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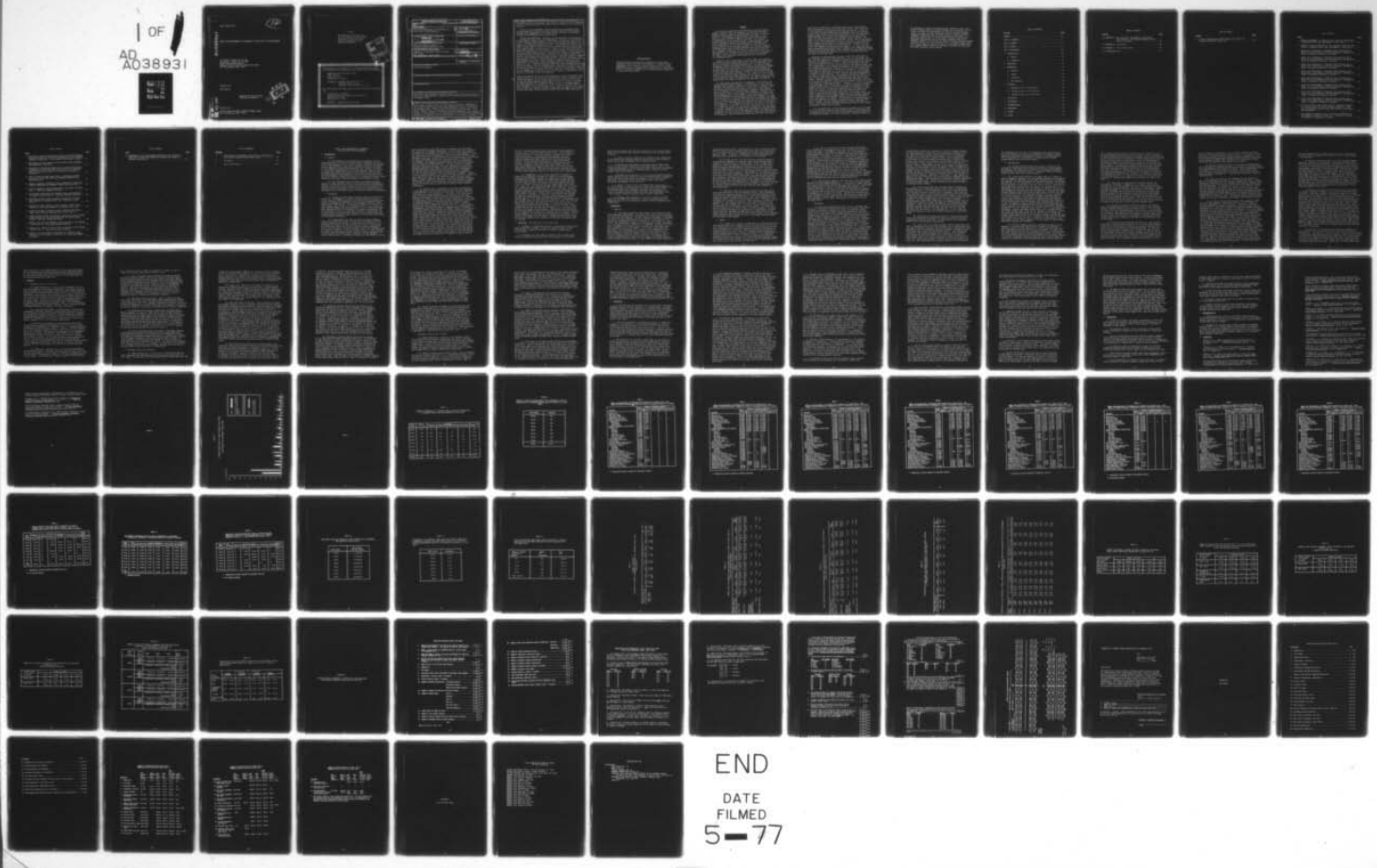

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Report HCSD-77-001

DENTAL CARE REQUIREMENTS OF DEPENDENTS OF ACTIVE DUTY US ARMY PERSONNEL

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February 1977

Final Report

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Prepared for:

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

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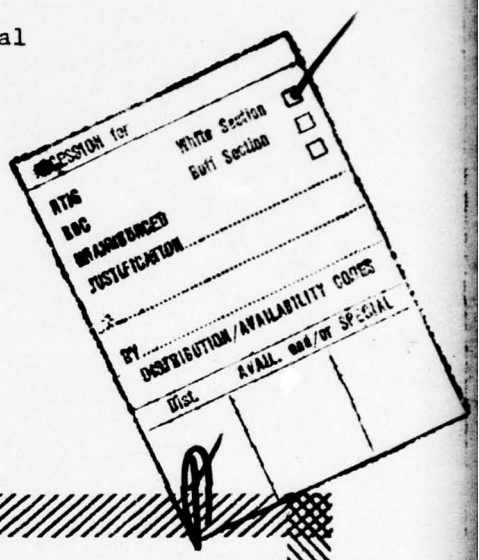

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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER: HCSD- 77-001	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): Dental Care Requirements of Dependents of Active Duty US Army Personnel.	5. TYPE OF REPORT & PERIOD COVERED: Final Report. 1 May 76 — 28 Feb 77.
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): George P. Barnes, ~~DDS, MSD~~ ~~COL, DC, USA~~; Warren A. Parker, ~~DDS, MPH~~ ~~COL, DC, USA~~	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Health Care Studies Division, Academy of Health Sciences, US Army, Fort Sam Houston, Texas 78234	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: Commander, US Army Health Services Command, ATTN: HSDS, Fort Sam Houston, Texas 78234	12. REPORT DATE: Feb 77
	13. NUMBER OF PAGES: 71 (12) 87 p.
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report)
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Unlimited Distribution

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dental Needs, Army Dependents, Financial Impact, Cost of Dental Care, Cost to Rank Ratios, DMFS/defs Rates, Types of Posts, Routine Dental Care, Preventive and Emergency Care.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A wide range of routine dental care services are provided to dependents of Army personnel residing on certain posts (RDDC posts) while only preventive and emergency dental therapy is afforded dependents living on other installations (PEDDC Posts). The purposes of this three part study were: (1) to obtain a reliable estimate of the dental needs of dependents; (2) to obtain an estimate of the potential costs to Army personnel if all dental care needed by dependents was purchased from civilian sources; (3) to obtain an estimate of →

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the financial burden placed on Army personnel as a result of actually purchasing dental care for dependents from civilian sources; and (4) to determine the dental caries prevalence rates among children attending on-post dependent schools.

A total of 5,213 dependents received examinations to determine dental treatment needs; 3,137 active duty Army personnel completed questionnaires listing actual expenditures for dependent dental care; and 1,107 dependent children received DMFS/defs caries examinations.

FINDINGS AND CONCLUSIONS: Dependents of Army personnel were determined to have extensive dental treatment requirements. The mean cost per dependent of purchasing all needed dental care from civilian sources was found to be $257.57. The mean cost for wives was found to be approximately $330.00 and for younger aged children approximately $82.00. The purchase of all dental care needed by their families from civilian sources would require enlisted personnel to expend between 6.7 percent and 8.7 percent of their base pay salaries. Commissioned officers would be required to expend between 2.9 percent and 4.5 percent of their salaries if all of the dental care needed by their dependents was purchased from civilian sources. Army personnel assigned to PEDDC posts devoted 2.0 percent of their base pay salaries to the actual purchase of dental care for their dependents from civilian sources. Personnel assigned to RDDC posts devoted 1.1 percent of their salaries to the purchase of civilian-provided dependent dental care. Among individuals assigned to PEDDC posts the expenditures for civilian provided dependent dental care was approximately $193.00 per year. Personnel assigned to RDDC posts spent approximately $109.00 per year for dental care for their dependents. Among third, fourth, fifth, and sixth grade children located on PEDDC posts, decayed tooth surfaces accounted for 37.7 percent to 49.3 percent of the total DMF rate. Among similar children located on RDDC posts, decayed tooth surfaces accounted for between 29.3 percent and 35.8 percent of the total DMF rate.

It is concluded that the cost of purchasing all dental care needed by dependent families from civilian sources would place a greater financial burden on enlisted members than on officers. The financial burden resulting from actually purchasing dependent dental care from civilian providers is greater for PEDDC personnel than for RDDC personnel. At posts providing extensive "routine" dental care for dependents, all of the dental treatment needs of these dependents are not met in Army clinics. While the dental caries attack rate is similar for children residing on PEDDC posts and RDDC posts, the RDDC children have fewer untreated carious lesions than their PEDDC counterparts.

ACKNOWLEDGEMENTS

The authors wish to express their appreciation to Major Aaron Schopper and Specialist Fifth Class Michael W. Calahan for their assistance in data reduction and data analysis, and to A. David Mangelsdorff, Ph.D., and Major Tommy S. Armstrong for their assistance in reviewing the manuscript and making invaluable suggestions to improve the study effort.

SUMMARY

This study was requested by the Department of the Army Surgeon General in January 1976. The Commander, US Army Health Services Command tasked the Academy of Health Sciences, US Army, to perform the study. The purposes of this three-part study were: (1) to obtain a current reliable estimate of the dental treatment needs of dependents of active duty US Army personnel; (2) to obtain a reliable estimate of the potential costs to Army personnel if they were to purchase all dental care needed by their dependents from civilian providers; (3) to obtain an estimate of the financial burden placed on active duty Army personnel as a result of actually purchasing dental care for their dependents from civilian providers; (4) to obtain an estimate of the extent to which dental care for Army dependents is purchased from civilian providers when that care is, and when it is not, provided in Army clinics; and (5) to determine the dental caries prevalence rates among children attending on-post dependent schools.

Within the Army, a wide range of "routine" dental care services are provided to the dependent population at certain posts (RDDC posts) while only preventive and emergency dental care is afforded the dependents at other installations (PEDDC posts). The type and quantity of dependent dental care provided at the various installations depends primarily upon the availability of the civilian dental manpower resources within the local areas and secondarily upon the availability of the local Army dental resources. In Part I of the study, 5,213 dependents of active duty Army personnel, who resided on or near 10 RDDC posts, received routine dental examinations to include x-rays, in order to determine their dental treatment needs. The sample included both dependent wives (all ages) and dependent children (age 4 through 20).

For each family represented by the examinees a questionnaire was completed which elicited information concerning family size, ages of dependent family members, sponsor's rank and length of federal service, and sponsor's annual base pay income. In Part II of the study, 3,137 active duty Army personnel were required to complete questionnaires which, in addition to eliciting the same information collected via the questionnaire in Part I, also required the sponsors to estimate their annual expenditures for the purchase of civilian provided dental care for their dependents. These military members were assigned to 21 Army installations, 10 of which were RDDC posts and the remainder were PEDDC posts. In both Part I and Part II of the study the subjects were divided, according to the sponsoring military member's rank, into the following eight subgroups: E-1 through E-3; E-4 and E-5; E-6 and E-7; E-8 and E-9; W-1 through W-4; O-1 and O-2; O-3 and O-4; and O-5 and O-6. In Part I of the study the dental care requirements, according to the mean number of specific treatments by category, were determined for each rank group. In addition, the mean costs of purchasing all dental care needed by the dependents in each rank group were determined using a fee scale devised by the authors. This fee scale was based upon, and within the dollar

range limits represented by, relatively current fees scales obtained from six recognized sources within the United States. These costs were in turn related to the sponsors' annual base pay salaries. In Part II of the study, the mean expenditures for dependent dental care actually purchased from civilian sources were determined for the two major groups (PEDDC and RDDC) and for each rank subgroup within each major group. These costs also were related to the sponsors' annual salaries. The number of civilian dentists practicing within 30 mile radii of the various posts in Part II were determined in order to ascertain if any relationship exists between the availability of civilian-provided dentistry and the actual expenditures for this care by Army families. In Part III of the study 1,107 dependent children in school grades 3, 4, 5, and 6 received dental caries prevalence examinations to determine their DMFS/defs (decayed missing/extracted filled) rates. These children attended elementary schools located on four Army installations, two of which were PEDDC posts and the other two were RDDC posts.

Dependents of Army personnel assigned to RDDC posts were found to have extensive unmet dental treatment needs. For all rank groups, the mean cost per dependent of purchasing all needed dental care from civilian providers was estimated to be $257.57. These costs ranged from a high of $330.47 per dependent wife to a low of $82.27 per dependent child age four through seven. The estimated percentages of the sponsors annual base pay salaries which would be required to purchase all dental care needed by their families ranged from 6.7 percent to 8.7 percent for enlisted personnel and from 2.9 percent to 4.5 percent for officers. As the length of residency at RDDC posts increased, the costs per dependent exhibited a slight, but steady decrease. Army personnel assigned to PEDDC posts were found to have greater actual expenditures for dependent dental care ($193.50 per annum) than soldiers stationed at RDDC posts ($109.45 per annum). Military personnel assigned to PEDDC posts devoted 2.0 percent of their base pay salaries to the purchase of dependent dental care, while those assigned to RDDC posts devoted 1.1 percent of their base pay salaries to the purchase of this health service. A higher percentage of soldiers assigned to RDDC posts (57.1 percent) reported no expenditures for dependent dental care than was found among individuals assigned to PEDDC posts (36.2 percent). A positive correlation was found between the number of civilian dentists practicing within 30 mile radii of the various posts and the mean annual expenditures for dependent dental care. Higher ranking officers and higher ranking enlisted personnel reported greater expenditures for dependent dental care than were reported by their lower ranking counterparts. No differences were found between the mean total DMFS rates of children attending schools on RDDC and PEDDC posts. However, the RDDC children exhibited a higher percentage of filled tooth surfaces and the PEDDC children were found to have a higher percentage of decayed tooth surfaces.

It is concluded that even those dependents residing on or near RDDC posts have extensive unmet dental treatment needs; the potential costs of purchasing all dental care needed by dependents decrease slightly as the length of residency on or near an RDDC post increases; and the cost

of purchasing all dental care needed by their dependents would place a greater financial burden on enlisted members than on officers. It is further concluded that expenditures for civilian provided dependent dental care create a greater financial burden for military personnel assigned to PEDDC posts than for those assigned to RDDC posts. At posts where a wide range of routine dental treatment is provided for dependents (RDDC posts), all of the dental treatment needs of the dependent population are not met and these individuals purchase extensive additional dental care from civilian sources. The dental caries attack rates are the same for children living on or near PEDDC and RDDC posts, but the RDDC children receive more extensive treatment for caries and have fewer untreated carious lesions.

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DENTAL CARE REQUIREMENTS OF DEPENDENTS
OF ACTIVE DUTY US ARMY PERSONNEL

1. INTRODUCTION.

a. Purpose.

(1) The purposes of this study were (a) to obtain a current reliable estimate of the dental treatment needs of dependents of active duty US Army personnel; (b) to obtain a reliable estimate of the potential costs to Army personnel if they were to purchase all dental care needed by their dependents from civilian providers; (c) to obtain an estimate of the financial burden placed on active duty Army personnel as a result of actually purchasing dental care for their dependents from civilian providers; (d) to obtain an estimate of the extent to which dental care for Army dependents is purchased from civilian sources when that care is and is not provided in Army clinics; and (e) to determine the dental caries prevalence rates among children attending on-post dependent schools.

(2) This information will be useful to the Assistant Surgeon General for Dental Services, Office of The Surgeon General, Department of the Army, and the Directorate of Dental Services, US Army Health Services Command in evaluating the effectiveness of the current Army dental care delivery system for dependents and in determining any possible need for improvement in the type and/or quantity of this care provided to dependents.

b. Background.

(1) Currently, a wide range of routine dental care services are provided to the dependents of military personnel residing on or near certain Army posts (RDDC posts) while only preventive and emergency dental therapy is afforded the dependents of Army personnel assigned to other installations (PEDDC posts). The basis for determining the quantity and type of dental care provided to the dependent population of the various posts depends primarily upon the availability of the civilian dental manpower resources within the surrounding local areas and secondarily upon the availability of the local Army dental resources. Historically, the US Army dental resources have been allocated to installations based upon assigned military strength, without regard for the estimated dental needs of the dependent populations.

(2) A knowledge of the extent to which the present dependent dental care delivery system meets the needs and the demands of the dependent population was necessary to enable the Army to determine if improvements are needed in the type and quantity of dental care provided that population. Within the last 20 years few studies concerning the dental care requirements of US Army personnel and/or their dependents have been reported. Hobson[1], in 1956, and Cassidy, et al[2], in 1973, reported the dental care requirements of Army recruits. However, neither of these studies evaluated the dental needs of dependents of Army personnel. A recent study by Parker[3], concerning the dental care requirements of active

duty Army personnel of all ranks and years of service, did not involve data collection on dependent populations. In 1974 a pilot study concerning the dental care requirements of dependents of active duty Army personnel was reported by the United States Army Institute of Dental Research[4]. Based upon data collected on 726 dependents, it was stated that the dental care requirements for every 10 wives included 25.9 restorations and 4.9 extractions. For every 10 dependent children 18.5 restorations and 2.9 extractions were required. The results of this study may or may not be applicable to the present day dependent population, because the data were collected during the time of the military draft. The report stated, in summary, that "data concerning the dental treatment requirements for the total dependent population would require a more comprehensive investigation." The applicability of information concerning dental care requirements for civilian populations to a highly transient population comprised entirely of military personnel and their dependents is unknown. It may be a moot question, however, since a review of publications[5],[6],[7] concerning adult dental care needs, did not reveal the needs by specific types of dental treatments required. Most papers concerning the dental health or disease status of populations published in the last decade have reported the findings in terms of caries indices, periodontal indices, gingival indices, or similar indices, rather than in terms of dental treatment requirements.

(3) Previous data or information concerning the expenditures by Army personnel for the purchase of dental care for their dependents, or the magnitude of the financial burden possibly created by these expenditures, were almost non-existent. The report of the United States Army Institute of Dental Research pilot study[4] indicated that some financial information had been collected by questionnaire at four Army installations. However, at all four of these installations, a wide range of routine dental care services was provided in Army dental clinics to the dependent population. Concerning the cost of dental treatment provided the civilian population, Johnson[8] found costs of $69.05 per child and $18.28 per patient visit in a mobile clinic program providing comprehensive, incremental services to indigent children in Alabama. In separate studies, Jong and Leske[9] and Drake[10] showed costs of approximately $69.00 per child for treatment of accumulated dental problems among Head Start children. Doherty and Vivian[11] recently reported the results of a study designed to determine and compare the costs of providing comprehensive children's dental care by three different delivery modes: private practices, public fixed clinics, and public mobile trailers. Over a three year period, 14,964 children were treated with a total of 35,181 patient visits. The average total costs ranged from $64.16 per patient, and $30.47 per patient visit, for the individuals treated in private practices, to $50.73 per patient and $20.57 per patient visit for those treated in mobile trailers. The costs for patients treated in public fixed clinics were $59.12 per patient and $22.95 per patient visit. In a recent report, Sonken[12] stated that in the United States the annual bill for health services today stands at over $500 for each man, woman and child, of which almost six percent is spent on dental

services. He further reported that the per capita dental expenditure for this country in 1973 was approximately $40.00. A later report[13] indicated that the 1975 per capita national expenditures for dentists' services was $34.62. In a study designed to estimate the cost of fulfilling unmet dental needs among 115 disadvantaged university students, Ferguson and Moran[14] reported that the average cost per student would be $318.62 excluding fees for surgical periodontal services. A similar study[15] was conducted to determine the costs of providing treatment of unmet dental needs among people served by three social agencies in Johnson County, Iowa. The people receiving services were County Home residents, Goodwill Industry clients, and Community Action clients. The costs of treating all unmet dental needs for these three groups were $851.77, $407.97, and $341.21; respectively.

(4) Ringleberg, et al[16] recently reported the results of a clinical trial designed to evaluate the effects of an anticariogenic agent among children age 8 through 12. Among eight year old children attending three different schools, the baseline mean Decayed, Missing and Filled Surface (DMFS) dental caries index scores ranged from 0.82 to 1.86. Among nine year old children the baseline DMFS scores ranged from 1.50 to 2.08. For ten year olds, the scores ranged from 2.50 to 3.35. Eleven year olds demonstrated DMFS scores in the 3.66 - 5.74 range and children age twelve had scores in the 4.56 - 4.88 range. Heifetz, Horowitz, and Korts[17], in 1976, reported the prevalence of dental caries among Caucasion and Black children living in a relatively low per-capita income county in Virginia. In this county the drinking water contains less than the optimal level of fluoride. Among nine year old children the DMFS rates for white males, black males, white females and black females were 5.13, 4.53, 5.40, and 6.85, respectively. Among children age ten, the DMFS rates for these four groups were 6.20, 5.88, 5.97, and 5.62. Among eleven year olds, the rates were 7.39, 6.19, 7.88, and 6.95. The authors further reported the percentages of the DMFS rates which were attibutable to decayed surfaces (D) and to filled surfaces (F). The percentage D/DMF for the four nine year old groups were 33.4 percent, 58.0 percent, 34.9 percent, and 36.0 percent. Among eleven year old children the percentage D/DMF for white and black males and white and black females were 35.2 percent, 55.2 percent, 42.1 percent, and 55.5 percent. The percentage F/DMF for the four nine year old groups were 50.6 percent, 28.2 percent, 59.0 percent, and 42.2 percent. Among eleven year old children the percentage F/DMF were 54.2 percent, 36.4 percent, 45.0 percent, and 34.3 percent.

2. OBJECTIVES. The objectives of this study were:

a. To conduct a clinical dental survey to determine the dental treatment requirements, by numbers of specific treatments needed, for the children (age 4 through 20) and wives (all ages) of active duty US Army personnel.

b. To stratify the total sample by sponsor's rank in order to determine the estimated amount and estimated percentage of the soldiers'

annual base pay incomes which would be required if all of the unmet dental needs of their families were satisfied via purchases from civilian dental providers.

c. To conduct a survey to determine the estimated annual expenditures by active duty Army personnel (ranks E-1 through O-6) for the purchase of dental care for their dependents from civilian providers.

d. To stratify the total sample by rank and by type of Army installation to which assigned (PEDDC posts versus RDDC posts) in order to determine the percentage of the sponsoring soldiers' annual base pay estimated to have actually been devoted to purchasing dental treatment for their families from civilian sources.

e. To determine the percentages of active duty Army personnel spending various estimated dollar amounts for the twelve month purchase of dependent dental care and to relate these percentages to the two types of dependent dental care provided by the Army (routine dental care versus preventive and emergency dental care only).

f. To conduct a clinical survey to determine what differences, if any, exist between the decayed, missing, filled tooth surfaces (DMFS) rates for permanent teeth and the decayed, extracted, filled surface (defs) rates for deciduous teeth exhibited by children attending grades 3, 4, 5, and 6 at schools located on PEDDC Army posts and the DMFS/defs rates shown by similar children attending schools located on RDDC posts.

g. To determine what differences, if any, exist between the D/DMF ratios and the F/DMF ratios exhibited by children attending schools on PEDDC posts and the ratios exhibited by similar children attending schools on RDDC posts.

3. METHODOLOGY.

a. Overview.

(1) This study consisted of three parts, with the first two parts being conducted simultaneously. The data in Part I were collected by means of routine dental examinations and questionnaires administered to dependents of active duty Army personnel. The data collection instrument for recording the results of these examinations and the specific instructions for conducting the examinations are shown in Appendix A-1 and Appendix A-2, respectively. The questionnaire completed by the examinees is shown in Appendix A-3. The examinations were rendered to all dependents reporting for routine dental treatment to the dental clinics located on ten Army posts within the Continental United States (CONUS). All of these installations were RDDC posts. The examinations were conducted by, and completion of the questionnaires was supervised by, the dental services within the ten Medical Department Activities (MEDDAC) located on these posts. The data collection phase extended over a six week period. The completed data collection instruments were submitted to the Health Care Studies Division (HCSD), Academy of Health Sciences, US Army (AHSUSA) where data compilation

and analyses were performed. Determinations were made concerning the mean number of specific dental treatment needs and the mean cost of satisfying all of the unmet dental needs of dependents for eight groups based upon sponsors' ranks. In addition, determinations were made concerning the mean annual base pay salaries of the sponsors of the examinees.

(2) The data in Part II of the study were collected by means of a questionnaire (Appendix A-4) rendered to active duty Army personnel assigned to 21 installations located in CONUS. Eleven of these installations are classified dentally as PEDDC posts and ten are RDDC posts. Completion of the questionnaires was supervised by the dental services within 18 MEDDACs and three MEDCENs located on these posts. The data collection phase extended over a six week period, using a sampling technique based upon month of birth, length of time assigned to the study site post, and status as to having dependents. During this time the completed questionnaires were submitted to HCSD, AHSUSA where data compilation and analyses were performed. Determinations were made concerning the mean annual base pay salaries and mean annual expenditures for civilian-provided dependent dental care for eight rank-based groups of Army members. In addition to the data obtained from the questionnaires, information concerning the number of civilian dentists located within a 30 mile radius of each study site was obtained from each Director of Dental Services (DDS) assigned to the involved posts.

(3) The data in study Part III were collected by dental caries prevalence examinations using the DMFS/defs indices. These examinations were rendered to selected dependent children attending elementary schools located on four CONUS Army installations. Two of these installations are classified dentally as PEDDC posts and the other two are RDDC posts. All examinations were conducted by the same dental officer. The data collection instrument for recording the results of these examinations is shown in Appendix A-5. The Parental Permission Letter used in this part of the study is included as Appendix A-6. The data collection phase extended intermittently over a nine week period, using a sampling technique based upon the child's grade in school, number of months residency at the study site, and parental permission for inclusion as a study subject. Determinations were made concerning the DMFS rates, the D/DMFS ratios and the F/DMFS ratios for children attending four different grades in the elementary schools located on the two types of posts. Data compilation and analyses were performed at HCSD, AHSUSA.

b. Sample.

(1) In Part I of the study a random sample of subjects was desired and would have been ideal. Several Directors of Dental Services (DDS) and other dental officers at the MEDDACs who were experienced in dental treatment of dependents were consulted regarding the potential difficulties in conducting this part of the study. These officers indicated that due to numerous adverse operational, logistic, and administrative considerations, random sampling would have been extremely difficult, if not impossible. Therefore, the subject in Part I, included all dependent wives and all dependent children (age 4 through 20) of active duty Army personnel (grades E-1 through O-6) who spontaneously reported for dental examinations and/or care to the dental clinics at the ten study posts.

(2) In Part II of the study the Army Oral Health Maintenance Program (AOHMP) was the mechanism used to select personnel for inclusion in the study sample. The AOHMP is a Department of the Army approved program requiring an annual dental evaluation during the anniversary of an individual's birth month. At the time of the evaluation, study data were collected. In both Part I and Part II, collection of the data in conjunction with an on-going dental health care program minimized the following: inconvenience to participants and requirements for additional dental resources. In the second study part, the population sampled was comprised entirely of active duty Army personnel permanently assigned to the 21 involved CONUS installations. At the time of their AOHMP dental examinations all personnel were required to complete the questionnaires provided they met the following criteria: were in the ranks of E-1 through O-6; had bona-fide dependents (wife and/or children), and had been assigned to their present Army post for ten or more months. Exclusion of those individuals with less than ten months residence at their present post precluded the collection of data concerning expenditures for dental care not purchased near the presently assigned installation.

(3) The population sampled in the third part of the study included dependent children attending grades 3, 4, 5, and 6 of all on-post schools at the four involved CONUS installations. All students in these four grades were examined provided they met the following three criteria: (a) written parental permission to conduct the examination was granted; (b) the child was not absent from school on the date and time his/her classmates were examined; and (c) the child had resided on or near the present post of residency for a minimum of ten months. Children with less than ten months residence on or near their present location were excluded from the survey in order to better insure that the data collected at each study site represented the true dental conditions of the population at the individual posts.

c. Procedures.

(1) All dental examinations in Part I of the study were conducted by US Army Dental Corps officers using the guideline "What dental treatment is necessary to restore the patient to reasonably optimum dental health?" Routine bitewing x-rays were mandatory for the examination of all wives, except those lacking posterior teeth, and for all children where indicated. As a result of these examinations the specific numbers of dental treatments currently needed by each of the examined dependents were recorded according to the following treatment categories: (a) examinations; (b) bitewing x-rays; (c) additional x-rays; (d) prophylaxes and scalings; (e) topical fluoride therapy; (f) one-surface amalgam restorations; (g) two-surface amalgam restorations; (h) amalgam restorations of three or more surfaces; (i) anterior non-metallic restorations; (j) acrylic crowns; (k) porcelain crowns; (l) 3/4 gold crowns; (m) full gold crowns; (n) gold crowns with acrylic; (o) gold crowns with porcelain; (p) stainless steel crowns; (q) units of fixed bridge prosthesis; (r) full dentures; (s) partial dentures (metal with/or without acrylic); (t) treatment partical dentures; (u) root canals (one-root); (v) root canals (two-roots); (w) root canals (three-roots); (x) routine extractions; (y) impacted teeth removed; (z) quadrants of subgingival currettage needed; (aa) quadrants of gingivectomy needed; (ab) quadrants

of gingivoplasty needed; (ac) quadrants of occlusal adjustment needed; (ad) occlusal sealant therapy; (ae) space maintainers (fixed-band type); (af) space maintainers (acrylic type); (ag) orthodontic therapy, and (ah) need for an oral disease control program. All of the dependents included in the survey were considered to need a dental examination. In determining the dental treatment requirements for occlusal sealant therapy, oral disease control programs, and orthodontic therapy, the needs were recorded as either positive (1) or negative (0) rather than the specific number of teeth needing therapy, or the number of patient visits required. On each examination form, the sponsor's rank, the dependent's relationship to the sponsor, and the dependent's age were recorded. Also recorded on this form were information concerning the number of months the examinee had been in residence on or near the presently assigned post and the type and quantity of Army-provided dependent dental care available at their previous residence. Regardless of the number of family members examined in the first study part, only one questionnaire (Appendix A-3) was completed per family. This questionnaire elicited the following information concerning the family unit: sponsor's military rank; sponsor's number of years of federal service for pay purposes; and the number and ages of all dependent family members.

(2) In the second study part, the Army sponsors completed the questionnaires in the installation dental clinics under the supervision of dental personnel. The questionnaires elicited the following information from each individual: present post of assignment; rank, number of years of federal service for pay purposes; present marital status; number of dependent children by ages; and the sponsor's estimate of the total amount of money which he/she expended during the preceding twelve months for the purchase of civilian-provided dental care for his/her dependents. In estimating their twelve-month expenditures for dependent dental care, the sponsors were required to choose from among the following dollar range categories: none; $1-25; $26-50; $51-100; $101-150; $151-200; $201-250; $251-300; $301-350; $351-400; $401-450; $451-500; $501-550; $551-600; $601-650; $651-700; $701-750; $751-800; $801-850; $851-900; $901-950; $951-1000; and over $1,000. If the estimate was more than $1,000, the sponsor was required to report the estimated expenditure to the nearest dollar.

(3) Information concerning the number of civilian dentists whose offices were located within 30 mile radii of the 21 posts was elicited telephonically from the local DDSs. The DDSs obtained this information from the local civilian dental organizations.

(4) In Part III of the study the data collected consisted of the number of decayed, missing, and filled permanent tooth surfaces (DMFS) and the number of decayed, extracted, and filled deciduous tooth surfaces (defs) exhibited by each of the examined dependent children. The DMFS and defs index scores were recorded by tooth and by surface. Other information collected on each examined dependent child consisted of the number of teeth erupted into the oral cavity and at risk to dental caries; the school grade in which the child was enrolled; the Army post on which the school was located; and the number of months the child had resided at the study site. All examinations were conducted within the school buildings

and radiographs were not used. The examinations were conducted according to the methods and procedures established by the American Dental Association Conference on the Clinical Testing of Cariostatic Agents[18], and in accordance with the principles of collecting and handling epidemiological data as stated by Grainger[19].

d. Data Handling.

(1) As data collection forms were returned to HCSD they were reviewed for completeness and erroneous entries prior to being computed and analyzed. The disposition of incomplete and erroneously completed forms was made by the project officers. Incomplete forms and erroneous entries did not constitute a sizeable problem.

(2) In the first study part, the dental care requirements, by specific treatment categories, for each examined dependent were determined. Also the number of dependents in each family represented by the examinees was computed. The data were grouped and analyzed according to the sponsors' ranks as follows: E-1 through E-3; E-4 and E-5; E-6 and E-7; E-8 and E-9; W-1 through W-4; O-1 and O-2; O-3 and O-4; and O-5 and O-6. Each of these eight rank groups was subdivided, according to the relationship of the dependents to the sponsors, into five subgroups as follows: children age four through seven; children age eight through eleven; children age twelve through fifteen; children age sixteen through twenty; and wives (all ages). For each subgroup within each rank group (except for the two situations cited later), the mean for each dental treatment requirement listed in 3.c.(1) was determined. No mean dental treatments were determined for children age one through three within all rank groups and for children twelve through fifteen and children age sixteen through twenty within the O-1 and O-2 rank group since no patients were examined within these subgroups. The numbers of patients examined within the following subgroups were considered to be insufficient for clinically significant, meaningful analysis and for those subgroups no mean dental treatment requirements were determined: children age eight through eleven; twelve through fifteen; and sixteen through twenty within the E-1 through E-3 rank group; children age sixteen through twenty within the E-4 and E-5 group; children age sixteen through twenty within the W-1 through W-4 group; children age eight through eleven within the O-1 and O-2 group; and children age four through seven within the O-5 and O-6 group. In addition to calculation of the mean number of needed dental treatments, the mean number of family members within each subgroup was calculated.

(3) For each subgroup within each rank group the mean cost per dependent of purchasing all needed dental treatments was computed by applying a dental fee scale (Appendix B-1) to the appropriate mean treatment requirements determined for the various subgroups. The dental fee scale used in this study part was formulated by the authors and based upon fee scales obtained from the following recognized sources: Texas Dental Association-Veterans Administration Maximum Dental Fee Allowances, Effective 1 July 1973; a sampling of US Coast Guard East Coast Contract Dental Fee Schedules in effect March 1976; Texas Medicaid Dental Fees in effect in

1975; the Mean Average Dental Fees for the State of California in 1973 and Mean Average Dental Fees for the United States in 1973 as reported by the American Dental Association Bureau of Economic Research and Statistics; and a fee scale derived by inflating the 1973 mean United States dental fee scale six percent a year for three years. Due to the multiplicity of orthodontic treatments utilized and the wide range of fees through the United States, none of the above sources provided a fee scale for orthodontic services. Therefore the orthodontic fees used in this study part were divised by using information provided by seven orthodontists and three other dentists practicing in various parts of the United States. From these individuals it was determined that the "routine" orthodontic case required approximately 24 to 26 months of treatment at a total cost of approximately $1,400 to $1,500. Therefore the orthodontic fee used in this study was $700 per year. Appendix B-2 summarizes the resource fee scales used to formulate the dental fee scale used in this part of the study.

(4) Based upon the calculations of individual dental care requirements, the number of dependents in the family, and the costs of dental care for a family member, the costs of purchasing all dental care needed by composite families, composed of the same number of members and same aged members as reported by the families in this study, were computed. In making these calculations, the mean cost of dental care that was obtained for one individual in each age/relationship subgroup was multiplied by the mean number of dependents in each subgroup (as reported by the families in this study) to give the costs of dental care for each subgroup within each rank group. For each rank group, the subgroup costs of dental care were added to give the mean cost of purchasing all dental care needed by an entire composite dependent family.

(5) The annual base pay of each family sponsor was computed using the information provided on the data collection forms concerning sponsor's rank and number of years of federal service for pay purposes. For each of the eight rank-based groups, the mean annual base pay salary was determined. The sponsors' annual base-pay incomes were then related to the costs of purchasing dental care needed by composite family units in such a manner as to depict the percentages of the sponsors' annual salaries which would be required to purchase all indicated dental care for the family.

(6) Based upon the information provided by the study subjects concerning the availability/non-availability of Army-provided dependent dental care at their previous residence, the examined dependents were divided into the following two prior-residency groups: (a) those that, prior to their present location, resided on RDDC posts and (b) those that previously resided on PEDDC posts. The group of subjects who previously resided in areas where "routine" dependent dental care was not provided by the Army were further subdivided into the following six subgroups which reflected the number of months they had resided at their present location: zero to 6 months residency at present post; 7 to 12

months residency at present post; 13 to 18 months residency at present post; 19 to 24 months residency at present post; 25 to 30 months residency at present post; and more than 30 months residency at present post. For each of the six months-of-present-residency subgroups within the group previously residing on PEDDC posts, the mean cost of purchasing all dental care needed by a dependent family member was calculated.

(7) The data collected in Part I of the study concerning dental care requirements by category, and number of dependents by age and relationship, were keypunched and analyzed by computer. The pre-programmed Statistical Package for the Social Sciences was used for data analysis. The financial data in this study part were manually tabulated and computed using the Olivetti Programma 101. Data analysis was limited to descriptive statistics.

(8) Based upon their post of assignment the Army sponsors in Part II of the study were divided into the following two groups: those assigned to PEDDC posts and those assigned to RDDC posts. The participants were further subdivided into the following eight subgroups depending upon their military rank: E-1 through E-3; E-4 and E-5; E-6 and E-7; E-8 and E-9; W-1 through W-4; O-1 and O-2; O-3 and O-4; and O-5 and O-6. As in the first study part, the monthly base pay salary of each sponsor was computed using the information provided on the data collection questionnaire concerning sponsor's rank and number of years of federal service for pay purposes and the Table of Pay and Allowances for Military Personnel which became effective in October, 1975. The resultant monthly salary was multiplied by 12 in order to determine each sponsor's annual base pay income.

(9) For each of the two major groups (those assigned to PEDDC posts and those assigned to RDDC posts) and for the total sample, the following demographic data were calculated: percentage of subjects presently married; mean number of dependent children; and mean number of dependents (i.e., wives plus children). The mean and standard deviation concerning the annual base pay salary was calculated for each rank subgroup within the two major groups and for the total sample. The same descriptive statistics were calculated concerning the mean estimated twelve-month expenditures for civilian-provided family dependent dental care for the various subgroups and for the total sample. For each rank subgroup and for the total subjects within each of the two major groups, the mean estimated expenditures for family-unit dependent dental care were related to the sponsors' mean annual base pay salaries to give percentages of the annual base pay which were estimated to have been spent to purchase dental treatment for the sponsors' families. The percentages of subjects spending various dollar amounts for the twelve-month purchase of dependent dental care were calculated for each rank subgroup within each major group and for the total subjects within each major group (PEDDC and RDDC). In making these calculations, the percentages of subjects spending the following dollar amount ranges were determined: None; $1-50; $51-100; $101-200; $201-300; $301-400; $401-500; $501-1,000; and over $1,000. The total number of civilian dentists practicing within 30 mile radii of the various Army installations were recorded for each post; for the total PEDDC posts and for the total RDDC posts. The mean twelve-month

estimated expenditures for dependent dental care were calculated for the total subjects assigned to the PEDDC posts and for those assigned to the RDDC posts.

(10) The data collected in Part II of this study were manually tabulated, computed, and the statistical tests were performed within HCSD using the Olivetti Programma 101. The Student's "t" test was used to test for the possibility of a difference existing between the mean annual salary of each rank subgroup in the PEDDC group and that of their corresponding rank subgroups in the RDDC group. This statistical test was also performed in order to compare the mean annual salary of the total PEDDC sample with the total RDDC sample. The mean estimated expenditures for dependent dental care reported by each rank subgroup in the PEDDC group was compared with the expenditures of their corresponding rank subgroups in the RDDC group using the Student's "t" test. A Pearson Product-Moment correlation coefficient was used to test for the possibility of a correlation existing between the number of civilian dentists practicing within 30 mile radii of the various posts and the mean annual expenditures for dependent dental care reported by the subjects assigned to those posts.

(11) The data collected in Part III of the study were grouped and analyzed separately according to the children's educational levels as follows: third grade students; fourth grade students; fifth grade students; and sixth grade students. Within each grade level, the students were divided into two groups: (a) those attending schools located on PEDDC posts, and (b) those attending schools located on RDDC posts. For each of the two groups within each grade level, the means and standard deviations were calculated for each of the following: number of teeth (permanent plus deciduous) erupted into the oral cavity and at risk to dental caries; number of decayed permanent tooth surfaces (D); number of missing permanent tooth surfaces (M); number of filled permanent tooth surfaces (F); number of decayed, missing and filled permanent tooth surfaces (DMFS); number of decayed deciduous tooth surfaces (d); number of extracted deciduous tooth surfaces (e); number of filled deciduous tooth surfaces (f); number of decayed, extracted and filled deciduous tooth surfaces (defs); number of total decayed tooth surfaces (total D equals D plus d); number of total missing tooth surfaces (total M equals M plus e); number of total filled tooth surfaces (total F equals F plus f); and number of total decayed missing and filled surfaces (total DMFS equals DMFS plus defs). For each group within the four grade levels, the total D to total DMFS and the total F to total DMFS ratios were calculated and expressed as percentages.

(12) The Part III data were manually tabulated, computed, and the statistical tests were performed within HCSD using the Olivetti Programma 101. The Student's "t" test was used to test for the possibility of a difference existing between the mean number of teeth at risk to dental caries among the PEDDC group within each grade level and the mean number of teeth at risk exhibited by their RDDC counterparts. This statistical test was also performed in order to compare the total DMFS rates of the two groups within each grade level. Within each of the four educational

levels the total D to total DMFS ratios for the two groups were tested for the possibility of an existing difference using a Modified Student's "t" test for the Significance of Difference Between Sample Proportions. This test also was used to compare the total F to total DMFS ratios for the two groups within each grade level.

4. FINDINGS.

a. Findings in Part I of the Study.

(1) Sample Composition. A total of 5,213 dependents of active duty Army personnel received dental examinations in the first part of the study. Included were 2,321 dependent wives and 2,892 dependent children. Included were 307 individuals whose sponsors were in the E-1 through E-3 rank group; 1,130 in the E-4 and E-5 group; 1,732 in the E-6 and E-7 group; 329 in the E-8 and E-9 group; 321 whose sponsors were Warrant Officers; 142 in the O-1 and O-2 group; 941 in the O-3 and O-4 group; and 311 in the O-5 and O-6 group. Table 1 relates the number of dependents examined according to their age category; according to their relationship to the sponsor; and according to the sponsors' ranks. The 5,213 dependents examined represented 3,278 different families. Table 2 relates the number of families represented according to the eight rank groups.

(2) Dental Care Requirements. The mean number of dental care requirements, according to specific treatment-need categories, for wives and for children in specific age subgroups whose sponsors are in grades E-1 through E-3 are related in Table 3. The same information concerning dependents whose sponsors are in grades E-4 and E-5; E-6 and E-7; E-8 and E-9; W-1 through W-4; O-1 and O-2; O-3 and O-4; and O-5 and O-6 are shown in Tables 4, 5, 6, 7, 8, 9, and 10, respectively.

(3) Mean Cost Per Dependent of Satisfying Unmet Dental Needs. The mean costs per dependent of purchasing all needed dental treatment, according to the sponsor's rank, dependent's age, and dependent's relationship-to-sponsor are presented in Table 11. The mean cost per dependent for the E-1 through E-3 group was $293.24; for the E-4 and E-5 group the mean cost was $293.66. The mean costs per dependent for the remaining groups were as follows: E-6 and E-7, $250.77; E-8 and E-9, $244.40; W-1 through W-4, $356.19; O-1 and O-2, $267.35; O-3 and O-4, $170.06; and O-5 and O-6, $316.24. For all ranks the mean cost per dependent was $257.57. The mean cost per dependent wife for all rank groups was $330.47. For all rank groups the mean costs per dependent child, according to age subgroups were as follows: Children age 4-7, $82.77; children age 8-11, $278.69; children age 12-15, $230.12; and children age 16-20, $237.33.

(4) Family size. The mean size of the families represented by the dependents examined in the first study part are reported in Table 12. Among the total sample, the mean number of dependents per family was 2.8969. The mean number of dependents per family for the eight rank-based groups were as follows: E-1 through E-3, 1.7406; E-4 and E-5, 2.3357, E-6 and

E-7, 3.4137; E-8 and E-9, 3.8981; W-1 through W-4, 3.0000; O-1 and O-2, 1.8527; O-3 and O-4, 3.0959; and O-5 and O-6, 3.7237.

(5) Cost of Satisfying Unmet Dental Needs of Composite Families According to Sponsors' Ranks. The costs of satisfying the unmet dental needs of composite families having the same number of (and aged) members as the families represented by the examinees in the first study part were calculated by multiplying the data in Table 11 with the corresponding data in Table 12 and adding the amounts obtained for each relationship-age category to give the family totals. This information is presented in Table 13. The costs of satisfying the unmet dental needs for entire composite families for the eight rank groups were projected to be the following: E-1 through E-3, $340.45; E-4 and E-5, $471.38; E-6 and E-7, $788.94; E-8 and E-9, $840.56; W-1 through W-4, $853.49; O-1 and O-2, $338.16; O-3 and O-4, $479.14; and O-5 and O-6, $1,034.47.

(6) Mean Annual Base Pay Salaries. Table 14 presents the mean annual base pay salaries of the Army members whose dependents were examined in the first part of the study. The mean annual base pay salaries for the various rank groups were: E-1 through E-3, $5,070.00; E-4 and E-5, $6,415.85; E-6 and E-7, $9,064.69; E-8 and E-9, $12,560.80; W-1 through W-4, $12,227.36; O-1 and O-2, $10,633.75; O-3 and O-4, $16,706.92; and O-5 and O-6, $22,946.60.

(7) Percentage of the Sponsors' Annual Base Pay Salaries Which Would be Required to Satisfy All Unmet Dental Needs of Composite Families. The percentage of the sponsors' annual base pay salaries which would be required to satisfy the unmet dental needs of composite families consisting of the same number (and aged) members as the families represented by the examinees in the first study part is present in Table 15. For the eight rank groups, the percentages of base pay incomes required to purchase all dental care needed by the dependent family members were: E-1 through E-3, 6.7 percent, E-4 and E-5, 7.3 percent; E-6 and E-7, 8.7 percent; E-8 and E-9, 6.7 percent; W-1 through W-4, 7.0 percent; O-1 and O-2, 3.2 percent; O-3 and O-4, 2.9 percent; and O-5 and O-6, 4.5 percent.

(8) Cost of Satisfying Unmet Dental Needs of Dependents Presently Residing on/near RDDC Posts Who Previously Resided on/near PEDDC Posts. Table 16 presents information concerning the cost of purchasing all dental care needed by dependents who moved from PEDDC posts to RDDC posts according to their length of residency on/near their present (RDDC) location. For those dependents residing on/near their present location less than six months the mean cost per dependent was $287.58. For those residing on/near their present locations for 7 to 12 months, 13 to 18 months, 19 to 24 months, 25 to 30 months, and for more than 30 months, the mean costs were $260.75, $263.78, $251.91, $243.53, and $214.71, respectively.

b. Findings in Part II of the Study.

(1) Sample Composition. A total of 3,137 active duty US Army personnel completed valid questionnaires and served as subjects in Part II of this study. Included were 1,737 individuals assigned to PEDDC posts and 1,400

soldiers who were assigned to RDDC posts. Included were 264 individuals in the E-1 through E-3 rank subgroup; 1,042 in the E-4 and E-5 subgroup; 915 in the E-6 and E-7 subgroup; 152 in the E-8 and E-9 subgroup; 171 Warrant Officers; 113 in the O-1 and O-2 subgroup; 362 in the O-3 and O-4 subgroup; and 118 in the O-5 and O-6 subgroup. Table 17 relates the number of subjects in each subgroup according to whether they were assigned to PEDDC posts or RDDC posts.

(2) Family Size. Among the total sample, 96.9 percent of the sponsors were presently married and they had a mean of 1.608 dependent children. The mean number of dependents (wives plus children) reported by the total sample was 2.578. Of those individuals assigned to PEDDC posts, 96.6 percent were presently married and they had a mean of 1.717 children. The mean number of dependents (wives plus children) reported by the personnel in this group was 2.683. In the RDDC group, 97.4 percent of the individuals were married; they reported a mean of 1.474 children; and they had a mean of 2.447 depentents.

(3) Mean Annual Base Pay Salaries. Table 18 presents the means and standard deviations (± S.D.) concerning the annual base pay salaries of the personnel completing the questionnaires. The individuals in the PEDDC group had a mean annual salary (± S.D.) of $9,660.16 (±$4,612.04). Those individuals in the RDDC group had a mean annual salary of $9,723.19 (± $4,659.55). The mean annual salaries (± S.D.) determined for the eight rank subgroups within the PEDDC groups were as follows: E-1 through E-3, $5,089.30 (± $257.12); E-4 and E-5, $6,303.81 (± $976.11); E-6 and E-7, $9,249.04 (± $1,087.02); E-8 and E-9, $12,744.36 (± $1,302.49); W-1 through W-4, $12,870.43 (± $2,376.67), O-1 and O-2, $10,832.86 (± $1,892.58); O-3 and O-4, $16,545.52 (± $1,836.01); and O-5 and O-6, $24,054.65 (± $2,847.67). Among the RDDC group, the mean annual salaries (± S.D.) for the eight rank subgroups were: E-1 through E-3, $5,0444.71 (± $274.17); E-4 and E-5, $6,188.24 (± $644.84); E-6 and E-7, $9,174.50 (± $1,152.69); E-8 and E-9, $12,772.87 (± $1,277.90); W-1 through W-4, $12,291.99 (± $2,462.94); O-1 and O-2, $10,197.93 (± $1,775.88); O-3 and O-4, $16,788.85 (± $1,850.65); and O-5 and O-6, $23.272.88 (± $2,434.55). Statistical analyses using Student's "t" test revealed no significant differences between the mean annual salaries of the subjects in the PEDDC group and the RDDC group. Comparisons of all eight pairs of corresponding rank subgroups within the two major groups also revealed no significant differences in mean annual base pay salaries between the PEDDC and RDDC groups.

(4) Mean Twelve-Month Expenditures for Dependent Dental Care. Information concerning the estimated expenditures for dependent dental care reported by the study participants is presented in Table 19. The mean estimated twelve-month expenditures for dependent dental care (± S.D.) determined for the eight rank subgroups within the PEDDC group were as follows: E-1 through E-3, $25.92 (± $65.49); E-4 and E-5, $75.80 (± $162.98); E-6 and E-7, $2331.70 (± $332.47); E-8 and E-9, $396.10 (± $572.09); W-1 through W-4, $321.25 (± $475.21); O-1 and O-2, $102.71 (± $120.01); O-3 and O-4, $313.55 (± $456.99); and O-5 and O-6, $543.81

(± $602.89). The mean estimated expenditure for all of the PEDDC subjects was $193.50 (± $354.58). Among the RDDC group the mean estimated expenditures for dependent dental care (± S.D.) for the eight rank subgroups were: E-1 through E-3, $22.37 (± $56.04); E-4 and E-5, $40.81 (± $98.40); E-6 and E-7, $127.95 (± $347.49); E-8 and E-9, $186.55 (± $263.65); W-1 through W-4, $243.39 (± $409.49); O-1 and O-2 $48.06 (± $218.26); O-3 and O-4, $185.11 (± $388.20); and O-5 and O-6, $285.99 (± $535.46). For all of the RDDC subjects, the mean estimated expenditure (± S.D.) was $109.45 (± $295.71). The difference between the mean expenditures reported by the total PEDDC group and the total RDDC group was statistically significant at the .001 level. When the mean expenditures reported by the E-4 and E-5 subgroup, the E-6 and E-7 subgroup, the E-8 and E-9 subgroup, the O-3 and O-4 subgroup, and the O-5 and O-6 subgroup within the PEDDC group were compared with their RDDC counterparts, the differences were found to be statistically significant in each instance. The differences between the mean expenditures reported by the two E-1 through E-3 subgroups, the two W-1 through W-4 subgroups, and the two O-1 and O-2 subgroups were not statistically significant ($p > .05$) in each case.

(5) Percentage of Annual Base Pay Salaries Devoted to the Purchase of Dependent Dental Care. The percentages of the sponsors' annual base pay salaries actually devoted to the purchase of dependent dental care are reported by subgroup in Table 20. The percentages devoted to the purchase of this care by the PEDDC subgroups were: E-1 through E-3, 0.5 percent; E-4 and E-5, 1.2 percent; E-6 and E-7, 2.5 percent; E-8 and E-9, 3.1 percent; W-1 through W-4, 2.5 percent; O-1 and O-2, 0.9 percent; O-3 and O-4, 1.9 percent; and O-5 and O-6, 2.3 percent. Among the RDDC subgroups the following percentages of the subjects' salaries were devoted to purchasing dependent dental care: E-1 through E-3, 0.4 percent; E-4 and E-5, 0.7 percent; E-6 and E-7, 1.4 percent; E-8 and E-9, 1.5 percent; W-1 through W-4, 2.0 percent; O-1 and O-2, 0.5 percent; O-3 and O-4, 1.1 percent; and O-5 and O-6, 1.2 percent. For all of the PEDDC subjects, 2.0 percent of their base pay salaries was reported to have been expended for the purchase of dependent dental care, while for all of the RDDC subjects only 1.1 percent of their salaries was expended for this health care service.

(6) Percentage of Subjects Spending Various Dollar Amounts for the Twelve-Month Purchase of Dependent Dental Care. The percentage of Army sponsors of all ranks spending various dollar amounts for the purchase of dependent dental care is shown in Figure 1. Among the PEDDC group 36.2 percent of the subjects reported no expenditures during the preceding 12 months; 10.5 percent reported expenditures between $1 and $50; 10.3 percent reported spending from $51 to $100; 14.1 percent reported spending from $101 to $200; 8.6 percent reported expenditures ranging from $201 to $300; 5.0 percent reported expenditures between $301 and $400; 5.9 percent spent between $401 and $500; 6.6 percent spent between $501 and $1,000, and 2.8 percent reported expenditures greater than $1,000. Among the RDDC, the percentages of subjects spending various dollar amounts were as follows: None, 57.1 percent, $1 to $50,

9.5 percent; $51 to $100, 12.1 percent; $101 to $200, 5.9 percent; $201 to $300, 4.9 percent; $301 to $400, 2.7 percent; $401 to $500, 2.9 percent; $501 to $1,000, 3.0 percent; and more than $1,000, 1.9 percent. The percentages of subjects spending various dollar amounts for the twelve-month purchase of dependent dental care are reported by rank subgroups and by major group in Table 21. Among the E-1 through E-3 subgroups, essentially the same percentage of subjects who were assigned to PEDDC posts and RDDC posts reported no expenditures for the purchase of dependent dental care. For the remaining seven pairs of rank subgroups, the percentages of subjects reporting no expenditures for the purchase of this care were consistantly greater among those individuals assigned to RDDC posts. None of the study subjects in ranks E-1 through E-3 spent more than $500 for dependent dental care. Among Warrant Officers and Lieutenants the percentages of subjects spending more than $500 were essentially the same for the PEDDC group and the RDDC group. For the remaining five pairs of rank subgroups, the percentages of subjects spending more than $500 were consistantly greater among those individuals assigned to PEDDC posts.

(7) Correlation Between the Number of Civilian Dentists Practicing Within 30 Mile Radii of the Various Posts and the Mean Annual Expenditures for Dependent Dental Care Reported by the Sponsors Assigned to Those Posts. The total number of civilian dentists having their offices within 30 mile radii of the 11 PEDDC posts was 7,045. The mean annual expenditures for the purchase of dependent dental care reported by the subjects assigned to these posts was $193.50. The total number of civilian dentists practicing within 30 mile radii of the ten RDDC posts was 376 and the mean annual expenditure for dependent dental care reported by the subjects assigned to the RDDC posts was $109.45. Use of a Pearson Product-Moment correlation coefficient revealed that positive correlations existed between the number of civilian dentists practicing within the local areas and the mean expenditures for the purchase of dependent dental care at PEDDC posts ($r = .39$), at RDDC posts ($r = .32$), and for all 21 posts ($r = .52$).

c. Findings in Part III of the Study.

(1) Sample Composition. A total of 1,107 dependent children received dental caries prevalence examinations and served as subjects in the third part of the study. Included were 506 children who attended schools located on PEDDC posts and 601 students attending schools located on RDDC posts. Included were 286 third grade students, 268 fourth graders, 284 fifth graders, and 269 sixth grade students. Table 22 relates the number of students in each grade level according to whether they attended schools located on PEDDC posts or RDDC posts.

(2) Number of Teeth at Risk to Dental Caries. Table 23 presents the means and standard deviations (± S.D.) concerning the number of teeth erupted into the oral cavity and at risk to dental caries exhibited by the children receiving DMFS/defs caries index examinations. Among the children attending schools located on PEDDC posts, the mean number of

teeth at risk (± S.D.) exhibited by the students in the various educational levels were: third grade, 23.02 (± 1.62); fourth grade, 21.97 (± 2.09); fifth grade 22.58 (± 2.04); and sixth grade, 23.78 (± 1.69). Among the RDDC group, the mean number of teeth at risk (± S.D.) for the four grade levels were: third grade, 22.49 (± 1.27); fourth grade, 22.32 (± 2.04); fifth grade, 22.72 (± 1.51); and sixth grade, 24.69 (± 2.59). Statistical analysis using Student's "t" test revealed no significant differences between the mean number of teeth at risk to dental caries exhibited by the third, fourth, fifth, and sixth grade children attending schools on PEDDC posts and the mean number of teeth at risk exhibited by their RDDC counterparts.

(3) Number of DMF Tooth Surfaces and def Tooth Surfaces Exhibited by the Children Examined in the Third Part of the Study. The means and standard deviations (± S.D.) concerning the DMF permanent tooth surfaces and the def deciduous tooth surfaces exhibited by the subjects in the third study part are related in Tables 24 and 25, respectively. For both the PEDDC group and the RDDC group the mean number of DMF permanent tooth surfaces increased as the grade levels in school increased. Conversely, for both groups the mean numbers of def deciduous tooth surfaces decreased as the educational levels increased.

(4) Number of Total DMF Surfaces (Permanent Plus Deciduous Teeth) Exhibited by the Examinees in Study Part III. Table 26 presents the means and standard deviations (± S.D.) concerning the total decayed tooth surfaces (D), total missing tooth surfaces (M), total filled tooth surfaces (F), and total DMF surfaces exhibited by the subjects in the third part of the study. The "total" surface figures reflect the tooth surfaces involved on the permanent plus the deciduous teeth. Among third grade students the mean total DMFS scores (± S.D.) exhibited by children in the two groups were: PEDDC group 11.02 (± 10.61); and RDDC group 10.46 (± 11.36). Among fourth grade students the mean total DMFS scores (± S.D.) were: PEDDC group 9.39 (± 8.35); and RDDC group 9.75 (± 8.58). The mean total DMFS scores (± S.D.) found among the fifth grade children were: PEDDC group 7.68 (± 6.54); and RDDC group 7.46 (± 6.12). Comparisons of all four pairs of corresponding educational grade levels within the two major groups, using Student's "t" test, revealed no significant differences in mean total DMFS scores between the PEDDC and RDDC groups.

(5) Percentage of Total DMF Surfaces Exhibited By the Examinees in Study Part III which were Decayed (D) Surfaces and Filled (F) Surfaces, Respectively. Table 27 reveals the total D/total DMFS ratios and the total F/total DMFS ratios found among the children examined in the third part of the study. In all instances these ratios are expressed as percentages of total DMFS. Among the PEDDC group the percentages of total DMF surfaces which were decayed surfaces for the third, fourth, fifth, and sixth grade children were: 37.7 percent, 41.9 percent, 46.9 percent, and 49.3 percent respectively. Among the RDDC group, the percentages of total DMFS which were decayed surfaces for these four grade levels were: 29.3 percent 29.6 percent 31.1 percent, and 35.8 percent respectively.

Among the four grade levels within the PEDDC group, the percentages of total DMF Surfaces which were filled surfaces were: third grade, 53.5 percent; fourth grade, 51.5 percent; fifth grade, 42.2 percent; and sixth grade, 44.1 percent. The RDDC group exhibited the following total F/total DMFS ratios: third grade, 65.2 percent; fourth grade, 62.4 percent; fifth grade 61.8 percent; and sixth grade, 55.0 percent. Statistical analyses using a Modified Student's "t" test for the Significance of Differences Between Sample Proportions revealed that the total D/total DMFS ratios were significantly lower among RDDC third grade students ($p < .05$), fourth graders ($p < .01$), fifth graders ($p < .01$), and sixth graders ($p < .01$) than among their PEDDC counterparts. The total F/total DMFS ratios were significantly higher among RDDC third graders ($p < .05$), fifth graders ($p < .01$), and sixth graders ($p < .01$) than the ratios exhibited by their PEDDC counterparts. The difference between the total F/total DMFS ratios exhibited by the PEDDC and RDDC fourth grade students was not statistically significant ($p > .05$).

5. DISCUSSION.

a. In the first part of the study, all of the data were collected on dependent wives and children residing on or near RDDC posts. For those dependents living on or near PEDDC posts, no administrative mechanisms or clinical methods were available which would allow the conduct of examinations designed to determine clinical dental care needs. Accordingly, unlike the second and third parts of the study, it was impossible to statistically analyze and compare Part I data collected at the two types of posts, and only descriptive statistics concerning this data is presented in the tables.

b. Due to the impossibility of examining dependents at PEDDC posts and since it was impractical to obtain study participants by random sampling, it was realized prior to initiation of Part I that this part of the study may contain a bias, the nature of which is unknown. The selection of those individuals actually seeking dental examinations and/or care as study participants (as was done at the RDDC posts) may have resulted in the data revealing dental treatment requirements and costs which are at variance to the maximum values for the entire dependent population in the Army.

c. The distribution of the Part I sample among the rank groups is adequately balanced for the total sample with approximately one-fourth of the examinees being dependents of lower ranking enlisted personnel, almost one-half of them being dependents of more senior enlisted personnel and Warrant Officers, and the remaining one-fourth being the dependents of commissioned officers. Also, the sample appears to be representative of Army families in general as to family size. The mean number of dependents within the families represented by the examinees in the first study part was 2.896. This compares favorably with information obtained from MILPERCEN stating that the average family unit in the Army contains 2.486 dependents.[20]

d. The information presented in Tables 3 through 10 indicates that the dental treatment requirements of dependents of active duty Army personnel are extensive even when the data are collected among individuals living in areas where a wide range of "routine" dental treatment is provided for dependents in Army clinics. Although the unmet dental care requirements of the dependent population is extensive, the number of treatments (in several categories) needed by dependent wives appears to be less than the number of treatments needed by active duty Army personnel as reported by Parker[3] in 1976. When the dental care requirements of active duty Army personnel are compared with the care requirements of dependent wives, the wives appear to need fewer amalgam restorations, extractions, full dentures, and partial dentures. Although there is little difference between the two groups concerning the need for prophylaxes, the percentage of wives needing oral disease control programs is lower than was reported for active duty Army personnel. Among those treatment requirements which can be compared in the two studies, it appears that the requirements for wives are greater only in the category of crowns needed. The relationships between the dental treatment needs of soldiers and dependent wives remain unchanged regardless of whether the wives are compared with male or female active duty personnel. The decreased dental care requirements among dependent wives may be due to: (1) differences in the sampling techniques utilized in the two surveys; (2) the possibility that dependent wives are better practitioners of self-administered preventive dentistry measures, as evidenced by their decreased requirement for oral disease control programs; or (3) other unknown reasons.

e. The mean cost per dependent of satisfying all unmet dental needs for the entire sample in Part I of the study was $257.57. This is less than the $318.62 previously estimated for disadvantaged university students in Connecticut or the costs ($341.00, $407.00, and $851.00) reported for people served by three social agencies in Iowa[14,15]. However, the mean costs for the wives in the E-1 through E-3 and the O-1 and O-2 rank groups (normally young adults) were almost identical to the mean cost for the disadvantaged university students ($320.49, $322.45, and $318.62). Although the fees used in the present study were generally greater than those used to calculate costs in the Iowa survey, the mean costs reported by the Iowa agencies ($330.00 versus $341.00, $407.00, and $851.00). Among the various age-relationship subgroups, the mean cost of satisfying all unmet dental needs was highest for dependent wives ($330.47) and the lowest mean cost ($82.27) was for dependent children age four through seven. This relationship of the various subgroups as to mean cost of dental care is probably due to the fact that dependent wives require the more expensive dental therapy such as dentures, crowns and periodontal therapy. Also younger children normally do not receive expensive orthodontic therapy to the same extent as do older children. The mean cost per dependent for dental care among those individuals presently residing on/near RDDC posts, who previously had lived on PEDDC posts, showed a slow but steady decrease as the length of residency at the present location increased. However, even those dependents who had resided on or near RDDC posts for more than 30 months needed extensive dental thereapy as was indicated by the mean cost of $214.71 for those individuals.

f. The mean costs of satisfying the unmet dental needs of composite families (Table 13) may be somewhat minimized due to the fact that in certain age categories, insufficient children were examined and no costs were calculated for these subgroups. However, it is unlikely that the failure to examine and project costs for children age one through three had a significant effect on the total costs since these children normally required little "routine" dental therapy. Also, the failure to project costs for other subgroups of children may have only a slight effect since parents in the various rank groups probably have few children in the age ranges where costs were not projected. The mean cost per composite family for dependent dental care was found to be directly related to sponsor's rank, with families of higher ranking enlisted members having greater costs than lower ranking enlisted personnel and the families of higher ranking officers requiring greater expenditures than the families of Lieutenants. The highest mean cost per composite family ($1,034.47) was found for the families of O-5s and O-6s. Conversely, the cost of purchasing all dental care needed by their families from civilian sources would place a greater financial burden on enlisted personnel and Warrant Officers than would be placed on commissioned officers. The percentages of the sponsors' annual base pay salaries which would be required to satisfy the unmet dental needs of composite families ranged from 6.7 percent to 8.7 percent for enlisted personnel and Warrant Officers, while the range for commissioned officers was 2.9 percent to 4.5 percent.

g. The distribution of the sample among the rank subgroups in Part II of the study is adequately balanced for the total sample as well as between the two major groups (PEDDC and RDDC). Although 62.4 percent of the subjects were in the ranks of E-4 through E-7, this was not unexpected for the following two reasons: the numbers of military personnel within given ranks/grades decrease as the rank/grade structure increases; and the percentages of both officers and enlisted personnel who are married and have dependents increase as their ranks/grades increase[21]. Since only 57.3 percent of all O-1s and only 18.2 percent of all E-1s in the Army are married, exclusion of military personnel without dependents from the study leads to the presumption that the E-1 through E-3 and O-1 and O-2 rank subgroups might contain less subjects than the other officer and enlisted subgroups.

h. The Part II sample appears to be representative of Army families in general as to family size. The mean number of dependents reported by the sponsors in this survey was 2.578 and, as in Part I, this compares favorably with the 2.486 reported by MILPERCEN[20]. The two major groups were adequately balanced as to family size, with the PEDDC group having a mean of 2.683 dependents and the RDDC group having a mean of 2.447 dependents. The two major groups were also well balanced as to mean annual base pay salary, with no significant differences existing between the mean annual salaries reported by the various PEDDC subgroups and those reported by the corresponding RDDC subgroups.

i. The purchase of dental care for their families places a greater financial burden on Army personnel who are assigned to PEDDC posts

than is placed on those assigned to RDDC posts, with the former devoting 2.0 percent of their base pay to this purchase while the latter devote only 1.1 percent. The fact that personnel assigned to RDDC posts spend significantly less money for dependent dental care than is expended by the individuals assigned to PEDDC posts might be related to at least two factors: the availability of dependent dental care provided at no cost by the Army at RDDC posts; and a possible inadequate supply of civilian dentists located within 30 mile radii of the RDDC posts. It is self evident that dependent dental care provided in Army clinics results in financial savings for military sponsors. The data also revealed a positive relationship between the number of civilian dentists practicing within 30 mile radii of the various posts and the mean expenditures for dependent dental care at the posts. Exemplifying this is the fact that two of the RDDC posts reported 12 and 8 civilian dentists, respectively, practicing near their locale and they further reported extremely low mean expenditures for dependent dental care. Conversely one PEDDC post reported the number of civilian dentists in the local area to be 750 and a very high mean expenditure for dependent dental care.

j. Just as the Part I data indicated a relationship between the cost of purchasing all dental care needed by composite families and the sponsors' ranks, the Part II data indicated that a relationship existed between sponsors' ranks and the actual expenditures for dependent dental care. In both the PEDDC and the RDDC groups, higher ranking enlisted members reported greater expenditures than lower ranking enlisted personnel and higher ranking officers spent more than lower ranking officers. Theoretically, at least two factors may partially explain this finding: differences in the mean number of dependents, with lower ranking personnel having less children than higher ranking personnel; and differences in mean salaries, with lower ranking personnel being less able to afford extensive dental treatment. Inability to afford extensive dental treatment might be indicated by comparing the percentage of personnel in the various PEDDC subgroups who reported no expenditures for this service. Among enlisted personnel in the PEDDC group 71.3 percent of the E-1 through E-3 subgroup; 52.4 percent of the E-4 and E-5 subgroup; 25.9 percent of the E-6 and E-7 subgroup; and 22.0 percent of the E-8 and E-9 subgroup reported no expenditures. Among officers the percentage of personnel reporting no expenditures were as follows: O-1 and O-2 subgroup, 36.2 percent; O-3 and O-4 subgroup, 14.3 percent; and O-5s and O-6s, 12.9 percent.

k. The fact that military personnel assigned to RDDC posts spent a mean of $109.45 for dependent dental care indicates that even when "routine" dental care for dependents is provided in Army dental clinics, the dental services at these posts do not fully satisfy all of the treatment needs of the dependent population for which they have responsibility. The Part I data indicating that dependents who had resided on or near RDDC posts for more than 30 months still required expenditures of $214.00 for all needed dental therapy further corroborates this conclusion. Personal communication with DDSs assigned to RDDC posts indicates that at these posts the dental treatment needs of the dependent population are

only partially satisfied and the remainder of their care requirements are either treated by civilian dentists or go unmet.

l. According to information published by the Social Security Administration, the FY 1975 per capita national expenditures for dentists' services was $34.62[13]. When the mean expenditure for family dependent dental care reported by the Army personnel in Part II, who were assigned to RDDC posts, ($109.45) is divided by the mean number of dependents reported by these individuals (2.477), a mean expenditure per dependent of $44.73 is derived. This indicates that, in addition to the "routine" dental care they receive in Army dental clinics, Army dependents residing on or near RDDC posts spend a greater amount for dental care in the civilian market than is spent by the general population.

m. The findings that a greater percentage of subjects assigned to RDDC posts reported no expenditures for dependent dental care, and that a lesser percentage spent more than $500, than did their PEDDC counterparts are consistent with the findings concerning mean expenditures for dependent dental care and were not unexpected.

n. Comparisons between the Part II data collected at RDDC posts and the Part I data may be theoretical rather than factual. Although the data in both parts of the study were collected at the same RDDC posts during the same time period, the extent to which the same families were involved in providing data is unknown. Nevertheless, if the mean annual expenditures for family-unit dependent dental care reported in Part II at RDDC posts is divided by the costs of satisfying unmet dental needs of families as computed in Part I, the following percentages are obtained: E-1 through E-3 group, 6.6 percent; E-4 and E-5 group, 8.7 percent; E-6 and E-7 group, 16.2 percent; E-8 and E-9 group, 22.2 percent; W-1s through W-4s, 28.5 percent; O-1s and O-2s, 14.2 percent; O-3s and O-4s, 38.6 percent; and O-5s and O-6s, 27.6 percent. Theoretically it appears that, in general, the families of higher ranking enlisted members and officers purchase a greater percentage of their total dental needs from civilian sources than do their lower ranking counterparts.

o. In Part III of the study the distribution of the sample between the PEDDC and RDDC groups is adequately balanced for the total sample as well as for each individual educational level. The greatest disparity in distribution is among fourth grade students, and this is not significant since 41 percent of the students were in the PEDDC group and 59 percent were in the RDDC group.

p. The data demonstrated that as the level in school increased, the mean DMFS scores showed a concomitant increase and the mean defs scores decreased. This was not unexpected and is due to the loss of deciduous teeth and the eruption of permanent teeth as the age (and grade in school) increased. The mean total DMFS scores for both the PEDDC and the RDDC groups decreased as the grade in school increased.

This was expected and is due to the length of time that the permanent and deciduous teeth had been erupted, exposed to the oral environment, and at risk to dental caries. The younger children had more deciduous teeth, which had been exposed to the oral environment for relatively long time periods, while the older children had more permanent teeth, which had recently erupted and were at risk to caries for only a short time period.

q. The PEDDC and RDDC groups were balanced as to the mean number of teeth erupted and at risk to dental caries. The two groups were also well balanced as to mean total DMFS scores. While statistical analysis revealed no significant differences between the two groups concerning the total DMFS scores, the percentages of the total DMFS scores attributable to decayed surfaces were significantly lower in the four RDDC grades than were found among their PEDDC counterparts. With the exception of fourth grade students, the percentage of the total DMFS scores, attibutable to filled surfaces was significantly higher among RDDC children. Thus, while the dental caries attack rates were the same for children attending schools on the two types of posts, the caries treatment rate was significantly better among children who lived where the Army provided a wide range of "routine" dental care for dependents. The fact that RDDC children had fewer active carious lesions might be one indication of better dental health.

6. CONCLUSIONS.

a. The dental treatment requirements of dependents of active duty Army personnel are extensive, even among patients residing on or near posts where a wide range of "routine" dental therapy is provided to dependents in Army clinics.

b. The estimated potential cost of satisfying all unmet dental needs of dependents is greatest for wives and least for younger aged children.

c. The cost of purchasing all dental care which might be needed by their families from civilian sources would place a greater financial burden on enlisted personnel and Warrant Officer (between 6.7 percent and 8.7 percent of their base pay salaries) than would be placed on commissioned officers (between 2.9 percent and 4.5 percent of their salaries).

d. The potential costs of purchasing all dental care needed by dependents decrease slightly as the length of residence on or near posts providing extensive "routine" dental care for dependents increases.

e. Army personnel assigned to PEDDC posts spend approximately twice as much money for civilian-provided dental care for their dependents as do personnel assigned to RDDC posts.

f. Actual expenditures for dependent dental care result in a greater financial burden for personnel assigned to PEDDC posts than for those

assigned to RDDC posts as evidenced by the fact that a greater percentage of their annual base pay is devoted to purchasing this care (2.0 percent versus 1.1 percent).

g. A greater percentage of personnel having no annual expenditures for dependent dental care is found among individuals assigned to RDDC posts than is found among individuals assigned to PEDDC posts.

h. At posts providing a wide range of "routine" dental treatment for dependents, all of the dental treatment needs of the dependent population are not met by the posts and these individuals purchase extensive additional dental treatment from civilian providers.

i. The dental caries attack rates are the same for children living on or near PEDDC and RDDC posts.

j. Children residing on or near posts providing a wide range of "routine" dental care for dependents receive more extensive treatment for dental caries and have fewer untreated carious lesions than do children residing on/near PEDDC posts.

7. RECOMMENDATIONS.

a. Recommend that the results of this study be made available to the Assistant Surgeon General for Dental Services, Office of The Surgeon General, Department of the Army and to the Directorate of Dental Services, US Army Health Services Command.

b. Recommend that the Army dental resource planners and managers mentioned above (7.a.) consider methods of alleviating the inequities in dental care provided to dependents in Army clinics at the various posts and the inequitable financial burden that the purchase of dependent dental care places on personnel assigned to PEDDC posts as compared to those assigned to RDDC posts.

8. REFERENCES.

[1]Hobson, R. W., "Dental Examinations of 8,139 Army Recruits, Preliminary Report." US Armed Forces Medical Journal, 7: 648, May 1956.

[2]Cassidy, J. E.; Parker, W. A.; and Hutchins, D. W., "Dental Care Requirements of Male Army Recruits." Military Medicine, 138: 27, January 1973.

[3]Parker, W. A., "Dental Care Requirements of Active Duty Army Personnel." United States Army Health Services Command (HSDS-P Report HCSD-76-009R, April 1976.

[4]US Army Medical Research and Development Command, "Dental Care Requirements for Dependents of Active Duty Army Personnel." US Army Institute of Dental Research Report No. 32, February 1974.

[5]Vital and Health Statistics, Data From National Health Survey, "Selected Dental Findings in Adults by Age, Race, and Sex. United States 1960-1962." Public Health Service Publication No. 1000 - Series 11 - No. 7, February 1965.

[6]Vital and Health Statistics, Data from National Health Survey, "Need for Dental Care Among Adults, United States 1960-1962." Public Health Service Publication No. 1000 - Series 11 - No. 36, March 1970.

[7]Vital and Health Statistics, Data from the National Health Survey, "Edentulous Persons, United States 1971." Department of Health Education and Welfare Publication No. (HRA) 74-1516 - Series 10 - No. 89, 1 June 1974.

[8]Johnson, J. E., "Incremental Dental Care for the Leeds Primary School." Journal of Public Health Dentistry, 31: 191, Summer 1971.

[9]Jong, A. and Leske, G. E., "Utilization and Cost of Dental Services for Preschool Children in Boston's Head Start Program." Journal of Public Health Dentistry, 28: 126, Spring 1968.

[10]Drake, C. W., "Service and Cost Analyses of a Head Start Dental Program in a Public Clinic." Journal of the North Carolina Dental Society, 53: 19, August 1970.

[11]Doherty, N. and Vivian, S. L., "Costs of Publicly Financed Dental Care for Children in Three Different Types of Practice Settings." Journal of Public Health Dentistry, 36: 40, Winter 1976.

[12]Sonken, S., "The future of Third Party Dentistry." Journal of Public Health Dentistry, 36: 40, Winter 1976.

[13]US Department of Health, Education and Welfare, Social Security Administration. Social Security Bulletin Vol. 39, No. 2, February 1976.

[14]Ferguson, F. S. and Moran, A., "Survey of Dental Needs and Estimated Cost of Dental Care of a Disadvantaged University Population." Journal of Public Health Dentistry, 36: 188, Summer 1976.

[15]Horton, P. S.; Field, H. M.; Soule, D. J.; and Erbe, C. F., "Dental Needs and Costs for Patients from Three Social Agencies." Journal of Public Health Dentistry, 36: 182, Summer 1976.

[16]Ringleberg, M. L.; Conti, A. J.; and Webster, D. B., "An Evaluation of Single and Combined Self-Applied Fluoride Programs In Schools." Journal of Public Health Dentistry, 36: 229, Fall 1976.

[17]Heifetz, S. B.; Horowitz, H. S.; and Korts, D. C., "Prevalence of Dental Caries in White and Black Children in Nelson County, Virginia, A Rural Southern Community." Journal of Public Health Dentistry, 36: 79, Spring 1976.

[18]American Dental Association, "Proceedings of the Conference on the Clinical Testing of Cariostatic Agents," Chicago, Illinois, October 1968.

[19]Grainger, R. M. "Epidemiological Data," Chapter 18 in Design and Analysis in Dental and Oral Research, pp 311-353, J. B. Lippencott Company, Philadelphia, Pennsylvania, 1972.

[20]US Army Military Personnel Center, "Survey Estimate of Marital Status and Dependents of Male Army Personnel." Personnel Management Development Directorate DAPC-PMP Report No. 1-76-S, May 1975.

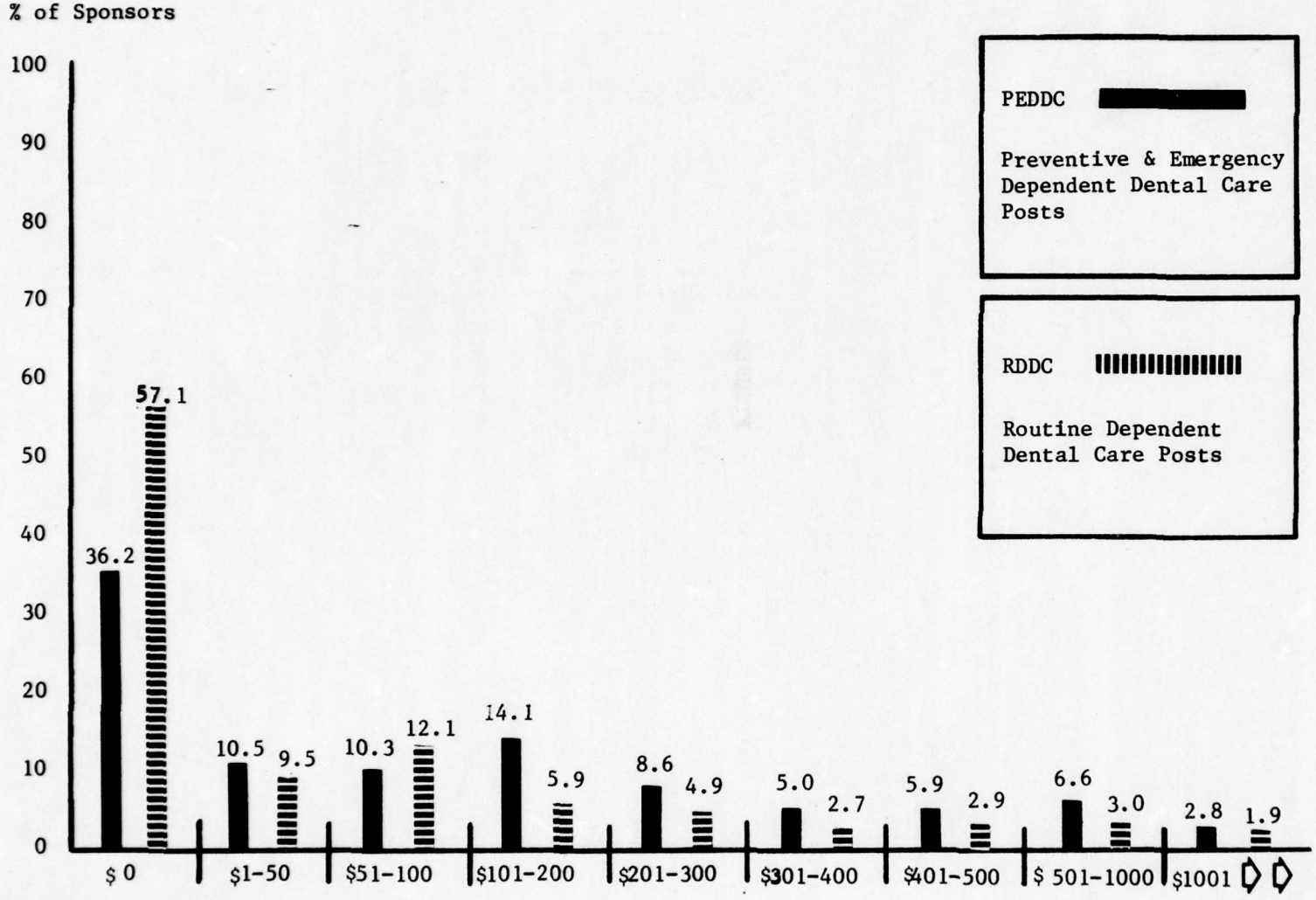
[21]US Army Military Personnel Center, "Army Personnel Composite. Sample Survey of Military Personnel." Personnel Management Development Directorate DAPC-PMP Report No. 4-74-S, November 1973.

FIGURES

Figure 1

12-MONTH EXPENDITURES BY ARMY SPONSORS (ALL RANKS)

FOR PURCHASE OF DEPENDENT DENTAL CARE



TABLES

TABLE 1

NUMBER OF DEPENDENTS, BY SPONSOR'S RANK, RECEIVING EXAMINATIONS TO DETERMINE DENTAL CARE REQUIREMENTS IN STUDY PART I

RANK GROUPS	WIVES ALL AGES	CHILDREN				
		AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20	TOTAL
E1-E3	254	35	7	5	6	307
E4-E5	756	221	102	39	12	1,130
E6-E7	550	358	421	297	106	1,732
E8-E9	91	23	75	82	58	329
W1-W4	130	46	67	56	22	321
O1-O2	108	29	5	--	--	142
O3-O4	335	253	208	116	29	941
O5-O6	97	24	48	77	65	311
TOTAL	2,321	989	933	672	298	5,213

TABLE 2

NUMBER OF FAMILIES REPRESENTED BY THE DEPENDENTS RECEIVING EXAMINATIONS TO DETERMINE DENTAL CARE REQUIREMENTS IN STUDY PART I

RANK GROUPS	FAMILIES
E1-E3	266
E4-E5	834
E6-E7	892
E8-E9	157
W1-W4	287
O1-O2	129
O3-O4	532
O5-O6	181
TOTAL	3,278

TABLE 3

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES E1-E3. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY: WIVES ALL AGES	CHILDREN AGE 4-7	CHILDREN AGE 8-11	CHILDREN AGE 12-15	CHILDREN AGE 16-20
Examinations	1.0000	1.0000			
Bite Wing X-Rays	0.9449	0.6000			
Additional X-Rays	2.6654	1.5429			
Prophylaxes & Scalings	0.8386	0.5714			
Topical Fluoride Therapy	0.4724	0.8857	*	*	*
Amalgam Restorations-Total	3.7637	2.3429			
One-Surface	2.1929	1.3143			
Two-Surface	1.2677	1.0286			
Three-Surface	0.3031	—			
Anterior Non-Metallic Restorations	0.3268	0.1714			
Crowns Total	0.2638	0.3715			
Acrylic	0.0079	0.1429			
Porcelain	0.0236	—			
3/4 Gold	0.0394	—			
Full Gold	0.1378	—			
Gold with Acrylic	0.0236	—			
Gold with Porcelain	0.0315	—			
Stainless Steel	—	0.2286			
Fixed Bridge-Total Units	0.7165	—			
Full Dentures	0.0315	—			
Partial Dentures (Metal-Acrylic)	0.1024	—			
Treatment Partial Dentures	0.0315	—			
Root Canals (Total)	0.0591	—			
One-Root	0.0276	—			
Two-Roots	0.0079	—			
Three-Roots	0.0236	—			
Extractions (Routine)	0.8937	0.2286			
Extractions (Impacted Teeth)	0.1496	—			
Subgingival Curettage by Quadrants	0.2244	—			
Gingivectomies by Quadrants	0.0315	—			
Gingivoplasties by Quadrants	0.0315	—			
Occlusal Adjustment by Quadrants	0.0630	—			
Occlusal Sealant Therapy	—	0.0286			
Space Maintainers (Fixed Band)	—	0.1714			
Space Maintainers (Acrylic)	—	—			
Orthodontic Therapy	0.0157	—			
Disease Control Program	0.6260	—			

* Insufficient patients examined for meaningful analysis.

TABLE 4

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES E4-E5. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY:				
	WIVES	CHILDREN			
	ALL AGES	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20
Examinations	1.0000	1.0000	1.0000	1.0000	
Bite Wing X-Rays	0.9497	0.7059	0.8235	0.9744	
Additional X-Rays	2.7474	1.4887	1.7549	1.6923	
Prophylaxes & Scalings	0.8452	0.6561	0.8137	0.8718	
Topical Fluoride Therapy	0.4206	0.8824	0.9216	0.8974	*
Amalgam Restorations-Total	2.3677	2.5611	3.3039	5.7180	
One-Surface	1.9021	1.4525	1.8529	3.8718	
Two-Surface	1.1442	1.0317	1.3922	1.3590	
Three-Surface	0.3214	0.0769	0.0588	0.4872	
Anterior Non-Metallic Restorations	0.4405	0.1855	0.0822	0.4615	
Crowns Total	0.4140	0.2624	0.1765	0.0256	
Acrylic	0.0317	0.0226	0.0098	0.0256	
Porcelain	0.0357	—	—	—	
3/4 Gold	0.0384	—	—	—	
Full Gold	0.1468	—	—	—	
Gold with Acrylic	0.0794	—	—	—	
Gold with Porcelain	0.0820	—	—	—	
Stainless Steel	—	0.2398	0.1667	—	
Fixed Bridge-Total Units	0.7976	—	—	—	
Full Dentures	0.0212	—	—	—	
Partial Dentures (Metal-Acrylic)	0.1574	—	—	—	
Treatment Partial Dentures	0.0384	—	—	—	
Root Canals (Total)	0.1137	—	—	0.1334	
One-Root	0.0476	—	—	0.0196	
Two-Roots	0.0185	—	—	0.0882	
Three-Roots	0.0476	—	—	0.0256	
Extractions (Routine)	0.5966	0.1991	0.3431	0.1795	
Extractions (Impacted Teeth)	0.2209	—	—	—	
Subgingival Currettage by Quadrants	0.2606	—	—	—	
Gingivectomies by Quadrants	0.0304	—	—	—	
Gingivoplasties by Quadrants	0.0185	—	—	—	
Occlusal Adjustment by Quadrants	0.0648	—	—	—	
Occlusal Sealant Therapy	—	0.0769	0.1176	—	
Space Maintainers (Fixed Band)	—	0.0860	0.1176	—	
Space Maintainers (Acrylic)	—	0.0226	0.0196	—	
Orthodontic Therapy	0.0066	—	0.2157	0.1026	
Disease Control Program	0.5873	—	0.4902	0.4872	

* Insufficient patients examined for meaninful analysis.

TABLE 5

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES E6-E7. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY: WIVES ALL AGES	CHILDREN AGE 4-7	CHILDREN AGE 8-11	CHILDREN AGE 12-15	CHILDREN AGE 16-20
Examinations	1.0000	1.0000	1.0000	1.0000	1.0000
Bite Wing X-Rays	0.9400	0.8128	0.8812	0.9663	0.9434
Additional X-Rays	2.7527	1.3715	1.4869	1.4613	1.9434
Prophylaxes & Scalings	0.8418	0.7151	0.8052	0.8653	0.8396
Topical Fluoride Therapy	0.4164	0.8659	0.9121	0.8788	0.7358
Amalgam Restorations-Total	2.5691	2.7654	3.2351	3.7811	4.8679
One-Surface	1.2818	1.5112	1.9287	2.7172	2.9717
Two-Surface	1.0218	1.2039	1.1995	0.9259	1.5094
Three-Surface	0.2655	0.0503	0.1069	0.1380	0.3868
Anterior Non-Metallic Restorations	0.4855	0.3575	0.1069	0.2155	0.1981
Crowns Total	0.3673	0.2569	0.0998	0.0572	0.3686
Acrylic	0.0327	0.0223	0.0214	0.0101	0.0189
Porcelain	0.0182	—	—	—	0.0101
3/4 Gold	0.0400	—	—	—	0.0094
Full Gold	0.1400	—	—	—	0.1132
Gold with Acrylic	0.0782	—	—	—	0.0472
Gold with Porcelain	0.0582	—	—	—	0.0943
Stainless Steel	—	0.2346	0.0784	0.0471	0.0755
Fixed Bridge-Total Units	0.8727	—	—	—	0.2264
Full Dentures	0.0473	—	—	—	—
Partial Dentures (Metal-Acrylic)	0.2091	—	—	—	—
Treatment Partial Dentures	0.0364	—	—	0.0034	0.0094
Root Canals (Total)	0.0509	—	—	0.0471	0.0566
One-Root	0.0200	—	—	0.0202	0.0472
Two-Roots	0.0164	—	—	0.0067	—
Three-Roots	0.0145	—	—	0.0202	0.0094
Extractions (Routine)	0.3782	0.3631	0.2946	0.2088	0.1604
Extractions (Impacted Teeth)	0.0691	—	—	—	0.3302
Subgingival Currettage by Quadrants	0.2327	—	—	—	0.0377
Gingivectomies by Quadrants	0.0491	—	—	—	—
Gingivoplasties by Quadrants	0.0564	—	—	—	—
Occlusal Adjustment by Quadrants	0.0509	—	—	—	0.0377
Occlusal Sealant Therapy	—	0.0698	0.1188	0.0337	—
Space Maintainers (Fixed Band)	—	0.0866	0.0879	—	—
Space Maintainers (Acrylic)	—	0.0279	0.0166	—	—
Orthodontic Therapy	0.0055	—	0.2209	0.1650	0.0660
Disease Control Program	0.5236	—	0.4394	0.4882	0.5189

TABLE 6

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES E8-E9. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY:				
	WIVES	CHILDREN			
	ALL AGES	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20
Examinations	1.000		1.0000	1.0000	1.0000
Bite Wing X-Rays	0.9341		0.9067	0.9878	0.9828
Additional X-Rays	2.5714		1.1067	1.7073	1.8966
Prophylaxes & Scalings	0.8571		0.8267	0.8659	0.9310
Topical Fluoride Therapy	0.4725	*	0.8400	0.8537	0.7931
Amalgam Restorations-Total	1.7912		3.3733	3.1219	3.0517
One-Surface	1.0989		2.1200	2.3780	1.9655
Two-Surface	0.5275		1.1333	0.7317	1.0000
Three-Surface	0.1648		0.1200	0.0122	0.0862
Anterior Non-Metallic Restorations	0.3956		0.0933	0.1220	0.1207
Crowns Total	0.2419		0.1333	0.0488	0.1674
Acrylic	0.0110		—	—	—
Porcelain	0.0330		—	—	—
3/4 Gold	0.0220		—	—	—
Full Gold	0.1099		—	—	0.1552
Gold with Acrylic	0.0440		—	—	0.0122
Gold with Porcelain	0.0220		—	—	—
Stainless Steel	—		0.1333	0.0488	—
Fixed Bridge-Total Units	0.6923		—	—	0.3276
Full Dentures	0.0220		—	—	—
Partial Dentures (Metal-Acrylic)	0.2308		—	—	0.0172
Treatment Partial Dentures	0.0220		—	—	—
Root Canals (Total)	0.0550		—	0.0122	0.0862
One-Root	0.0440		—	0.0122	0.0517
Two-Roots	—		—	—	—
Three-Roots	0.0110		—	—	0.0345
Extractions (Routine)	0.2198		0.3600	0.2317	0.3448
Extractions (Impacted Teeth)	0.0879		—	—	0.2241
Subgingival Currettage by Quadrants	0.2967		—	—	0.0690
Gingivectomies by Quadrants	0.1978		—	—	—
Gingivoplasties by Quadrants	0.0440		—	—	—
Occlusal Adjustment by Quadrants	0.1099		—	—	—
Occlusal Sealant Therapy	—		0.0400	0.0488	—
Space Maintainers (Fixed Band)	—		0.0133	0.0488	—
Space Maintainers (Acrylic)	—		0.0133	0.0366	—
Orthodontic Therapy	—		0.200	0.1220	0.0517
Disease Control Program	0.5385		0.4267	0.5366	0.6379

* Insufficient Patients examined for meaningful analysis

TABLE 7

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES W1-W4. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY:				
	WIVES	CHILDREN			
	ALL AGES	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20
Examinations	1.0000	1.0000	1.0000	1.0000	
Bite Wing X-Rays	0.9692	0.6957	0.8806	0.9821	
Additional X-Rays	3.1231	2.5000	3.3731	2.7143	
Prophylaxes & Scalings	0.9154	0.8478	0.8657	0.9464	*
Topical Fluoride Therapy	0.6154	0.9565	0.9552	0.8571	
Amalgam Restorations-Total	2.3230	2.7826	2.9851	2.8928	
One-Surface	1.0769	1.9348	1.5075	1.9643	
Two-Surface	0.8923	0.8261	1.3582	0.8571	
Three-Surface	0.3538	0.0217	0.1194	0.0714	
Anterior Non-Metallic Restorations	0.4923	0.0652	0.2090	0.2857	
Crowns Total	0.7770	0.4782	0.1940	0.1071	
Acrylic	0.0077	0.0217	—	—	
Porcelain	—	—	—	—	
3/4 Gold	0.1000	—	—	—	
Full Gold	0.3462	—	—	—	
Gold with Acrylic	0.1923	—	—	—	
Gold with Porcelain	0.1308	—	—	—	
Stainless Steel	—	0.4565	0.1940	0.1071	
Fixed Bridge-Total Units	0.8538	—	—	—	
Full Dentures	0.0154	—	—	—	
Partial Dentures (Metal-Acrylic)	0.1308	—	—	—	
Treatment Partial Dentures	0.0231	—	—	—	
Root Canals (Total)	0.0462	—	—	0.0179	
One-Root	0.0231	—	—	0.0179	
Two-Roots	0.0154	—	—	—	
Three-Roots	0.0077	—	—	—	
Extractions (Routine)	0.3923	0.5217	1.0000	0.3036	
Extractions (Impacted Teeth)	0.3077	—	-	—	
Subgingival Currettage by Quadrants	0.3154	—	—	0.0893	
Gingivectomies by Quadrants	0.0231	—	—	—	
Gingivoplasties by Quadrants	0.0154	—	—	—	
Occlusal Adjustment by Quadrants	0.1462	—	—	—	
Occlusal Sealant Therapy	—	0.1522	0.3881	0.1607	
Space Maintainers (Fixed Band)	—	0.1087	0.1493	—	
Space Maintainers (Acrylic)	—	0.0435	0.0448	—	
Orthodontic Therapy	0.0154	—	0.4925	0.2857	
Disease Control Program	0.6231	—	0.6716	0.4643	

* Insufficient patients examined for meaningful analysis.

TABLE 8

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES O1-O2. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY: WIVES ALL AGES	CHILDREN AGE 4-7	CHILDREN AGE 8-11	CHILDREN AGE 12-15	CHILDREN AGE 16-20
Examinations	1.0000	1.0000			
Bite Wing X-Rays	0.9815	0.8621			
Additional X-Rays	2.2593	0.7241			
Prophylaxes & Scalings	0.9167	0.6207			
Topical Fluoride Therapy	0.5741	0.8276	*	**	**
Amalgam Restorations-Total	2.4167	1.4483			
One-Surface	1.2963	1.0345			
Two-Surface	0.8426	0.3793			
Three-Surface	0.2778	0.0345			
Anterior Non-Metallic Restorations	0.2778	0.4828			
Crowns Total	0.7871	0.0345			
Acrylic	0.0093	—			
Porcelain	0.0648	—			
3/4 Gold	0.1667	—			
Full Gold	0.2593	—			
Gold with Acrylic	0.1389	—			
Gold with Porcelain	0.1481	—			
Stainless Steel	—	0.0345			
Fixed Bridge-Total Units	0.4074	—			
Full Dentures	—	—			
Partial Dentures (Metal-Acrylic)	0.0370	—			
Treatment Partial Dentures	—	—			
Root Canals (Total)	0.0649	—			
One-Root	0.0093	—			
Two-Roots	—	—			
Three-Roots	0.0556	—			
Extractions (Routine)	0.4259	0.0690			
Extractions (Impacted Teeth)	0.3611	—			
Subgingival Currettage by Quadrants	0.2407	—			
Gingivectomies by Quadrants	0.0926	—			
Gingivoplasties by Quadrants	0.0370	—			
Occlusal Adjustment by Quadrants	0.1667	—			
Occlusal Sealant Therapy	—	0.1034			
Space Maintainers (Fixed Band)	—	—			
Space Maintainers (Acrylic)	—	0.0345			
Orthodontic Therapy	0.0185	—			
Disease Control Program	0.4722	—			

* Insufficient patients examined for meaningful analysis

** No patients examined

TABLE 9

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES 03-04. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY:				
	WIVES	CHILDREN			
	ALL AGES	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20
Examinations	1.0000	1.0000	1.0000	1.0000	1.0000
Bite Wing X-Rays	0.9224	0.8458	0.8654	0.9655	0.9310
Additional X-Rays	1.7224	0.9486	1.4952	1.2586	1.4828
Prophylaxes & Scalings	0.8000	0.6719	0.7740	0.8190	0.8966
Topical Fluoride Therapy	0.3881	0.8142	0.7981	0.7586	0.6207
Amalgam Restorations-Total	1.8840	2.6799	2.9325	2.9901	2.9999
One-Surface	1.0989	2.2609	2.1200	2.3780	1.9655
Two-Surface	0.5672	0.3913	0.7452	0.5000	0.9310
Three-Surface	0.2179	0.0277	0.0673	0.1121	0.1034
Anterior Non-Metallic Restorations	0.1791	0.0356	0.0337	0.0431	0.2069
Crowns Total	0.3971	0.0474	0.0144	—	0.1553
Acrylic	0.0030	—	—	—	0.0345
Porcelain	0.0209	—	—	—	0.0259
3/4 Gold	0.0358	—	—	—	—
Full Gold	0.1791	—	—	—	0.0259
Gold with Acrylic	0.0687	—	—	—	—
Gold with Porcelain	0.0896	—	—	—	—
Stainless Steel	—	0.0474	0.0144	—	0.0690
Fixed Bridge-Total Units	0.3224	—	—	—	0.1034
Full Dentures	0.0030	—	—	—	—
Partial Dentures (Metal-Acrylic)	0.0239	—	—	—	—
Treatment Partial Dentures	—	—	—	—	—
Root Canals (Total)	0.0627	—	—	0.0344	0.1035
One-Root	0.0209	—	—	0.0086	0.0345
Two-Roots	0.0149	—	—	0.0086	0.0690
Three-Roots	0.0269	—	—	0.0172	—
Extractions (Routine)	0.1552	0.1067	0.4231	0.0603	0.2414
Extractions (Impacted Teeth)	0.0836	—	—	—	0.2759
Subgingival Currettage by Quadrants	0.1224	—	—	—	0.0040
Gingivectomies by Quadrants	0.0478	—	—	—	—
Gingivoplasties by Quadrants	0.0388	—	—	—	—
Occlusal Adjustment by Quadrants	0.0687	—	—	—	—
Occlusal Sealant Therapy	—	0.0830	0.1346	0.0431	—
Space Maintainers (Fixed Band)	—	0.0198	0.0481	—	—
Space Maintainers (Acrylic)	—	0.0237	0.0240	—	—
Orthodontic Therapy	—	—	0.2356	0.1552	0.1724
Disease Control Program	0.3343	—	0.3317	0.4138	0.5862

TABLE 10

DENTAL CARE REQUIREMENTS OF DEPENDENTS WHOSE SPONSORS ARE IN GRADES 05-06. MEAN NUMBER OF REQUIRED PROCEDURES, TREATMENTS OR SERIES OF TREATMENTS ACCORDING TO CATEGORY

TREATMENT	NUMBER OF TREATMENTS NEEDED BY:				
	WIVES	CHILDREN			
	ALL AGES	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20
Examinations	1.0000		1.0000	1.0000	1.0000
Bite Wing X-Rays	0.9072		0.8333	0.9481	0.9846
Additional X-Rays	1.9691		1.7292	0.9870	1.3385
Prophylaxes & Scalings	0.7835		0.7083	0.7662	0.7846
Topical Fluoride Therapy	0.2990	*	0.8750	0.7143	0.5385
Amalgam Restorations-Total	0.9072		1.6666	1.8441	1.4615
One-Surface	0.3505		0.8750	1.4156	0.8615
Two-Surface	0.3814		0.7708	0.3766	0.5077
Three-Surface	0.1753		0.0208	0.0519	0.0923
Anterior Non-Metallic Restorations	0.1856		0.0625	0.0130	0.0462
Crowns Total	0.5257		0.0208	—	0.0462
Acrylic	0.0206		—	—	—
Porcelain	—		—	—	0.0154
3/4 Gold	0.0206		—	—	0.0154
Full Gold	0.2680		—	—	—
Gold with Acrylic	0.0206		—	—	—
Gold with Porcelain	0.1959		—	—	0.0154
Stainless Steel	—		0.0208	—	—
Fixed Bridge-Total Units	0.3918		—	—	0.0154
Full Dentures	—		—	—	—
Partial Dentures (Metal-Acrylic)	0.0619		—	—	0.0154
Treatment Partial Dentures	—		—	—	0.0154
Root Canals (Total)	0.0515		—	—	0.0438
One-Root	0.0206		—	—	0.0308
Two-Roots	0.0309		—	—	—
Three-Roots	—		—	—	0.0130
Extractions (Routine)	0.0412		0.2500	0.0909	0.1231
Extractions (Impacted Teeth)	0.0825		—	—	0.4769
Subgingival Currettage by Quadrants	0.3711		—	—	0.0308
Gingivectomies by Quadrants	0.1546		—	—	—
Gingivoplasties by Quadrants	0.1340		—	—	—
Occlusal Adjustment by Quadrants	0.0825		—	—	—
Occlusal Sealant Therapy	—		0.1875	0.0779	—
Space Maintainers (Fixed Band)	—		0.1042	—	—
Space Maintainers (Acrylic)	—		0.0417	0.0130	—
Orthodontic Therapy	—		0.3542	0.1818	0.0308
Disease Control Program	0.3505		0.4375	0.3247	0.3538

* Insufficient patients examined for meaningful analysis

TABLE 11

COST OF SATISFYING UNMET DENTAL NEEDS OF DEPENDENTS ACCORDING TO SPONSORS' RANKS, AGE AND RELATIONSHIP CATEGORIES. MEAN COST PER DEPENDENT WHEN FEE SCALES WERE APPLIED TO MEAN TREATMENT REQUIREMENTS

RANK GROUP	MEAN COST						MEAN PER DEPENDENT
	WIVES ALL AGES	CHILDREN					
		AGE 1-3	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20	
E1-E3	$320.49	**	$ 95.50	*	*	*	$293.24
E4-E5	361.79	**	87.84	$262.59	$217.14	*	293.66
E6-E7	350.76	**	96.96	263.04	228.30	$265.62	250.77
E8-E9	306.43	**	*	241.95	189.98	227.16	244.40
W1-W4	401.69	**	106.54	480.74	306.63	*	356.19
O1-O2	322.45	**	62.14	*	**	**	267.35
O3-O4	197.28	**	52.70	244.08	190.95	263.45	170.01
O5-O6	393.45	**	*	375.46	289.80	188.62	316.24
ALL RANKS	$330.47	**	$ 82.27	$278.69	$230.12	$237.33	$257.57

* INSUFFICIENT PATIENTS EXAMINED FOR MEANINGFUL ANALYSIS

** NO PATIENTS EXAMINED

TABLE 12

MEAN NUMBER OF DEPENDENTS WITHIN THE FAMILIES REPRESENTED BY THE EXAMINEES IN STUDY PART I ACCORDING TO AGE AND RELATIONSHIP OF DEPENDENTS TO SPONSORS

RANK GROUP	WIVES ALL AGES	CHILDREN					FAMILY SIZE *
		AGE 1-3	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20	
E1-E3	0.9850	0.4060	0.2594	0.0714	0.0150	0.0038	1.7406
E4-E5	0.9664	0.5336	0.5048	0.2314	0.9767	0.0228	2.3357
E6-E7	0.9720	0.2444	0.6704	0.7377	0.5538	0.2354	3.4137
E8-E9	0.9618	0.0892	0.3376	0.7643	0.9554	0.7898	3.8981
W1-W4	0.9721	0.2544	0.4808	0.5610	0.4634	0.2683	3.0000
O1-O2	0.9845	0.3798	0.3333	0.1163	0.0155	0.0233	1.8527
O3-O4	0.9906	0.3346	0.6823	0.5846	0.3816	0.1222	3.0959
O5-O6	0.9669	0.0884	0.3149	0.6519	0.8729	0.8287	3.7237
ALL RANKS	0.9745	0.3348	0.5330	0.4882	0.3685	0.1979	2.8969

* SPONSORS EXCLUDED

TABLE 13

MEAN COST OF SATISFYING UNMET DENTAL NEEDS OF COMPOSITE FAMILIES CONSTITUTED SIMILAR TO THE FAMILIES REPRESENTED BY THE DEPENDENTS EXAMINED IN STUDY PART I. DATA COMPUTED USING TABLES 11 AND 12

RANK GROUP	WIVES ALL AGES	CHILDREN					ENTIRE FAMILY
		AGE 1-3	AGE 4-7	AGE 8-11	AGE 12-15	AGE 16-20	
E1-E3	$315.68	**	$ 24.77	*	*	*	$340.45
E4-E5	349.63	**	44.34	$ 60.76	$ 16.65	*	471.38
E6-E7	340.94	**	65.00	$194.04	126.43	$ 62.53	788.94
E8-E9	294.72	**	*	184.92	181.51	179.41	840.56
W1-W4	390.48	**	51.22	269.70	142.09	*	853.49
O1-O2	317.45	**	20.71	*	**	**	338.16
O3-O4	195.43	**	35.96	142.69	72.87	32.19	479.14
O5-O6	380.43	**	*	244.76	252.97	156.31	1034.47

* INSUFFICIENT PATIENTS EXAMINED FOR MEANINGFUL ANALYSIS

** NO PATIENTS EXAMINED

TABLE 14

MEAN ANNUAL BASE PAY SALARIES OF ARMY SPONSORS WHOSE DEPENDENTS WERE EXAMINED IN STUDY PART I

RANK GROUP	MEAN ANNUAL BASE PAY SALARY
E1-E3	$ 5,070.00
E4-E5	$ 6,415,85
E6-E7	$ 9,064.69
E8-E9	$12,560.80
W1-W4	$12,227.36
01-02	$10,633.75
03-04	$16,706.9[illegible]
05-06	$22,946.60

TABLE 15

PERCENTAGE OF THE SPONSORS' ANNUAL BASE PAY SALARIES WHICH WOULD BE REQUIRED TO SATISFY THE UNMET DENTAL NEEDS OF THE COMPOSITE FAMILIES CONSTITUTED SIMILAR TO THE FAMILIES REPRESENTED IN STUDY PART I

RANK GROUPS	PERCENTAGE
E1-E3	6.7%
E4-E5	7.3%
E6-E7	8.7%
E8-E9	6.7%
W1-W4	7.0%
O1-O2	3.2%
O3-O4	2.9%
O5-O6	4.5%

TABLE 16

COST OF SATISFYING UNMET DENTAL NEEDS OF DEPENDENTS PRESENTLY RESIDING ON OR NEAR RDDC POSTS WHO PREVIOUSLY RESIDED ON OR NEAR PEDDC POSTS

LENGTH OF PRESENT RESIDENCY IN MONTHS	NUMBER OF DEPENDENTS	MEAN COST
0-6	556	$287.58
7-12	839	$260.75
13-18	313	$263.78
19-24	400	$251.91
25-30	104	$243.53
More than 30	589	$214.71

TABLE 17

NUMBER OF SPONSORS
RESPONDING TO SURVEY CONCERNING EXPENDITURE FOR DEPENDENT DENTAL CARE:
STUDY PART II

SUBJECT GROUPS AS TO TYPES OF POSTS	RANK SUBGROUPS								TOTAL
	E1-E3	E4-E5	E6-E7	E8-E9	W1-W4	O1-O2	O3-O4	O5-O6	
PEDDC POSTS	129	597	544	100	75	47	175	70	1,737
RDDC POSTS	135	445	371	52	96	66	187	48	1,400
	264	1,042	915	152	171	113	362	118	3,137

TABLE 18

ANNUAL BASE PAY SALARIES OF ARMY SPONSORS SERVING AS SUBJECT IN STUDY PART II: MEANS AND STANDARD DEVIATIONS

SUBJECT GROUPS AS TO TYPES OF POSTS	RANK SUBGROUPS E1-E3	E4-E5	E6-E7	E8-E9	W1-W4	O1-O2	O3-O4	O5-O6	ALL RANKS
PEDDC POSTS	$5,098.30	$6,303.81	$9,249.04	$12,744.36	$12,870.43	$10,832.86	$16,545.52	$24,054.65	$9,660.06
	257.12	976.11	1,087.02	1,302.49	2,376.67	1,892.58	1,836.01	2,847.67	4,612.04
RDDC POSTS	$5,044.71	$6,188.24	$9,174.58	$12,772.87	$12,291.99	$10,197.93	$16,788.85	$23,272.88	$9,723.19
	274.17	644.84	1,152.69	1,277.90	2,462.94	1,775.88	1,850.65	2,434.55	4,659.55
PERCENTAGE DIFFERENCE BETWEEN GROUPS	0.9%	1.8%	0.8%	0.2%	4.5%	5.9%	1.4%	3.2%	
t VALUE	1.357	2.778	1.139	-0.128	1.539	1.807	-1.252	1.539	-0.381
SIGNIFICANCE LEVEL	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.

TABLE 19

TWELVE MONTH EXPENDITURES FOR DEPENDENT DENTAL CARE REPORTED BY THE SUBJECTS IN STUDY PART II: MEANS AND STANDARD DEVIATIONS

SUBJECT GROUPS AS TO TYPES OF POSTS		RANK SUBGROUPS E1-E3	E4-E5	E6-E7	E8-E9	W1-W4	O1-O2	O3-O4	O5-O6	ALL RANKS
PEDDC POSTS	$\overline{X}$	$25.92	$ 75.80	$231.70	$396.10	$321.25	$102.71	$313.55	$543.81	$193.50
	S.D.	65.43	162.98	332.47	572.09	475.21	120.01	456.99	602.89	354.58
RDDC POSTS	$\overline{X}$	$22.37	$ 40.81	$127.95	$186.55	$243.39	$ 48.06	$185.11	$285.99	$109.45
	S.D.	56.04	98.40	347.49	263.65	409.49	218.26	388.20	535.46	295.71
PERCENTAGE DIFFERENCE BETWEEN GROUPS		13.7%	46.2%	44.8%	52.9%	24.2%	53.2%	41.0%	47.4%	43.4%
t VALUE		0.472	4.019	4.522	2.490	1.143	1.543	2.882	2.367	7.127
SIGNIFICANCE LEVEL		N.S.	$p<.001$	$P<.001$	$p<.02$	N.S.	N.S.	$p<.01$	$p<.02$	$p<.001$

TABLE 20

PERCENTAGE OF ANNUAL BASE PAY SALARIES DEVOTED TO THE TWELVE-MONTH PURCHASE OF DEPENDENT DENTAL CARE RESPONSES IN STUDY PART II

SUBJECT GROUPS AS TO TYPES OF POSTS	E1-E3	E4-E5	E6-E7	E8-E9	W1-W4	O1-O2	O3-O4	O5-O6	ALL RANKS
PEDDC POSTS	0.5%	1.2%	2.5%	3.1%	2.5%	0.9%	1.9%	2.3%	2.0%
RDDC POSTS	0.4%	0.7%	1.4%	1.5%	2.0%	0.5%	1.1%	1.2%	1.1%

TABLE 21

PERCENTAGE OF ARMY SPONSORS, BY RANK, SPENDING VARIOUS DOLLAR AMOUNTS FOR TWELVE-MONTH PURCHASE FOR DEPENDENT DENTAL CARE

RANK GROUPS	TYPES OF POSTS	DOLLAR AMOUNT RANGES								
		$0	$1-$50	$51-$100	$101-$200	$201-$300	$301-$400	$401-$500	$501-$1000	OVER $1,000
E1-E3	PEDDC	71.3%	12.4%	7.7%	7.0%	0.0%	0.8%	0.8%	0.0%	0.0%
	RDDC	70.4%	16.3%	6.7%	4.4%	0.7%	1.5%	0.0%	0.0%	0.0%
E4-E5	PEDDC	52.4%	12.9%	11.1%	11.1%	6.0%	2.8%	2.1%	1.4%	0.2%
	RDDC	67.4%	8.3%	14.2%	4.3%	2.0%	1.8%	1.3%	0.7%	0.0%
E6-E7	PEDDC	25.9%	11.4%	9.0%	15.1%	10.7%	6.3%	10.1%	8.9%	2.6%
	RDDC	56.1%	5.7%	11.8%	7.3%	8.3%	2.7%	4.3%	1.4%	2.4%
E8-E9	PEDDC	22.0%	3.0%	7.0%	14.0%	13.0%	12.0%	9.0%	12.0%	8.0%
	RDDC	48.1%	1.9%	5.8%	7.7%	13.5%	1.9%	7.7%	11.5%	1.9%
W1-W4	PEDDC	12.0%	9.3%	14.7%	21.4%	9.3%	5.3%	12.0%	10.7%	5.3%
	RDDC	35.4%	19.8%	5.2%	8.3%	5.2%	3.1%	6.3%	10.4%	6.3%
01-02	PEDDC	36.2%	14.9%	14.9%	10.6%	10.6%	12.8%	0.0%	0.0%	0.0%
	RDDC	69.7%	13.7%	10.6%	3.0%	0.0%	1.5%	0.0%	0.0%	1.5%
03-04	PEDDC	14.3%	4.6%	15.4%	22.3%	14.9%	5.7%	4.0%	13.7%	5.1%
	RDDC	40.1%	11.2%	17.7%	5.9%	5.9%	3.7%	3.7%	8.1%	3.7%
05-06	PEDDC	12.9%	2.9%	2.9%	20.0%	5.7%	4.3%	11.4%	22.8%	17.1%
	RDDC	33.3%	6.2%	10.4%	10.4%	10.4%	12.5%	2.1%	10.5%	4.2%

TABLE 22

NUMBER OF CHILDREN, BY GRADE IN SCHOOL, RECEIVING DMF SURFACE DENTAL CARIES PREVALENCE EXAMINATIONS IN STUDY PART III

SUBJECT GROUPS AS TO TYPES OF POSTS	GRADES IN SCHOOL				
	THIRD	FOURTH	FIFTH	SIXTH	TOTAL
PEDDC POSTS	134	110	139	123	506
RDDC POSTS	152	158	145	146	601
TOTAL	286	268	284	269	1,107

TABLE 23

NUMBER OF TEETH ERUPTED INTO THE ORAL CAVITY AND AT RISK TO DENTAL CARIES EXHIBITED BY THE CHILDREN RECEIVING DMF SURFACE EXAMINATIONS: MEANS AND STANDARD DEVIATIONS

SUBJECT GROUPS AS TO TYPES OF POSTS	GRADES IN SCHOOL			
	THIRD	*FOURTH*	*FIFTH*	*SIXTH*
PEDDC POSTS	23.02 ± 1.62	21.97 ± 2.09	22.58 ± 2.04	23.78 ± 1.69
RDDC POSTS	22.49 ± 1.27	22.32 ± 2.04	22.72 ± 1.51	24.69 ± 2.59
DIFFERENCE BETWEEN GROUPS	0.53	0.35	0.14	0.91
t VALUE	0.260	0.121	0.060	0.284
SIGNIFICANCE LEVEL	N.S.	N.S.	N.S.	N.S.

TABLE 24

NUMBER OF DMF SURFACES (PERMANENT TEETH) EXHIBITED BY THE CHILDREN IN STUDY PART III: MEANS AND STANDARD DEVIATIONS

SUBJECT GROUPS AS TO TYPES OF POSTS	GRADES IN SCHOOL			
	THIRD	FOURTH	FIFTH	SIXTH
PEDDC POSTS	2.21 ± 2.86	3.06 ± 3.47	3.18 ± 3.40	4.78 ± 4.41
RDDC POSTS	2.02 ± 2.45	2.80 ± 2.80	3.56 ± 3.21	4.73 ± 4.44

TABLE 25

NUMBER OF def SURFACES (DECIDUOUS TEETH) EXHIBITED BY THE CHILDREN IN STUDY PART III: MEANS AND STANDARD DEVIATIONS

SUBJECT GROUPS AS TO TYPES OF POSTS	GRADES IN SCHOOL			
	THIRD	FOURTH	FIFTH	SIXTH
PEDDC POSTS	8.81 ± 9.04	6.33 ± 6.76	4.50 ± 5.90	2.52 ± 4.43
RDDC POSTS	8.44 ± 10.04	6.95 ± 7.49	5.73 ± 7.03	2.73 ± 3.94

TABLE 26

NUMBER OF TOTAL DMF SURFACES (PERMANENT PLUS DECIDUOUS TEETH) EXHIBITED BY THE CHILDREN IN STUDY PART III: MEANS AND STANDARD DEVIATIONS

GRADES IN SCHOOL	TYPES OF POSTS	TOTAL D	TOTAL M	TOTAL F	TOTAL DMFS
THIRD	PEDDC POSTS	4.15±5.25	0.97±2.76	5.90±8.67	11.02±10.61
	RDDC POSTS	3.06±4.02	0.58±1.81	6.82±9.36	10.46±11.36
		PERCENTAGE DIFFERENCE BETWEEN GROUPS			5.1%
				t VALUE	0.437
				SIGNIFICANCE LEVEL	N.S.
FOURTH	PEDDC POSTS	3.93±4.76	0.62±1.88	4.84±7.18	9.39±8.35
	RDDC POSTS	2.89±3.59	0.78±2.10	6.08±7.20	9.75±8.58
		PERCENTAGE DIFFERENCE BETWEEN GROUPS			3.7%
				t VALUE	-0.351
				SIGNIFICANCE LEVEL	N.S.
FIFTH	PEDDC POSTS	3.60±4.34	0.84±2.41	3.24±5.08	7.68±7.42
	RDDC POSTS	2.89±2.95	0.66±1.99	5.74±6.99	9.29±8.19
		PERCENTAGE DIFFERENCE BETWEEN GROUPS			17.3%
				t VALUE	-1.664
				SIGNIFICANCE LEVEL	N.S.
SIXTH	PEDDC POSTS	3.60±3.71	0.48±1.65	3.22±4.80	7.30±6.54
	RDDC	2.67±2.33	0.69±2.39	4.10±5.09	7.46±6.12
		PERCENTAGE DIFFERENCE BETWEEN GROUPS			2.1%
				t VALUE	-0.191
				SIGNIFICANCE LEVEL	N.S.

TABLE 27

PERCENTAGES OF TOTAL *DMF SURFACES EXHIBITED BY THE CHILDREN IN STUDY* PART III WHICH WERE DECAYED (D) SURFACES AND FILLED (F) SURFACES, RESPECTIVELY

TYPES OF POSTS	GRADES IN SCHOOL							
	THIRD		FOURTH		FIFTH		SIXTH	
	SURFACES		SURFACES		SURFACES		SURFACES	
	D	F	D	F	D	F	D	F
PEDDC	37.7%	53.5%	41.9%	51.5%	46.9%	42.2%	49.3%	44.1%
RDDC	29.3%	65.2%	29.6%	62.4%	31.1%	61.8%	35.8%	55.0%
DIFFERENCE BETWEEN GROUPS	8.4%	11.7%	12.3%	10.9%	15.8%	19.6%	13.5%	10.9%
t VALUE	2.114	-1.711	2.688	-1.575	3.372	-3.162	2.556	-1.821
SIGNIFICANCE LEVEL	P<.05	P<.05	P<.01	N.S.	P<.01	P<.01	P<.01	P<.05

APPENDIX A

DATA COLLECTION INSTRUMENTS, INSTRUCTIONS, QUESTIONNAIRES, AND PARENTAL PERMISSION FORMS USED IN THE STUDY

ACTIVE DUTY DEPENDENT DENTAL CARE SURVEY

1.	ENTER THE CODE NUMBER FOR THE RANK OF THE MILITARY SPONSOR OF THE PATIENT BEING EXAMINED. (SEE INSTRUCTION SHEET FOR CODE NUMBERS.)	☐☐	1,2
2.	ENTER 1 IF THE PATIENT IS A DEPENDENT WIFE OR 2 IF THE PATIENT IS A DEPENDENT CHILD	☐	3
3.	ENTER THE NUMBER OF MONTHS THE PATIENT HAS RESIDED ON OR NEAR THE SPONSOR'S PRESENT DUTY POST	☐☐	4,5
4.	DID THE ARMY PROVIDE DEPENDENT DENTAL CARE, BEYOND EMERGENCY SERVICE, AT YOUR PREVIOUSLY ASSIGNED POST (ENTER 1 FOR YES: 2 FOR NO)	☐	6
5.	ENTER THE AGE OF THE PATIENT BEING EXAMINED	☐☐	7,8
6.	EXAMINATION	☐	9
7.	B/W X-RAYS	☐	10
8.	ADDITIONAL X-RAYS (ENTER THE NUMBER OF ADDITIONAL X-RAYS NEEDED)	☐☐	11,12
9.	PROPHYLAXIS & SCALING (ENTER 1 IF NEEDED)	☐	13
10.	TOPICAL FLUORIDE (ENTER 1 IF NEEDED)	☐	14
11.	NUMBER OF REQUIRED RESTORATIONS: ONE-SURFACE AMALGAM	☐☐	15,16
	TWO-SURFACE AMALGAM	☐☐	17,18
	THREE OR MORE SURFACE AMALGAM	☐☐	19,20
12.	NUMBER OF ANTERIOR NON-METALLIC RESTORATIONS NEEDED	☐☐	21,22
13.	NUMBER OF CROWNS NEEDED: ACRYLIC	☐☐	23,24
	PORCELAIN	☐☐	25,26
	GOLD 3/4	☐☐	27,28
	GOLD FULL	☐☐	29,30
	GOLD WITH ACRYLIC	☐☐	31,32
	GOLD WITH PORCELAIN	☐☐	33,34
14.	FIXED BRIDGE (BY NUMBER OF UNITS)	☐☐	35,36
15.	NUMBER OF FULL DENTURES REQUIRED	☐	37
16.	NUMBER OF PARTIAL DENTURES WITH METAL AND/OR ACRYLIC REQUIRED	☐	38
17.	NUMBER OF TREATMENT PARTIAL DENTURES REQUIRED	☐	39

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18.	NUMBER OF ROOT CANAL TREATMENTS NEEDED ON TEETH WITH: ONE ROOT	☐☐	40,41
	TWO ROOTS	☐☐	42,43
	THREE ROOTS	☐☐	44,45
19.	NUMBER OF ROUTINE EXTRACTIONS NEEDED	☐☐	46,47
20.	NUMBER OF EXTRACTIONS (IMPACTION) NEEDED	☐	48
21.	NUMBER OF QUADRANTS NEEDING SUBGINGIVAL CURRETTAGE	☐	49
22.	NUMBER OF QUADRANTS NEEDING GINGIVECTOMIES	☐	50
23.	NUMBER OF QUADRANTS NEEDING GINGIVOPLASTY	☐	51
24.	NUMBER OF QUADRANTS NEEDING OCCLUSAL ADJUSTMENT	☐	52
25.	NUMBER OF STAINLESS STEEL CROWNS	☐☐	53,54
26.	OCCLUSAL SEALANT R_x (ENTER 1 IF NEEDED)	☐	55
27.	SPACE MAINTAINER (FIXED BAND TYPE)	☐	56
28.	SPACE MAINTAINER (REMOVABLE ACRYLIC)	☐	57
29.	IF THE CHILD DEFINITELY REQUIRES DEFINITIVE ORTHODONTIC CARE, ENTER 1	☐	58
30.	MULTIAPPOINTMENT DISEASE CONTROL PROGRAM (ENTER 1 IF NEEDED)	☐	59

INSTRUCTIONS FOR COMPLETION OF DATA COLLECTION FORM: ACTIVE DUTY DEPENTENT DENTAL CARE SURVEY

1. The examinations of the dependent wives and children in this survey should be conducted using the guideline "What dental treatment is necessary to restore the patient to reasonably optimum dental health?" Bite-Wing X-rays should be taken on all patients having posterior teeth.

2. Be sure to use the CODE numbers representing the various ranks, NOT the ranks themselves. The code numbers concerning the ranks of the military sponsors are listed below:

ENLISTED		WARRANT OFFICER		OFFICER	
RANK	CODE NO.	RANK	CODE NO.	RANK	CODE NO.
E-1	11	WO-1	21	O-1	31
E-2	12	WO-2	22	O-2	32
E-3	13	WO-3	23	O-3	33
E-4	14	WO-4	24	O-4	34
E-5	15			O-5	35
E-6	16			O-6	36
E-7	17				
E-8	18				
E-9	19				

3. Question #7: B/W X-Rays - Enter the number 1 on each form completed for a patient having B/W X-Rays taken.

4. Question #8: Additional X-Rays - Enter the actual number of additional X-Rays required.

5. Question #14: Enter the total number of fixed bridge UNITS required, NOT the number of fixed bridges.

6. Question #15: Full Dentures - Either a full maxillary or full mandibular denture would be recorded as 1. Both a full maxillary and a full mandibular would be entered as 2.

7. Questions #21, 22, 23, and 24: Quadrants needing curettage, gingivectomies, gingivoplasties, and occlusal adjustments. The questions refer to quadrants involved. If only one or two teeth are involved, or if only a partial quadrant is involved, these instances should be counted as 1 quadrant.

8. Question #26: Occlusal sealants - If sealant therapy is indicated, the number 1 should be entered regardless of the number of teeth indicated for sealant treatment.

OVER

9. Question #29: Orthodontic Care - Enter the number 1 if, in the opinion of the examiner, the child definitely needs definitive orthodontic care that would require treatment by a *specialist* in *orthodontics.*

10. Question #30: Multi-appointment oral disease control programs - Do NOT enter the number of appointments needed. If the patient needs a multi-appointment disease control program, enter 1.

11. All questions where there are two boxes associated with the answer - Be sure that entries are made in both boxes.

For Example:

3	0	= correct
0	3	= correct
	3	= incorrect
3		= incorrect

12. While wives of all ages will be examined in this survey, only children age 4 through 20 will be included as subjects.

This survey is being conducted to determine the dental care needs of dependents of active duty Army personnel. Your participation in this survey may enable the Army to better meet the dental needs of dependents. Please answer all of the following questions by either entering the appropriate code number or filling in the box provided next to each question.

If you are not a dependent of an Active Duty Army member, or if you have filled this form out previously, please do not complete it again. If more than one member of your family is examined in this survey, complete only one questionnaire for the entire family.

1. The post on/or near which we are residing is: ..... ☐ 1

POST	CODE NUMBER	POST NAME	CODE NUMBER
Ft Campbell	0	Ft Sill	5
Ft Hood	1	Ft Huachuca	6
Ft Lee	2	Ft Knox	7
Ft Polk	3	Ft McClellan	8
Ft Rucker	4	Ft Leavenworth	9

2. The rank of the sponsoring military member in our family is (Enter Code):..... ☐☐ 2,3

ENLISTED		WARRANT OFFICER		OFFICER	
RANK	CODE NO.	RANK	CODE NO.	RANK	CODE NO.
E-1	11	WO-1	21	O-1	31
E-2	12	WO-2	22	O-2	32
E-3	13	WO-3	23	O-3	33
E-4	14	WO-4	24	O-4	34
E-5	15			O-5	35
E-6	16			O-6	36
E-7	17				
E-8	18				
E-9	19				

3. Our military sponsor has completed the following years of federal service for pay purposes: (Please use 2 digits. If he has 9 years or less, enter a zero before the number. For example, if he has 4 years in, enter [0] [4].)..... ☐☐ 4,5

4. Is there a dependent wife eligible for medical care in the family? (1=Yes, 2=No)..... ☐ 6

5. Enter the number of children in your family that are eligible for medical care (If you have more than 9 children, only enter up to 9)..... ☐ 7

6. Enter the ages of your dependent children starting with the youngest. Only give the ages for those children counted in question 5 above. (Please use 2 digits, if a child is 9 years or less in age, enter a zero before the number. For example, if the child is 4, enter [0] [4].) ..... ☐☐ 8,9
☐☐ 10,11
☐☐ 12,13
☐☐ 14,15
☐☐ 16,17
☐☐ 18,19
☐☐ 20,21
☐☐ 22,23
☐☐ 24,25

ACTIVE DUTY DEPENDENT DENTAL CARE SURVEY SPONSORS QUESTIONAIRE

This form is to be completed by active duty Army personnel with dependents who have been assigned to their present post for at least 10 months.
Please answer all of the following questions in the boxes provided using a code number.

1. The post to which I am assigned is: ..... ☐☐ 1,2

POST	CODE NUMBER	POST	CODE NUMBER
Ft Ben Harrison	10	Ft Hood	21
Ft Carson	11	Ft Campbell	22
Ft Dix	12	Ft Lee	23
Ft Eustis	13	Ft Knox	24
Ft Belvoir	14	Ft Sill	25
Ft McPhearson	15	Ft Leavenworth	26
Ft Ord	16	Ft Polk	27
Ft Sheridan	17	Ft McClellan	28
Ft Lewis	18	Ft Rucker	29
Ft Bliss	19	Ft Huachuca	30
Ft Sam Houston	20		

2. My rank is (Use Code Number): ..... ☐☐ 3,4

RANK	CODE NO.	RANK	CODE NO.	RANK	CODE NO.
E-1	11	WO-1	21	O-1	31
E-2	12	WO-2	22	O-2	32
E-3	13	WO-3	23	O-3	33
E-4	14	WO-4	24	O-4	34
E-5	15			O-5	35
E-6	16			O-6	36
E-7	17				
E-8	18				
E-9	19				

3. How many years of federal service do you have completed for pay purposes? ☐☐ 5,6
(Please use 2 digits. If you have 9 years or less, enter a zero before the number. For example, if you have 4 years, enter [0] [4] .)

4. Are you presently married? (1=Yes, 2=No) ..... ☐ 7

5. Enter the number of childern in your family that are eligible for medical care. (If you have more than 9 childern, only enter up to 9) ..... ☐☐ 8,9

6. Enter the ages of all your dependents starting with the youngest. Only give the ages for those childern counted in question 5 above. (Please use 2 digits, if a child is 9 years old or less in age, enter zero before the number. For Example, if a child is 4, enter [0] [4] .) ..... ☐☐ 10,11
☐☐ 12,13
☐☐ 14,15
☐☐ 16,17
☐☐ 18,19
☐☐ 20,21
☐☐ 22,23
☐☐ 24,25
☐☐ 26,27

7. What is the total amount of money which you spent during the past twelve months, to purchase dental treatment from civilian dentists for all of your dependents? (In the boxes at the right, enter the code number that best answers the question.) ..... ☐☐ 28,29

AMOUNT	CODE NO.	AMOUNT	CODE NO.
None	11	$451-$500	22
$1-$25	12	$501-$550	23
$26-$50	13	$551-$600	24
$51-$100	14	$601-$650	25
$101-$150	15	$651-$700	26
$151-$200	16	$701-$750	27
$201-$250	17	$751-$800	28
$251-$300	18	$801-$850	29
$301-$350	19	$851-$900	30
$351-$400	20	$901-$950	31
$401-$450	21	$951-$1000	32
		Over $1000	33

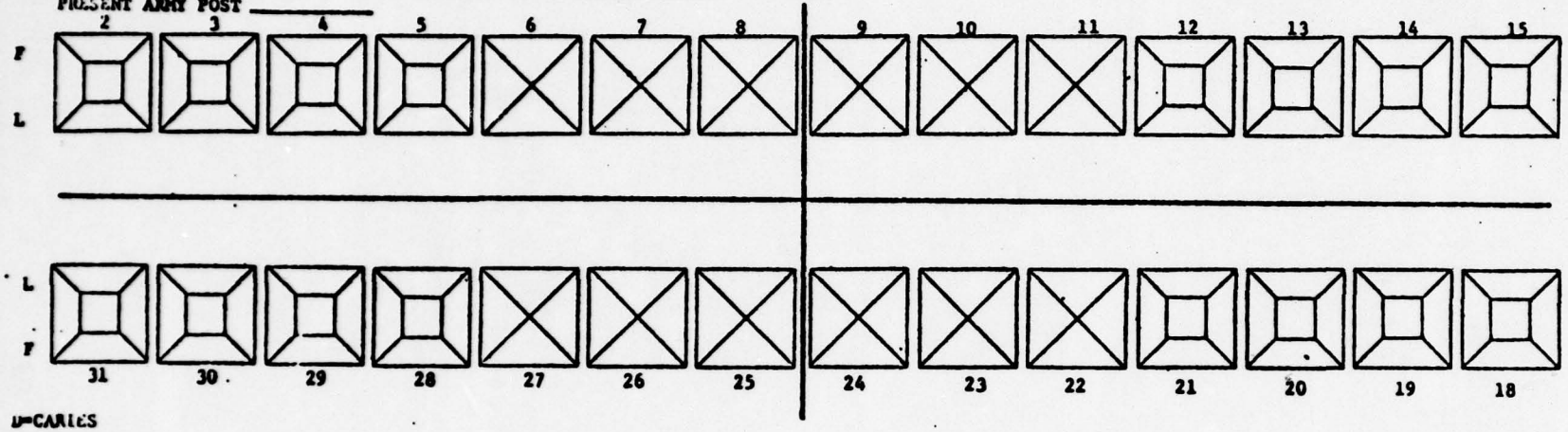
8. If you spent more than $1000, how much did you spend to the nearest dollar? ..... ☐☐☐☐ 30, 31, 32,33

DMF/def CARIES EXAMINATION DEPENDENT CHILDREN

PATIENT NUMBER _____ ARMY POST WHERE SCHOOL IS LOCATED _____

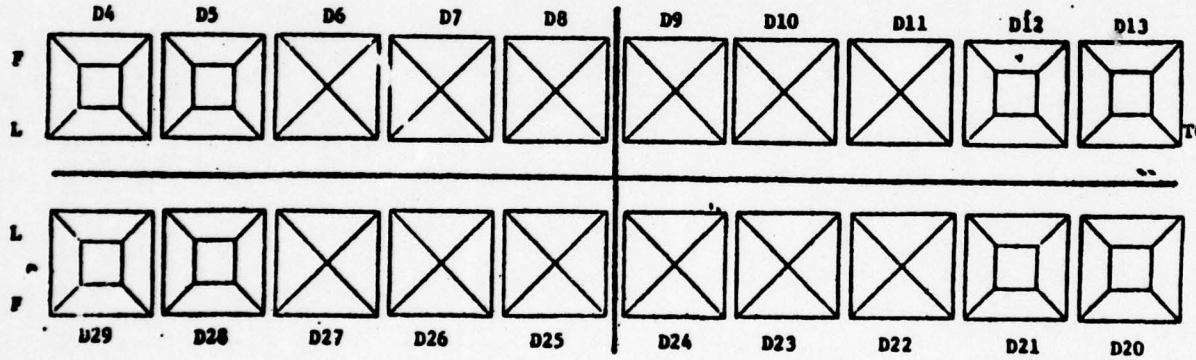
NUMBER OF MONTHS AT PRESENT ARMY POST _____ GRADE IN SCHOOL _____

DMFS



D=CARIES
F=FILLED
M=MISSING

defs



DMF		def	
D=	_____	d=	_____
M=	_____	e=	_____
F=	_____	f=	_____
TOTAL	_____		_____

DHS Form 205 (OT)
August 1976

PERMISSION TO CONDUCT DENTAL EXAMINATIONS ON DEPENDENT CHILD

Date

Department of the Army
Local Dental Service
Fort_____00000

Dear Parent:

The Health Care Studies Division, Academy of Health Sciences, US Army, Fort Sam Houston, Texas is presently conducting a survey to determine the need for dental care among dependent children of US Army personnel.' Dental examinations of children will be conducted in Grades 3, 4, 5, and 6 of the dependent schools located on your post during the period September thru November 1976. Dental X-Rays will not be used in these examinations. The dentists (Army Dental Corps Officers) conducting these examinations request permission to examine your child during this survey. Would you please complete the attached form and return it to the classroom teacher within the next 72 hours.

_____
(Local DDS Signature to be entered here)
Director of Dental Services

---

1. STUDENT'S NAME_____
2. GRADE IN SCHOOL_____
3. ARMY POST_____
4. NUMBER OF MONTHS THE DEPENDENT HAS LIVED ON OR NEAR THIS POST_____

I hereby DO___ DO NOT___ grant permission for the above named dependent child to receive a dental examination to be conducted in the school by US Army Dental Corps Officers.

_____
(SIGNED - PARENT OR GUARDIAN)

_____
DATE

APPENDIX B

FEE SCALES

Dental Fee Scale Used in Study Part I

PROCEDURE	FEE
1. Examination	$ 7.50
2. B/W X-Rays	$ 9.00
3. Additional X-Rays	$ 1.50
4. Prophylaxis & Scaling	$ 13.50
5. Topical Fluoride	$ 8.50
6. One-Surface Amalgam Restoration	$ 10.50
7. Two-Surface Amalgam Restoration	$ 16.50
8. Three or More Surface Amalgam Restoration	$ 22.50
9. Anterior Non-Metallic Restoration	$ 13.50
10. Acrylic Crown	$ 98.00
11. Porcelain Crown	$143.50
12. Gold 3/4 Crown	$117.50
13. Gold Full Crown	$123.00
14. Gold with Acrylic Crown	$134.50
15. Gold with Porcelain Crown	$173.00
16. Fixed Bridge (per unit)	$128.50
17. Full Denture	$255.00
18. Partial Dentures with metal and/or acrylic required	$257.00
19. Treatment Partial Dentures	$133.00
20. Root Canal Treatments, One Root	$ 92.50
21. Root Canal Treatments, Two Roots	$123.50
22. Root Canal Treatments, Three Roots	$157.00
23. Routine Extractions	$ 12.50
24. Extractions (Impaction)	$ 64.50

PROCEDURE	FEE
25. Subgingival Curettage per Quadrant	$ 25.00
26. Gingivectomies per Quadrant	$ 70.00
27. Gingivoplasties per Quadrant	$ 70.00
28. Occlusal Adjustment per Quadrant	$ 15.00
29. Stainless Steel Crown	$ 35.00
30. Occlusal Sealant Treatment (for all teeth in oral cavity)	$ 20.00
31. Space Maintainer (Fixed Band Type)	$ 41.00
32. Space Maintainer (Removable Acrylic)	$ 59.00
33. Definitive Orthodontic Care (per year)	$700.00
34. Multiappointment Disease Control Program (for entire series)	$ 25.00

SUMMARY OF RESOURCE DENTAL FEE SCALES USED TO FORMULATE THE FEE SCALE USED IN STUDY PART I

Procedure	USCG Contract Fees (Range)	Texas MEDICAID Fees (Mean)	Mean 1973 Calif. Fees	Mean 1973 USA Fees	Mean 1973 USA Fees Adjusted 6% Per Yr (3 Yrs)	Texas Dental Assn-VA Fees
1. Examination	$8.-$10.	$7.00	$6.57	$6.29	$7.48	$10.
2. B/W X-Rays	$6.-$1		$8.22	$7.78	$9.25	
3. Additional X-Rays	$1.-$3.	$5.00	$1.73	$1.68	$1.75	$1.
4. Prophylaxis & Scaling	$9.-$15.	$11.00	$13.64	$11.19	$13.32	$13.
5. Topical Fluoride	$6.	$8.00	$7.85	$7.37	$8.75	
6. One-Surface Amalgam Restoration	$7.-$12.	$15.00	$11.17	$8.95	$10.65	$10.
7. Two-Surface Amalgam Restoration	$12.-$16.	$20.00	$16.63	$13.95	$16.60	$16.
8. Three or more Surface Amalgam Restoration	$15.-$24.	$25.00	$21.25	$19.01	$22.63	$24.
9. Anterior Non-Metallic Restoration	$9.-$15.	$19.00	$15.01	$11.54	$13.73	$16. to $24.
10. Acrylic Crown	$95.-$115.		$86.15	$82.37	$98.10	$132.
11. Porcelain Crown	$125.-$175.		$121.22	$120.45	$143.45	$150.
12. Gold 3/4 Crown	$115.-$125.		$99.91	$98.88	$117.75	$132.
13. Gold Full Crown	$110.-$165.		$107.48	$103.15	$122.85	$124.
14. Gold with Acrylic Crown	$125.-$160.		$117.27	$113.02	$134.60	$141.00
15. Gold with Porcelain Crown	$150.-$200.		$146.43	$145.29	$173.02	$186.00
16. Fixed Bridge (per unit)	$50.-$175.		$112.50	$107.95	$128.55	$101. to $141.
17. Full Denture	$200.-$250.		$250.58	$214.26	$255.17	$210.

SUMMARY OF RESOURCE DENTAL FEE SCALES USED TO FORMULATE THE FEE SCALE USED IN STUDY PART I

Procedure	USCG Contract Fees (Range)	Texas *MEDICAID* Fees (Mean)	Mean 1973 Calif. Fees	Mean 1973 USA Fees	Mean 1973 USA Fees Adjusted 6% Per Yr (3 Yrs)	Texas Dental Assn-VA Fees
18. Partial Dentures with Metal and/or Acrylic	$200.-$295.		$227.57	$215.64	$256.80	$181. to $231.
19. Treatment Partial Dentures			$115.86	$111.69	$133.02	
20. Root Canal Treatments, One Root	$85.-$90.		$84.15	$77.52	$92.32	$91.
21. Root Canal Treatments, Two Roots	$110.-$125.		$109.66	$103.75	$123.55	$119.
22. Root Canal Treatments, Three Roots	$135.-$160.		$141.12	$132.03	$157.25	$147.
23. Routine Extractions	$8.-$15.	$12.00	$12.50	$10.68	$12.70	$10.
24. Extractions (Impaction)	$25.-$75.		$57.62	$54.21	$64.55	$21. to $70.
25. Subgingival Curettage per Quadrant	$10.-$20.		$22.43	$21.22	$25.25	$14.
26. Gingivectomies per Quadrant	$150.		$65.88	$58.59	$69.76	$59.
27. Gingivoplasties per Quadrant			$65.88	$58.59	$69.76	
28. Occlusal Adjustment per Quadrant			$14.07	$12.50	$14.89	
29. Stainless Steel Crown	$35.	$36.00	$29.42	$29.34	$34.93	
30. Occlusal Sealant Treatment (for all teeth in oral cavity)		$20.00				
31. Space Maintainer (Fixed Band Type)		$38.00	$40.94	$34.45	$41.02	

SUMMARY OF RESOURCE DENTAL FEE SCALES USED TO FORMULATE THE FEE SCALE USED IN STUDY PART I

Procedure	USCG Contract Fees (Range)	Texas MEDICAID Fees (Mean)	Mean 1973 Calif. Fees	Mean 1973 USA Fees	Mean 1973 USA Fees Adjusted 6% Per Yr (3 Yrs)	Texas Dental Assn-VA Fees
32. Space Maintainer (Removable Acrylic)			$52.05	$49.35	$58.76	
33. Definitive Orthodontic Care (per year)	*	*	*	*	*	*
34. Muli-appointment Disease Control Program (for Entire Series)	$25.(Max)	$8.(per visit)	$7.30 (per visit)	$7.14 (per visit)	$8.50 (per visit)	

* The average orthodontic case required approximately 24 to 26 months treatment time at an average total cost of approximately $1400 - $1500. This information was obtained from seven orthodontists and three general dentists practicing in ten different locations throughout the United States.

APPENDIX C

LIST OF STUDY SITES

LIST OF MEDCEN AND MEDDAC UTILIZED FOR DATA COLLECTION

Brooke Army Medical Center, Fort Sam Houston, TX 78234
Madigan Army Medical Center, Tacoma, WA 98431
William Beaumont Army Medical Center, Fort Bliss, TX 79920
MEDDAC, Fort Belvoir, VA 22060
MEDDAC, Fort Benjamin Harrison, IN 46216
MEDDAC, Fort Carson, CO 80913
MEDDAC, Fort Campbell, KY 42223
MEDDAC, Fort Dix, NJ 08640
MEDDAC, Fort Eustis, VA 23604
MEDDAC, Fort Hood, TX 76545
MEDDAC, Fort Huachuca, AZ 85613
MEDDAC, Fort Leavenworth, KS 66027
MEDDAC, Fort Lee, VA 23801
MEDDAC, Fort McClellan, AL 36205
MEDDAC, Fort McPherson, GA 30330
MEDDAC, Fort Ord, CA 93941
MEDDAC, Fort Polk, LA 71459
MEDDAC, Fort Rucker, AL 36360
MEDDAC, Fort Knox, KY 40121
MEDDAC, Fort Sheridan, IL 66037
MEDDAC, Fort Sill, OK 73503
MEDDAC, Fort Jackson, SC 29207

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