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AN ASSESSMENT OF THE DENTAL NEEDS OF ARMY RECRUITS.(U)
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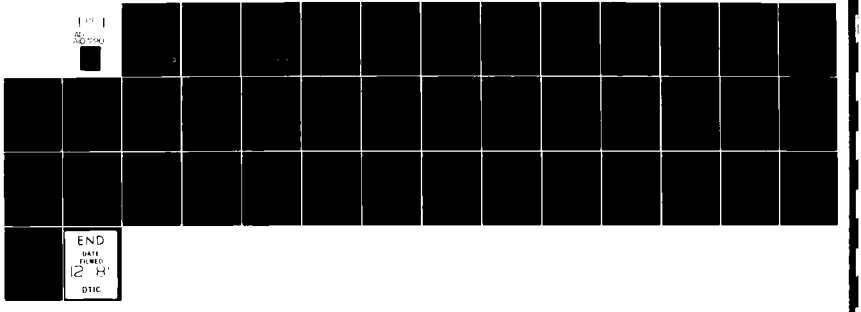

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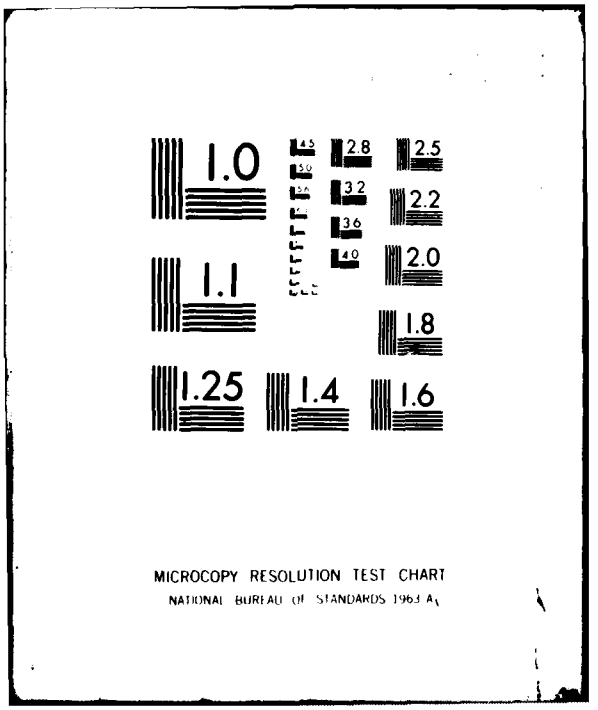
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AN ASSESSMENT OF THE DENTAL NEEDS OF ARMY RECRUITS

by

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FINAL REPORT

July 1981

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
Current information about the dental care needs of Regular Army recruits is not routinely available to the Department of the Army Assistant Surgeon General for Dental Services for use in determining the allocation of limited dental resources. Similar information about the Reserve and National Guard components is also sorely lacking to mobilization planners. The purpose of this study was to determine the dental treatment needs of Army recruits by component, sex, ethnic background, and level of education. A random selection of incoming recruits was examined by experienced dental officers, and treatment plans were developed. The

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resulting data was analyzed to determine the needs per thousand recruits for 15 care variables. Treatment times were also established to provide the required care. In general the dental care needs of current all-volunteer forces are approximately the same as when the draft was in effect although shifts have occurred in the relative magnitude among the care variables. Restorations account for 41% of total care needs of recruits. Significant differences were shown among the needs for Army components. Level of education and ethnic background are important variables in determining recruit population dental needs. It is recommended that the report be made available to dental resource utilization and mobilization planners and that a dental classification system that identifies severity of care needs be developed and implemented.

ABSTRACT

Current information about the dental care needs of Regular Army recruits is not routinely available to the Department of the Army Assistant Surgeon General for Dental Services for use in determining the allocation of limited dental resources. Similar information about the Reserve and National Guard components is also sorely lacking to mobilization planners. The purpose of this study was to determine the dental treatment needs of Army recruits by component, sex, ethnic background, and level of education. A random selection of incoming recruits was examined by experienced dental officers, and treatment plans were developed. The resulting data was analyzed to determine the needs per thousand recruits for 15 care variables. Treatment times were also established to provide the required care. In general the dental care needs of current all-volunteer forces are approximately the same as when the draft was in effect although shifts have occurred in the relative magnitude among the care variables. Restorations account for 41% of total care needs of recruits. Significant differences were shown among the needs for Army components. Level of education and ethnic background are important variables in determining recruit population dental needs. It is recommended that the report be made available to dental resource utilization and mobilization planners and that a dental classification system that identifies severity of care needs be developed and implemented.

An Assessment of the Dental Needs of Army Recruits

1. INTRODUCTION.

a. Problem. Accurate information about the dental care needs of the current US Army recruit population is not collected by routinely submitted reports. Such information is needed by the Department of the Army Assistant Surgeon General for Dental Services and the Director of Dental Services (DDS), US Army Health Services Command (HSC) to determine adequate and appropriate dental staffing levels and specialty mix at installations concerned with providing care to this population. In addition, very limited data are available concerning the dental care needs of Army Reserve and National Guard recruits for use by staffers in determining mobilization requirements.

b. Purpose. The purpose of this study was to develop a report specifying the types and frequency of occurrence of dental needs for recruits in each component of the Army and to determine the treatment time required for meeting these needs.

c. Background.

(1) The most recent information concerning Army recruits was collected in 1969 and reported by Cassidy et al.[1] This study was performed when the draft was in effect. Because the all-volunteer military force may represent a different socio-economic and educational level[2] from the draft force, an updated assessment of the dental condition of newly inducted Army personnel is essential.

(2) Hobson[3] reported that the 1956 Army recruit required 4.7 restorations while Cassidy et al.[1] reported a need for 5.1 restorations per recruit in 1969. Cassidy's finding compares closely to restorative needs of Marines for the same time period (5.0 per Marine).[4] A 1960 study[5] of Air Force enlisted men indicated that 5.3 restorations were needed. A 1977 study reported by Christen et al.[6] indicated that 6.2 restorations per Air Force recruit were required. Studies conducted with Navy recruits in 1957[7] and 1959[8] reported a restoration need of 6.2 and 7.0 per recruit. A study conducted on Army personnel in 1976 reported that 17-19 year olds required 5.6 restorations per person[9] but the age group was not necessarily composed exclusively of recruits. Spinks and Schneider[10] reported a requirement for 5.0 restorations per Navy/Marine recruit in 1981. The requirement for restorations was a common treatment need collected in each study and, therefore, is used as the means for comparison. Restorations also comprised the greatest type of dental treatment needed for this age group.

2. OBJECTIVES.

The objectives of the study were:

a. To determine the dental care needs of Army recruits by type of treatment required for each Army component category inductee (Regular, Reserve, and National Guard).

b. To determine the treatment time required to provide the needed care for each of the sample groups.

3. METHODOLOGY.

a. Overall Approach. A demographic and treatment plan type dental needs assessment of randomly selected inductees was conducted at each Army reception station.

b. Study Population. The population studied consisted of recently inducted Army personnel who were in-processing onto active duty.

c. Sample Population. The study population was selected from the recruit population which was composed of approximately 170,000 recruits for Fiscal Year 1981. From this group a three percent (5,100) sample was selected for evaluation. Each of the seven US Army Reception Stations participated in the study. The stations were located at Fort Dix, NJ; Fort Knox, KY; Fort Jackson, SC; Fort McClellan, AL; Fort Leonard Wood, MO; Fort Sill, OK; and Fort Bliss, TX. Each installation was visited by a Dental Studies Office project officer to insure that the sampling requirements of the study were met.

d. Sampling Procedure. Data collection began 5 January 1981 and continued until the sample quotas for each installation were met. The sampling process varied from site to site depending on the facilities available, the flow of recruits through the center, and the proximity of the center to a dental treatment facility with bite-wing x-ray capability. Site visits to the centers indicated that the manner in which the recruits were examined was dictated by the in-processing procedure, that is, not alphabetic or by serial number. In order to maintain patient flow the sample selection was based on the order of examination. For example, every fifth person or every tenth person was examined depending on the local situation. The project officers and participating DENTAC Commanders determined the exact process that best fit the local operation.

e. Dental Examination Procedure.

(1) Recruits selected for inclusion in the sample had their demographic data (see Appendix A) completed during the examination process. Forms were not passed out prior to the examination. The examination consisted of a clinical assessment of the treatment needs as described in the instructions provided each examiner (see Appendix A). Each study participant had panographic x-ray available to assist in making decisions about treatment needs. A selected sub-sample also received bite-wing x-rays. The care needs were entered on the study data collection form in Section II (see Appendix A) by a dental auxilliary or the examiner.

(2) The basic guidance provided each examining officer for conducting an examination consisted of the following: "Your examination findings should result in the formulation of a treatment plan that you feel will restore this patient to reasonably optimal oral health. That is, base your plan on a realistic evaluation of the patient's age, past dental disease experience, and the degree to which you feel the patient can be motivated to maintain a level of health to which you plan to restore him or her." Panographic x-rays should be used as a minimal diagnostic aid, and bite-wings should be acquired whenever possible. See Appendix A for the specific demographic and clinical items collected and the complete instructions to examiners.

(3) Each DENTAC Commander designated an experienced dental officer to conduct the examinations. One officer conducted all examinations whenever possible; however, when this was not possible the number of examiners was kept to a minimum. No more than two examiners were used at any installation.

f. Data Handling Procedure. Each DENTAC Commander or his designee was responsible for collecting and submitting completed forms to the project officer at DSO. The forms were checked for completeness and legibility prior to submission to the project officer.

g. Analysis of Data.

(1) Completed forms were reviewed by DSO personnel prior to the data being transferred to punched cards. Data were keypunched by the Production Division, Health Care Systems Support Activity (HCSSA), HSC. The Operations Analysis Office (OAO), Directorate of Combat Developments and Health Care Studies (DCDHCS), provided computer support for processing and analyzing the data. The preprogrammed Statistical Package for the Social Sciences (SPSS) was used for the analyses. Programming support was provided by Health Care Studies Division (HCSD), DCDHCS.

(2) Descriptive statistics were obtained to portray status of the total sample population and sub-groups to include absolute and relative frequency distributions by the sub-categories for the entire population.

(3) Appropriate inferential statistical tests were applied to determine if statistically significant differences occurred between selected sub-groups.

4. FINDINGS.

a. Table 1 shows a comparison of the demographic variables for the sample surveyed with seven months of actual recruit input data obtained from the Recruiting Division, Office of the Deputy Chief of Staff for Personnel, Department of the Army (ODCSPER, DA).

b. Table 2 describes the dental procedure requirements by Army component and for the entire recruit sample. It should be noted that the restorative requirements are derived from sub-samples consisting of only those personnel who had bite-wing radiographs taken. These requirements have been used to project hours of care required for each component and for the total recruit samples as shown in Table 3. Procedural treatment times are at Appendix B.

c. Table 4 shows the relationship between the current survey and the data reported for the 1969 recruit survey for those categories of care that can be compared. Since the 1969 survey considered only male active duty recruits, the data comparison is made with the regular Army male sub-sample of the 1981 survey. The treatment times for comparable needs, at Appendix B, were applied to both the 1969 and 1981 data.

d. The distribution of care needs among the Army components is presented in Tables 5 through 7. Additional tables with data pertaining to care needs by sex, ethnic background, and level of education may be found at Appendix C. Information collected to describe the prevalence of periodontosis, ANUG, and gingival

inflammation are shown at Appendix D. The findings found in Appendices C and D were not pertinent to the objectives of the study but were collected to better describe the occurrence of the conditions and clarify clinical impressions of concerned clinicians; therefore, they will not be included in the body of the report.

e. Table 5 shows the distribution of the hours of care required for the Regular Army sample. Appendix C contains a series of tables concerning the distribution of specific care needs among this group.

f. Figure 1 depicts the hours of care required per 1000 personnel and the percentage of the population involved. Total hours per category were obtained by using the mean hour of each 2 hour category.

5. DISCUSSION.

a. The mean age of the Regular Army sample (20.3 years) compares very closely to the actual mean age (20.0 years) of recruits currently entering the Army. Comparison between other variables for the active force and data provided by the Recruiting Division also show a favorable pattern. Although the sample for the regular force showed a 10 percent difference between the actual input for an eight month period for level of education, the mean care needs are still considered valid measures and can be applied to actual annual means obtained from DCSPER, DA, if the differences warrant a recalculation. It was recognized during the planning stages of the survey that recruit input composition does have seasonal variation especially for level of education. The study sample was collected from January through March 1981. This period was considered by Recruiting Division, DSCPER, DA to have less variation than either the Spring or Fall seasons. Since it was impractical, from an operational standpoint, to collect data for a full year, the quarter selected was considered to be the best for overall mix. The mean care needs derived from this sample by demographic variables, at Appendix D, can be applied should any dramatic shift in composition of the recruit population occur.

b. The frequency of occurrence of dental needs per thousand personnel by category of care required as shown in Table 2 depict the requirements for fifteen types of basic dental care. The requirement for restorations (5,278 per 1000) closely parallels the restorative needs of Navy/Marine recruits reported by Spinks in 1981 (5,000 per 1000) but less than the need reported for Air Force recruits (6,200 per 1000) in 1979 by Christen. The current findings for overall restorative needs do not differ measurably from those reported by Cassidy et al. in 1969 (5,066) for male recruits or from results published in earlier studies. The type of restorative mix does show a change towards fewer one surface requirements and an increase in the multi-surface restorative requirement. This finding will affect the relative treatment time requirements.

c. Examiners subjectively reported that they felt the restorative requirement would be drastically reduced over past studies because of their impression the general state of oral health of recruits was better than that observed during the draft. This observation was shared by project officers during visits to study sites. However, it is believed that more teeth are currently preserved and are at risk to restorative lesion formation and restoration replacement. Fluoridation, other preventive services, and availability of

care may all contribute to the increase in the presence of restorable teeth. Although not measurable, the severity of deterioration of teeth with caries was generally felt by examiners to be less than in the past. There did not appear to be as many "bombed-out mouths" in the current recruit population. Although these are subjective clinical impressions, they are of practical significance.

d. In general, the requirement for care between Army components was shown to be different and is larger for Reserve and National Guard than for Regular Army recruits. Although there are individual variable inconsistencies, the overall requirement for hours of care required supports this and will be discussed in greater detail later.

e. The time requirement for accomplishing the dental needs of recruits (Table 3) shows the total time requirement for each of the Army components and the total sample. This time estimate represents a comprehensive evaluation of the treatment needs of the current recruit population and does not indicate a reduction in care requirements has occurred. The mean hours of care by variables are useful in determining total workload requirements but can also be used to determine staffing mix and other resource requirements for installations where large segments of this population will receive their initial treatment in the Army Dental Care System. For example, 8,510 hours of care would be required to treat the needs of 1,000 newly inducted personnel at their first permanent duty station. Of this requirement, 3,510 hours or 41 percent of the total requirement is for restorative while only 220 hours or 2.6 percent of the requirement is for removable prosthetic devices..

f. When the male segment of the current study is compared to the 1969 Army recruit survey (Cassidy), for those variables that can be compared (Table 4), there are some important shifts in the workload requirement which should be considered. Only the male segment of the Regular Army component was used for this comparison since the 1969 survey was exclusively for male inductees. The restorative requirement is essentially the same for both surveys. The lower frequency but higher time requirement is due to the occurrence of a higher proportion of multi-surface restorations being reported in the current survey. Nineteen percent of the total sample was free of a restorative requirement. The requirement for extractions of erupted teeth was slightly lower in the current survey than in 1969; however, an endodontic category was not collected at that time and such conditions were treated by extraction. When the endodontic requirement for the current survey is added to the erupted extraction requirement, the need for extraction is essentially the same for both surveys. There has been a decline in the need for both fixed and removable prosthetic services since the 1969 survey. The increase in the need for scaling and prophylaxis may be due to a change in practice philosophy or may be a true change. However, both surveys indicate a high need for dental hygienist-provided services. In comparing Tables 5 through 7, it can be seen that the National Guard component had 5 percent fewer persons in the 0-2 hour category, but in each component the largest percent of the sample required between 4 to 6 hours of care. Only the Regular Army component reached the 50th percentile in the 4 to 6 hour category, while both the Regular Army and the Reserve components reached the 75th percentile in the 8 to 10 hour category. Although the distributions do not differ drastically, the data does reflect that mobilization requirements for Reserve and National Guard components are slightly different than the requirement for the Regular force.

g. The non bite-wing adjusted total time requirement was significantly different among Army components when an analysis of variance (ANOVA) was performed ($F = 7.390$, $df = 2/5581$, $p < .0006$). Both the Reserve and National Guard components have substantially overall higher needs than the Regular Army recruits. This factor should be taken into consideration when planning for mobilization. There was not a significant difference for Sex when ANOVA was performed for total treatment hours ($F = .343$, $df = 1/5515$, $p < .5581$), but it should be noted that the restorative requirement between males was significantly different from females ($F = 20.754$, $df = 1/5564$, $p < .0001$). Females require an average of .5 restorations more per person than the males surveyed. Level of education was shown to be an important variable to be considered when looking at potential workload requirements. The treatment hours required between non-high school graduates, high school graduates, and more than a high school education were significantly different ($F = 18.246$, $df = 2/5536$, $p < .0001$). The non-high school graduates required an average of 1.2 hours of care more than did high school graduates and 2.2 hours care more than the group with greater than a high school education. Therefore, the level of education of incoming personnel has a decided importance in estimating the dental workload requirement. Ethnic background was reported by white, black, and other categories. An ANOVA was used to determine if significant differences existed between groups. Significant differences were shown among ethnic groups ($F = 13.041$, $df = 2/5538$, $p < .0001$): Blacks required an average of 1.3 hours more care than Whites and 2.3 hours more care than the Other group. Based upon the data collected for this survey it has been demonstrated that the educational level and/or ethnic mix of a recruit population can make a substantial difference in the resulting requirement for dental care.

h. The data presented in Table 5 was used to calculate the approximate man-hours of care required per 1000 recruit population. The midpoints for hours of care required were used to estimate the requirements. Figure 1 graphically portrays the results. That is, the 76% of the population requiring less than ten hours of care require approximately 3,704 man-hours. The remaining 24% have a requirement of 3,450 man-hours. With fixed limited resources for providing care to this population, a classification system designed to identify severity of need would be extremely valuable for raising the maximum number of recruits to an acceptable state of dental health. Currently such a system is not available but should be devised and implemented.

i. The data presented in Appendix C, Tables C1, C2, and C3 show the impact of the sex, level of education, and ethnic mixes on the care required. It is important to have information about changes in these factors as they have definite relation to the resources required to provide care to the Army recruit population. Table C4 describes the distribution of the restoration need among the population surveyed. This table was derived from non bite-wing adjusted data and is included to provide a crude illustration of distribution for this care variable since it impacts so heavily on the hours of care required (41% of the total hours required is for restorative care). Table C5 shows the percent of the population that does not have a care requirement for each variable. With the exception of restorations, prophylaxis, and calculus removal, the requirements for other types of care are confined to relatively small segments of the population.

j. The information contained in Appendix D describes the prevalence of periodontosis and ANUG among the recruits surveyed by component, sex, level of education, and ethnic background. In addition the gingival index scores are also presented. This data should be considered as baseline for future surveys to assess changes in the gingival/periodontal health of future recruit populations.

k. Although the requirement for oral hygiene counseling was not a variable in the treatment plan it should be considered a universal requirement for all recruits. The high prevalence of restorative needs, the prevalence of ANUG (Table D2), and the Gingival Index score (Table D3), which approaches one for the entire sample, document the need for this preventive service. The estimated time requirement, which should be added to the time reported in Table 3, should be at least one hour. This counseling can be accomplished by an integral part of the Army Preventive Dentistry Program and should be accomplished early in the treatment process. A standardized initial counseling session should be developed to be followed by individualized sessions tailored to the needs of the patient and should be implemented as part of the treatment regimen.

6. CONCLUSIONS.

a. The treatments of Army recruits, by component, have been quantified, and an estimate of the hours of care required has been established.

b. The overall requirement for dental care among recruits currently being processed for training is approximately the same as the recruits when the draft was in effect.

c. There was, however, a shift in the types of care needed, with reductions noted in the need for fixed and removable prosthodontics.

d. Restorative needs constitute 41% of the total care requirements for incoming recruits.

e. There are significant differences in the total time required for dental needs among Regular, Reserve, and National Guard recruits.

f. Level of education and ethnic background are important variables in determining recruits' dental needs.

g. A dental classification which recognizes severity of dental need should be developed to maximize the efficient use of dental resources in order to maximize the effect of dental care to the concerned population.

h. Oral health counseling should be a universally applied preventive service and should be initiated as early as possible in the care delivery process.

7. RECOMMENDATIONS.

a. Recommend these findings be made available to the Assistant Surgeon General for Dental Services.

b. Recommend a dental classification system which identifies severity of

care needs be devised and implemented to maximize effectiveness of the Dental Care System.

c. Recommend that the size and mix of dental staffs at installations providing initial care to large segments of recruit populations reflect the care needs shown in this study.

d. Recommend the findings for Reserve and National Guard components be made available to mobilization planners.

e. Recommend that surveys be conducted in the future to monitor the care needs of Army recruits at 5 or 10 year intervals or when drastic changes in the methods of obtaining recruits occur.

f. Recommend that an initial oral health counseling process be developed for participation by all recruits and that individualized counseling be encouraged as part of the care delivery process.

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Table 1

Dental Needs of Army Recruits - 1981 Survey

	Regular Army	Reserve	National Guard	Total Sample	Actual*
Mean Age (years)	20.3	20.1	19.9	20.2	20.0
Marital Status					
Married	18%	17%	17%	18%	-
Not Married	82%	83%	83%	82%	-
Sex					
Male	82%	75%	91%	83%	84%
Female	18%	25%	9%	17%	16%
Ethnic Background					
White	68%	66%	73%	67%	71%
Black	24%	28%	19%	24%	25%
Other	8%	7%	8%	8%	4%
Education Level					
Non-High School Graduate	24%	54%	27%	32%	21%
High School Graduate	62%	34%	47%	55%	72%
More then High School	14%	11%	9%	12%	7%

*Recruiting Div, ODCSPER, DA, 1 Oct 80 thru 3 Apr 81.

Table 2

Dental Procedure Requirements Per 1000 Army Recruits By Service Component

Type of Dental Procedure	FREQUENCY PER 1000 RECRUITS			
	Regular Army (N = 3,708)	Reserve (N = 742)	National Guard (N = 1,120)	Combined Sample (N = 5, 613)
Restorations*				
One-surface	2,695	2,553	2,757	2,639
Two-surface	1,702	1,876	1,736	1,735
Three-surface or more	831	1,060	936	885
Fixed Prosthodontics				
Individual Crowns	277	240	276	272
Bridge Abutments	374	380	430	386
Removable Prosthodontics				
Complete Dentures	9	12	10	10
Partial Dentures	94	95	106	96
Endodontics				
Anterior	69	70	61	68
Posterior	133	117	113	127
Exodontics				
Erupted Teeth	801	759	928	822
Impacted Teeth	1,710	1,692	1,914	1,744
Periodontal Services	118	149	154	129
Preventive Services				
Prophylaxis	949	934	943	946
Calculus Removal	858	882	889	867
Examination	1,000	1,000	1,000	1,000

*Includes only those recruits having bite-wing x-rays. N = regular, reserve, NG

Table 3

Dental Needs of Army Recruits - 1981 Survey

Mean Treatment Time Requirements by Total Sample and by Army Component in Hours

	Regular Army	Reserve	National Guard	Total Sample
Restorative*	3.38	3.33	4.06	3.51
Endodontia	.54	.49	.46	.52
Fixed Prosthodontia	1.28	1.21	1.38	1.29
Removable Prosthodontia	.21	.23	.24	.22
Exodontia - Erupted	.19	.18	.22	.20
Impaction	1.64	1.62	1.84	1.67
Periodontia	.24	.30	.31	.26
Prophylaxis	.35	.34	.35	.35
Calculus Removal	.16	.17	.17	.16
Examination	.33	.33	.33	.33
Total Hours	8.32	8.20	9.36	8.51

*Includes only those recruits having bite-wing radiographs; N = 1,773 Regular, N = 405 Reserve, N = 537 National Guard.

Table 4

Comparison of Dental Care Needs Per 1000 Army Recruits in 1969 and 1981

Type of Care	Number of Procedures			
	1969*		1981**	
	Number	Hours	Number	Hours
Restorations	5,066	2.79	4,979	2.85
Extractions	1,013	.25	1,043 ***	.25
Removable Prosthodontics	155	.33	95	.19
Fixed Prosthodontics	897	1.80	674	1.33
Scaling and Prophylaxis	1,229	.34	1,842	.53
		5.51 hrs		5.15 hrs

*Cassidy, J.E., Parker, W.A., and Hutchins, D.W. "Dental Care Requirements of Male Army Recruits." Military Medicine, 138:27, January 1973.
**Includes only male recruits.
***Adjusted to include erupted extractions and endodontic requirement. An endodontic requirement was not established in 1969 and those teeth were included in the extraction category.

Table 5

Distribution of Care Needs by Hours of Care Required for the Regular Army Component

Hours	Cumulative Percent	Category Percent
0 - 2	12	12
2 - 4	28	16
4 - 6	52	24
6 - 8	66	14
8 - 10	76	10
10 - 12	84	8
12 - 14	89	5
14 - 16	93	4
16 - 18	95	2
18 - 20	97	2
20 or more	100	3

Table 6

Distribution of Care Needs by Hours of Care Required for the Reserve Component

Hours	Cumulative Percent	Category Percent
0 - 2	12	12
2 - 4	25	13
4 - 6	47	22
6 - 8	65	18
8 - 10	75	10
10 - 12	84	9
12 - 14	89	5
14 - 16	92	3
16 - 18	94	2
18 - 20	96	2
20 or more	100	4

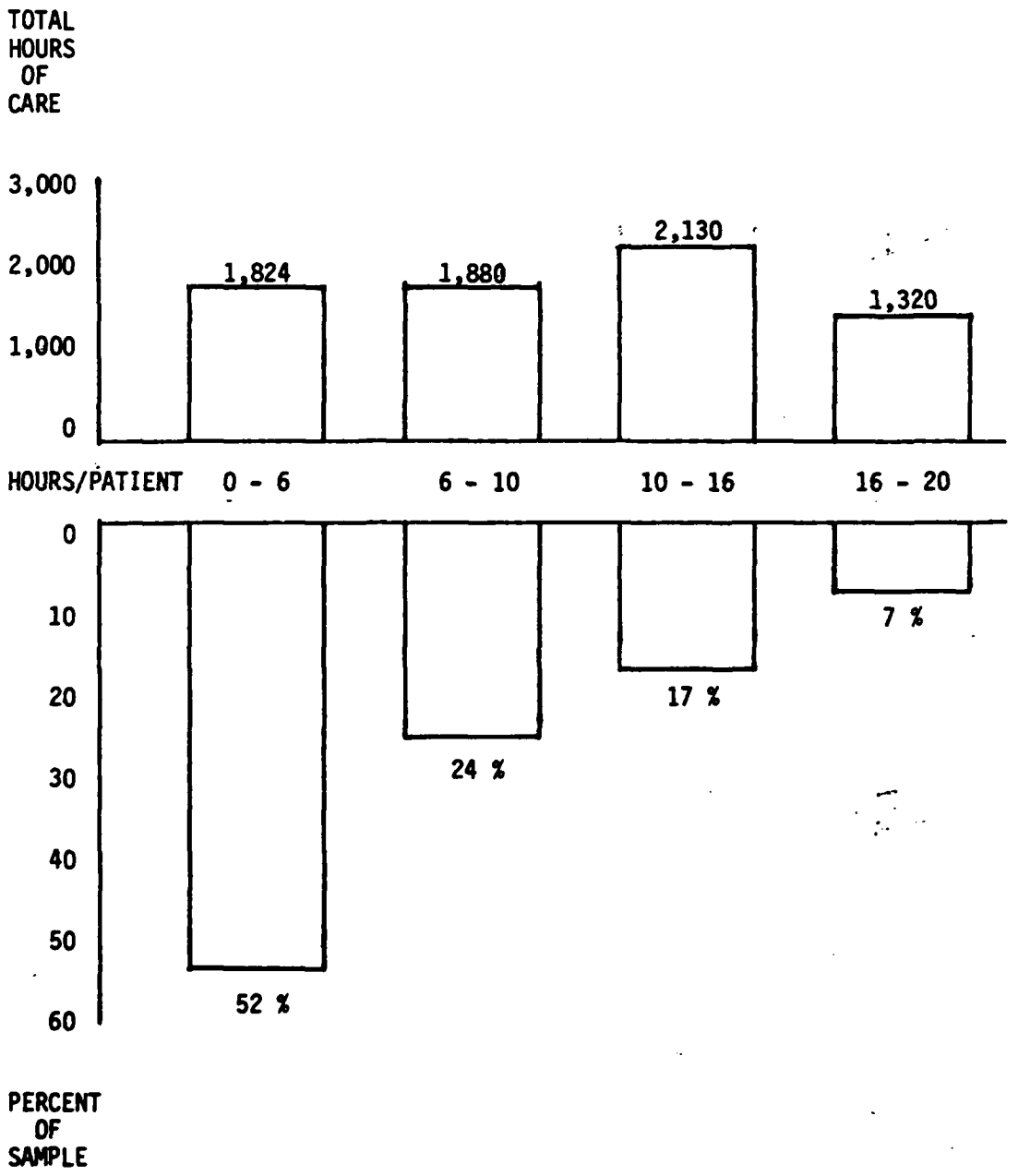
Table 7

Distribution of Care Needs by Hours of Care Required for the National Guard Component

Hours	Cumulative Percent	Category Percent
0 - 2	9	9
2 - 4	24	15
4 - 6	46	22
6 - 8	61	15
8 - 10	73	12
10 - 12	81	8
12 - 14	87	6
14 - 16	91	4
16 - 18	94	3
18 - 20	96	2
20 or more	100	4

Figure 1

DISTRIBUTION OF THE REGULAR ARMY SAMPLE BY HOURS OF CARE REQUIRED PER 1000 PERSONNEL COMPARED TO THE PERCENT OF THE SAMPLE INVOLVED



APPENDIX A

SECTION I: DEMOGRAPHIC DATA

1. INSTALLATION CODE [ ][ ] 1,2
2. STATUS: (REGULAR ARMY=1; ARMY RESERVE=2; NATIONAL GUARD=3) [ ] 3
3. STATE OF RESIDENCE (USE TWO LETTER POSTAL CODE) [ ][ ] 4,5
4. DATE OF BIRTH (MONTH, DAY, YEAR) [ ][ ], [ ][ ], [ ][ ] 6,7,8,9,10,11
5. SEX (MALE=1, FEMALE=2) [ ] 12
6. ETHNIC ORIGIN: [ ] 13
   - (1) WHITE
   - (2) BLACK
   - (3) HISPANIC
   - (4) AMERICAN INDIAN
   - (5) ORIENTAL AMERICAN
   - (6) OTHER
7. HIGHEST LEVEL OF EDUCATION ATTAINED: GRADES= 01 TO 25 [ ][ ] 14,15
8. NUMBER OF PERSONS IN YOUR IMMEDIATE FAMILY (INCLUDING YOURSELF: 01 TO 20) [ ][ ] 16,17
9. MARITAL STATUS: (MARRIED=1, NOT MARRIED=2) [ ] 18
10. ESTIMATED FAMILY INCOME: [ ] 19
    - (1) LESS THAN $4,000
    - (2) $4,000 TO $7,999
    - (3) $8,000 TO $12,499
    - (4) $12,500 TO $14,999
    - (5) $15,000 TO $19,000
    - (6) $20,000 TO $24,999
    - (7) $25,000 TO $29,999
    - (8) $30,000 +

SECTION II: CLINICAL (EACH ITEM MUST CONTAIN A NUMERICAL ENTRY)

RADIOGRAPHS

1. WERE BITE-WING X-RAYS USED IN PREPARING THIS TREATMENT PLAN. (NO=0, YES=1) [ ] 30

PREVENTIVE

2. PROPHYLAXSIS. (NO=0, YES=1) [ ] 31
3. CALCULUS REMOVAL. (NO=0, YES=1) [ ] 32

4. NUMBER OF RESTORATIONS REQUIRED:

ONE SURFACE		33,34
TWO SURFACE		35,36
THREE SURFACE		37,38

ENDODONTICS

5. NUMBER OF ANTERIOR TEETH REQUIRING ROOT CANAL TREATMENT — 39,40

6. NUMBER OF POSTERIOR TEETH REQUIRING ROOT CANAL TREATMENT — 41,42

PERIODONTICS

7. PERIODONTAL TREATMENT REQUIRED. (NO=0, YES=1, SEE INSTRUCTIONS) — 43

8. PERIODONTOSIS PRESENT. (NO=0, YES=1) — 44

9. ANUG PRESENT. (NO=0, YES=1) — 45

10. GINGIVAL INDEX:

	ENTER SCORE	
TOOTH NUMBER 3	___	
TOOTH NUMBER 9	___	
TOOTH NUMBER 12	___	
TOOTH NUMBER 19	___	SEE CRITERIA — 46,47
TOOTH NUMBER 25	___	
TOOTH NUMBER 28	___	

PROSTHODONTICS, REMOVABLE

11. NUMBER OF COMPLETE DENTURES REQUIRED. — 48

12. NUMBER OF PARTIAL DENTURES REQUIRED. — 49

PROSTHODONTICS, FIXED

13. NUMBER OF INDIVIDUAL CROWNS REQUIRED. — 50,51

14. NUMBER OF BRIDGE ABUTMENTS REQUIRED. — 52,53

EXTODONTIA

15. NUMBER OF ERUPTED TEETH REQUIRING EXTRACTION. — 54,55

16. NUMBER OF IMPACTED TEETH REQUIRING REMOVAL. — 56,57

INSTRUCTIONS FOR RECORDING DATA

Be sure that all boxes are filled in. LEAVE NO BLANKS. Enter "0" where no other number is required. EXAMPLE: If a patient requires two extractions, enter the numbers [0] [2]

SECTION I: Demographic Data

1. Installation code: self-explanatory.

2. Status: self-explanatory.

3. State of residence: EXAMPLE: Texas (TX), Ohio (OH).

4. Date of birth: EXAMPLE: 03/16/49 (March 16, 1949).

5. Sex: self-explanatory.

6. Ethnic origin: self-explanatory.

7. Highest level of education attained: EXAMPLE: high school graduate = 12; first two years of college = 14; etc.

8. Number of persons in your immediate family: EXAMPLE: 2 brothers, 1 sister, mother, father, yourself -- totals 6.

9. Marital status: self-explanatory.

10. Estimated family income: enter corresponding numerical code for estimated family income for the past 12 months.

SECTION II: Clinical

Your examination findings should result in the formulation of a treatment plan that you feel will restore this patient to reasonably optimal oral health. That is, base your plan on a realistic evaluation of the patient's age, past dental disease experience, and the degree to which you feel the patient can be motivated to maintain the level of oral health to which you plan to restore him/her. Diagnostic guidelines or criteria will not be imposed upon you; your clinical judgment should be the basis for determining the optimal treatment plan for each study participant.

Use of Bite-Wing X-Rays:

1. Self-explanatory.

2. Prophylaxis: enter "YES" if an adult prophylaxis, dental procedure code 01110, is required.

3. Calculus removal: enter "YES" if a periodontal scaling, dental procedure code 04342, is required.

4. Restorations required: ONE surface: Enter total number of one-surface amalgam, dental procedure code 02140, and/or simple resin, dental procedure code 02320, restorations required. Also, include silicate cements, dental procedure code 02210. TWO surface: Enter total number of two-surface amalgam, dental procedure code 02150, and/or complex resin, dental procedure code 02336, restorations required. THREE surface: Enter total number of three and four or more-surface restorations, dental procedure codes 02160 and 02161, required.

5. Anterior root canal therapy: self-explanatory.

6. Posterior root canal therapy: self-explanatory.

7. Periodontal treatment required: ENTER "YES" if the therapy required must be performed by a dentist.

8. Periodontosis: self-explanatory:

9. ANUG: self-explanatory.

10. Gingival index: To determine the gingival score: Dry tissues around the teeth to be scored and apply the following criteria:

Gingival Score	Criteria
0	Gingival tissue is normal in color and tightly adapted to the tooth--tissue is firm and no exudate is present.
1	Inflammatory changes are present, but do not completely encircle the tooth. Changes may include one or a combination of the following: o Any change from normal gingival color o Loss of normal density and consistency o Slight enlargement or blunting of the papilla or gingiva o Tendency to bleed upon palpation or probing
2	Inflammatory changes listed above completely encircle the tooth.

Enter the appropriate score for each tooth number on the line provided. DO NOT add the scores. If a tooth that is indicated for scoring is missing DO NOT substitute an adjacent tooth; merely leave the line blank. Leave boxes 46 and 47 blank.

11. Complete dentures: self-explanatory.

12. Partial dentures: self-explanatory.

13. Individual crowns: Indicate the number of individual non-temporary crowns required. These include and are limited to dental procedure codes 06710, 06713, 06740, 06750, 06760, 06780, and 06790.

14. Bridge abutments: Indicate the number of fixed partial denture retainers required. Types of retainers to be reported are those described by dental procedure codes in the 06100 series. DO NOT include fixed partial denture pontics in the 06200 series.

15. Erupted teeth: Report the number of teeth requiring extraction as defined by dental procedure codes 07110 and 07120.

16. Impacted teeth: Report the number of impactions requiring removal as defined by dental procedure code 07130.

APPENDIX B

APPENDIX B

WEIGHTED TREATMENT TIME FACTORS FOR SPECIFIC DENTAL PROCEDURES

1. From Cassidy et al.:

Specialty Area	Clinical Procedure	Treatment Time Required (Hours)
Restorative	One-surface restoration	0.35
	Two-surface restoration	0.83
	Three-surface restoration	0.83
Removable prosthodontics	Maxillary full denture	3.23
	Mandibular full denture	3.23
	Maxillary partial denture	1.97
	Mandibular partial denture	1.97
Fixed prosthodontics	Crowns	1.97
	Abutment crowns	1.97
Exodontics	Extractions: Erupted	0.24
	Impacted	0.96
Oral hygiene	Prophylaxis	0.37
	Calculus removal	0.19

2. Estimated Endodontic Treatment Time

Anterior Tooth	2.00
Posterior Tooth	3.00
Mean Periodontal Treatment Time	2.00

3. Examination and Radiographs 0.25

APPENDIX C

Supplemental Care Needs Data

Table C1

Mean Hours of Care Required for Total Sample by Sex

	Mean Hours		
	Male	Female	Significance
Restorations	2.5663	3.0305	F = 20.754, df = 1/5564, p < .0001
Removable Prosthetics	.2029	.3214	F = 15.982, df = 1/5558, p < .0001
Fixed Prosthetics	1.3559	.9641	F = 16.666, df = 1/5571, p < .0001
Extractions	.2064	.1486	F = 24.901, df = 1/5555, p < .0001
Impactions	1.7575	1.2749	F = 67.823, df = 1/5575, p < .0001
Endodontics	.5172	.5122	F = .009, df = 1/5554, p = NS
Periodontal Care	.2642	.2347	F = 1.514, df = 1/5570, p = NS
Calculus Removal	.1687	.1452	F = 105.545, df = 1/5571, p <.0001
Prophylaxis	.3551	.3233	F = 114.650, df = 1/5572, p <.0001
Total Hours	7.9453	7.7534	F = .343, df = 1/5515, p = NS
Sample Size	4580	937	

Table C2

Mean Hours of Care Required for Total Sample
by Level of Education

	Mean Hours of Care			
	Non High School Graduate	High School Graduate	Beyond High School	Significance
Restorative	2.8225	2.6143	2.3223	F = 8.160, df = 2/5585, p < .0003
Removable Prosthetics	.2005	.2227	.2795	F = 2.286, df = 2/5579, p = NS
Fixed Prosthetics	1.4664	1.2218	1.1431	F = 5.931, df = 2/5592, p < .0027
Extractions	.1976	.1984	.1911	F = .142, df = 2/5576, p = NS
Impactions	1.9859	1.6268	1.0590	F = 84.950, df = 2/5596, p <.0001
Endodontics	.5794	.4980	.4335	F = 2.925, df = 2/5575, p = NS
Periodontal Care	.2797	.2468	.2636	F = 1.390, df = 2/5591, p = NS
Calculus Removal	.1696	.1627	.1610	F = 7.926, df = 2/5592, p < .0004
Prophylaxis	.3517	.3496	.3471	F = .815, df = 2/5593, p = NS
Total Hours	8.8718	7.6408	6.6134	F = 18.246, df = 2/5536, p <.0001
Sample Size	1824	3084	699	

Table C3

Mean Hours of Care Required for Total Sample
by Ethnic Background

	Mean Hours			
	White	Black	Other	Significance
Restorations	2.4964	3.1550	2.4054	F = 28.209, df = 2/5587, p < .0001
Removable Prosthetics	.1773	.3672	.1727	F = 26.998, df = 2/5581, p < .0001
Fixed Prosthetics	1.2824	1.4550	.8490	F = 8.167, df = 2/5594, p < .0003
Extractions	.1780	.2508	.1988	F = 24.887, df = 2/5578, p < .0001
Impactions	1.8261	1.2750	1.5429	F = 57.839, df = 2/5598, p < .0001
Endodontics	.4892	.6347	.3798	F = 6.600, df = 2/5577, p < .0014
Periodontal Care	.2407	.3141	.2571	F = 5.935, df = 2/5593, p < .0027
Calculus Removal	.1635	.1679	.1669	F = 2.586, df = 2/5594, p = NS
Prophylaxis	.3510	.3473	.3471	F = 1.224, df = 2/5595, p = NS
Total Hours	7.6956	8.9207	6.614	F = 13.041, df = 2/5538, p < .0001
Sample Size	3803	1324	414	

Table C4

Distribution of Hours of Care Required for Restorations

Hours of Care	Cumulative Percent	Category Percent
0	19	19
.35 - 2	54	35
2 - 4	76	22
4 - 6	88	12
6 - 8	94	6
8 - 10	97	3
> 10	100	3

N = 5594

Table C5

Percent of Sample Not Requiring Care
by Category of Care

	Percent
Restorative	19
Removable Prosthetics	92
Fixed Prosthetics	73
Extractions	64
Impactions	41
Endodontics	86
Periodontal Care	87
Calculus Removal	13
Prophylaxis	5

APPENDIX D

Table D1

Prevalence of Periodontosis Among Recruits
by Sex, Ethnic Background, and Level of Education

	Percent	Sample Size
Sex		
Male	2.94	4622
Female	1.59	1443
Ethnic Background		
White	2.00	3834
Black	4.79	1335
Other	2.85	420
Level of Education		
Non High School Graduate	3.58	1814
High School Graduate	1.33	3077
More Then High School	2.58	696
Total Sample	2.7	5555

Table D2

Prevalence of Acute Necrotizing Ulcerative Gingivitis (ANUG) Among Recruits by Sex, Ethnic Background, and Level of Education

	Percent	Sample Size
Sex		
Male	3.31	4621
Female	2.22	942
Ethnic Background		
White	3.46	3834
Black	2.62	1333
Other	3.80	420
Level of Education		
Non High School Graduate	2.03	1815
High School Graduate	2.53	3074
More Than High School	1.72	696
Total Sample	3.22	5609

Table D3

Mean Gingival Index Scores for Army Recruits
by Sex, Ethnic Background, and Level of Education

	Mean Score	Sample Size
Sex		
Male	.97	4633
Female	.93	943
Ethnic Background		
White	.96	3845
Black	.99	1336
Other	.97	419
Level of Education		
Non High School Graduate	1.03	1822
High School Graduate	.95	3080
More Than High School	.88	696
Total Sample	.97	5609

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