AD-A261 541

(2)

DIRECTORATE OF
HEALTH CARE STUDIES
AND CLINICAL INVESTIGATION

DTIC
ELECTE
MAR 2 1993
S C D

THE DENTAL NEEDS OF RESERVE COMPONENT SOLDIERS
VOLUME I:
INTRODUCTION, METHODS, AND CHARACTERISTICS OF STUDY SAMPLE

COL Jay D. Shulman, DMD, MA, MSPH
LTC Richard D. Guerin, DDS, MS, MPH
SFC Brian A. Bolay
SFC Timothy R. Williams

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

DR 92-002
1 November 1992

93-04320

TO CONSERVE FIGHTING STRENGTH

UNITED STATES ARMY
MEDICAL DEPARTMENT CENTER AND SCHOOL
FORT SAM HOUSTON, TEXAS 78234-6100

93 3 1 092

NOT

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

* *

Regular users of services of the Defense Technical Information Center (Per DOD Instruction 5200.21 may purchase copies directly from the following:

Defense Technical Information Center (DTIC)
ATTN: DTIC-DDR
Cameron Station
Alexandria, VA 22304-6145

Telephones:	DSN	284-7633, 4 or 5
	Commerical	(703) 274-7633, 4 or 5

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

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

Telephone: COMMERCIAL (703) 487-4600

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY 2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	3. DISTRIBUTION / AVAILABILITY OF REPORT Distribution unlimited; Approved for Public Release
4. PERFORMING ORGANIZATION REPORT NUMBER(S) DR92-002	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION COL Jay D. Shulman 6b. OFFICE SYMBOL (If applicable) HSHN-D	7a. NAME OF MONITORING ORGANIZATION DA Office of the Surgeon General
6c. ADDRESS (City, State, and ZIP Code) Directorate of Health Care Studies & Clinical Investigation, Bldg 2268, Ft. Sam Houston, TX 78234-6100	7b. ADDRESS (City, State, and ZIP Code) DASG-DC Washington, DC 20310
8a. NAME OF FUNDING / SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO. DA 308914

11. TITLE (Include Security Classification) (U) The Dental Needs of Reserve Component Soldiers Volume I: Introduction, Methods, and Characteristics of Study Sample

12. PERSONAL AUTHOR(S) COL Jay D. Shulman, LTC Richard D. Guerin, SFC Brian Bolay, SFC Timothy R. Williams

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM Jan 84 TO Nov 92	1992 Nov 1	52

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Dental Epidemiology, Dental needs, Dental Readiness, Dental Fitness, Military Medicine, U.S. Army, U.S. Army Reserves

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

(U)

A dental needs study of the Army Reserve Components was conducted from 28 May to 30 September 1985. Examinations of soldiers of the Army National Guard (ARNG) and U.S. Army Reserve (USAR) were performed using the approach similar to that of the National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-1986. In addition to recording decayed, missing, and filled surfaces and periodontal attachment position a treatment needs assessment and Department of Defense Dental Fitness Classification were done. Examinations were performed by 39 Reserve and Active Component dental officers who were calibrated to the standards used in the National Survey.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL COL Jay D. Shulman	22b. TELEPHONE (Include Area Code) (210) 221-0047/ DSN471- 22c. OFFICE SYMBOL HSHN-D

DD Form 1473, JUN 86 Previous editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
Unclassified

19. ABSTRACT (Continued):

A multi-stage sampling technique was used for both the ARNG and USAR. Annual Training sites that had 400 or more soldiers training during the study period were included in the sampling frame. Examinations were performed on 4,281 ARNG and 3,231 USAR soldiers. Because of problems in the sampling process, data needed to decode (reweight) the sampling scheme was lost at many sites. Consequently, confidence intervals of point estimates cannot be determined.

The selection process for the USAR focused on members of troop program units (TPUs) and excluded members of the Individual Ready Reserve (IRR) and Individual Mobilization Augmentees (IMAs) because only the TPUs train as a group. To the extent that the TPUs and the rest of the USAR are different population types (with concomitant differences in dental health) the results may be biased.

TABLE OF CONTENTS

DISCLAIMER i

DD FORM 1492 ii

TABLE OF CONTENTS iii

EXECUTIVE SUMMARY vi

ACKNOWLEDGEMENTS vii

INTRODUCTION AND OVERVIEW 1

Purpose of the Study 1
Organization of the Report 1
Purpose of the Report 1
Army Reserve Components 1
Background 2

METHODS 3

The Sample 3
The Examination 4
Patient Information 4
Measures of Dental Status 5
Estimates of Treatment Needs 5
Estimates of Potential Emergencies 5
The Examiners 5
Data Analysis and Management 6

RESULTS 7

Sample Characteristics 7
Comparison of Demographics of Sample and Population . . 7

DISCUSSION 7

Examiner Standardization 7

CONCLUSION 9

RECOMMENDATIONS 9

REFERENCES 11

TABLES 13

Table 1: Site Selection 14
Table 2: Examiner Characteristics 15
Table 3: Distribution of Sample by Age Group 16
Table 4: Distribution of Sample by Sex 17
Table 5: Distribution of Sample by Pay Grade (Enlisted Soldiers and Warrant Officers) 18

Table 6: Distribution of Sample by Pay Grade (Commissioned Officers) 19
Table 7: Distribution of Sample by Home State of Unit . . . 20
Table 8: Distribution of Sample by Level of Education . . . 21
Table 9: Distribution of Sample by Ethnic Group 22
Table 10: Distribution of Sample by Unit Type. 23
Table 11: Comparison of Sample to Reserve Component Population 24
Table 12: Comparison of Sample to Population: ARNG 25
Table 13: Comparison or Sample to Populaiton: USAR 26
Table 14: Breakdown of Sample by Site 27
Table 15: Breakdown of Sample by Selection Method 28

FIGURES 29

Figure 1: Military Reserves 30

APPENDIX 31

Appendix A: Letter of Instruction 32

EXECUTIVE SUMMARY

A dental needs study of the Army Reserve Components was conducted from 28 May to 30 September 1985. Examinations of soldiers of the Army National Guard (ARNG) and U.S. Army Reserve (USAR) were performed using the approach similar to that of the National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-1986. In addition to recording decayed, missing, and filled surfaces and periodontal attachment position a treatment needs assessment and Department of Defense Dental Fitness Classification were done. Examinations were performed by 39 Reserve and Active Component dental officers who were calibrated to the standards used in the National Survey.

A multi-stage sampling technique was used for both the ARNG and USAR. Annual Training sites that had 400 or more soldiers training during the study period were included in the sampling frame. Examinations were performed on 4,281 ARNG and 3,231 USAR soldiers. Because of problems in the sampling process, data needed to decode (reweight) the sampling scheme was lost at many sites. Consequently, confidence intervals of point estimates cannot be determined.

The selection process for the USAR focused on members of troop program units (TPUs) and excluded members of the Individual Ready Reserve (IRR) and Individual Mobilization Augmentees (IMAs) because only the TPUs train as a group. To the extent that the TPUs and the rest of the USAR are different population types (with concomitant differences in dental health) the results may be biased.

Comparisons of the sample to the USAR and ARNG master personnel tapes showed that despite some differences in proportions of age-rank-sex-race strata the sample appears reasonably representative. When the results were reweighted to compensate for differences between the sample and the master personnel databases (post-stratification analysis) the point estimates of the dental fitness classification proportions for the ARNG and USAR were not materially different from the unweighted estimates, varying by less than one percentage point each.

Accesion For
NTIS CRA&I ☑
DTIC TAB ☐
Unannounced ☐
Justification
By
Distribution /
Availability Codes
Dist | Avail and / or Special
A-1

TED 1

ACKNOWLEDGMENT

A large-scale study such as this cannot succeed without the efforts of many people both within and outside the Health Care Studies and Clinical Investigation Activity (HCSCIA). Since this report was written several years after the study was done many of the people who are acknowledged are no longer in the position they held during the planning and execution of the study. They will be listed with the position they occupied then.

Sergeant First Class Brian Bolay was the study administrator. Ms. Patricia Twist, Management Analyst designed the data entry forms and prepared the graphics. LTC John Coventry provided statistical consultation. Sergeant First Class Tim Williams helped prepare the final report.

Colonel Michael N. Mattia, DC, Dental Surgeon, U.S. Army Forces Command (FORSCOM), helped in the study design and was the point of contact at FORSCOM. Walter A. Brusch, COL, DC, Health Care Systems Support Activity, made several site visits. George R. O'Daniel, LTC, MS, U.S. Army Personnel Center, provided the USAR dental officers who served as examiners. LTC William A. Ward, DC, ARNG, National Guard Bureau planned and coordinated the ARNG portion of the study. LTC William Satterfield, DC, USAR, helped us plan the study and served as an examiner.

Mr. Ron Long, Computer Specialist, Data Processing Installation, Fort Detrick, MD managed our database and provided programming assistance.

R. Gary Rozier, DDS, MPH, Department of Health Policy and Administration, University of North Carolina provided guidance on the study design, helped train examiners, and helped analyze the data.

Philip Swango, DDS, MPH, National Institute of Dental Research, helped train the examiners.

The examiners and local project directors performed with outstanding dedication, often working long hours under less than optimal conditions.

Examiners:

Samuel Angulo, CPT, DC, USA
Thomas Barrett, MAJ, DC, USAR
Bruce Butler, COL, DC, USAR
John Buyer, CPT, DC, USA
Wilfred Calkins, MAJ,DC, USAR
Walter Davison, CPT,DC, USAR
Peter Demizio, MAJ, DC, USA
Steven Dokken, LTC, DC, USAR

Edwards, CPT, DC, USAR
Michael Fair, MAJ, DC, ARNG
Glenn Garland, CPT, DC, USAR
Edward Hadaway, CPT, DC, ARNG
Ernest Hinrichs, COL, DC, USAR
Lee Johns, CPT,USA
Frank Jones, LTC, DC, ARNG
Brony Kastantin, MAJ, DC, ARNG
George Keary, MAJ, DC, ARNG
Rodger Keleher, LTC, DC, ARNG
Joel Knutson, MAJ, DC, USA
Kenneth Law, COL, DC, ARNG
Edward Lokiec, CPT, DC, USAR
William Marchbanks, COL, DC, USAR
Mark Maxwell, CPT,DC, USA
Marcus McDonald, CPT, DC, USA
David Mehlish, LTC, DC, USAR
Harrison Pittman, COl, DC, ARNG
William Satterfield, LTC, DC, USAR
Ray Scott, LTC, DC, ARNG
Robert Skvorak, MAJ, DC, USA
Bradley Vance, MAJ, DC, USA
Mack Warren,MAJ,DC, USA
Robert Wood, COL, DC, USAR
William Woodson, CPT, DC, USAR
Matthew Zizmor, MAJ, DC, USAR

Local Project Directors

Abram Adams, COL, DC, USA
John Beaty,MAJ, DC, USA
Jim Dixon, LTC, DC, USA
John Megher, LTC, DC, USA
George Maxfield, CPT, DC, USA
Melvin Mitchell, COL, MS, ARNG
Joseph Perry, COL, DC, USA
Grover Peters, CPT, MS, USA
Robert Swords, LTC, DC, USA

INTRODUCTION AND OVERVIEW

Purpose of the Study

It is widely suspected that a substantial proportion of soldiers in the U.S. Army Reserve (USAR) and the Army National Guard (ARNG) were in poor dental health. If that perception is true, then dental problems and emergencies may significantly interfere with the mobilization, deployment, and combat operations of Army reserve forces. Because accurate data on the dental health of these personnel are not routinely collected, the Assistant Surgeon General for Dental Services commissioned a study in 1985 to address these concerns. In the summer of 1985, the Dental Studies Division of the U.S. Army Health Care Studies and Clinical Investigation Activity conducted a nationwide examination survey of 7,512 reserve component soldiers from the USAR and ARNG. The purposes of the study were to assess their dental health, determine their dental treatment needs, and estimate their potential for dental emergencies.

Organization of the Report

The results of this study will be presented in four volumes. This volume, Volume I, will present the background, methodology, and characteristics of the sample. Volume II examines the potential for dental emergencies of reserve soldiers. Volume III discusses the treatment needs of reserve component soldiers, and Volume IV presents their oral health.

Purpose of the Report

This report discusses the background and purposes and study methodology of the Army Reserve Components Dental Need Study, 1985. It provides details on subject selection, examiner training, and compares the sample to the population from which it was drawn.

Army Reserve Components

The Army Reserve Components are the Army National Guard and the Army Reserves. They are two of several Department of Defense (DoD) reserve components. Figure 1 shows the strength of the DoD reserve components and a breakdown of the Army Reserve Components. Half the Army's maneuver brigades are in the Reserve Components with 95 percent of these in the ARNG.

Background

The ARNG comprises the National Guard of the states, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. It is responsible to the governor through the state/territorial adjutant general until federalized. The governor has the authority to activate any or all of the state/territorial ARNG in response to an emergency. The District of Columbia ARNG is responsible to the Under Secretary of the Army through the District of Columbia Adjutant General. The September 1990 end strength of the ARNG was 455,260.[1]

The USAR is composed of the Ready Reserve, Standby Reserve, and Military Retired Reserve. The Ready Reserve is composed of the Selected Reserve and the Individual Ready Reserve (IRR). The Selected Reserve is composed of Troop Program Units (TPU) and Individual Mobilization Augmentees (IMA). The individual soldiers of the USAR are in the Individual Ready Reserve (IRR). The September 1990 end strength of the USAR was 595,107.[2]

The RC is 58.9 percent of the Total Army, containing 54 percent of its combat, 58 percent of its combat support, and 70 percent of its combat service support soldiers.[3] Unlike Active Component soldiers, whose dental treatment is provided by the Army, RC soldiers must pay for their treatment. Given the cost of dental treatment and the low income level of many RC soldiers, it is likely their dental treatment needs will be disproportionately great and they cause substantial problems upon activation. A knowledge of RC soldiers' needs will facilitate planning for the support of mobilization and the theater of operations.

Several studies have assessed the dental treatment needs of active duty military populations. The average number of restorations required per soldier has been found to range from 4.7 to 7.0 (Hobson, 1956; Hellman, Ludwick, and Osterling, 1957; Rovelstad, Irons, McConnell, Hackman, and Collevecchio, 1959; Szmyd and McCall, 1960; Ludwick, 1974; Parker, Schopper, Mangelsdorff, and Cheatham, 1979; Parker, Brunner, and Mangelsdorff, 1981; Christen,

---

[1]Directorate for Information Operations and Reports. Department of Defense: Selected Manpower Statistics; Fiscal Year 1990. (DIOR Publication No. DIOR/MO1-90). Washington, DC: U.S. Government Printing Office, 1991, 198.

[2]Ibid. 198.

[3]Davenport, D. E. (Chairman). (1991, August). ROA National Security Report: The Future of the Reserve Forces of the United States. The Officer, 67, 36.

Park, Graves, Young, and Rahe, 1977; Cassidy, Parker, and Hutchins, 1973; Spinks and Schneider, 1981).

In contrast, the dental treatment needs of RC units have received little attention. A review of the literature reveals only two epidemiologically sound studies. One surveyed the needs of the Air National Guard (Yacovone, Box, & Mumford, 1985); the other surveyed the needs of the North Carolina Army National Guard (Raborn, Rozier, King, & Mangelsdorff, 1984). Results from the Air National Guard study showed that the dental treatment needs per airman were .52 one surface and .75 multiple surface restorations and .16 extractions. In the ARNG study, it was determined that 7.2% of guardsmen required emergency treatment and 22.9% required immediate attention. Thus, over 30% of those surveyed required treatment prior to deployment.

METHODS

The Sample

Soldiers from the ARNG and USAR were examined during their two week summer annual training (AT) periods. Summer training periods were chosen to capitalize on the large numbers of soldiers brought together at some summer training sites. Most of the time, ARNG and USAR soldiers are spread throughout the United States. Except for summer training, they rarely aggregate in sufficient numbers for a cost effective study.

Examination sites were selected separately for the ARNG and USAR. For each Army region, two-week training periods at AT locations were selected for the ARNG and the USAR from the annual Site-Date Report for Training Year 5. The sampling frame in each region consisted of all two-week training periods between 25 May and 30 September 1985 scheduled to receive at least 450 troops. Since time periods were sampled, training locations with more than one eligible time period could be selected more than once. We selected 11 training periods at 11 different training locations for the ARNG and 11 sites-date periods at 8 different training locations for the USAR (see Table 1).

The goal was to examine 400 soldiers during each two-week examination period. The plan was to sample all units present during the two week period in proportion to their strength until the requisite number of exams was achieved. The original plan was to select individual soldiers from each unit at random from the unit roster. In practice, it was not possible to adhere to the plan. Most of the time, we had to settle for whatever soldiers the unit could spare at the time of the examination. Most units were under severe time constraints during their training periods.

The Examination

In order to minimize our impact on unit training, soldiers were examined at times and places convenient to the units. Moreover, large numbers of soldiers had to be examined quickly. To meet these constraints an examination protocol was developed that could be performed quickly under a wide variety of conditions. For logistical reasons all examinations were performed without radiographs.

Four general categories of information were captured in the examination: patient information, measures of dental health, estimates of treatment needs, and estimates of the potential for dental emergencies.

Patient Information

Personal demographic data such as age, race, level of education, race, and sex. In addition, limited military information such as pay grade, time in the Reserve Components, and the unit identification code of the soldier's unit were collected. Finally limited data about utilization of dental services such as the use of a personal dentist, coverage by dental insurance, time since last dental visit, and opinion about personal dental health were collected.

Measures of Dental Status

Two measures of dental status were used. One was decayed, missing, and filled surfaces (DMFS). DMFS was chosen because of its long-standing, widespread use as a measure of cumulative caries experience. The use of DMFS allows the study's findings to be compared to a variety of other study populations.

The other measure was a periodontal measure developed by the National Institute of Dental Research (NIDR). For each soldier, we selected one side of the mouth at random and examined all teeth on that side, except third molars. The rationale and measurement procedure are described in Brown, Oliver, & Loe (1990).

Estimates of Treatment Needs

All examiners recorded treatment needs for each soldier. Treatment needs assessments were conservative, aimed only at restoring function or eliminating possible emergencies. Treatment options were limited to basic services likely to be provided during mobilization and deployment. These were single tooth restorations,

extractions, and removable prosthetic appliances. For teeth needing restorations, examiners indicated the number of surfaces needing restoration.

Although any mobilizing force will probably present some pulpal and periapical problems, the examiners were not asked to indicate the need for pulpal therapy because they did not have access to radiographs or other diagnostic aids. Estimates based solely on clinical appearance were felt to be extremely unreliable.

The need for multiple unit fixed partial dentures was not estimated. Although multiple unit cast restorations are provided at certain times and places for deployed forces, such treatment would not be employed during a large scale mobilization.

Estimates of Potential Emergencies

To estimate potential emergencies the dental fitness classification prescribed in DoD Directive 6410.1, "Standardization of Dental Classification and of Specifications for Conducting Dental Examinations", dated April 29, 1985 was used. Under that classification scheme, patients in Class 1 do not require dental treatment. Patients in Class 2 have dental conditions that are not likely to result in dental emergencies within 12 months. Those is Class 3 have dental conditions that are likely to cause a dental emergency within 12 months. Patients in Class 4 require a dental examination.

The examiners were asked to also apply the DoD classification scheme to each tooth. The results permit the estimation of the number of potential emergency conditions and the types of treatment needed to intercept the problems on a tooth-by-tooth basis.

Because pericoronitis is an important source of dental emergencies in the field, the examiners were asked to note any third molars that had at least one of the following signs or symptoms: suppuration, swelling, or pain. Because acute necrotizing ulcerative gingivitis (ANUG) is also a source of oral problems among soldiers, the presence or absence of the problem was recorded. To be diagnosed as having ANUG, a soldier had to have at least one necrotic papilla; a severe gingivitis was not sufficient.

The Examiners

All examiners were military dentists, either from the U.S. Army Dental Corps, or from the Reserve Components (see Table 2). All attended one of two training sessions conducted at Fort Sam Houston. The Reserve Component examiners included clinical specialists in private practice, general dentists in private

practice, public health dentists, dentists from dental school faculties, and dentists from state and federal governments.

All examiners were calibrated for the DMFS examination by the principal investigators and dental epidemiologists from the University of North Carolina School of Public Health and NIDR. For the initial training sessions, the definitions, coding criteria, and training slides developed by NIDR for its National Survey of Oral Health in U.S. Employed Adults and Seniors: 1985-1986 were used. All examiners were then calibrated on a series of live patients. Examiners were also calibrated in similar sessions for the periodontal measures, using the NIDR protocol and a series of patients.

The examiners were not calibrated for estimating treatment needs. One reason is that we felt that the art and science of clinical dentistry could not be adequately distilled down into a reasonable set of coding rules. We preferred to trust the training and experience of the examiners. Second, it was felt that a single set of coding rules (one developed by a panel of experts, for example) should not be imposed on the examiners. A second, but related reason is that during actual mobilization and deployment, dental problems will be diagnosed and treated by dentists trained in different schools with varying amounts of clinical experience and clinical opinion. The workload faced by the military will be very much a product of that diversity. By not calibrating our examiners to a single treatment standard, we hoped to capture some of that diversity.

The examiners were also not calibrated in the use of the DoD dental fitness classification system. The DoD definitions of the various dental fitness classes were presented to the examiners as they were stated in the DoD instruction. They were not given amplifying criteria because no official Army-wide or DoD-wide set of additional criteria existed.

Data Analysis and Management

Completed examination forms were screened and edited by the Dental Studies Division of the U.S. Army Health Care Studies and Clinical Investigation Activity. The data were entered onto a computer tape through a contract monitored by the Health Care Systems Support Activity. Data analysis was performed by Dental Studies personnel at the Fort Detrick Data Processing Center using the Statistical Analysis System (SAS).

RESULTS

Sample Characteristics

A total of 7,512 exami· ·ions were performed at 19 AT sites from May to August 1985. . the 7,512 soldiers examined 4,281 belonged to the ARNG and 3,231 belonged to the USAR. Examinations were performed on 806 officers, 98 warrant officers, and 6,575 enlisted soldiers. Tables 3 - 10 present breakdowns of the sample by demographic and military variables. Table 11 compares the sample to the overall RC population.

Comparison of Demographics of Sample and Population

Tables 12 and 13 compare the proportions of soldiers sampled by rank-race-sex-age group to the master personnel file (population) for the ARNG and USAR, respectively. The observed values are the actual values sampled in each stratum. The expected values for each stratum are based on the stratum-specific percentages found in the population.

DISCUSSION

Examiner Standardization

All examiners were calibrated in the techniques and measurements of the study at a three day clinical and didactic session. Due to a lack of operatories, patients, and time, the instructors did not perform enough repeat examinations on patients to compute coefficients of reliability. Consequently, there is no quantitative evidence of the extent to which the examiners were calibrated. In addition, although site visits were made by members of the study team to reinforce the Letter of Instruction, replicate examinations were not performed due to lack of resources.

Examining reserve component soldiers during their two week training periods proved to be exceedingly difficult. Despite extensive planning and preparation, it was not possible to implement the initial sampling plan. At most of the examination sites, examiners found it difficult to enumerate, locate, and contact the RC units they planned to examine. Although the examiners were provided with lists of units expected to be present during the examination period based on the Site-Date Training Report, the lists proved to be of little use at most exam sites. Extensive changes had apparently been made to the training schedule between the time the plan was published and the beginning of data collection.

Examiners were instructed to sample 400 soldiers from all of the units present during the examination period, sampling each unit in proportion to its strength. To follow those instructions, they would have had to have been able to identify all of the units present and to determine the size of each unit before starting any examinations. Unfortunately, many examiners were still tracking down units long after the examination period began.

Failure to be able to identify units at the outset of each examination period had two important consequences. First, it was not possible to know all the units present at some sites. Second, the examiners were unable to calculate sampling targets for each unit. Instead, they had to sample as many soldiers from each unit as possible.

Another major problem was with the selection of individual soldiers from units. Most unit commanders were surprised by the study. Letters were sent to all of the units originally listed for our sites in the Site-Date Training Plan several months in advance of the study. Unfortunately, due to the many changes to the plan, few of the commanders present at our sites had received the letters. By the time they learned of the study, many were heavily involved in demanding training schedules. Most tried their best to accommodate the study, but many were unwilling to let the examiners randomly select the soldiers to be examined because of their heavy operational demands. In many instances, unit leaders selected the soldiers that they could afford to send at the time of the examinations. A few commanders simply refused to participate or gave grudging partial cooperation.

Because of the difficulty and confusion associated with the sampling process, some of the data needed to decode (reweight) the sampling scheme were unavailable or lost at many sites. At some sites, there was uncertainty about the number of units that were actually present. At others, there was uncertainty about the sizes of the units we sampled.

Despite the sampling problems, the samples were probably free from any systematic sampling bias. Sites were selected at random, and although the units at most examination sites were not the ones we expected, the changes are unlikely to have introduced any serious selection bias. Selection bias could have been introduced in the instances when unit leaders selected the study participants instead of our examiners. But, in most cases, their selections were based more upon their training demands than on criteria that would have biased the sample.

The representativeness of the sample appears to be fairly reasonable in light of our comparisons between the samples and their respective populations (Tables 12 and 13). Some differences do appear, however. For example, 20-29 year old enlisted and warrant black males from the ARNG were oversampled and 50 year and

older enlisted and warrant white males were undersampled (see Table 12). The differences between the population and the sample are statistically significant but it is not known whether they are of practical significance.

To investigate the sensitivity of the results to the unrepresentative sample, some of the results were recalculated using weighting factors that reweighted the samples to be distributed as their respective populations in terms of rank, age, sex, and race (post-stratification). The reweighted results were not materially different from our unweighted results. For example, when we recomputed the proportions of Class 3s in the ARNG and USAR, the reweighted results differed from their unweighted counterparts by less than one percentage point each.

The selection process for Army Reserve soldiers focused on the members of Troop Program Units and excluded members of the Individual Ready Reserve and Individual Mobilization Augmentees because they are not assigned as a unit and their location could not be determined from the Site-Date Training Report. Figure 6 shows that only 48 percent of the Army Reserve was in the sampling frame. To the extent that the troop program units (TPUs) and the rest of the USAR are different population types (with concomitant differences in dental health) the results would be biased.[4]

CONCLUSION

A reasonably representative sample of the ARNG and of TPU personnel in the USAR has been gathered that is certainly adequate to address the concerns over dental health that generated the study.

RECOMMENDATIONS

If there is continued policy interest in the dental readiness of the reserves, relevant dental information should eventually be incorporated into the automated personnel systems of the ARNG and USAR. Large cross-sectional studies, such as this one, can be an excellent way to identify a problem or shed light on a one-time policy question. But they are a poor way to monitor an issue over time; they are simply too expensive and take too long to generate answers.

---

[4]We have no reason to believe that such differences exist.

In lieu of using an automated system, or until automation is a reality, a good way to monitor the dental health of the reserves would be to survey a small proportion of the reserves each summer using calibrated reserve dental public health officers and a standardized data collection instrument, without attempting a large representative sample. Precedence should be given to examining the units most likely to be among the first to deploy or to those suspected of having significant dental problems.

REFERENCES

Directorate for Information Operations and Reports. (1991). Department of Defense: Selected Manpower Statistics; Fiscal Year 1990. (DIOR Publication No. DIOR/MO1-90). Washington, DC: U.S. Government Printing Office.

Davenport, D. E. (Chairman). (1991, August). ROA National Security Report: The Future of the Reserve Forces of the United States. The Officer, 67, 36.

Brown, L., Oliver, R., & Loe, H. (1990). Evaluating periodontal status of U.S. employed adults. JADA, 121, 226-32.

Cassidy, J. E., Parker, W. A., & Hutchins, D. W. (1973). Dental Care Requirements of Male Army Recruits. Military Medicine, 138, 27-29.

Christen, A. G., Park, P. R., Graves, R. C., Young, J. M., & Rahe, A. J. (1979). United States Air Force Survey of Dental Needs, 1977: Methodology and Summary of Findings. JADA, 98, 276.

Helman, L. P., Ludwick, W. E., & Osterling, E. W. (1957). Naval Dental Needs and Treatment. JADA, 55, 828.

Hobson, R. W. (1956). Dental Examinations of 8,139 Army Recruits, Preliminary Report. United States Armed Forces Medical Journal, 7, 648.

Ludwick, W. E., Gendron, E. G., Pagas, J. A., & Weldon, A. L. (1974). Military Medicine, 139(2), 121-123.

Parker, W. A., Brunner, D. G., & Mangelsdorff, A. D. (1981). An Assessment of the Dental Needs of Army Recruits (Report No. 81-004). Fort Sam Houston, Texas: U.S. Army Academy of Health Sciences, Dental Studies Office. (DTIC No. AD A107290).

Parker, W. A., Schopper, A. W., Mangelsdorff, A. D., & Cheatham, J. L. (1979). Determination and Distribution of Dental Care Needs of the Active Duty Army. Public Health Reports, 94(2), 182-185.

Reynolds, H. T. (1984). Analysis of Nominal Data (Sage University Paper No. 7). Beverly Hills CA: Sage Publications.

Rovelstad, G. H., Irons, R. P., McConnell, J. P., Hackman, R. C., & Collevecchio, E. J. (1959). Survey of Dental Needs of Naval Recruits I: Status of Dental Health. JADA, 58, 60.

Raborn, W. G., Rozier R. G., King, J. E., & Mangelsdorff, A. D. (1983). Dental Health Care Status of the North Carolina Army Reserve National Guard (Report No. CR 83-002). Fort Sam Houston Texas: U.S. Army Health Care Studies and Clinical Investigation Activity, Dental Studies Division. (DTIC No. AD A137354).

Snedecor, G. W. & Cochran, W. G. (1980). Statistical Methods, 7th Ed. Ames, IA: Iowa State University Press.

Szmyd, L., & McCall, J. (1960). Restorative Dentistry Workload of the US Air Force Dental Service. United Stated Armed Forces Medical Journal, 11, 1011.

Yacovone, J. A., Box, J. B., & Mumford, R. A. (1985). Dental Survey of Air National Guard Personnel. Military Medicine, 150, 476.

TABLES

Table 1

Site Selection

SITE	USAR	ARNG	PERIOD
Fort McClellan, AL	X		25 May - 8 Jun
Fort McCoy, WI	X		1 Jun - 15 Jun
Fort Polk, LA	X		1 Jun - 15 Jun
Yakima Firing Center, WA	X		8 Jun - 22 Jun
Camp Edwards, MA	X		14 Jun - 29 Jun
Camp Roberts, CA	X		15 Jun - 29 Jun
Fort McCoy, AL		X	15 Jun - 29 Jun
Fort Chaffee, AR		X	15 Jun - 29 Jun
Fort Eustis, VA		X	15 Jun - 29 Jun
Fort Stewart, GA		X	15 Jun - 29 Jun
Fort Drum, NY	X	X	30 Jun - 13 Jul
Camp Shelby, MS	X		6 Jul - 28 Jul
Fort Sill, OK		X	7 Jul - 27 Jul
Fort Bragg		X	4 Aug - 31 Aug
Fort Sill, OK		X	10 Aug - 24 Aug
Fort Hood, TX	X		12 Jul - 28 Jul
Camp Grayling, MI	X		20 Jul - 3 Aug
Fort Carson		X	12 Aug - 24 Aug
Fort Campbell, KY	X		18 Aug - 31 Aug

Table 2

Examiner Characteristics[a]

	Rank				
	CPT	MAJ	LTC	COL	Total
ARNG/USAR Examiners	7	6	8	9	30
Examinations	1,065	999	1,500	1,117	4,681
Active Component Examiners	9	4	1	2	16
Examinations	1,924	730	120	57	2,831

Note:

[a]The two colonels and the lieutenant colonel were public health dentists from the study team.

Table 3

Distribution Of Sample By Age Group

	ARNG		USAR	
AGE GROUP	N	%	N	%
NOT KNOWN	43	1.0	25	0.8
17-19	197	4.6	180	5.6
20-24	1,302	30.4	925	28.6
25-29	885	20.7	659	20.4
30-34	541	12.6	407	12.6
35-39	601	14.0	496	15.4
40-44	370	8.6	298	9.2
45-49	209	4.9	150	4.6
50-54	99	2.3	67	2.1
≥55	34	0.8	24	0.7
TOTAL	4,281	100.0	3,231	100.0

Table 4

Distribution Of Sample By Sex

SEX	ARNG		USAR	
	N	%	N	%
MALE	4,012	93.7	2,753	85.2
FEMALE	269	6.3	478	14.8
TOTAL	4,281	100.0	3,231	100.0

Table 5

Distribution Of Sample By Pay Grade

(Enlisted Soldiers And Warrant Officers)

	ARNG		USAR	
RANK	N	%	N	%
UNKNOWN	18	0.4	15	0.5
E?	31	0.7	9	0.3
E1	57	1.3	30	0.9
E2	243	5.7	232	7.2
E3	473	11.0	385	11.9
E4	1,368	32.0	918	28.4
E5	1,019	23.8	567	17.5
E6	502	11.7	307	9.5
E7	177	4.1	151	4.7
E8	36	0.8	52	1.6
E9	13	0.3	5	0.2
TOTAL	3,919	91.5	2,656	82.2
W1	12	0.3	4	0.1
W2	19	0.4	27	0.8
W3	11	0.3	11	0.3
W4	5	0.1	9	0.3
TOTAL	47	1.1	51	1.6

Table 6

Distribution Of Sample By Pay Grade

(Commissioned Officers)

	ARNG		USAR	
RANK	N	%	N	%
O?	1	0.0	3	0.1
O1	93	2.2	50	1.5
O2	50	1.2	48	1.5
O3	79	1.8	136	4.2
O4	54	1.3	193	6.0
O5	18	0.4	71	2.2
O6	2	0.0	8	0.2
TOTAL	297	6.9	509	15.8
ALL TROOPS	4,281	100.0	3,231	100.0

Table 7

Distribution Of Sample By Home State Of Unit

	ARNG		USAR	
STATE	NUMBER	PERCENT	NUMBER	PERCENT
NOT REPORTED	7	0.2	110	3.4
AL	175	4.1	24	0.7
AR	10	0.2	6	0.2
AZ	23	0.5	0	0.0
CA	472	11.0	5	0.2
CO	11	0.3	0	0.0
CT	3	0.1	59	1.8
DC	0	0.0	7	0.2
FL	1	0.0	387	12.0
GA	218	5.1	62	1.9
IA	95	2.2	43	1.3
IL	2	0.0	237	7.3
IN	2	0.0	47	1.5
KS	0	0.0	20	0.6
KY	328	7.7	1	0
LA	289	6.8	216	6.7
MA	1	0.0	129	4.0
MD	0	0.0	22	0.7
ME	230	5.4	1	0.0
MI	0	0.0	121	3.7
MN	0	0.0	23	0.7
MO	65	1.5	360	11.1
MS	16	0.4	0	0.0
NE	0	0.0	26	0.8
NJ	1	0.0	106	3.3
NM	1	0.0	1	0.0
NY	682	15.9	311	9.6
OH	343	8.0	79	2.4
OK	83	1.9	42	1.3
OR	5	0.1	0	0.0
PA	2	0.0	161	5.0
RQ	0	0.0	69	2.1
SC	1	0.0	37	1.1
TN	469	11.0	31	1.0
TX	14	0.3	262	8.1
VA	2	0.0	99	3.1
VQ	24	0.6	0	0.0
WA	334	7.8	5	0.2
WI	372	8.7	61	1.9
WV	0	0.0	61	1.9

Table 8

Distribution Of Sample By Level Of Education

	ARNG		USAR	
EDUCATION	N	%	N	%
NOT REPORTED	9	0.2	6	0.2
NO HS	68	1.6	16	0.5
SOME HS	376	8.8	135	4.2
GED	391	9.1	284	8.8
HS GRAD	1,634	38.2	1,097	34.0
SOME COL	1,245	29.1	943	29.2
COL GRAD	397	9.3	424	13.1
GRAD DEG	161	3.8	326	10.1

Table 9

Distribution Of Sample By Ethnic Group

	ARNG		USAR	
ETHNIC GROUP	N	%	N	%
NOT REPORTED	5	0.1	2	0.1
BLACK	892	20.8	1,084	33.5
WHITE	3,047	71.2	1,876	58.1
ASIAN	24	0.6	11	0.3
HISPANIC	240	5.6	228	7.1
OTHER	73	1.7	30	0.9

Table 10

Distribution Of Sample By Unit Type

	ARNG		USAR	
STATUS OF UNIT	N	%	N	%
UNKNOWN	7	0.2	110	3.4
COMBAT ARMS ONLY[a]	1,960	45.8	212	6.6
CAN BE COMBAT ARMS[b]	527	12.3	633	19.6
NOT COMBAT ARMS[c]	1,787	41.7	2,276	70.4
TOTALS	4,281	100.0	3,231	100.0

[a]Infantry, Armor, Field Artillery, Aviation, Air Defense Artillery. [b] Engineer, Chemical. [c]All others

Table 11

Comparison Of Sample To Reserve Component Population

	ARNG (%)		USAR[a] (%)	
STATUS	Sample	Pop.	Sample	Pop.
UNKNOWN	.4	NA	.5	NA
ENLISTED	91.5	90.3	82.2	84.8
WARRANT OFFICER	1.1	2.1	1.6	1.4
OFFICER	6.9	7.5	15.8	13.8

[a]Troop Program Units

Table 12

Comparison Of Sample To Population: ARNG

RANK	RACE	SEX	AGE	EXPECTED	OBSERVED	χ^2_{indiv}
OFF	BLACK	FEMALE	ALL	3.11	3	0.004
OFF	BLACK	MALE	17-29	5.21	7	0.613
OFF	BLACK	MALE	30+	9.28	10	0.057
OFF	WHITE	FEMALE	17-29	5.02	7	0.777
OFF	WHITE	FEMALE	30-39	7.86	7	0.094
OFF	WHITE	FEMALE	40+	2.78	6	3.726
OFF	WHITE	MALE	17-29	64.43	83	5.351
OFF	WHITE	MALE	30-39	118.66	102	2.340
OFF	WHITE	MALE	40-49	65.96	43	7.991
OFF	WHITE	MALE	50+	17.03	5	8.502
OFF	HISPANIC	BOTH	ALL	11.25	10	0.138
OFF	OTHER	BOTH	ALL	5.93	7	0.193
E&W	BLACK	FEMALE	17-19	2.64	4	0.701
E&W	BLACK	FEMALE	20-29	41.86	52	2.454
E&W	BLACK	FEMALE	30-39	17.02	26	4.744
E&W	BLACK	FEMALE	40+	2.26	4	1.335
E&W	BLACK	MALE	17-19	31.58	17	6.731
E&W	BLACK	MALE	20-29	346.18	486	56.477
E&W	BLACK	MALE	30-39	180.11	183	0.047
E&W	BLACK	MALE	40-49	56.47	78	8.213
E&W	BLACK	MALE	50+	12.76	12	0.046
E&W	WHITE	FEMALE	17-19	6.48	4	0.947
E&W	WHITE	FEMALE	20-29	74.88	100	8.430
E&W	WHITE	FEMALE	30-39	30.82	24	1.507
E&W	WHITE	FEMALE	40+	7.48	15	7.574
E&W	WHITE	MALE	17-19	175.78	149	4.080
E&W	WHITE	MALE	20-29	1223.51	1285	3.091
E&W	WHITE	MALE	30-39	731.53	686	2.834
E&W	WHITE	MALE	40-49	428.39	388	3.807
E&W	WHITE	MALE	50+	160.57	101	22.102
E&W	HISPANIC	FEMALE	ALL	10.04	7	0.920
E&W	HISPANIC	MALE	17-19	7.14	14	6.602
E&W	HISPANIC	MALE	20-29	113.27	99	1.798
E&W	HISPANIC	MALE	30-39	83.26	69	2.441
E&W	HISPANIC	MALE	40-49	38.11	28	2.683
E&W	HISPANIC	MALE	50+	12.83	7	2.649
E&W	OTHER	FEMALE	ALL	7.01	7	0.000
E&W	OTHER	MALE	17-19	5.86	7	0.220
E&W	OTHER	MALE	20-29	52.56	42	2.123
E&W	OTHER	MALE	30-39	26.24	23	0.401
E&W	OTHER	MALE	40-49	10.05	7	0.925
E&W	OTHER	MALE	50+	3.81	3	0.172

$\chi^2 = 185.84$ with 41 df; $p = 0.0$

Table 13

Comparison Of Sample To Population: USAR

RANK	RACE	SEX	AGE	EXPECTED	OBSERVED	χ^2_{indiv}
OFF	BLACK	FEMALE	ALL	15.23	5	6.874
OFF	BLACK	MALE	17-29	5.95	20	33.185
OFF	BLACK	MALE	30+	18.04	22	0.871
OFF	WHITE	FEMALE	17-29	9.45	11	0.255
OFF	WHITE	FEMALE	30-39	32.49	20	4.800
OFF	WHITE	FEMALE	40+	15.50	14	0.145
OFF	WHITE	MALE	17-29	37.86	45	1.349
OFF	WHITE	MALE	30-39	140.17	178	10.212
OFF	WHITE	MALE	40-49	122.07	152	7.341
OFF	WHITE	MALE	50+	24.37	16	2.872
OFF	HISPANIC	BOTH	ALL	6.35	8	0.427
OFF	OTHER	BOTH	ALL	11.49	2	7.842
E&W	BLACK	FEMALE	17-19	10.95	13	0.383
E&W	BLACK	FEMALE	20-29	129.43	152	3.936
E&W	BLACK	FEMALE	30-39	52.95	47	0.668
E&W	BLACK	FEMALE	40+	8.77	7	0.356
E&W	BLACK	MALE	17-19	29.67	25	0.735
E&W	BLACK	MALE	20-29	317.23	495	99.622
E&W	BLACK	MALE	30-39	165.23	210	12.133
E&W	BLACK	MALE	40-49	56.99	66	1.424
E&W	BLACK	MALE	50+	11.24	13	0.275
E&W	WHITE	FEMALE	17-19	18.64	16	0.375
E&W	WHITE	FEMALE	20-29	144.85	113	7.004
E&W	WHITE	FEMALE	30-39	55.16	37	5.978
E&W	WHITE	FEMALE	40+	13.43	9	1.459
E&W	WHITE	MALE	17-19	133.93	102	7.611
E&W	WHITE	MALE	20-29	719.74	616	14.953
E&W	WHITE	MALE	30-39	376.09	307	12.692
E&W	WHITE	MALE	40-49	224.57	163	16.879
E&W	WHITE	MALE	50+	70.44	51	5.367
E&W	HISPANIC	FEMALE	ALL	16.32	19	0.440
E&W	HISPANIC	MALE	17-19	6.09	8	0.600
E&W	HISPANIC	MALE	20-29	59.26	97	24.027
E&W	HISPANIC	MALE	30-39	36.64	67	25.150
E&W	HISPANIC	MALE	40-49	11.92	19	4.200
E&W	HISPANIC	MALE	50+	3.20	6	2.461
E&W	OTHER	FEMALE	ALL	11.37	10	0.165
E&W	OTHER	MALE	17-19	5.77	5	0.103
E&W	OTHER	MALE	20-29	38.49	13	16.878
E&W	OTHER	MALE	30-39	15.55	7	4.700
E&W	OTHER	MALE	40-49	4.86	2	1.685
E&W	OTHER	MALE	50+	1.28	1	0.060

$\chi 2$ = 348.492 with 41 df; p = 0.0

Table 14

Breakdown Of Sample By Site

Site	Sample Size
Fort McClellan, AL	406
Fort McCoy, WI	917
Fort Polk, LA	267
Yakima Firing Center, WA	330
Camp Edwards, MA	231
Camp Roberts, CA	609
Fort Drum, NY	392
Camp Shelby, MS	483
Fort Hood, TX	375
Camp Grayling, MI	363
Fort Campbell, KY	575
Fort Chaffee, AR	282
Fort Eustis, VA	408
Fort Stewart, GA	421
Fort Sill, OK	641
Fort Bragg, NC	411
Fort Carson, CO	429
Total	7,510

Table 15

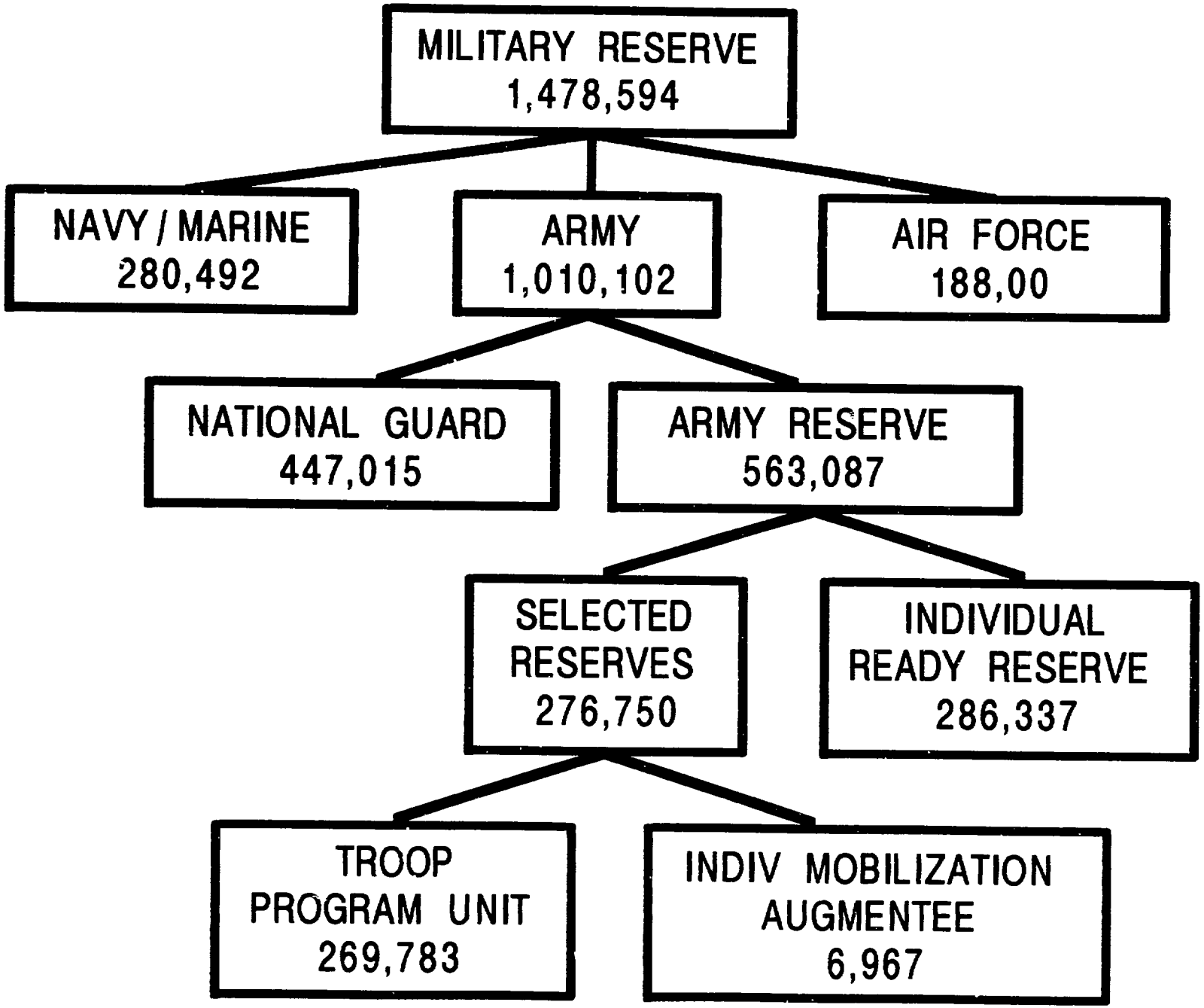
Breakdown Of Sample By Selection Method

Method	N	Proportion of Sample
Unknown	91	1.2
By Unit[a]	1,463	19.5
By Unit[b]	1,924	25.6
Census[c]	982	13.1
Random by examiner	3,001	39.9

[a]Criteria not known. [b]Criteria in LOI not used. [c]More than 95% of unit examined.

FIGURES

Figure 1


MILITARY RESERVE
1,478,594
NAVY / MARINE
280,492
ARMY
1,010,102
AIR FORCE
188,00
NATIONAL GUARD
447,015
ARMY RESERVE
563,087
SELECTED
RESERVES
276,750
INDIVIDUAL
READY RESERVE
286,337
TROOP
PROGRAM UNIT
269,783
INDIV MOBILIZATION
AUGMENTEE
6,967

APPENDIX

APPENDIX A

LETTER OF INSTRUCTION

GENERAL INSTRUCTIONS

EXAMINATION FORM ENTRIES

The data entry form is a two-sided 8 1/2 x 11 page.

Information should be entered using pencil only.

If an incorrect entry is made, erase it completely and enter the correct data clearly.

All data entries must be entered on the form by either the examiner or a trained recorder. Do not allow the patient to make any entries on the data form.

Never guess at a call or try to remember it and fill it in later. Accuracy of the data is the most important consideration.

SEQUENCE OF EXAMINATION

1 - Patient information

2 - DMFS Assessment

3 - Pericoronitis Assessment

4 - Periodontal Attachment Assessment

5 - ANUG Assessment

6 - Treatment Needs and Emergency Needs Assessment

7 - Prosthetic Assessment

8 - Patient Classification

RECORDING GENERAL SURVEY INFORMATION

Answer all of the questions in the general information portion of the form using the following guidelines:

1. SSN - last four digits of social security number.

2. RESPONDENT - enter a one-digit number according to the following code:

   1 = patient consents, exam not contraindicated by medical history

   2 = patient consents to repeat exam

   3 = patient presents to examination site but refuses exa

   4= designated patient did not present to examination site

   5 = patient not examined due to present medical condi tion or past medical history

3. SSI/MOS - specialty skill indicator (for example, a general dentistry officer has the SSI of 63A). If patient is not sure, leave it blank

4. SEX - self explanatory.

5. AGE - age at last birthday.

6. EDUCATION CODE - self explanatory. Use a score of "5" for Associate degree.

7. ETHNIC CODE - self explanatory.

8. PAY GRADE - as per example on form.

9. YEARS IN GUARD/RESERVES - only time in USAR/ARNG.

10. STATUS CODE - self explanatory.

11. UNIT CODE (UIC) - unit identification code; a list of units and their UICs will be provided to each examination team.

12. ARE YOU COVERED BY A DENTAL INSURANCE PLAN? Patient's or spouse's plan.

13. DO YOU HAVE A PRIVATE DENTIST? - does the patient have a dentist that he sees at least once every 2 years?

14. WHEN DID YOU LAST SEE A DENTIST? (INDICATE NUMBER OF MONTHS) - number of months since last dentist for any purpose.

15. DO YOU THINK YOU ARE IN GOOD DENTAL HEALTH? - patient's best guess.

16. WHAT SELECTION CRITERION WAS USED TO OBTAIN THIS PATIENT? Enter a one-digit number using the following codes:

0 = Patient presents individually - method of selection unknown

1 = Patient presents as part of quota from unit; criteria used to select quota unknown

2 = Patient presents as part of quota from unit; criteria used to select quota provided by examiner or project officer.

3 = Entire unit (95% or more) examined

4 = Patient picked at random from unit roster by examiner or project officer.

17. EXAMINER'S LAST FOUR SSN - (for data management purposes only).

18. TODAY'S DATE - self explanatory.

DMFS DETERMINATION

GENERAL INSTRUCTIONS

For the DMFS assessment, examine all teeth, excluding third molars. Make an entry for every tooth on the form.

Conduct the DMFS assessment separately; do not combine it with other portions of the examination.

Do not score deciduous teeth in the DMFS determination. If a deciduous tooth occupies the space of an unerupted permanent successor, score the permanent tooth as unerupted and disregard the deciduous tooth. If both are present, score only the permanent tooth.

Supernumerary teeth should be disregarded in the DMFS assessment. If a supernumerary tooth exists, determine the "legitimate" occupant of the space and score it accordingly.

If you determine that a third molar is occupying the space of a missing second molar, disregard the third molar and score the

second molar as missing according to the guidelines for scoring missing teeth.

While evaluating surfaces of malposed or rotated teeth, score the surfaces based on the anatomy of the crown and not on the relative positions of the surfaces in the mouth.

The decision rules used for DMFS assessment may seem arbitrary and contrary to good clinical training and experience. Adhere strictly to these rules during this portion of the exam.

INDIVIDUAL TOOTH SCORES

In the DMFS Assessment portion of the form there is a row of boxes for every tooth. Each row is numbered with the tooth number of a particular tooth. The row of boxes corresponding to each third molar has been blocked out.

The column formed by the first box in every row is referred to as the SCEMUY column, named for the codes that you should use in the boxes in that column. These codes are:

S = Sound tooth
C = Crowned tooth (full coverage)
E = Extracted due to decay or periodontal disease
M = Lost for other reasons
U = Unerupted or congenitally missing
Y = Excluded from the study

The remainder of the blocks in the row for each tooth form columns that are headed by the letters M,O,D,F, and L referring to the five surfaces of each posterior tooth. Note that for anterior teeth the O blocks have been marked out because anterior teeth are not considered to have an incisal surface in DMFS calculation. The two codes that should be used in these columns are:

D = Decayed
F = Filled

The codes S,C,E,M,U, and Y are used to refer to the tooth as a whole. Do not use them in the boxes in the individual surface columns.

The codes D and F refer only to specific surfaces and should never be used in the SCEMUY column.

If you score a tooth using a box in the SCEMUY column, leave the boxes in the individual surface columns blank for that tooth.

If you score individual surfaces for a tooth using the boxes in the individual surface columns, then leave the box in the SCEMUY column blank for that tooth.

The decision rules that you should use in scoring the teeth with these codes are discussed in the remainder of this section.

SOUND TEETH

If a tooth has no carious lesions or restorations that were placed because of carious lesions, score the tooth as sound by placing an "S" in the SCEMUY column for that tooth. If you score a tooth as sound, do not score any individual surfaces in the surface columns. Teeth that have restorations that were placed only because of trauma or only for esthetic reasons are considered sound in the DMFS assessment.

CARIOUS TEETH

The presence of gross cavitation is sufficient for the diagnosis of caries. Use the following criteria for teeth with small or incipient lesions.

1. Pits and fissures on the occlusal, buccal, and lingual surfaces are diagnosed as carious when the explorer catches after insertion with moderate to firm pressure and the catch is accompanied by one or more of the following signs of decay:

a. Softness at the base of the area.

b. Opacity adjacent to the area as evidence of undermining or demineralization.

c. Softened enamel adjacent to the area which may be scraped away with the explorer.

2. Smooth areas on buccal or lingual surfaces are diagnosed as carious if they are decalcified or if there is a white spot and the area is found to be soft by:

a. Penetration with an explorer.

b. Scraping away the enamel with the explorer.

3. Proximal surfaces, in areas exposed to direct visual and tactile examination, are judged by the same criteria that apply to smooth surfaces on the buccal and lingual. In areas that cannot be examined directly, a discontinuity in the enamel in which the explorer catches should be diagnosed as carious if there is softness. In posterior teeth, visual evidence of

undermining under a marginal ridge is not sufficient evidence of a proximal lesion unless a surface break can be entered with the explorer. In the anterior teeth, transillumination can serve as a useful aid in discovering proximal lesions. Ideally, the actual diagnosis of caries should be confirmed with an explorer; however, clear visualization of a lesion by transillumination can justify a positive diagnosis.

For each tooth, score all carious surfaces by entering "Ds" in the boxes in the appropriate individual surface columns.

If you score one or more carious lesions for any tooth, make no score in the SCEMUY column for that tooth.

When the tooth crown is destroyed by caries and only the roots remain, place a "D" in all surface columns for that tooth.

When a carious lesion on a surface extends beyond the line angle onto another surface, score the other surface as carious. If you have difficulty deciding if a lesion crosses a line angle, be conservative and don't add the additional surface.

In the DMFS determination, incisal edges of anterior teeth are not considered as separate surfaces and are not represented on the data collection forms. If a lesion is confined solely to the incisal edge, score the nearest adjacent surface as carious. If a restored surface has either recurrent decay or a separate carious lesion, score that surface as decayed.

MISSING TEETH

Permanent teeth extracted because of caries or periodontal disease should be scored with an "E" in the SCEMUY column. No mark should be placed in any of the individual surface columns for that tooth.

Permanent teeth that have been lost for reasons other than caries or periodontal disease will be scored with an "M" in the SCEMUY column. Teeth included in this category are teeth that have been avulsed and those extracted for orthodontic reasons. No marks should be placed in the individual surface columns for that tooth.

Permanent teeth that have never erupted into the mouth should be scored as "U" in the SCEMUY column. This category includes both unerupted and congenitally absent teeth.

FILLED TEETH

Score all surfaces that have been restored because of caries with "Fs" in the individual surface columns. Don't score a surface as filled if it has been restored solely for esthetic purposes or to repair damage from trauma.

If a restoration on a posterior tooth extends beyond a line angle onto another surface, score the other surface as filled. If it is difficult to determine if a restoration has crossed a line angle onto another surface, be conservative and do not include the additional surface.

A proximal filling on an anterior tooth is not considered to involve the adjacent lingual or labial surface unless it extends at least one-third of the distance to the opposite proximal surface.

If a tooth has a defective restoration, missing restoration or partially missing restoration, score the surfaces involved in the original preparation outline as filled unless decay is present. If decay is present in any portion of a defective restoration, score only the carious surfaces as decayed.

If a tooth has a full coverage crown placed because of caries, score the tooth with a "C" in the SCEMUY column. If you score a tooth is this manner, don't score the individual surfaces. If you determine that a full coverage crown was placed solely for esthetic purposes or to repair damage from trauma, mark the tooth as sound. If a full coverage crown has current decay, don't use the "C" code; mark the appropriate surfaces as decayed and the remaining surfaces as filled.

If a tooth has been restored with a partial coverage cast restoration, placed because of decay, score the surfaces covered with "Fs" in the individual surface columns. Don't put a "C" in the SCEMUY column; the "C" is for full coverage only. If the restoration extends slightly past a line angle onto the buccal surface simply as a matter of standard preparation design, don't include the buccal.

EXCLUDED TEETH

Teeth that are present but cannot be scored for the DMFS assessment should be scored with a "Y" in the SCEMUY column. Don't use teeth that are present but cannot be scored for the DMFS assessment should be scored with a "Y" in the SCEMUY column. Don't use the "Y" in the individual surface columns; the entire tooth must be excluded.

If you cannot examine all surfaces adequately, exclude the entire tooth. Try to exclude as few teeth as possible.

PERICORONITIS ASSESSMENT

Do not use simply to indicate the presence of partially erupted teeth. In this study, make a diagnosis of pericoronitis only if one or more of the following are present: pain, suppuration, or swelling.

PERIODONTAL ATTACHMENT ASSESSMENT

Examine the periodontal attachment on one side of the mouth only. Determine which side to examine from the last digit of the patient's SSN. If that digit is even (zero is even), examine the right side; if it's odd, examine the left side. If the last digit has already been used for random sampling, use the next to the last digit.

On the buccal and mesial surfaces of each tooth, measure the distance from the marginal gingiva to the CEJ and the distance from the marginal gingiva to the bottom of the sulcus or pocket.

For single rooted teeth, measure the buccal surface from the midpoint of that surface. For molars, measure from the midpoint of the buccal surface of the mesial or mesiobuccal root.

Measure the mesial surface from the buccal, getting as close to the contact point as possible while holding the probe parallel with the long axis of the tooth.

Round all measurements downward. This may result in a score of zero sulcus depth.

Use the left side of the Periodontal Assessment Section for maxillary measurements and the right side for mandibular measurements. On each side, record the buccal measurements in the top two rows of boxes and the mesial measurements in the bottom two. The rows marked "A" are for the measurements from the gingival margin to the CEJ. The rows marked "B" are for the measurements from the gingival margin to the bottom of the sulcus or pocket.

The measurement from the gingival margin may be negative if the gingival margin is apical to the CEJ. If you record a negative number, make a definite minus sign in front of it.

Make an entry in every box in this section of the form. If you are unable to make a measurement, line out the corresponding box.

If a tooth is missing, line out all four boxes associated with that tooth.

If the mesial or mesiobuccal root of a molar is missing, exclude the buccal measurement; that measurement must be on the buccal of that root. Do not substitute the distal root.

ANUG ASSESSMENT

Do not diagnosis ANUG unless the patient exhibits at least one necrotic papilla. A severe gingivitis is not sufficient.

If the patient has ANUG, place a "1" in the box provided. If not, place a "0" in the box.

TREATMENT NEEDS AND EMERGENCY TREATMENT ASSESSMENT

TREATMENT NEEDS ASSESSMENT

You may combine the Treatment Needs Assessment with the Emergency Treatment Assessment.

In the Treatment Needs Assessment, examine each permanent tooth that is present and estimate the treatment requirements for that particular tooth.

All permanent teeth present in the mouth, including third molars, are included in this portion of the exam.

Score the treatment requirements for each tooth according to the following codes:

0 = no treatment required
1 = one surface restoration is required (not cast metal)
2 = two surface restoration is required (not cast metal)
3 = three surface restoration is required (not cast metal)
4 = four surface restoration is required (not cast metal)
5 = five surface restoration or cast metal restoration is required
6 = extraction of the tooth is required

All possible types of treatment are not included in the list above. Do not try to build in or compensate for these other types of treatment. For example, don't call for cast restorations on two teeth because you feel that they should be bridge abutments unless they require crowns in their own right. Similarly, don't treatment plan a restoration for a tooth that

you suspect needs root canal therapy unless the tooth requires that restoration without the endodontic treatment.

Make an entry in the treatment needs column for every tooth on the form. Place a "0" in the column for missing teeth.

Be conservative when you treatment plan each tooth. Indicate that amount of care that will maintain or restore function. If you are in doubt as to whether to replace a restoration, restore an additional surface, or call for a cast restoration, don't do it.

EMERGENCY NEEDS ASSESSMENT

This portion of the examination may be combined with the Treatment Needs Assessment.

All permanent teeth present will be scored in this portion of the examination.

Score each tooth with a "3" in the column labeled "Class 3" if you feel that it will cause a dental emergency within the next 12 months if left untreated. Place a "0" in that column if you feel that the tooth will not cause a dental emergency within the next 12 months.

Place a "0" in the "Class 3" column for each missing tooth.

Make one of the two possible entries, either "0" or "3", for every tooth on the form.

PROSTHETIC ASSESSMENT

Answer the questions using the following guidelines:

1. HOW MANY DENTURES ARE PRESENT? If the patient is wearing complete or partial removable prostheses, indicate the number of each in the boxes provided. Do not count prostheses unless they are in the patient's possession at the examination.

2. HOW MANY DENTURES ARE REQUIRED? Indicate the number of complete and partial removable prostheses that you would treatment plan for the patient. Be conservative.

PATIENT CLASSIFICATION

Indicate the patient's dental classification according to the definitions in AR 40-3.

The definitions of each class are:

Class 1 - Personnel who require no dental treatment.

Class 2 - Personnel whose existing dental condition is unlikely to result in a dental emergency within 12 months.

Class 3 - Personnel who require dental treatment to correct a dental condition that is likely to cause a dental emergency within 12 months.

Class 4 - Personnel who require a dental examination.

PATIENT SELECTION

By name selection from a unit roster is the only sure way to obtain a random sample. For example, if you need 20 troops from a 100 man unit, choose every fifth person. It is critical that you do all that you can to select your patients in this manner. A similar approach used the last digit of the soldier's SSN. For example, you could take a 10% sample by restricting your patients to a last SSN digit of "0", or "1", or "2"... . Similarly, you could draw a 20% sample by using any two digits. This may not work too well in small units but should be good for larger units (over 30).

If this is impossible, another (although inferior) method of patient selection is examining the entire unit. If the unit is large (over 100), you will undersample the other units. The possibility will exist that the unit you examined in toto is atypical (for example, from a particularly disadvantaged region) and may bias the results. Do not give control of the selection process to the unit. It is important to guard against the unit's sending you their misfits or (horror of horrors) their dental sick call.

IF YOU NEED HELP

INTERPRETATION OF INSTRUCTIONS

Call LTC Jay D. Shulman or MAJ Richard D. Guerin at the following numbers:

AV 471-6028/7027

COM (512) 221-6028/7027

LACK OF COOPERATION FROM UNIT COMMANDERS

For problems with National Guard Units call:

LTC William A. Ward (DC ARNG)
Dental Plans Officer
National Guard Bureau
AV 289-3084/3085

For problems with USAR Units call:

COL Michael N. Mattia
FORSCOM Dental Surgeon
Ft. McPherson, GA 30330
AV 588-4216