0.11	0.09	0.81	1.01
All Active Duty	54,814	26.2	16.8	62.4	0.32	0.18	0.71	1.21
95% Confidence Interval (± %)		4.4	3.6	4.8	[.26-.37]	[.14-.22]	[.65-.77]	[1.16-1.26]

4. Distribution of DoD Dental Classification Based Only on Endodontic Treatment Needs

Assuming any tooth identified as needing endodontic therapy has the potential for an acute flare-up at any time, all patients with endodontic treatment need

(3.2 percent of the population) were automatically classified in dental class 3 status.

5. Composite Time Values for Endodontic Treatment Needs

Appendix A shows CTV calculations for dental procedures. For the entire population, the mean CTV needed for endodontic treatment is 0.61 [ci: 0.54-0.67] and the median is 0. For those who have treatment need, the mean CTV required is 18.8 [ci: 18.0-19.6] and the median is 16.1, which corresponds to treatment for one tooth. CTV counts cluster relative to the number of teeth needing treatment.

Figure 9.4 illustrates that 67.5% of the total endodontic CTV requirements are due to one tooth per person needing care, 20.1% of the total relate to 2 teeth per person needing care, 8.3% and 4.1% of total CTV requirements are needed for treating 3 and 4+ teeth per person, respectively.

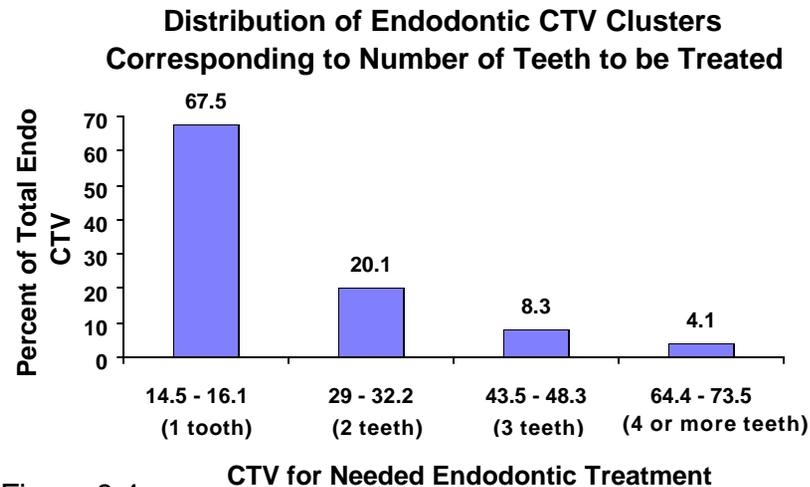


Figure 9.4

6. Distribution of Teeth Requiring Endodontic Therapy

As illustrated in Figure 9.5, the distribution of type of teeth diagnosed to need endodontic treatment is as follows: anterior - 24.8%, [\pm 3.8%]; premolar - 15.9%, [\pm 3.2%]; and molar - 59.3%, [\pm 4.4%].

Distribution of Type of Teeth Needing Endodontic Care

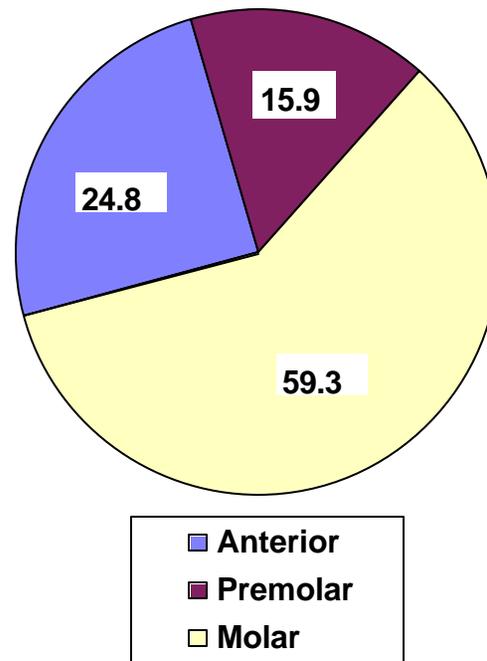


Figure 9.5

10. DENTAL UTILIZATION

Dental Utilization of Active Duty Military Personnel

Dental utilization by active duty military personnel was assessed using a self-administered questionnaire. To enable valid comparisons of active duty personnel with their employed civilian cohorts, many questions were identical in wording to those used on the National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-1986 (NIDR, 1987). In all tables, point estimates are presented along with 95% confidence intervals so that statistically significant differences between any two values within the table or between tables can be readily determined. Due to variation in the size of subgroups in the sample, some estimates have wider confidence intervals than others.

Figure 10.1 and Table 10.1 show time since last dental visit for all active duty personnel. **Nearly all (99.2%) have seen a dentist within the past two years.** Table 10.1 also presents bivariate results of time since last dental visit across gender, race, age group, education level, paygrade, and DoD dental fitness classification.

Logistic regression results show only two factors significantly affect the **likelihood of having seen a dentist within the past year: perceiving a need for dental care decreases the likelihood 0.7 times, and compared to active duty personnel in DoD dental class 1, those in class 2 and class 3 are 0.6 and 0.5 times, respectively, less likely to have seen a dentist within the past year.**

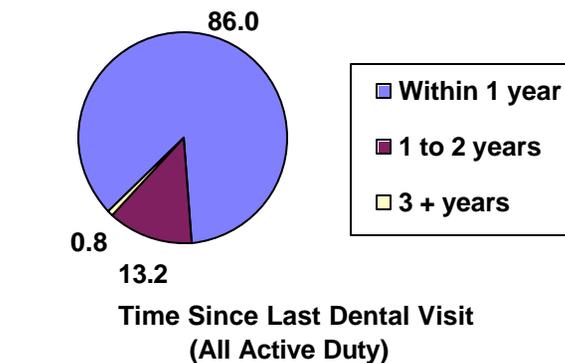


Figure 10.1

Table 10.1

**PERCENT DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT
(FOR ALL ACTIVE DUTY)**

	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
Gender									
Male	1,508,996	85.7	± 1.3	13.5	± 1.2	0.8	± 0.2	0.0	0.0
Female	177,262	88.2	+ 2.3	10.8	+ 2.1	1.0	+ 0.8	0.0	0.0
Race									
White	1,264,164	86.2	± 1.3	13.0	± 1.2	0.8	± 0.3	0.0	0.0
Black	323,269	85.2	+ 1.9	13.7	+ 1.8	1.0	+ 0.5	0.0	0.0
Other	98,825	86.3	± 3.3	13.0	± 3.2	0.7	± 0.5	0.0	0.0
Age									
18 - 19 years	41,827	82.4	+ 5.9	16.6	+ 5.8	1.0	+ 1.4	0.0	0.0
20 - 24 years	583,040	85.6	± 1.7	13.4	± 1.5	1.0	± 0.4	0.0	0.0
25 - 29 years	417,754	86.1	+ 1.7	13.1	+ 1.7	0.8	+ 0.4	0.0	0.0
30 - 34 years	309,524	85.7	± 2.1	13.8	± 2.1	0.5	± 0.4	0.0	0.0
35 - 39 years	207,809	86.5	± 2.5	12.6	± 2.4	0.9	± 0.6	0.0	0.0
40 - 44 years	94,861	88.2	+ 2.6	10.8	+ 2.8	1.0	+ 0.9	0.0	0.0
45 - 49 years	31,443	88.6	± 4.9	11.4	± 4.9	0.0	0.0	0.0	0.0
Education									
No College	654,729	83.9	+ 2.1	15.1	+ 1.9	1.0	+ 0.4	0.0	0.0
Some College	702,759	87.1	± 1.3	12.1	± 1.2	0.8	± 0.3	0.0	0.0
College Graduate	215,616	87.8	± 1.9	11.6	± 1.9	0.6	± 0.4	0.0	0.0
Beyond College	113,154	87.5	+ 4.1	11.8	+ 4.2	0.7	+ 0.9	0.0	0.0
Paygrade									
E1 - E4	768,742	85.4	± 1.6	13.7	± 1.5	0.9	± 0.4	0.0	0.0
E5 - E6	529,846	85.6	+ 2.1	13.6	+ 2.1	0.8	+ 0.4	0.0	0.0
E7 - E9	176,939	87.7	± 1.9	11.4	± 1.8	0.9	± 0.7	0.0	0.0
O1 - O3	158,980	87.8	± 2.9	11.6	± 3.1	0.6	± 0.7	0.0	0.0
O4 - O7	51,751	88.0	+ 4.3	11.9	+ 4.4	0.1	+ 0.2	0.0	0.0
DoD Dental Class									
1	127,027	91.3	+ 2.3	7.9	+ 2.2	0.8	+ 0.8	0.0	0.0
2	1,314,281	86.1	+ 1.6	13.1	+ 1.5	0.8	+ 0.6	0.0	0.0
3	244,950	82.4	± 1.6	16.4	± 1.5	1.2	± 0.5	0.0	0.0
All Active Duty	1,686,258	86.0	± 1.3	13.1	± 1.2	0.8	± 0.2	0.0	0.0

Tables 10.2-10.6 show time since last dental visit across age groups, holding gender and race constant. Where available, comparison data from the National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-86 (NIDR, 1987) is provided. Figure 10.2 shows an overall comparison of dental utilization between active duty personnel and their employed civilian cohorts. This comparison is based on black and white races only because no data are available for non-black, non-white civilians. Furthermore, overall civilian figures were adjusted to match the race, gender, and age composition of the active duty military so that valid comparisons between the populations could be made. Adjustment was necessary

because, while over three-quarters of the military population falls between 20 and 34 years of age, roughly half of the employed civilian population does. Furthermore, while only 7.5% of the military population falls between 40 and 49 years of age, nearly one-quarter of the employed civilian population does. Likewise, the two populations differ in racial and gender composition. **Active duty military personnel are more likely to have visited a dentist within the past year than their civilian cohorts.** Graphical presentations of the data should be viewed with caution because they exclude variances of the estimated values.

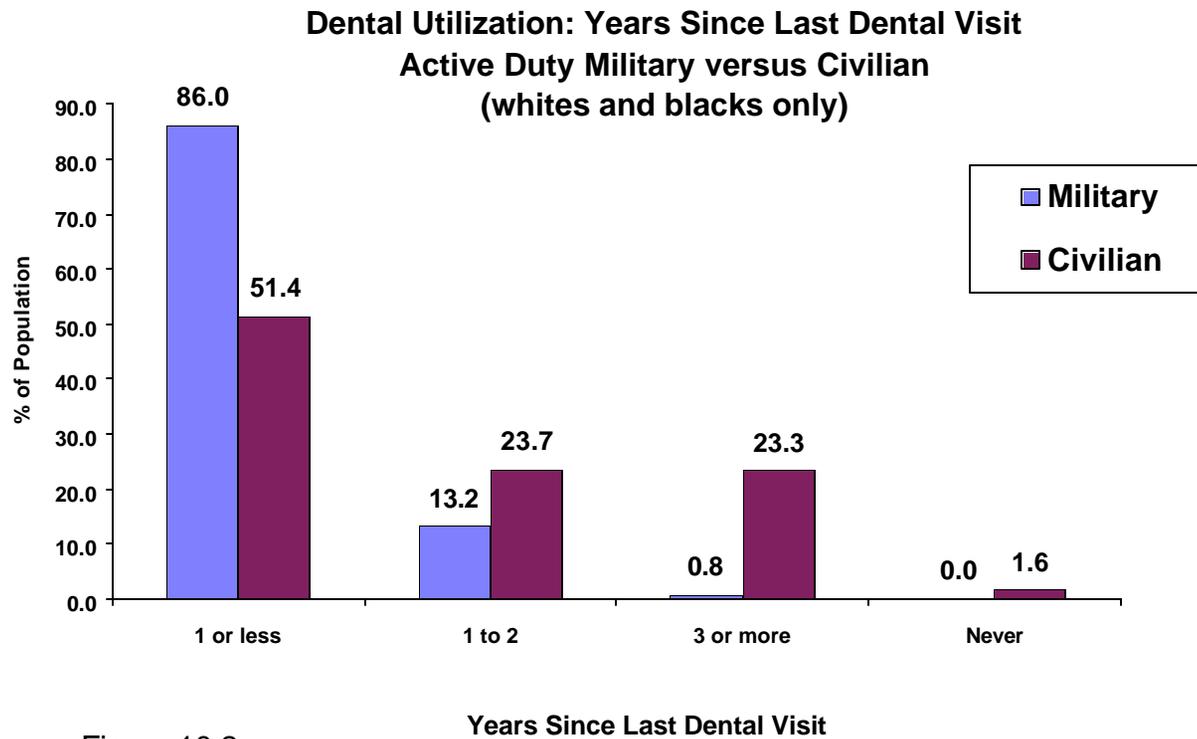


Figure 10.2

Figure 10.3 and Table 10.2 present results for white males. Across all age groups, **military white males are far more likely to have seen a dentist within the past year than their employed civilian cohorts**. Gaps in annual dental utilization between the two populations range from 17% to 40% depending on age category.

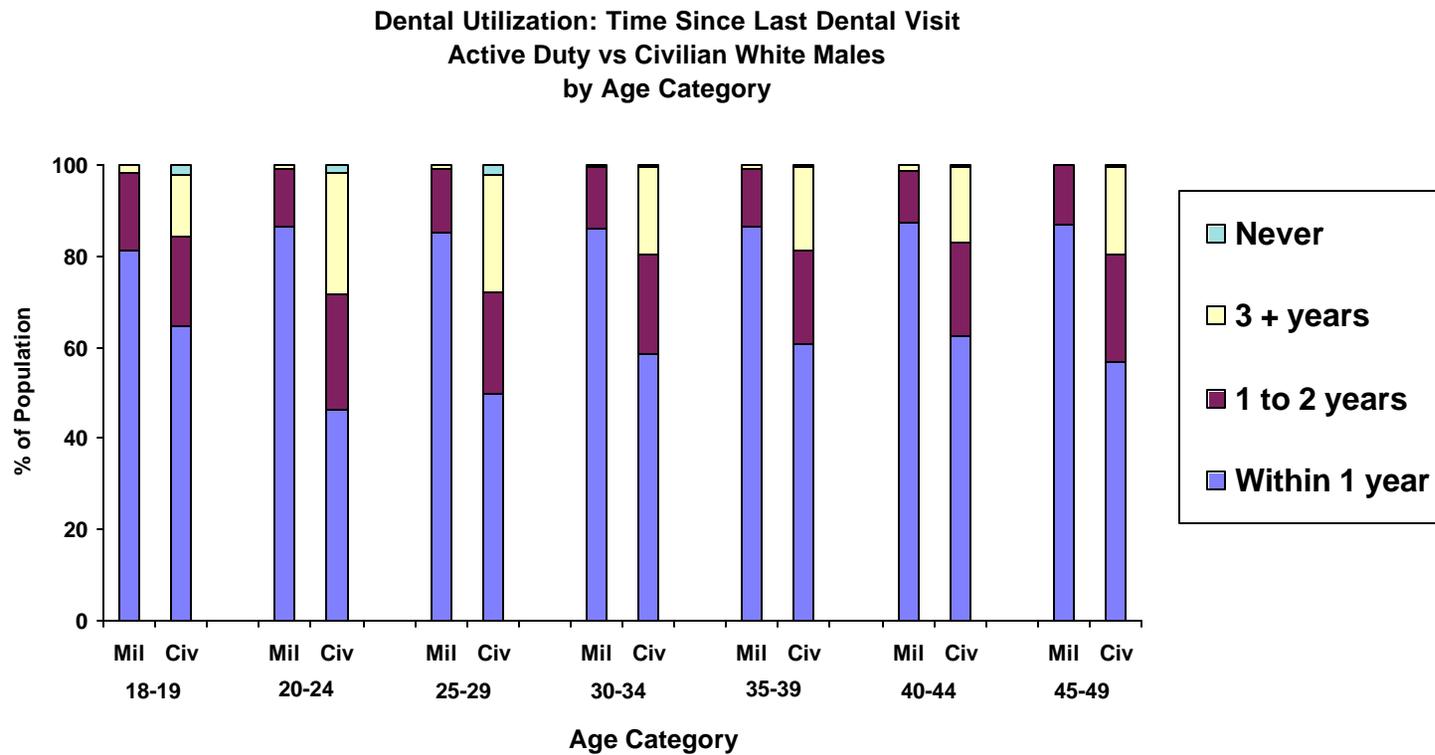


Figure 10.3

Table 10.2

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT MILITARY WHITE MALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	29,265	81.3	+ 7.9	17.1	+ 8.0	1.5	+ 1.9	0.0	0.0
20 - 24 years	394,039	86.4	± 1.6	12.8	± 1.6	0.8	± 0.3	0.0	0.0
25 - 29 years	279,018	85.1	± 2.0	14.2	± 1.9	0.7	± 0.5	0.0	0.0
30 - 34 years	215,496	86.0	± 2.3	13.6	± 2.3	0.4	± 0.4	0.0	0.0
35 - 39 years	141,965	86.3	+ 2.8	12.7	+ 2.8	1.0	+ 0.7	0.0	0.0
40 - 44 years	65,126	87.4	± 3.2	11.2	± 3.4	1.4	± 1.3	0.0	0.0
45 - 49 years	23,863	86.8	± 6.2	13.2	± 6.2	0.0	0.0	0.0	0.0
All ages	1,148,772	86.0	± 1.3	13.1	± 1.2	0.8	± 0.2	0.0	0.0

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT CIVILIAN WHITE MALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	1,640,716	64.6	± 7.8	19.8	± 6.7	13.6	± 5.7	*	*
20 - 24 years	6,030,197	46.4	+ 3.9	25.4	+ 3.3	26.5	+ 3.5	1.7	+ 1.0
25 - 29 years	7,363,804	49.9	± 3.3	22.2	± 2.7	25.6	± 3.1	2.3	± 1.0
30 - 34 years	7,168,794	58.5	± 3.5	22.0	± 2.9	19.1	± 2.5	*	*
35 - 39 years	6,384,180	60.9	± 3.5	20.3	± 2.7	18.2	± 2.7	*	*
40 - 44 years	5,207,825	62.6	+ 3.3	20.4	+ 2.7	16.7	+ 2.5	0.7	+ 0.6
45 - 49 years	4,161,612	56.8	± 3.7	23.4	± 3.1	19.2	± 2.9	0.7	± 0.6

* insufficient sample size for stable estimate

Table 10.3 and Figure 10.4 present results for white females. Across all age groups, **military white females are far more likely to have seen a dentist within the past year than their employed civilian cohorts.** Gaps in annual dental utilization between the two populations range from 23% to 49% depending on age category.

**Dental Utilization: Time Since Last Dental Visit
Active Duty vs Civilian White Females
by Age Category**

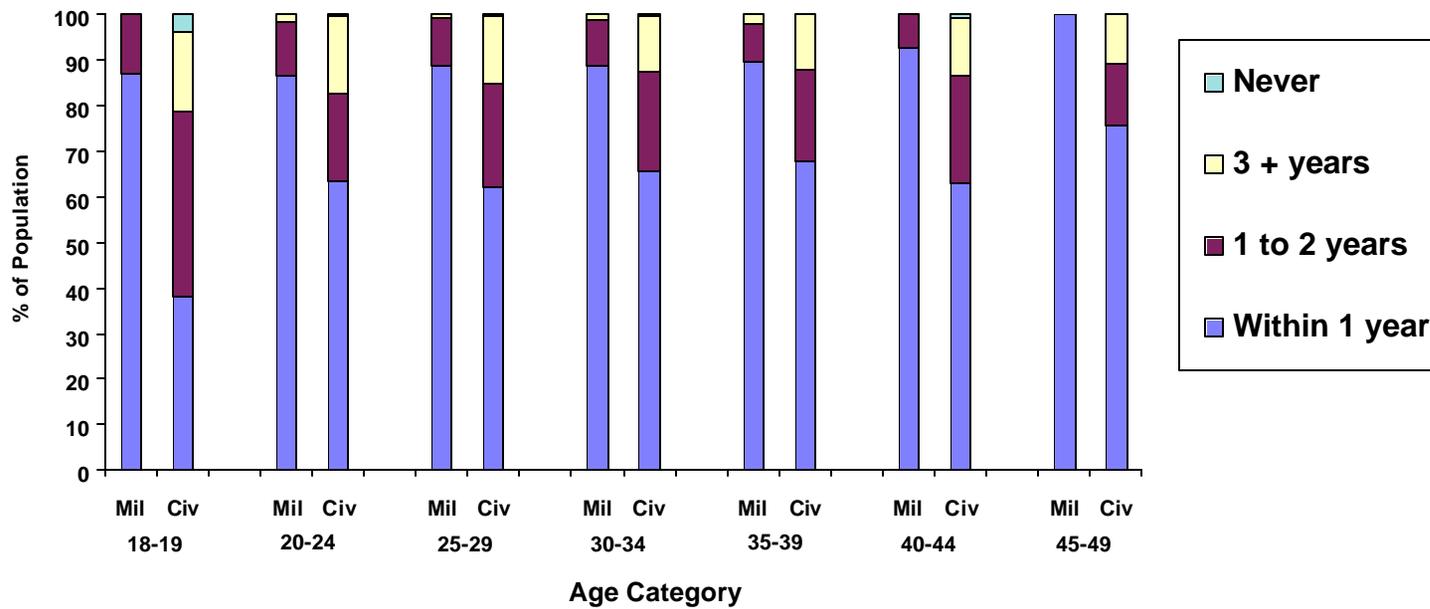


Figure 10.4

Table 10.3

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT MILITARY WHITE FEMALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	3,649	87.3	+ 12.4	12.7	+ 12.4	0.0	0.0	0.0	0.0
20 - 24 years	43,248	86.8	± 4.2	11.5	± 4.0	1.7	± 1.9	0.0	0.0
25 - 29 years	30,041	88.8	+ 3.6	10.5	+ 3.6	0.7	+ 1.0	0.0	0.0
30 - 34 years	17,761	88.8	± 5.3	10.0	± 4.8	1.1	± 2.1	0.0	0.0
35 - 39 years	13,838	89.5	+ 6.0	8.5	+ 4.1	2.0	+ 3.5	0.0	0.0
40 - 44 years	5,440	92.6	+ 7.4	7.4	+ 7.4	0.0	0.0	0.0	0.0
45 - 49 years	1,588	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All ages	115,565	88.4	+ 2.7	10.4	+ 2.4	1.2	+ 1.1	0.0	0.0

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT CIVILIAN WHITE FEMALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	1,621,700	38.2	+ 8.6	40.4	+ 8.6	17.8	+ 6.7	3.6	+ 3.3
20 - 24 years	5,601,953	63.5	± 3.3	19.1	± 2.5	17.2	± 2.7	*	*
25 - 29 years	5,834,949	62.2	+ 3.1	22.8	+ 2.7	14.9	+ 2.4	*	*
30 - 34 years	5,388,541	65.7	+ 3.3	21.8	+ 2.9	12.1	+ 2.4	*	*
35 - 39 years	4,928,037	67.6	± 3.5	20.3	+ 3.1	12.1	± 2.5	*	*
40 - 44 years	4,100,710	63.0	+ 3.3	23.5	+ 2.9	12.8	+ 2.4	*	*
45 - 49 years	3,143,166	75.5	+ 3.1	13.8	+ 2.5	10.7	+ 2.2	*	*

* insufficient sample size for stable estimate

Table 10.4 and Figure 10.5 present results for black males. Across all age groups, military black males are substantially more likely to have seen a dentist within the past year than their employed civilian cohorts. Gaps in annual dental utilization between the two populations range from 36% to 87% depending on age category.

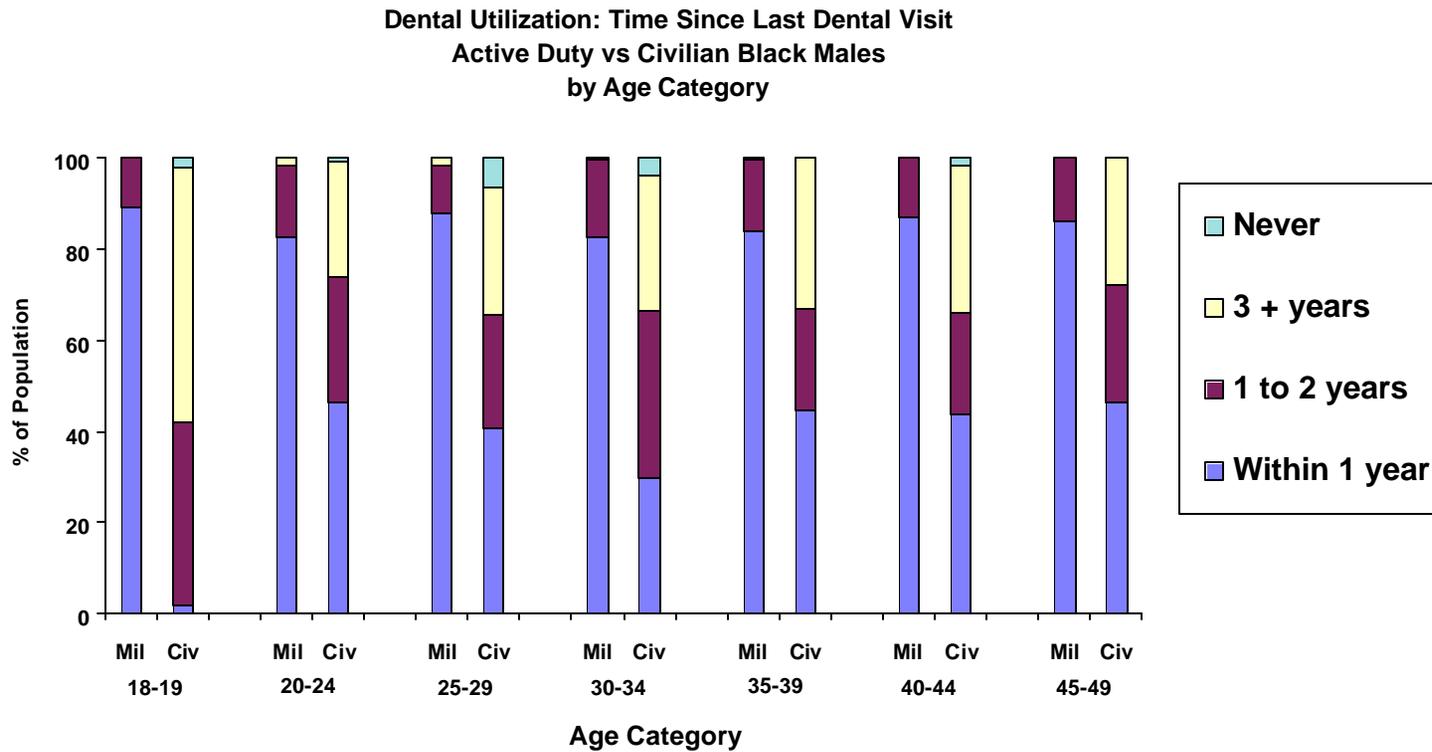


Figure 10.5

Table 10.4

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT MILITARY BLACK MALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	5,865	89.2	± 10.2	10.8	± 10.2	0.0	0.0	0.0	0.0
20 - 24 years	91,198	82.9	± 3.8	15.4	± 3.7	1.7	± 1.3	0.0	0.0
25 - 29 years	73,894	87.8	± 3.5	10.8	± 3.3	1.4	± 1.0	0.0	0.0
30 - 34 years	49,572	82.6	± 4.6	17.0	± 4.6	0.4	± 0.5	0.0	0.0
35 - 39 years	33,845	84.2	± 5.9	15.6	± 5.9	0.2	± 0.4	0.0	0.0
40 - 44 years	13,994	87.0	± 6.4	13.0	± 6.4	0.0	0.0	0.0	0.0
45 - 49 years	3,210	86.1	± 12.5	13.9	± 12.5	0.0	0.0	0.0	0.0
All ages	271,578	84.7	± 2.3	14.2	± 2.1	1.1	± 0.5	0.0	0.0

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT CIVILIAN BLACK MALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	104,764	1.8	± 7.2	40.1	± 26.6	55.9	± 27.0	*	*
20 - 24 years	677,753	46.6	± 11.4	27.5	± 10.2	25.2	± 10.0	*	*
25 - 29 years	760,904	40.6	± 9.8	24.9	± 8.6	27.9	± 8.8	6.6	± 4.9
30 - 34 years	704,268	29.7	± 9.0	36.9	± 9.4	29.8	± 9.0	*	*
35 - 39 years	623,299	44.8	± 9.4	22.2	± 7.8	33.0	± 9.0	0.0	0.0
40 - 44 years	510,610	43.9	± 9.8	22.3	± 8.2	32.4	± 9.2	*	*
45 - 49 years	424,050	46.6	± 11.8	25.8	± 10.4	27.6	± 10.6	0.0	0.0

* insufficient sample size for stable estimate

Results for black females are displayed in Table 10.5 and Figure 10.6. Across all age groups, with the exception of 18-19 year olds, military black females are significantly more likely to have seen a dentist within the past year than their employed civilian cohorts. Gaps in annual dental utilization between the two populations range from 37% to 64% depending on age category.

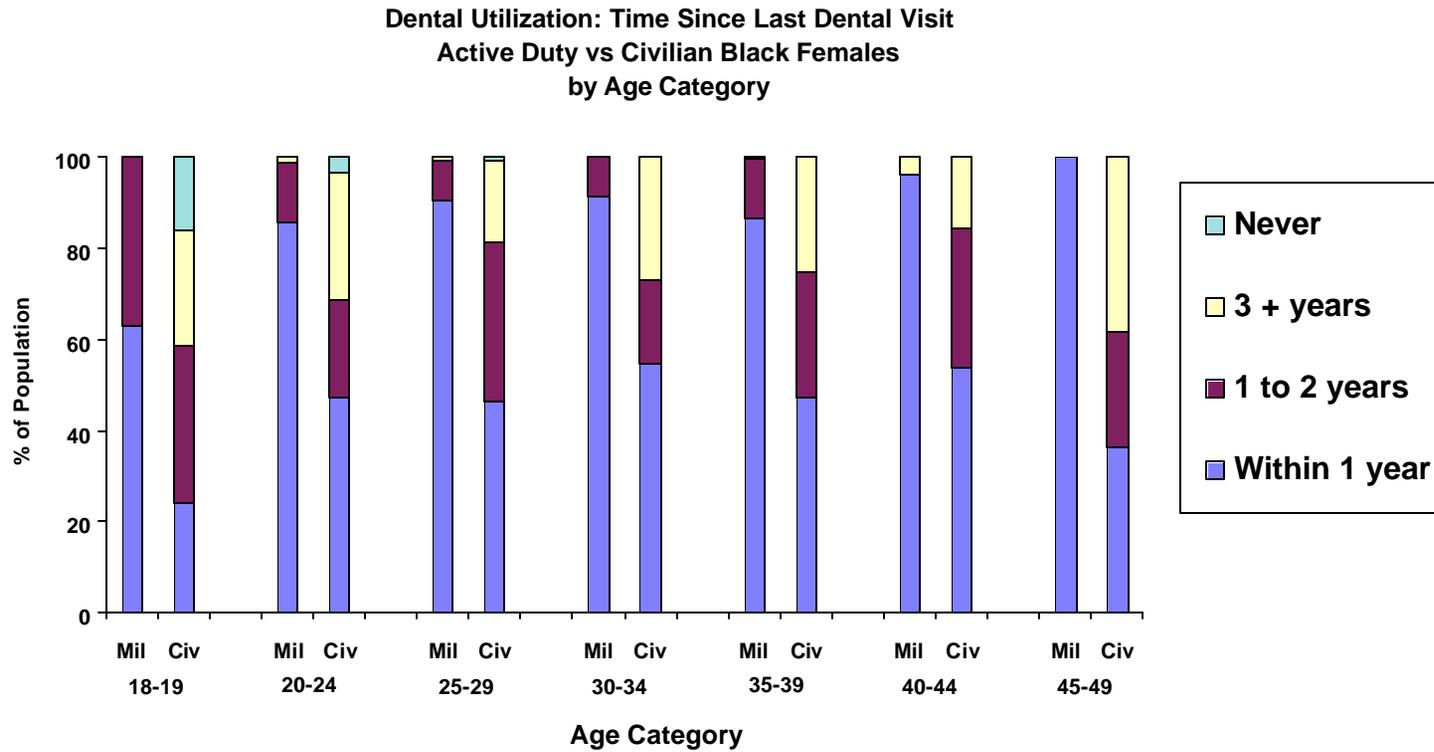


Figure 10.6

Table 10.5

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT MILITARY BLACK FEMALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	980	63.0	± 36.4	37.0	± 36.4	0.0	0.0	0.0	0.0
20 - 24 years	20,918	85.8	± 5.4	13.1	± 5.7	1.1	± 1.5	0.0	0.0
25 - 29 years	13,069	90.7	± 6.2	8.4	± 6.0	0.9	± 1.6	0.0	0.0
30 - 34 years	8,120	91.6	± 7.3	8.4	± 7.3	0.0	0.0	0.0	0.0
35 - 39 years	5,513	86.4	± 13.4	13.3	± 13.4	0.3	± 0.6	0.0	0.0
40 - 44 years	2,496	96.2	± 7.4	0.0	± 0.0	3.8	± 7.4	0.0	0.0
45 - 49 years	595	100	0.0	0.0	± 0.0	0.0	0.0	0.0	0.0
All ages	51,691	87.9	± 4.1	11.2	± 4.2	0.9	± 1.0	0.0	0.0

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT CIVILIAN BLACK FEMALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	87,757	24.2	± 22.3	34.3	± 24.9	25.5	± 22.7	16.0	± 19.2
20 - 24 years	787,285	47.1	± 10.2	21.6	± 8.4	27.9	± 9.2	*	*
25 - 29 years	684,780	46.4	± 8.6	35.0	± 8.2	17.7	± 6.7	*	*
30 - 34 years	771,602	54.8	± 8.2	18.5	± 6.3	26.7	± 7.2	*	*
35 - 39 years	667,289	47.2	± 8.2	27.7	± 7.4	25.1	± 7.0	0.0	0.0
40 - 44 years	558,456	53.8	± 8.2	30.8	± 7.6	15.5	± 5.9	0.0	0.0
45 - 49 years	436,122	36.2	± 8.8	25.4	± 8.0	38.4	± 8.8	0.0	0.0

* insufficient sample size for stable estimate

There is no national civilian data available on dental utilization to compare with non-white, non-black active duty military personnel. Table 10.6 and Figure 10.7 profile dental utilization of military non-white, non-black males and females. Results show no statistically significant difference between these groups, with the exception of 18-19 year olds.

Comparing active duty military subgroups only (i.e. comparing results between rather than within previous tables), within race, females show a statistically significant higher annual dental utilization than males for 45-49 year old blacks and whites and for 18-19 year old non-black, non-whites. Across race, 40-44 year old non-black, non-white males show significantly higher annual dental utilization than similarly aged black or white males.

**Dental Utilization: Time Since Last Dental Visit
Active Duty Non-white, Non-black Males vs Females
by Age Category**

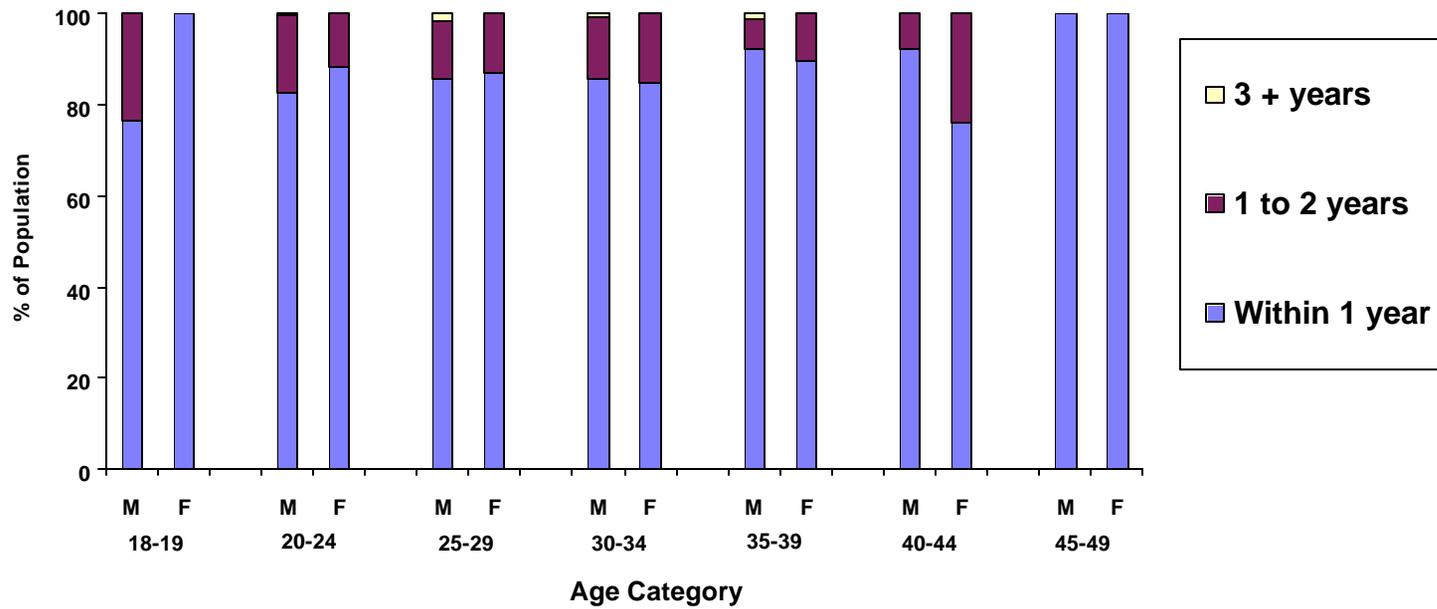


Figure 10.7

Table 10.6

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT MILITARY NON-WHITE, NON-BLACK MALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	1,935	76.4	± 19.0	23.6	± 19.0	0.0	0.0	0.0	0.0
20 - 24 years	29,881	82.6	± 6.5	17.0	± 6.4	0.4	± 0.8	0.0	0.0
25 - 29 years	19,201	85.6	± 5.2	12.9	± 4.5	1.5	± 1.4	0.0	0.0
30 - 34 years	17,046	85.8	± 6.6	13.3	± 6.3	0.9	± 1.2	0.0	0.0
35 - 39 years	11,658	92.4	± 4.9	6.4	± 4.6	1.2	± 2.3	0.0	0.0
40 - 44 years	7,077	92.3	± 6.5	7.7	± 6.5	0.0	0.0	0.0	0.0
45 - 49 years	2,020	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All ages	88,818	86.2	± 3.5	13.0	± 3.5	0.8	± 0.5	0.0	0.0

DISTRIBUTION OF TIME SINCE LAST DENTAL VISIT CIVILIAN NON-WHITE, NON-BLACK FEMALES									
	Estimated Population	Within 1 year		1 to 2 years		3 + years		Never	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	134	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 - 24 years	3,928	88.2	± 7.9	11.8	± 7.9	0.0	0.0	0.0	0.0
25 - 29 years	2,532	86.9	± 14.2	13.1	± 14.2	0.0	0.0	0.0	0.0
30 - 34 years	1,528	84.8	± 17.1	15.2	± 17.1	0.0	0.0	0.0	0.0
35 - 39 years	989	89.7	± 19.5	10.3	± 19.5	0.0	0.0	0.0	0.0
40 - 44 years	729	76.0	± 34.7	24.0	± 34.7	0.0	0.0	0.0	0.0
45 - 49 years	168	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 10.7 shows the distribution of dental services consumed over the past 12 months by all active duty military personnel across DoD dental classification.

Individuals in dental class 1 are more likely to have had a dental examination and an oral prophylaxis and

less likely to have received emergency care, dentures, fillings, or extractions than those in DoD class 2 or 3. As Figure 10.8 shows, examinations, teeth cleanings, and having fillings account for the largest categories of dental services consumed.

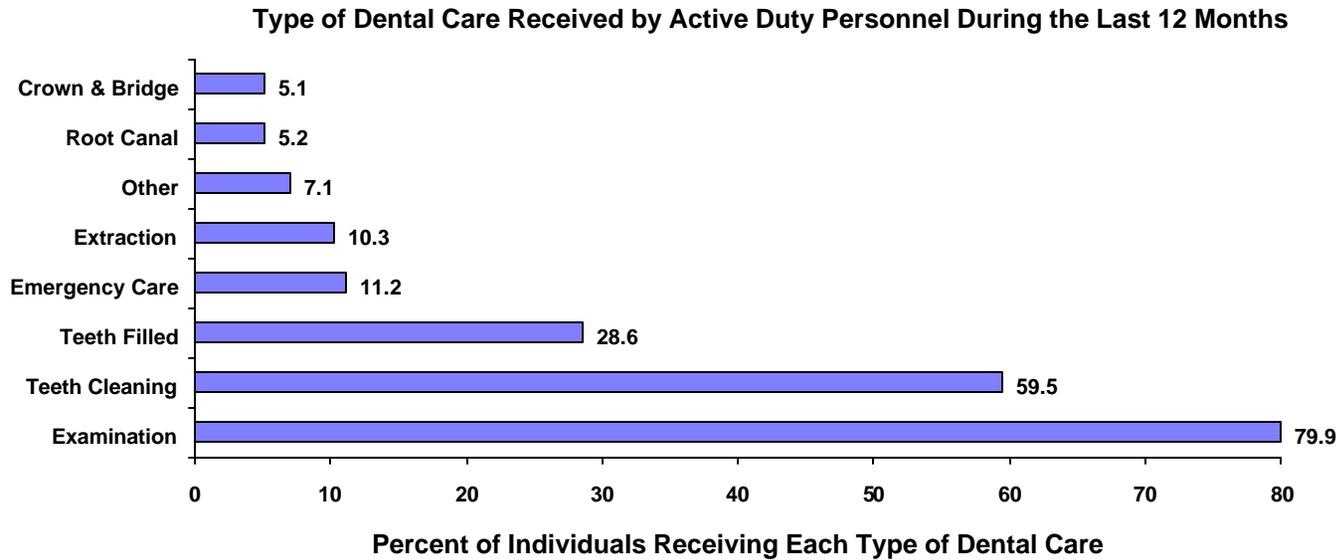


Figure 10.8

Table 10.7

PATTERN OF DENTAL CARE RECEIVED OVER THE PAST 12 MONTHS BY DOD DENTAL CLASSIFICATION								
TYPE OF DENTAL CARE RECEIVED	ALL		PERCENT FOR EACH DOD DENTAL CLASSIFICATION					
	(N=1,686,258)	95% CI	Class 1 (N=127,027)	95% CI	Class 2 (N=1,314,281)	95% CI	Class 3 (N=244,950)	95% CI
EXAMINATION	79.9	± 0.8	86.5	± 2.2	80.3	± 0.8	74.3	± 2.0
TEETH CLEANING	59.5	± 0.8	72.7	± 2.7	60.1	± 1.0	49.5	± 2.4
EMERGENCY CARE	11.2	± 0.6	8.0	± 1.6	10.5	± 0.6	16.9	± 1.8
TEETH FILLED	28.6	± 0.8	18.6	± 2.4	28.5	± 0.8	34.6	± 2.2
EXTRACTION	10.3	± 0.6	8.0	± 1.6	10.1	± 0.6	12.5	± 1.6
ROOT CANAL	5.2	± 0.4	2.3	± 1.0	4.6	± 0.4	9.6	± 1.4
GUM SURGERY	1.9	± 0.2	2.1	± 0.8	1.6	± 0.2	3.0	± 0.8
BRACES	0.8	± 0.2	1.3	± 0.8	0.8	± 0.2	0.6	± 0.4
CROWN & BRIDGE	5.1	± 0.4	3.4	± 1.2	5.3	± 0.4	5.2	± 1.0
DENTURES	1.4	± 0.2	2.3	± 1.0	1.3	± 0.2	2.0	± 0.6
OTHER	3.0	± 0.2	4.6	± 1.2	3.0	± 0.4	2.3	± 0.8

Restricting the sample to only those active duty personnel who reported having seen a dentist within the past 12

months, the distribution of dental services consumed is presented in Table 10.8. Statistically *significantly fewer*

emergency treatments, fillings, extractions, dentures, and root canals were provided to individuals in DoD dental class 1 than those in class 2 or 3. Figure 10.9 displays a bar graph of the type of dental services

consumed by **active duty personnel who saw a dentist within the past year.** Again, **examinations, teeth cleanings, and having fillings account for the largest categories of dental services consumed.**

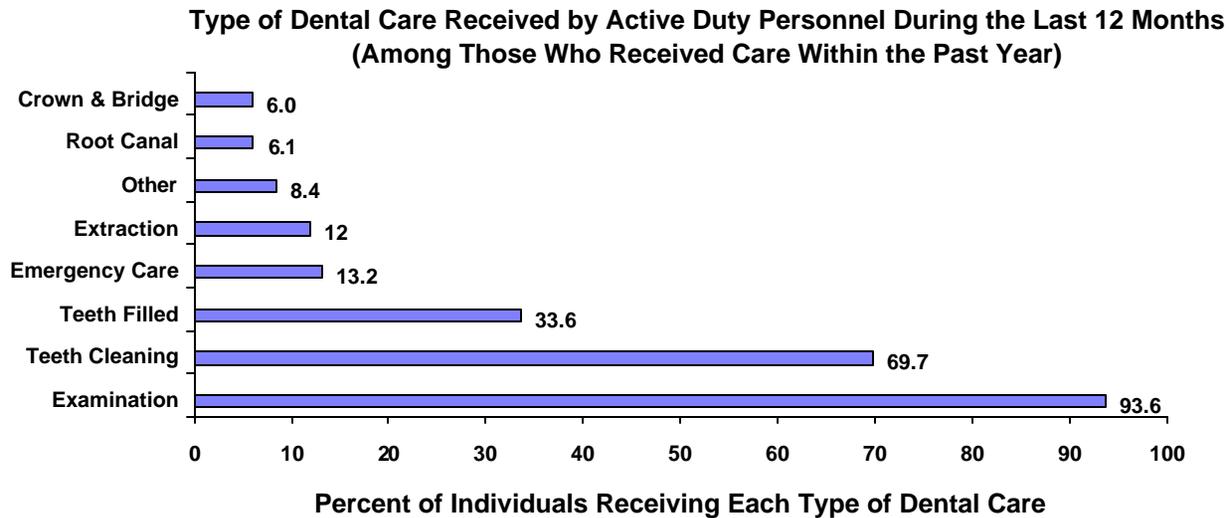


Figure 10.9

Table 10.8

PATTERN OF DENTAL CARE RECEIVED OVER THE PAST 12 MONTHS AMONG THOSE RECEIVING CARE IN THE PAST YEAR BY DOD DENTAL CLASSIFICATION								
TYPE OF DENTAL CARE RECEIVED	PERCENT FOR EACH DOD DENTAL CLASSIFICATION							
	ALL (N=1 449 842)	95% CI	Class 1 (N=115 978)	95% CI	Class 2 (N=1 132 075)	95% CI	Class 3 (N=201 789)	95% CI
EXAMINATION	93.6	± 0.4	96.4	± 1.2	93.8	± 0.6	90.9	± 1.6
TEETH CLEANING	69.7	± 0.8	81.0	± 2.5	70.2	± 1.0	60.6	± 2.5
EMERGENCY CARE	13.2	± 0.6	8.8	± 1.8	12.3	± 0.6	20.6	± 2.2
TEETH FILLED	33.6	± 0.8	20.8	± 2.5	33.3	± 1.0	42.4	± 2.5
EXTRACTION	12.0	± 0.6	8.9	± 1.8	11.8	± 0.6	15.3	± 1.8
ROOT CANAL	6.1	± 0.4	2.6	± 1.0	5.4	± 0.4	11.8	± 1.6
GUM SURGERY	2.2	± 0.2	2.3	± 1.0	1.9	± 0.2	3.7	± 1.0
BRACES	1.0	± 0.2	1.4	± 0.8	1.0	± 0.2	0.8	± 0.4
CROWN & BRIDGE	6.0	± 0.4	3.7	± 1.2	6.2	± 0.6	6.3	± 1.2
DENTURES	1.7	± 0.2	2.5	± 1.0	1.5	± 0.2	2.5	± 0.8
OTHER	3.5	± 0.4	5.1	± 1.4	3.4	± 0.4	2.8	± 0.8

11. PERCEIVED NEED FOR DENTAL CARE

Perceived Need for Dental Care

Perceived need for dental care was assessed for all active duty personnel using a self-administered questionnaire. To enable valid comparisons of military personnel with their employed civilian cohorts, many questions were identical in wording to those used on the National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-1986 (NIDR, 1987). In all tables, point estimates are presented along with 95% confidence intervals so that statistically significant differences between any two values within the table or between tables can be readily determined. Due to variation in the size of subgroups in the sample, some estimates have wider confidence intervals than others.

Table 11.1 shows perceived need for dental care for all active duty personnel as well as across gender, race, age category, education level, paygrade, and DoD dental classification. ***Slightly more than half of all individuals perceive a need for dental care. Statistically significant differences in perceived need for dental care exist between blacks and whites, whites and non-black racial groups, officers and enlisted personnel, as well as across some age groups, most educational levels, and all DoD dental classes.*** Figure 11.1 presents a bar chart of perceived need for dental care across DoD dental classification.

Logistic regression shows that active duty personnel ***more likely to perceive a need for dental care*** have the following characteristics and odds ratios (OR): have calculus or overhanging restorations (OR=1.1); have one to

three (1.6) or four or more decayed teeth (4.0); or are in DoD dental class 2 (1.7) or class 3 (3.6). In addition, compared to 18-19 year old individuals, 20-24 and 25-29 year olds are 1.4 times, 30-34 and 35-39 year olds are 1.6 times, 40-44 year olds are 1.9 times, and 45-49 year olds are 2.2 times more likely to perceive a need for dental care. Individuals who have seen a dentist in the past year are ***less likely to perceive a need for dental care*** (OR=0.7) as are non-whites, non-blacks (0.8) compared to whites, and E5-E6 (0.8), E7-E9 (0.8), O1-O3 (0.6) and O4-O7 (0.5) compared to E1-E4.

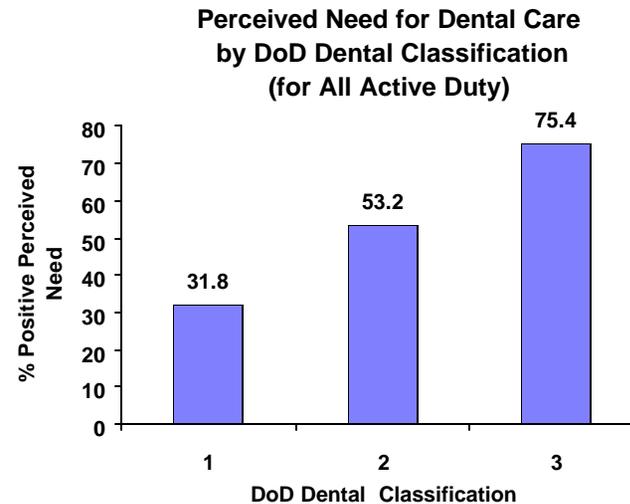


Figure 11.1

Table 11.1

PERCENT DISTRIBUTION OF PERCEIVED NEED FOR DENTAL CARE (FOR ALL ACTIVE DUTY)			
	Estimated Population	Positive Perceived Need %	95% CI
GENDER			
Male	1,508,996	55.0	+ 1.9
Female	177,262	53.4	+ 3.3
RACE			
White	1,264,164	52.4	+ 1.9
Black	323,269	62.6	+ 2.7
Other	98,825	60.5	+ 3.8
AGE CATEGORY			
18 - 19 years	41,827	53.0	+ 5.9
20 - 24 years	583,040	60.0	+ 2.2
25 - 29 years	417,754	51.9	+ 2.3
30 - 34 years	309,524	52.6	+ 2.1
35 - 39 years	207,809	50.8	+ 2.6
40 - 44 years	94,861	54.2	+ 3.7
45 - 49 years	31,443	51.1	+ 9.5
EDUCATION			
No College	654,729	58.5	+ 1.8
Some College	702,759	56.4	+ 2.4
College Graduate	215,616	48.6	+ 3.3
Beyond College	113,154	35.9	+ 3.0
PAYGRADE			
E1 - E4	768,742	59.8	+ 2.0
E5 - E6	529,846	54.2	+ 2.3
E7 - E9	176,939	54.2	+ 2.6
O1 - O3	158,980	39.8	+ 3.1
O4 - O7	51,751	35.6	+ 5.1
DOD DENTAL CLASS			
1	127,027	31.8	+ 4.7
2	1,314,281	53.2	+ 2.2
3	244,950	75.4	+ 3.1
All Active Duty	1,686,258	54.8	+ 1.8

Tables 11.2-11.6 show perceived need for dental care across age groups, holding gender and race constant. Where available, comparison data from the National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-86 (NIDR, 1987) is provided. Figure 11.2 shows an overall comparison of perceived need between active duty military personnel and their employed civilian cohorts. This comparison is based on black and white races only because no data are available for non-black, non-white civilians. Furthermore, overall civilian figures were adjusted to match the race, gender, and age composition of the active duty military so that valid comparisons between the populations could be made. Adjustment was necessary

because while over three-quarters of the military population falls between 20 and 34 years of age, roughly half of the employed civilian population does. Furthermore, while only 7.5% of the military population falls between 40 and 49 years of age, nearly one-quarter of the employed civilian population does. Likewise, the two populations differ in racial and gender composition. **Active duty military personnel and their employed civilian cohorts show roughly equal perceived need for dental care.** Graphical presentations of the data should be viewed with caution because they exclude variances of the estimated values.

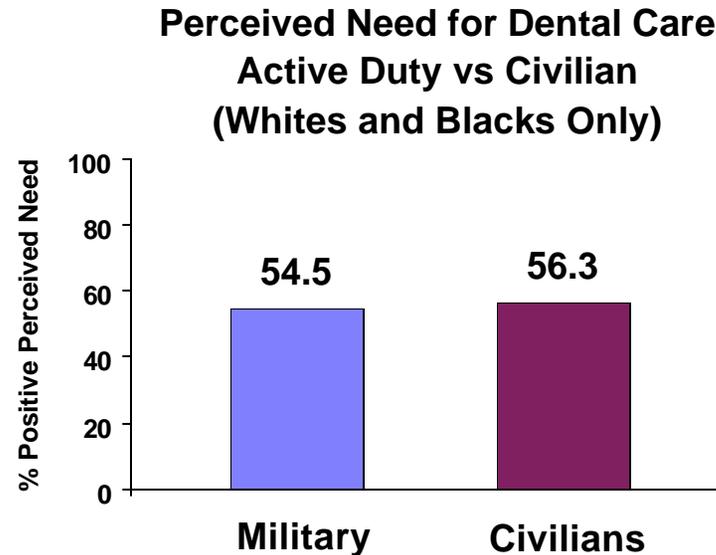


Figure 11.2

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Table 11.2 and Figure 11.3 present results for white males. ***With the exception of 18-19 year old white males, there is no statistically significant difference in perceived need for dental care between active duty white males and their employed civilian cohorts.***

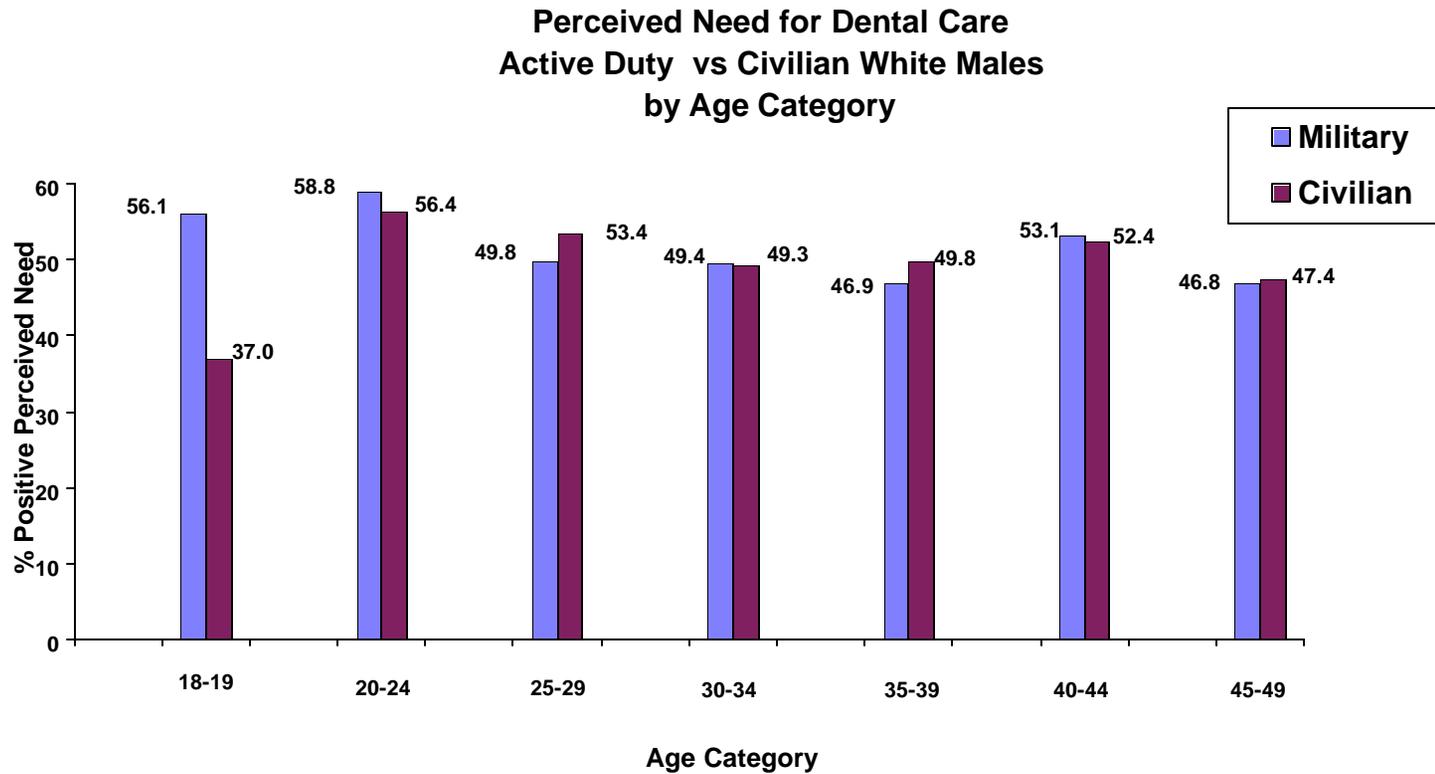


Figure 11.3

Table 11.2

PERCENT DISTRIBUTION OF PERCEIVED NEED FOR DENTAL CARE ACTIVE DUTY VS CIVILIAN WHITE MALES						
	MILITARY			CIVILIAN		
	Estimated Population	Positive Perceived Need %	95% CI	Estimated Population	Positive Perceived Need %	95% CI
18 - 19 years	29,265	56.1	± 8.5	1,640,716	37.0	± 8.0
20 - 24 years	393,867	58.8	± 2.4	6,030,197	56.4	± 3.9
25 - 29 years	279,018	49.8	± 2.3	7,363,804	53.4	± 3.3
30 - 34 years	215,496	49.4	± 2.6	7,168,794	49.3	± 3.5
35 - 39 years	141,965	46.9	± 2.8	6,384,180	49.8	± 3.5
40 - 44 years	65,126	53.1	± 5.2	5,207,825	52.4	± 3.5
45 - 49 years	23,863	46.8	± 10.0	4,161,612	47.4	± 3.7
All ages	1,148,600	52.8	± 2.0			

Table 11.3 and Figure 11.4 present results for white females. *There is no statistically significant difference in perceived need for dental care between active duty white females and their employed civilian cohorts.*

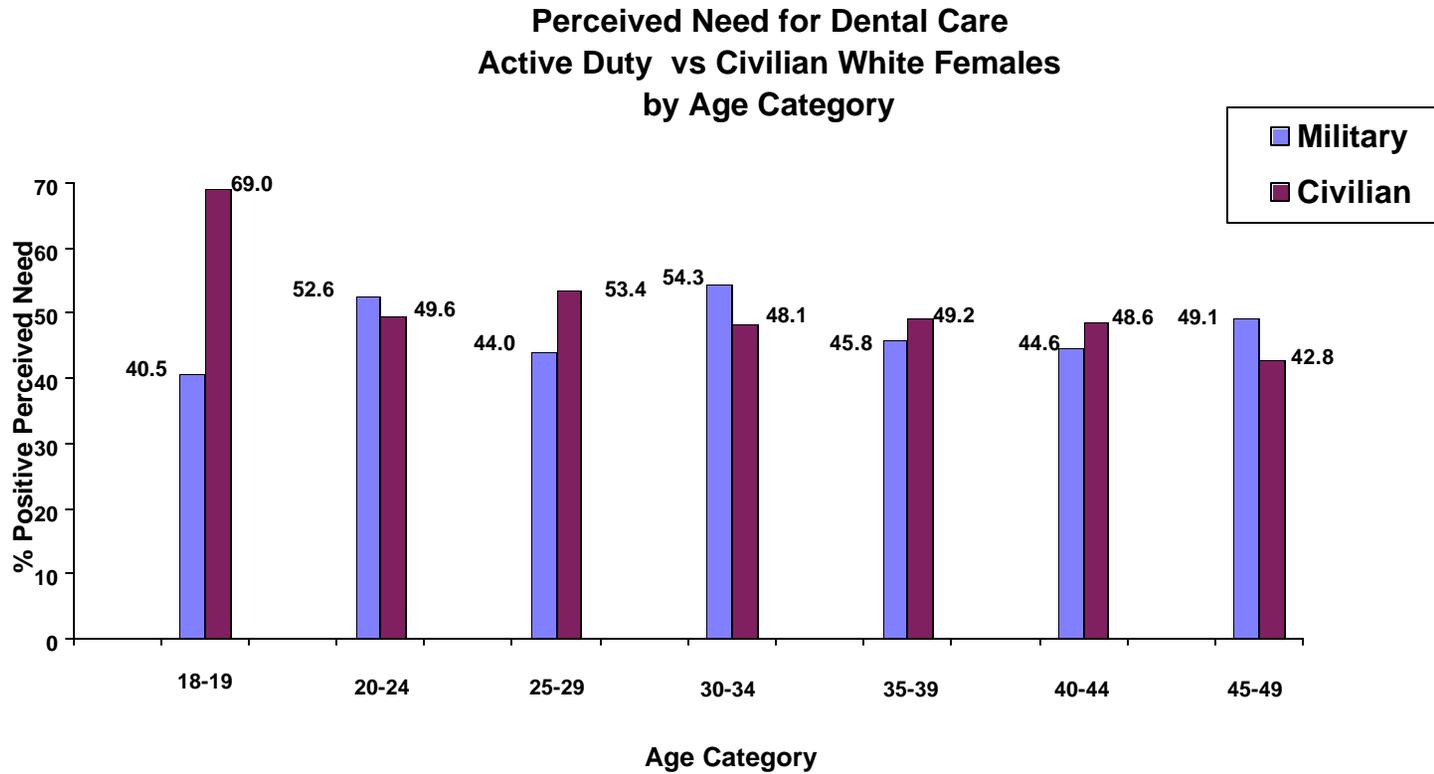


Figure 11.4

Table 11.3

PERCENT DISTRIBUTION OF PERCEIVED NEED FOR DENTAL CARE ACTIVE DUTY VS CIVILIAN WHITE FEMALES						
	MILITARY			CIVILIAN		
	Estimated Population	Positive Perceived Need %	95% CI	Estimated Population	Positive Perceived Need %	95% CI
18 - 19 years	3,648	40.5	± 24.8	1,621,700	69.0	± 8.2
20 - 24 years	43,248	52.6	± 6.2	5,601,953	49.6	± 3.5
25 - 29 years	30,041	44.0	± 6.6	5,834,949	53.4	± 3.1
30 - 34 years	17,761	54.3	± 9.6	5,388,541	48.1	± 3.5
35 - 39 years	13,838	45.8	± 9.2	4,928,037	49.2	± 3.7
40 - 44 years	5,440	44.6	± 13.0	4,100,710	48.6	± 3.5
45 - 49 years	1,588	49.1	± 23.8	3,143,166	42.8	± 3.5
All ages	115,564	49.0	± 4.0			

Table 11.4 and Figure 11.5 present results for black males. ***With the exception of 18-19 year olds, there is no statistically significant difference in perceived need for dental care between active duty black males and their employed civilian cohorts.***

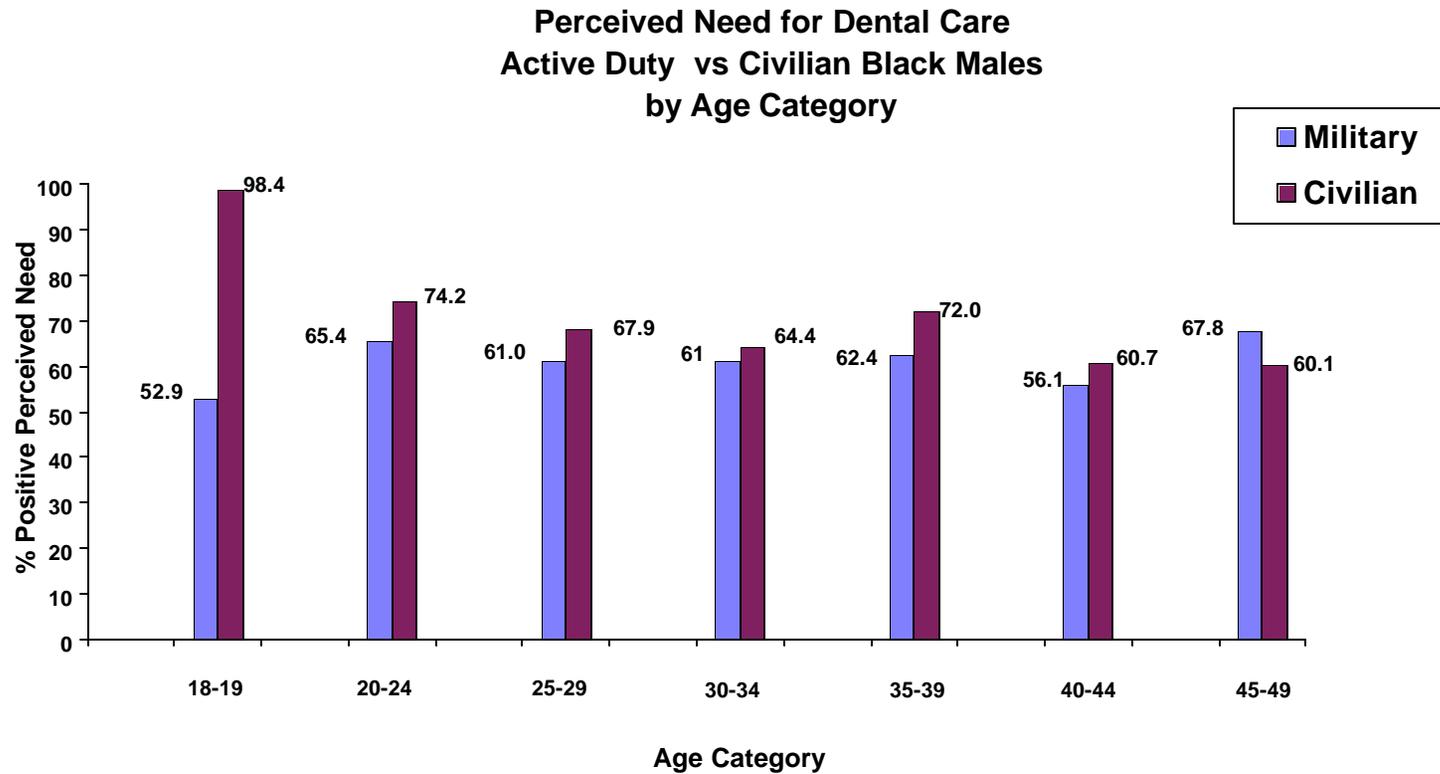


Figure 11.5

Table 11.4

PERCENT DISTRIBUTION OF PERCEIVED NEED FOR DENTAL CARE ACTIVE DUTY VS CIVILIAN BLACK MALES						
	MILITARY			CIVILIAN		
	Estimated Population	Positive Perceived Need %	95% CI	Estimated Population	Positive Perceived Need %	95% CI
18 - 19 years	5,865	52.9	± 25.8	104,764	98.4	± 6.9
20 - 24 years	91,198	65.4	± 4.7	677,753	74.2	± 10.0
25 - 29 years	73,894	61.0	± 5.2	760,904	67.9	± 9.2
30 - 34 years	49,572	61.0	± 4.8	704,268	64.4	± 9.4
35 - 39 years	33,845	62.4	± 5.8	623,299	72.0	± 8.6
40 - 44 years	13,994	56.1	± 9.3	510,610	60.7	± 9.6
45 - 49 years	3,210	67.8	± 21.1	424,050	60.1	± 11.6
All ages	271,578	62.3	± 3.1			

Table 11.5 and Figure 11.6 present results for black females. With the exception of 25-29 year olds, there is ***no significant difference in perceived need for dental care between active duty black females and their employed civilian cohorts.***

**Perceived Need for Dental Care
Active Duty vs Civilian Black Females
by Age Category**

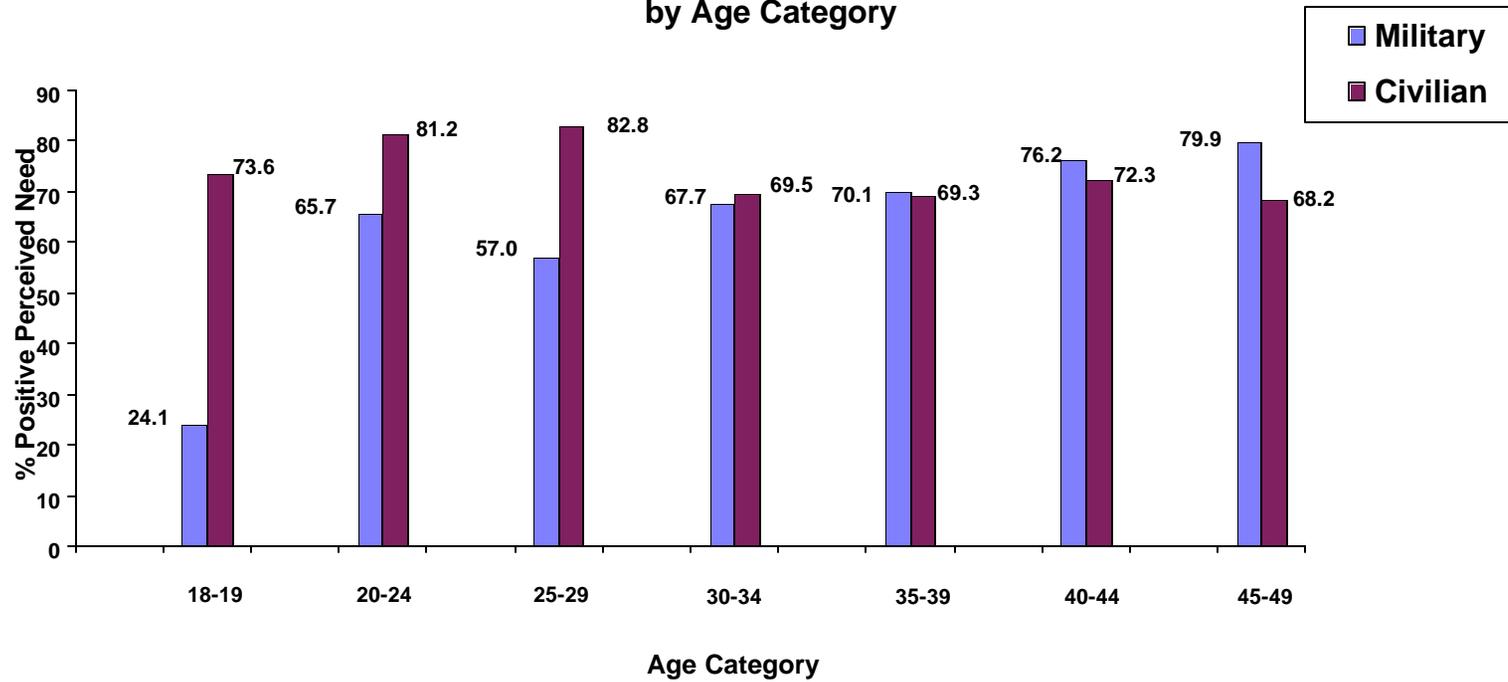


Figure 11.6

Table 11.5

PERCENT DISTRIBUTION OF PERCEIVED NEED FOR DENTAL CARE ACTIVE DUTY VS CIVILIAN BLACK FEMALES						
	MILITARY			CIVILIAN		
	Estimated Population	Positive Perceived Need %	95% CI	Estimated Population	Positive Perceived Need %	95% CI
18 - 19 years	908	24.1	± 31.0	87,757	73.6	± 23.1
20 - 24 years	20,918	65.7	± 9.7	787,285	81.2	± 8.0
25 - 29 years	13,069	57.0	± 9.0	684,780	82.8	± 6.7
30 - 34 years	8,120	67.7	± 11.6	771,602	69.5	± 7.6
35 - 39 years	5,513	70.1	± 14.6	667,289	69.3	± 7.6
40 - 44 years	2,496	76.2	± 17.5	558,456	72.3	± 7.6
45 - 49 years	595	79.9	± 36.9	436,122	68.2	± 8.4
All ages	51,619	64.2	± 6.2			

There is no national civilian data available on perceived need for dental care to compare with non-white, non-black active duty personnel. Accordingly, Table 11.6 and Figure 11.7 profile perceived need for dental care of non-white, non-black males and females. Results show no statistically significant difference between these groups.

**Perceived Need for Dental Care
Non-white, Non-black Active Duty
by Age Category**

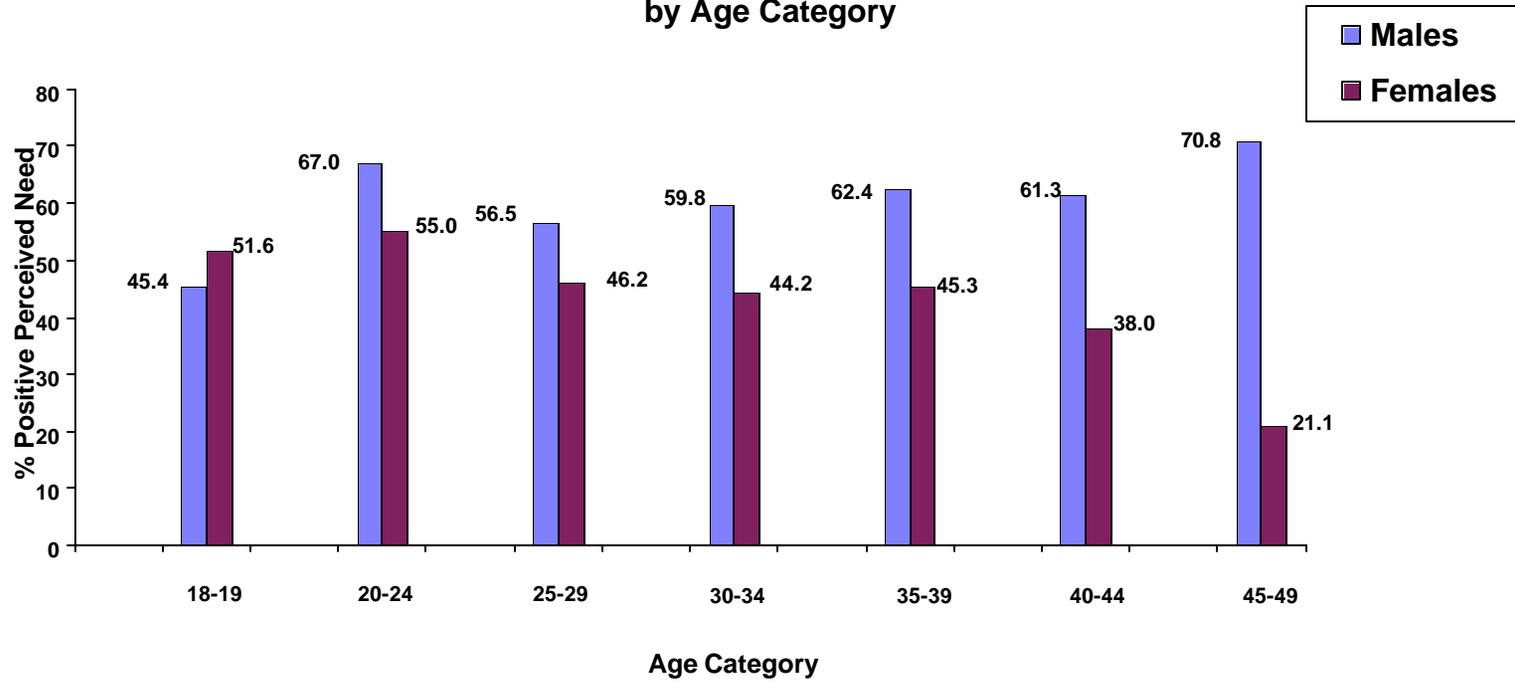


Figure 11.7

Table 11.6

PERCENT DISTRIBUTION OF PERCEIVED NEED FOR DENTAL CARE NON-WHITE, NON-BLACK ACTIVE DUTY						
	MALES			FEMALES		
	Estimated Population	Positive Perceived Need %	95% CI	Estimated Population	Positive Perceived Need %	95% CI
18 - 19 years	1,935	45.4	± 19.1	134	51.6	± 72.0
20 - 24 years	29,881	67.0	± 5.4	3,928	55.0	± 17.5
25 - 29 years	19,201	56.5	± 7.6	2,532	46.2	± 18.6
30 - 34 years	17,046	59.8	± 7.0	1,528	44.2	± 27.4
35 - 39 years	11,658	62.4	± 8.7	989	45.3	± 34.1
40 - 44 years	7,077	61.3	± 8.1	729	38.0	± 42.6
45 - 49 years	2,020	70.8	± 18.6	167	21.1	± 44.0
All ages	88,818	61.9	± 3.7	10,007	48.3	± 11.6

Comparing active duty military subgroups only (i.e. comparing results between rather than within previous tables) within race, there is no significant difference between males and females. Comparing across race, 25-29, 30-34, and 35-39 year old black males have greater perceived need for dental care than white males; 35-39 and 40-44 year old black females have greater perceived need for dental care than white females; and 20-24, 30-34, and 35-39 year old non-black, non-white males have greater perceived need for dental care than white males.

Overall, black males and females and non-white, non-black males have greater perceived need for dental care than white males and females and non-white, non-black females.

Tables 11.7-11.12 and Figures 11.8-11.13 display self-perceived urgency for dental care among those who perceive a need for dental care. Perceived need for immediate dental care is statistically significantly greater in DoD Class 3 individuals than those in Class 1 or 2 (Table 11.7 and Figure 11.8).

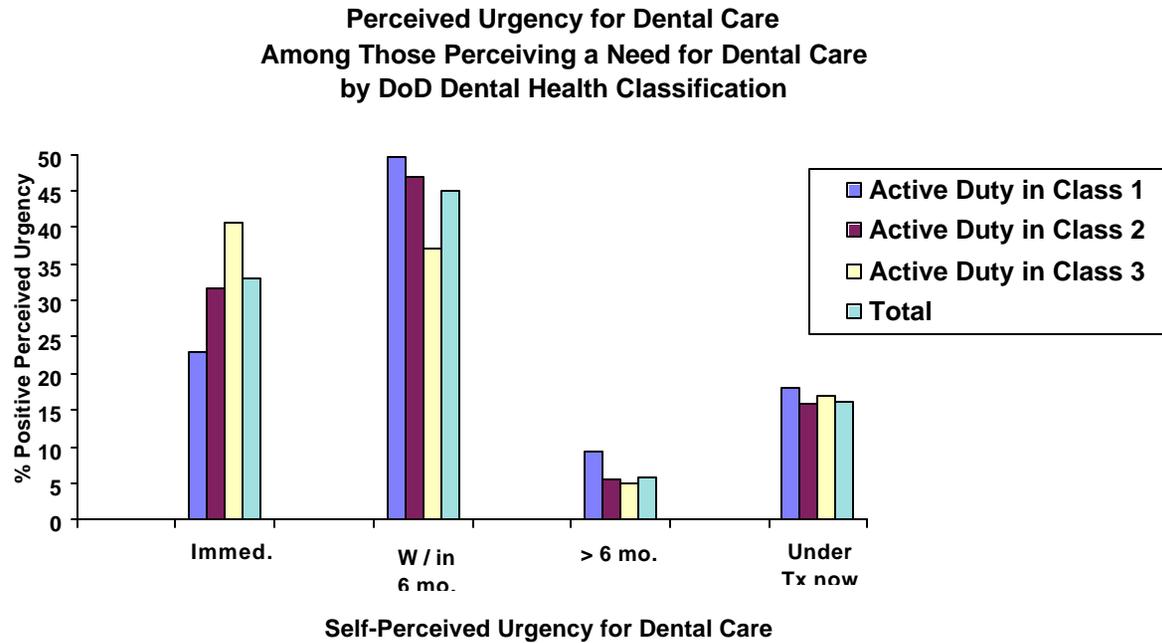


Figure 11.8

Table 11.7

PERCENT DISTRIBUTION OF SELF-PERCEIVED URGENCY FOR DENTAL CARE AMONG ACTIVE DUTY PERCEIVING A NEED FOR DENTAL CARE									
		Self-Perceived Urgency for Dental Care							
	Estimated Population	Immediately		Within 6 months		More than 6 months		Currently under Tx	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
DOD DENTAL CLASS									
1	40,394	22.9	± 4.8	49.6	± 6.2	9.4	± 3.4	18.1	± 5.7
2	699,535	31.6	± 2.6	46.9	± 1.9	5.6	± 0.7	15.9	± 2.0
3	184,709	40.8	± 3.8	37.0	± 3.7	5.1	± 1.2	17.1	± 3.8
TOTAL	924,638	33.1	± 2.4	45.1	± 1.7	5.7	± 0.6	16.2	± 1.8

Tables 11.8-11.12 and Figures 11.9-11.13 focus on self-perceived urgency for dental care across age group, holding gender and race constant. Results for white males are presented in Figure 11.9 and Table 11.8.

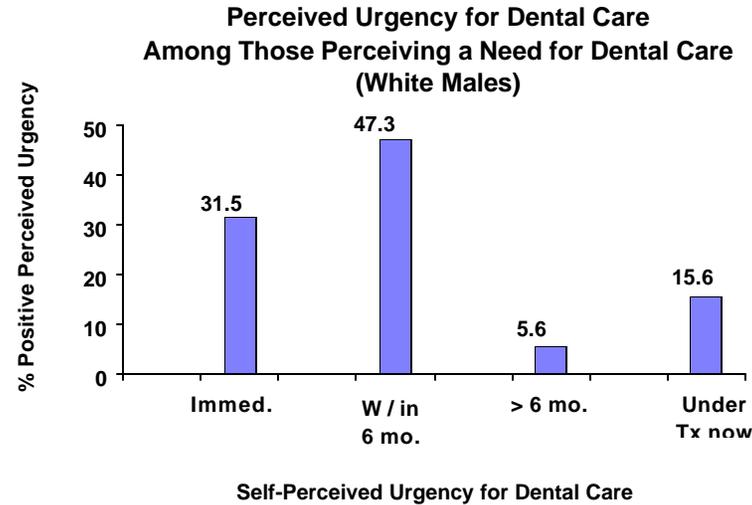


Figure 11.9

Table 11.8

PERCENT DISTRIBUTION OF SELF-PERCEIVED URGENCY FOR DENTAL CARE AMONG THOSE PERCEIVING A NEED FOR DENTAL CARE (WHITE MALES)									
	Estimated Population	Self-Perceived Urgency for Dental Care							
		Immediately		Within 6 months		More than 6 months		Currently under Tx	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	16,417	30.0	± 13.8	52.7	± 11.6	5.6	± 5.5	11.7	± 8.6
20 - 24 years	231,547	33.5	± 5.4	49.0	± 2.8	5.6	± 1.5	11.9	± 3.2
25 - 29 years	139,028	29.4	± 3.1	49.0	± 3.4	6.7	± 1.8	14.9	± 2.5
30 - 34 years	106,532	28.5	± 4.0	46.5	± 4.4	5.3	± 1.7	19.7	± 2.6
35 - 39 years	66,541	32.9	± 5.2	41.5	± 5.0	5.8	± 2.0	19.8	± 3.8
40 - 44 years	34,611	31.7	± 8.4	45.5	± 8.2	3.7	± 2.2	19.1	± 6.2
45 - 49 years	11,174	35.2	± 11.4	29.0	± 10.3	3.1	± 3.7	32.7	± 13.4
All ages	605,850	31.5	± 3.3	47.3	± 2.4	5.6	± 0.8	15.6	± 2.1

* insufficient sample size for stable estimate

Self-perceived urgency for dental care of black males across age group is given in Table 11.9 and Figure 11.10.

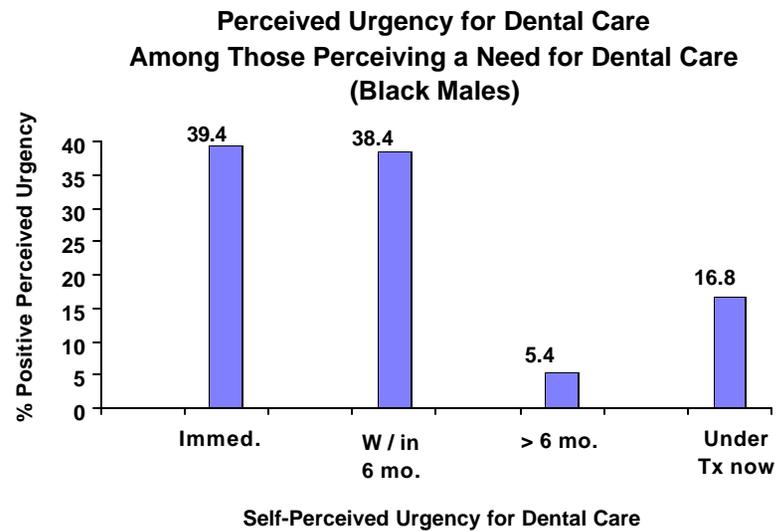


Figure 11.10

Table 11.9

PERCENT DISTRIBUTION OF SELF-PERCEIVED URGENCY FOR DENTAL CARE AMONG THOSE PERCEIVING A NEED FOR DENTAL CARE (BLACK MALES)									
	Estimated Population	Self-Perceived Urgency for Dental Care							
		Immediately		Within 6 months		More than 6 months		Currently under Tx	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	3,105	33.4	± 20.9	39.7	± 20.6	3.2	± 6.4	23.7	± 19.9
20 - 24 years	59,600	41.4	± 5.5	38.3	± 6.9	8.2	± 4.1	12.1	± 3.4
25 - 29 years	45,102	36.6	± 5.2	43.3	± 6.4	3.9	± 2.9	16.2	± 4.5
30 - 34 years	30,223	40.4	± 7.2	38.7	± 6.5	3.5	± 2.1	17.4	± 5.9
35 - 39 years	21,124	39.7	± 6.7	35.7	± 5.7	4.8	± 3.4	19.8	± 6.6
40 - 44 years	7,845	41.8	± 11.9	20.7	± 10.8	4.3	± 6.0	33.2	± 11.0
45 - 49 years	2,177	25.6	± 24.9	24.5	± 24.8	0.0	± 0.0	49.9	± 25.1
All ages	169,176	39.4	± 3.5	38.4	± 3.9	5.4	± 1.7	16.8	± 3.0

* insufficient sample size for stable estimate

Results for white females are presented in Figure 11.11 and Table 11.10. The sample size of 40-49 year old white females was too small to allow valid estimates.

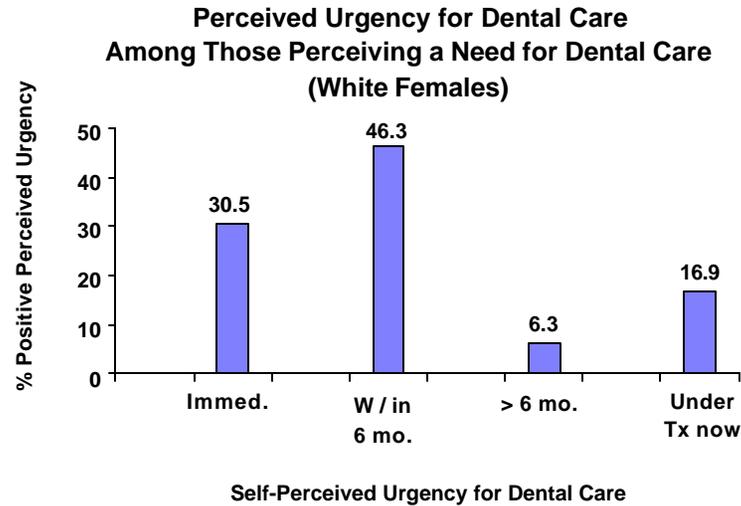


Figure 11.11

Table 11.10

PERCENT DISTRIBUTION OF SELF-PERCEIVED URGENCY FOR DENTAL CARE AMONG THOSE PERCEIVING A NEED FOR DENTAL CARE (WHITE FEMALES)									
	Estimated Population	Self-Perceived Urgency for Dental Care							
		Immediately		Within 6 months		More than 6 months		Currently under Tx	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	1,478	39.4	± 27.4	23.5	± 20.0	*	*	*	*
20 - 24 years	22,757	28.7	± 7.0	52.1	± 7.9	5.7	± 3.2	13.5	± 4.9
25 - 29 years	13,214	29.0	± 8.6	48.0	± 9.2	8.1	± 6.2	14.9	± 8.0
30 - 34 years	9,650	30.2	± 10.2	42.5	± 10.7	6.0	± 7.2	21.3	± 10.2
35 - 39 years	6,332	35.6	± 11.7	41.2	± 14.0	2.4	± 3.6	20.8	± 13.7
40 - 44 years	2,425	37.9	± 20.8	32.9	± 15.9	4.5	± 9.0	24.7	± 15.8
45 - 49 years	780	*	*	*	*	*	*	*	*
All ages	56,636	30.5	± 4.6	46.3	± 4.2	6.3	± 2.3	16.9	± 4.2

* insufficient sample size for stable estimate

Self-perceived urgency for dental care of black females across age group is given in Figure 11.12 and Table 11.11. The sample size of 18-19 and 45-49 year old black females was too small to allow valid estimates.

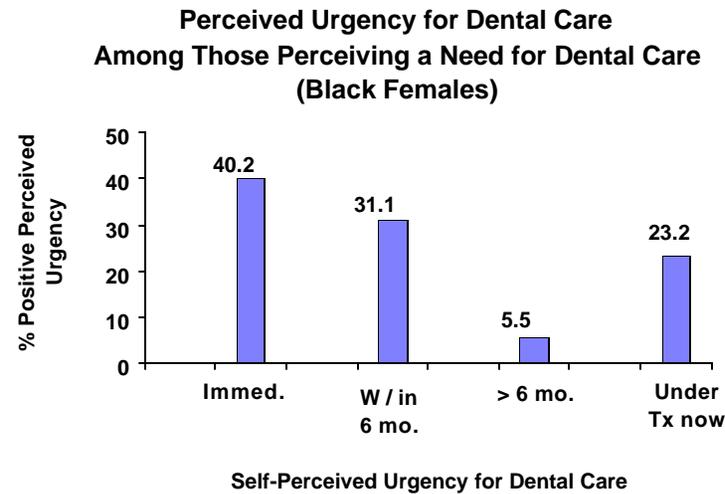


Figure 11.12

Table 11.11

PERCENT DISTRIBUTION OF SELF-PERCEIVED URGENCY FOR DENTAL CARE AMONG THOSE PERCEIVING A NEED FOR DENTAL CARE (BLACK FEMALES)									
	Estimated Population	Self-Perceived Urgency for Dental Care							
		Immediately		Within 6 months		More than 6 months		Currently under Tx	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	236	*	*	*	*	*	*	*	*
20 - 24 years	13,752	40.0	± 11.1	32.5	± 13.4	6.2	± 4.3	21.3	± 9.0
25 - 29 years	7,456	45.0	± 11.0	33.6	± 10.7	3.4	± 4.5	18.0	± 10.3
30 - 34 years	5,498	34.9	± 15.6	29.7	± 12.5	6.3	± 7.0	29.1	± 14.5
35 - 39 years	3,865	46.0	± 26.8	24.0	± 17.2	5.0	± 7.1	25.0	± 16.9
40 - 44 years	1,901	38.0	± 32.5	34.1	± 32.5	3.2	± 6.2	24.8	± 21.8
45 - 49 years	475	*	*	*	*	*	*	*	*
All ages	33,183	40.2	± 7.0	31.1	± 7.1	5.5	± 2.6	23.2	± 6.8

* insufficient sample size for stable estimate

Table 11.12 and Figure 11.13 compare self-perceived urgency for dental care of non-black, non-white males to non-black, non-white females. The sample size of 18-19 year old non-black, non-white males and 18-19, 30-34, 35-39, 40-44, and 45-49 year old non-black, non-white females was too small to permit valid estimates.

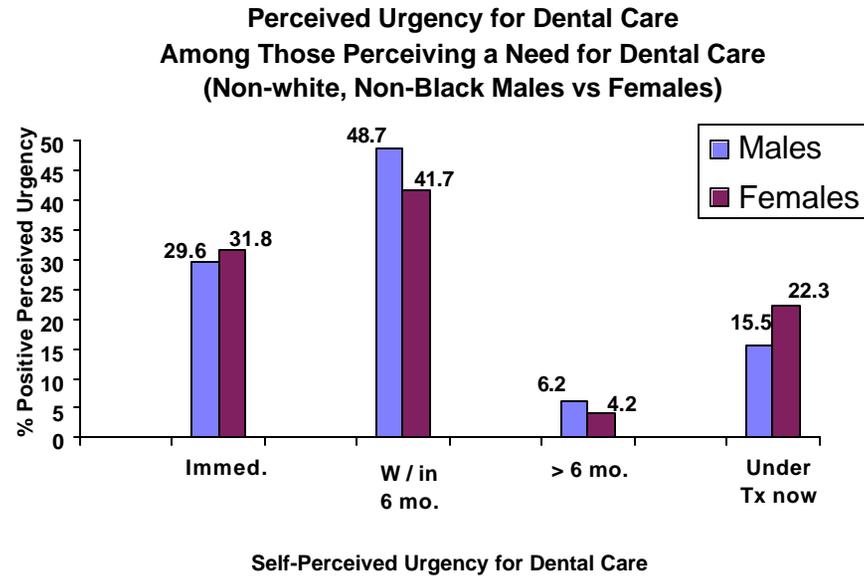


Figure 11.13

Comparing results across tables 11.8 - 11.12, there is ***no significant difference in perceived need for immediate dental care between males and females within race*** for any given age group. However, ***overall, across race, there is significantly greater perceived need for immediate dental care by black males than by white males, white females, or non-black males, and by black females than by non-white, non-black females.***

Table 11.12

PERCENT DISTRIBUTION OF SELF-PERCEIVED URGENCY FOR DENTAL CARE AMONG THOSE PERCEIVING A NEED FOR DENTAL CARE MILITARY NON-BLACK, NON-WHITE MALES									
		Self-Perceived Urgency for Dental Care							
	Estimated Population	Immediately		Within 6 months		More than 6 months		Currently under Tx	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	879	*	*	*	*	*	*	*	*
20 - 24 years	20,009	29.0	± 7.2	54.3	± 9.2	5.4	± 3.2	11.3	± 4.8
25 - 29 years	10,842	32.7	± 7.8	50.7	± 7.4	8.9	± 4.7	7.7	± 4.2
30 - 34 years	10,187	28.4	± 8.7	48.3	± 10.4	2.2	± 2.5	21.1	± 7.8
35 - 39 years	7,281	36.6	± 12.4	35.5	± 14.6	6.6	± 5.9	21.3	± 9.5
40 - 44 years	4,335	27.5	± 12.2	48.0	± 13.8	4.2	± 5.0	20.3	± 9.8
45 - 49 years	1,429	*	*	33.1	± 23.3	*	*	44.8	± 20.6
All ages	54,962	29.6	± 3.5	48.7	± 4.5	6.2	± 2.4	15.5	± 3.4

* insufficient sample size for stable estimates

PERCENT DISTRIBUTION OF SELF-PERCEIVED URGENCY FOR DENTAL CARE AMONG THOSE PERCEIVING A NEED FOR DENTAL CARE MILITARY NON-BLACK, NON-WHITE FEMALES									
		Self-Perceived Urgency for Dental Care							
	Estimated Population	Immediately		Within 6 months		More than 6 months		Currently under Tx	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI
18 - 19 years	69	*	*	*	*	*	*	*	*
20 - 24 years	2,158	15.3	± 13.5	51.4	± 19.6	*	*	30.1	± 15.4
25 - 29 years	1,169	63.2	± 27.4	*	*	0.0	0.0	*	*
30 - 34 years	675	*	*	*	*	*	*	*	*
35 - 39 years	449	*	*	*	*	*	*	*	*
40 - 44 years	277	*	*	*	*	*	*	*	*
45 - 49 years	35	*	*	*	*	*	*	*	*
All ages	4,832	31.8	± 12.8	41.7	± 12.9	4.2	± 4.9	22.3	± 9.8

* insufficient sample size for stable estimate

APPENDIX A

COMPUTATION OF COMPOSITE TIME VALUES (CTV) FOR DENTAL TREATMENT PROCEDURES

COMPOSITE TIME VALUES (CTV) ASSIGNMENT FOR DENTAL CLINICAL PROCEDURES

Military dentistry uses a Standardized Code on Dental Procedures which is a modification of the American Dental Association's Code on Dental Procedures and Nomenclature. The military code for dental procedures assigns Composite Time Values (CTV) for each procedure to be used for workload accountability. For every episode of dental care delivered, the care provider records a list of the treatment codes involved. This list of codes is then converted into numeric CTV.

The TSCOHS collected dental treatment requirements expressed as counts of specific dental procedures (i.e. number of two surface restorations, crowns, molars requiring endodontic treatment, patients in each PSR code, etc.). In order to address the total workload of treatment needs and to make comparisons across clinical disciplines possible, raw

counts of dental treatment procedures were converted into CTV.

Consulting specialists in each clinical discipline were asked to provide a list of the dental procedure codes they normally record when delivering each specific dental treatment. For example, when treating a patient with an amalgam restoration it is customary to record procedure codes for patient examination, rubber dam, local anesthesia, and patient handling time. ***The specialists were asked to exclude procedure codes which are occasionally taken and list only those which are routinely a part of each specific dental treatment. This approach guards against artificial inflation of CTV counts.*** The following pages of this section provide a detailed description of the calculations and assumptions used in the process of converting required dental treatments into composite time values.

CTV ASSIGNMENT FOR RESTORATIVE CARE AND SEALANTS

ADD ON PROCEDURES FOR RESTORATIVE CARE

0130 - other examination	0.4
9973 - patient handling (tx)	1.4
2960 - rubber dam	0.4
9211 - local anesthesia	1.0
subtotal for restorative care	3.2
TOTAL (for each rest. procedure)	3.2/ 1.3 restorations per appointment = 2.5

(assumption: 1.3 restorative procedures per restorative appointment) Based on information collected on 555 restorative appointments at Bolling AFB from May-July 1994.

TOTAL PROCEDURES FOR RESTORATIVE CARE

One surface restoration

2140 - one surface amalgam 1.0 plus 2.5 = **3.5**

Two surface restoration

2150 - two surface amalgam 1.9 plus 2.5 = **4.4**

Three surface restoration

2160 - three surface amalgam 2.2 plus 2.5 = **4.7**

Four or more surface restoration

2161 - four or more surface amalgam 2.6 plus 2.5 = **5.1**

Note: CTV for amalgam restorations were used. The CTV for a single surface resin plus etch (1.4) is greater than for a single surface amalgam (1.0). However, the CTV for a two surface resin (1.4) is less than for a two surface amalgam (1.9). Also, three surface resin plus etch (2.1) and three surface amalgam restorations (2.2) have essentially the same CTV. The TSCOHS data base does not indicate the type of restorative material required. Assuming all restorations to be amalgam should not cause significant error in the operative CTV count.

PROCEDURES FOR SEALANTS

0130 - other examination	0.4
9973 - patient handling (tx)	1.4
subtotal for sealants	1.8

(assume four sealants placed per appointment) $1.8 / 4 = 0.45$

1350 - pit/fissure sealant $0.3 + 0.45 = \mathbf{0.75}$

CTV ASSIGNMENT FOR ORAL SURGERY (EXTRACTIONS)

SIMPLE EXTRACTION

7110 - simple tooth removal	0.7
0130 - other examination	0.4
0160 - blood pressure x 2	0.4
9211 - local anesthesia	1.0
9973 - pt. handling (tx)	1.4
9631 - prescription	0.3
7520 - biopsy	(1.4) not included in total
TOTAL	4.2

COMPLICATED EXTRACTION

7120 - complicated tooth removal	1.2
0130 - other examination x 2	0.8
0160 - blood pressure x 2	0.4
9211 - local anesthesia	1.0
9973 - pt. handling (tx) x 2	2.8
9631 - prescription	0.3
9918 - post-op. tx	0.5
7520 - biopsy	(1.4) not included in total
TOTAL	7.0

IMPACTION REMOVAL

7130 - impacted tooth removal	1.4
0130 - Other examination x 2	0.8
0160 - blood pressure x 2	0.4
9211 - local anesthesia	1.0
9973 - pt. handling (tx) x 2	2.8
9630 - other therapeutic med.	0.6
9631 - prescription	0.3
4250 - mucogingival flap	2.6
9918 - post-op. tx	0.5
7520 - biopsy	(1.4) not included in total
9231 - IV sedation	(1.2) not included in total

TOTAL **10.4**

Assumption: By not including biopsy, IV sedation and other commonly used codes not listed, giving full credit for other listed codes for each extraction should provide a reasonable estimate of actual CTV for each procedure.

CTV ASSIGNMENT FOR ENDODONTIC PROCEDURES

0130 - other examination x 2	0.8
0220 - radiographs x 4	0.8
2940 - temporary restoration x 2	1.0
2960 - rubber dam x 2	0.8
3360 - endodontic interim treatment	1.8
4330 - occlusal adjustment	0.7
3311-3334 endodontic therapy	2.3 (anterior), 2.8 (premolar), 3.9 (molar)
9211 - local anesthesia x 2	2.0
9630 - other therapeutic med (NaOCl, etc.) x 2	1.2
9631 - prescription	0.3
9973 - patient handling time (tx) x 2	2.8
<u>TOTAL (anterior)</u>	<u>14.5</u>
<u>TOTAL (premolar)</u>	<u>15.0</u>
<u>TOTAL (molar)</u>	<u>16.1</u>

CTV ASSIGNMENT FOR PROSTHODONTIC PROCEDURES

SINGLE TOOTH CAST RESTORATION

0130 - other examination x 2	0.8	
9973 - patient handling (tx) x 2	2.8	
9630 - other therapeutic med.	1.2	
9211 - local anesthesia	2.0	
9923 - Impression	0.8	
6711 - interim crown	2.1	
2940 - temp. cementation	0.5	
6611 - stain and glaze (71%)	1.5	$(2.1)(.71) = 1.5$
61x0 - metal(29%), pfm(71%)	10.1	$.29(7.7) + .71(11.1) = 10.1$
(assumes 71% of crowns will be porcelain fused to metal. <u>1990 ADA Survey of Dental Services Rendered</u>)		

TOTAL **21.8**

FIXED PARTIAL DENTURE ABUTMENTS

(assumes 2 abutments per FPD, does not include the pontics)

0130 - other examination x 2	0.8	
9973 - patient handling (tx) x 2	2.8	
9923 - Impression	0.8	
6711 - interim FPD	3.2	
6611 - stain and glaze (71%)	3.0	$(2.1)(.71)(2) = 3.0$
2940 - cementation x 2 abutments	1.0	
61x0 - metal (29%), pfm (71%)	20.2	$(10.1)(2) = 20.2$
total for both abutments	31.8	

TOTAL (single abutment) **15.9** ($31.8/2 = 15.9$)

FIXED PARTIAL DENTURE PONTIC

(note: all patient handling time, impressions, etc. are counted with the abutments)

62xx - pontic (assume .5 metal and .5 pfm)	1.4
6611 - stain and glaze (assume pfm are chairside stained and glazed)	1.5
TOTAL (single pontic)	2.9

REMOVABLE PARTIAL DENTURE

0130 - other examination x 4	1.6	
9973 - patient handling (tx) x 4	5.6	
9923 - impression	0.8	
5330 - rpd corrected cast x 25%	0.7	$2.6/4 = .65$ (assumes corrected cast technique 25% of cases)
5203 - cast metal RPD	12.3	
2970 - odontoplasty	0.4	$(0.2)(2) = 0.4$
9918 - post-op tx	0.5	
TOTAL	21.9	

COMPLETE DENTURE (ONE ARCH)

0130 - other examination x 6	2.4	
9973 - patient handling (tx) x 6	8.4	
9923 - impression x 2	1.6	
9924 - jaw relation record	4.1	
5820 - chairside remount	3.5	
5110 - complete denture		10.3
9918 - post-op. tx	0.5	
TOTAL	30.8	

POST AND CORE

0130 - other examination x 2	0.8	
9973 - patient handling (tx) x 2	2.8	
9630 - other ther. med. (irrigation)	0.6	
9211 - local anesthesia	1.0	
3335 - root canal filling removal	2.0	
2940 - temporary restoration	0.5	
6711 - interim crown	2.1	
6720 - post-core, metal	4.4	
9923 - impression	0.8	
2960 - rubber dam x 2	0.8	

TOTAL

15.8

CTV ASSIGNMENT FOR PERIODONTAL SCREENING AND RECORDING CODES

Periodontal status and treatment requirements were assessed using Periodontal Screening and Recording (PSR) a rapid and effective way to screen patients for periodontal diseases. PSR is an adaptation of the Community Periodontal Index of Treatment Needs (CPITN), which is endorsed by the World Health Organization. PSR is recommended by The American Dental Association and The American Academy of Periodontology for all patients as an integral part of oral examinations. PSR includes suggested guidelines for appropriate patient management based on individual PSR score. Following the guidance of a group of consulted military periodontists, PSR treatment guidelines were converted to dental procedure codes and composite time values (CTV). The following provides the breakout of dental procedure codes taken when treating each PSR coded sextant and an explanation of the conversion to CTV.

Code 1: Oral hygiene instruction
Coronal polish
Topical fluoride application

Code 2: Oral hygiene instruction
Scaling by oral prophylaxis technician or registered dental hygienist
Coronal polish
Topical fluoride application

Code 3: Comprehensive periodontal examination by a dental officer
Vertical bitewing and selected periapical radiographic survey
Oral hygiene instruction
Scaling, and root planing as indicated, with anesthetic by RDH or a dental officer
Coronal polish
Topical fluoride application

Post-hygiene reevaluation by a dental officer.

Code 4: Comprehensive periodontal examination by a dental officer
Vertical bitewing and selected periapical radiographic survey
Oral hygiene instruction
Scaling, and root planing as indicated, with anesthetic by RDH or a dental officer
Coronal polish
Topical fluoride application
Post-hygiene reevaluation by a dental officer
Periodontal Surgery to include: a) blood pressure recording
 b) anesthetic
 c) mucogingival flaps
 d) root planing
 e) prescription medications
 f) adjunctive surgical procedures
Postoperative Treatment at 1, 2, and 4 weeks.

Included in this scheme are the conservative assumptions that:

- Two sextants can receive either root planing or surgery during the same appointment.
- No surgical therapy will be required for code 3 sextants.
- Osseous surgery, osseous grafting, guided tissue regeneration, or distal/mesial wedge will be required in only one-half of code 4 sextants.
- Complete (7.2) or limited (0.7) occlusal adjustment, and antimicrobial therapy have not been factored into these estimates.
- The requirement for supportive periodontal therapy is not included in the algorithm.

Estimated Comprehensive Periodontal Treatment Based on Whole Mouth PSR

- 1) Given a dentition with all six sextants PSR code 1, the following dental treatment is required:
Oral hygiene instruction, coronal polish, topical fluoride application.

Dental Procedure Codes

0130- other examination	0.4
1330- oral hygiene inst.	0.3
1110- adult prophylaxis	1.8
1240- topical fluoride tx	0.7
9973- patient handling (tx)	<u>1.4</u>
Total CTV	4.6

CTV per Code 1 sextant = $4.6/6 = 0.8$

- 2) Given a dentition with all six sextants PSR code 2, the following dental treatment is required:

Oral hygiene instruction, coronal polish, topical fluoride application, scaling by hygienist.

Dental Procedure Codes

0130- other examination	0.4
1330- oral hygiene inst.	0.3
4342- periodontal scaling x 6	2.4
1110- adult prophylaxis	1.8
1240- topical fluoride tx	0.7
9973- patient handling (tx)	<u>1.4</u>
Total CTV	7.0

CTV per Code 2 sextant = 7.0/6 = 1.2

3) Given a dentition with all six sextants PSR code 3, the following dental treatment is required:

Oral hygiene instruction, coronal polish, topical fluoride application, type 2 exam by specialist, selected periapical radiographs, vertical bitewing radiographs, scaling and root planing (4 settings, root plane x 6), local anesthetic.

Dental Procedure Codes

0130- other examination x 4	1.6	
0140- comprehensive exam x 2	7.2	
0210- intraoral series of radiographs	2.8	
1330- oral hygiene inst. x 6	1.8	
4343- scaling and root planing x 6	8.4	
1110- adult prophylaxis	1.8	
1240- topical fluoride tx	0.7	
9211- local anesthesia x 4	4.0	
9972- patient handling (dx) x 2	2.0	
9973- patient handling (tx) x 4	<u>5.6</u>	
Total CTV		35.9

CTV per Code 3 sextant = 35.9/6 = 6.0

4) Given a dentition with all six sextants PSR code 4, the following dental treatment is required:

Oral hygiene instruction, coronal polish, topical fluoride application, type 2 exam by specialist, selected periapical radiographs, vertical bitewing radiographs, scaling and root planing (4 settings, root plane x 6), local anesthetic, post-hygiene reevaluation by specialist, six sextants of periodontal surgery at four settings, final scaling and root planing (4 sittings, root plane x 6).

Dental Procedure Codes

0130- other examination x 14	5.6	
0140- comprehensive exam x 2	7.2	
0160- blood pressure x 8	1.6	
0210- intraoral series of radiographs	2.8	
1330- oral hygiene inst. x 16	4.8	
4250- mucogingival flap x 12	31.2	
4343- scaling and root planing x 12	19.2	
1110- adult prophylaxis	1.8	
1240- topical fluoride tx	0.7	
9211- local anesthesia x 8	8.0	
9631- prescription x 4	1.2	
9918- postoperative treatment x 9	4.5	
9972- patient handling (dx) x 2	2.0	
9973- patient handling (tx) x 14	<u>19.6</u>	
Total CTV		110.2 + 15 (surgery supplement 2.5 x 6) = 125.2

CTV per Code 4 sextant = 125.2/6 = 20.9

Osseous surgery, osseous grafting, guided tissue regeneration, or distal/mesial wedge techniques will be required in only one half of code 4 sextants. Therefore count $5.1/2 = 2.5$ CTV (surgery supplement) for each code 4 sextant.

Surgery supplement

4260- osseous resective surgery	1.4
4261- osseous graft	1.5
4268- guided tissue regeneration	1.5
4230- mesial/distal wedge	<u>0.7</u>
Total	5.2

APPENDIX B

ORAL HEALTH OF UNITED STATES ADULTS 1985-86 (NATIONAL FINDINGS) COMPOSITION OF SAMPLE AND ESTIMATED POPULATION (18 to 49 Years of Age)							
AGE INTERVAL	RACE	MALE		FEMALE		TOTAL	
		NUMBER IN SAMPLE	ESTIMATED POPULATION	NUMBER IN SAMPLE	ESTIMATED POPULATION	NUMBER IN SAMPLE	ESTIMATED POPULATION
18-19	WHITE	140	1,640,716	123	1,621,700	263	3,262,416
	BLACK	13	104,764	14	87,757	27	192,521
	TOTAL	153	1,755,787	137	1,714,859	290	3,470,646
20-24	WHITE	637	6,030,197	791	5,601,953	1428	11,632,150
	BLACK	73	677,753	91	787,285	164	1,465,038
	TOTAL	710	7,013,913	882	6,557,441	1592	13,571,354
25-29	WHITE	836	7,363,804	915	5,834,949	1751	13,198,753
	BLACK	98	760,904	126	684,780	224	1,445,684
	TOTAL	934	8,462,000	1041	6,854,000	1975	15,316,000
30-34	WHITE	763	7,168,794	777	5,051,200	1540	12,219,994
	BLACK	100	704,268	143	771,602	243	1,475,870
	TOTAL	863	8,194,000	920	6,421,000	1783	14,615,000
35-39	WHITE	777	6,384,180	661	4,928,037	1,438	11,312,217
	BLACK	106	623,299	142	667,289	248	1,290,588
	TOTAL	883	7,007,479	803	5,595,326	1,686	12,602,805
40-44	WHITE	811	5,207,825	805	4,100,710	1,616	9,308,535
	BLACK	100	510,610	141	558,456	241	1,069,066
	TOTAL	911	5,718,435	946	4,659,166	1,857	10,377,601
45-49	WHITE	704	4,161,612	727	3,143,166	1,431	7,304,778
	BLACK	69	424,050	115	436,122	184	860,172
	TOTAL	773	4,585,662	842	3,579,288	1,615	8,164,950
TOTAL POPULATION		5,227	42,737,276	5,571	35,381,080	10,798	78,118,356

Oral Health of U.S. Employed Adults and Seniors: 1985-86; U.S. Department of Health and Human Services, National Institute of Dental Research, NIH Pub. No. 87-2868, 1987, Bethesda, Maryland

APPENDIX C
DOD DENTAL CLASSIFICATION CRITERIA

DOD DENTAL CLASSIFICATION CRITERIA

Source: DoD Instruction 6410.1, *Standardization of Dental Classifications*

CLASS 1 : not requiring dental treatment or reevaluation within 12 months.

- A. No dental caries or defective restorations
- B. Arrested caries for which treatment is not indicated
- C. Healthy periodontium, no bleeding on probing, oral prophylaxis not indicated
- D. Replacement of missing teeth not indicated
- E. Unerupted, partially erupted, or malposed teeth that are without historical, clinical, or radiographic signs or symptoms of pathosis and are not recommended for prophylactic removal
- F. Absence of temporomandibular disorder; stable occlusion

CLASS 2: conditions present which, if not treated or followed up, are **not expected** to, but have the potential to result in dental emergencies within 12 months.

- A. Treatment or followup indicated for dental caries with minimal extension into dentin or minor defective restorations easily maintained by the patient where the condition does not cause definitive symptoms
- B. Interim restorations or prostheses that can be maintained by the patient where the underlying condition does not cause definitive symptoms. (This includes teeth that have been restored with permanent restorative materials, but for which protective coverage is indicated).
- C. Edentulous areas requiring prostheses but not on an immediate basis
- D. Periodontal disease or periodontium exhibiting:
 - (1) Requirement for oral prophylaxis
 - (2) Requirement for maintenance therapy; this includes stable or non-progressive mucogingival conditions requiring periodic evaluation
 - (3) Non-specific gingivitis
 - (4) Early or mild adult periodontitis
 - (5) Supragingival or slight subgingival calculus

CLASS 2: (Cont.)

- E. Unerupted, partially erupted, or malposed teeth that are without historical, clinical, or radiographic signs or symptoms of pathosis, but which are recommended for prophylactic removal
- F. Active orthodontic treatment
- G. Temporomandibular disorder patients in maintenance therapy

CLASS 3: oral conditions which, if not treated, **are expected** to result in dental emergencies within 12 months. When there are questions in determining classification between Class 2 and Class 3, patient should be placed in Class 3.

- A. Dental caries, tooth fractures, or defective restorations where the condition extends beyond the dentinoenamel junction and causes definitive symptoms; dental caries with moderate or advanced extension into dentin; and defective restorations not maintained by the patient.
- B. Interim restorations or prostheses that cannot be maintained for a 12-month period. (This includes teeth that have been restored with permanent restorative materials but for which protective coverage is indicated).
- C. Periodontal diseases or periodontium exhibiting:
 - (1) Acute gingivitis or pericoronitis
 - (2) Active moderate to advanced periodontitis
 - (3) Periodontal abscess
 - (4) Progressive mucogingival condition
 - (5) Periodontal manifestations of systemic disease or hormonal disturbances
 - (6) Moderate to heavy subgingival calculus
- D. Edentulous areas or teeth requiring immediate prothodontic treatment for adequate mastication, communication, or acceptable esthetics
- E. Unerupted, partially erupted, or malposed teeth with historical, clinical, or radiographic signs or symptoms of pathosis, that are recommended for removal

CLASS 3: (Cont)

- F. Chronic oral infections or other pathologic lesions including:
 - (1) Pulpal or periapical pathology requiring treatment
 - (2) Lesions requiring biopsy or awaiting biopsy report
- G. Emergency situations requiring therapy to relieve pain, treat trauma, treat acute oral infections, or provide timely follow-up care (e.g., drain or suture removal) until resolved
- H. Temporomandibular disorder requiring active treatment