

Running Head: MEPRS Data Reliability

Data Quality in the Military Health System:

A Research of Data Reliability in the Medical Expense and Performance Reporting System

(MEPRS)

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Graduate Management Project (GMP)

May, 1998

**DTIC QUALITY INSPECTED 4**

**20000113 001**

# REPORT DOCUMENTATION PAGE

*Form Approved*  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY <i>(Leave blank)</i>		2. REPORT DATE MAY 1998		3. REPORT TYPE AND DATES COVERED FINAL REPORT ( 0897 TO 0498 )	
4. TITLE AND SUBTITLE DATA QUALITY IN THE MILITARY HEALTH SYSTEM A RESEARCH OF DATA RELIABILITY IN THE MEDICAL EXPENSE AND PERFORMANCE REPORTING SYSTEM (MEPRS)				5. FUNDING NUMBERS	
6. AUTHOR(S) CPT GILROY G. GOTIANGCO					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SYSTEMS RESEARCH AND APPLICATIONS INTERNATIONAL `INC. 1777 NORTHWEST LOOP 410 SUITE 510 SAN ANTONIO, TEXAS 78217				8. PERFORMING ORGANIZATION REPORT NUMBER  34a-98	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) US ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL BLDG 2841 MCCS-HRA US ARMY-BAYLOR PROGRAM IN HCA 3151 SCOTT ROAD, SUITE 1412 FORT SAM HOUSTON, TX 78234-6135				10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE. DISTRIBUTION IS UNLIMITED				12b. DISTRIBUTION CODE	
13. ABSTRACT <i>(Maximum 200 words)</i> In light of significant data driven programs (Enrollment Based Capitation, Medicare Subvention) within the Department of Defense (Health Affairs), data quality management is becoming an important management principle. A key information system these programs rely on is the Medical Expense and Performance Reporting System (MEPRS). This paper studies the dimension of data reliability within the MEPRS system. It compares and analyzes data from the local MEPRS system at each graduate medical education (GME) medical treatment facility (MTF) for all three services, and compares it to the same data sets residing at the replicated databases at each MTF's affiliated central MEPRS system (MEPRS Central or MEQS). Up to now, data reliability is an assumption held by many within DoD. Unfortunately, this has never been comprehensively studied and therefore, never proven. Without reliability verification, the other fundamental data quality principles (accuracy, completeness, and currency) become meaningless. This paper will research MEPRS reliability by comparing the consistency of data between the local and central systems for each GME MTF within DoD at the MTF level (gross summary level), the functional category level (MEPRS 1st Digit), and the work center level (MEPRS 3rd Digit). This study is a necessary fundamental step in the eEstablishment of sound data quality improvement programs for the DoD MEPRS system.SA					
14. SUBJECT TERMS MEPRS, DATA QUALITY				15. NUMBER OF PAGES 83	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT N/A		18. SECURITY CLASSIFICATION OF THIS PAGE N/A		19. SECURITY CLASSIFICATION OF ABSTRACT N/A	
				20. LIMITATION OF ABSTRACT UL	

## ACKNOWLEDGEMENTS

This author would like to thank all the personnel who assisted me during the year. First, this paper would have been impossible to start if it were not for the cooperation of the MEPRS offices at all fourteen medical treatment facilities. I would also like to thank the bio-statistics staff at SRA, Dr. John Coventry, Sandy Rogers, Kathy Hutchinson, Norma Gonzalez, Herb Escobar, and Rahul Khundra for all their guidance and help. Their assistance made it possible for me to collect and properly analyze my data. More importantly they were an important source for needed advice and education concerning the subject matter. Lastly, special thanks to all my supervisors, Dr. George Gisin, LTC Sandy White, and LTC Charles Wainright for their mentorship and support throughout the year.

## ABSTRACT

In light of significant data driven programs (Enrollment Based Capitation, Medicare Subvention) within the Department of Defense (Health Affairs) data quality management is becoming an important management discipline. A key information system these programs rely upon is the Medical Expense and Performance Reporting System (MEPRS). This paper studies the dimension of data reliability within the MEPRS system. It compares and analyzes data from the local MEPRS system at each graduate medical education (GME) medical treatment facilities (MTFs) for all three services, and compares it to the same data sets residing at the replicated databases at each MTF's affiliated central MEPRS system (MEPRS Central or MEPRS Executive Query System). Up to now, data reliability is an assumption held by many within DoD. Unfortunately, this has never been comprehensively studied and therefore, never proven. Without reliability verification, the other fundamental data quality principles (accuracy, completeness and currency) become meaningless. This paper researched MEPRS reliability by comparing the consistency of data between the local and central systems for each GME MTF within DoD at the MTF level (gross summary level), the functional category level (MEPRS 1st Digit), and the work center level (MEPRS 3rd digit). This study was a necessary fundamental step in the establishment of sound data improvement programs for the DoD MEPRS system.

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## INTRODUCTION

### Conditions Which Prompted the Study

This paper will research the data integrity of the Medical Expense and Reporting System (MEPRS) in the Military Health System (MHS). This study is important because of the dramatic changes currently occurring in the MHS. Department of Defense (DoD) downsizing efforts, combined with a national imperative to reduce health care costs, are pressuring the MHS to restructure into a more cost effective system. Staffing, services, and budgets are all being analyzed for process improvements. In 1994, DoD published The Economics of Sizing the Military Medical Establishment, more commonly referred to as the 'Section 733 study', that evaluated the economic efficiencies of the pre-existing structure of the MHS (DoD, 1994). The study identified inefficiencies in the MHS and also suggested the size of the organization was larger than needed. In response to this "make or buy" study, the MHS has instituted very aggressive restructuring and downsizing programs. The rationale and basis for current and future changes are based upon the information systems currently supporting the MHS (Corey, 1997).

The MHS has many systems. Five of the most critical systems are: 1. The Medical Expense and Performance Reporting System (MEPRS), 2. Retrospective Case Mix Analysis System (RCMAS), 3. Resource Analysis and Planning System (RAPS), 4. The Defense Eligibility and Enrollment Reporting System (DEERS), and 5. The Composite Health Care System (CHCS). As a whole, the MHS relies on these systems (and their subsets) to provide accurate information as part of the decision making process.

The MEPRS system is a "multi-user information system that supports the reporting and analysis of financial and operating performance data from Department of Defense (DoD) medical

treatment facilities (MTFs).” (OASD(HA), 1995a). Its purpose is to provide utilization, manpower, costing, staffing, and expense information concerning the MHS.

RCMAS is a biometrics database containing patient level information. It is used for “healthcare planning, management, and assessment” (OASD(HA), 1995b). It collects all inpatient direct care (from the Standard Inpatient Data Record (SIDR) and the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS)). It provides admission, treatment, and disposition information for all patients treated within the MHS MTF facilities.

DEERS is DoD’s population demographics database. It contains demographic information on all beneficiaries in DoD. Like RCMAS, it provides detailed individual information.

RAPS is the MHS population projection and utilization model. It is a highly aggregated system that conducts scenario analysis and forecasting within the MHS. Using information pulled from other systems, it provides a six year projection of beneficiary population and their impact (medical resources consumption, demand) (OASD (HA), 1994).

Lastly, CHCS is DoD’s integrated hospital computer system. Unlike the other systems mentioned, CHCS is an operational system designed to support the day-to-day operations of an MTF (patient scheduling, lab, pharmacy, and administration). It is also the gateway to other information systems within the hospital. This is one of the source systems feeding information to the other database systems.

Based upon these systems, the MHS is developing programs designed to dramatically change the organization. Three key programs are TRICARE, Enrollment Based Capitation (EBC), and Medicare Subvention. TRICARE is a program attempting to adapt certain managed care principles into the MHS operating structure. Using the concept of primary care managers

(PCMs) and cost-shares, the MHS hopes to recapture revenue lost to the civilian health care community and to reduce utilization rates of its beneficiary population. TRICARE is changing the delivery of care but did not change the method in which the MTFs are operationally funded. EBC and Medicare Subvention are the two programs currently in development designed to restructure the financing of care to an at-risk model. EBC and Medicare Subvention will establish a funding mechanism whereby the MTF will be financially rewarded or penalized depending upon its operational efficiencies.

EBC is a prospective budgeting program whereby each MTF's budget will be determined according to the population in their catchment area who have identified the MTF as the facility of choice for medical care (TRICARE Prime). The MTF will lose funding for any beneficiary choosing any other alternatives under the TRICARE system (those choosing the contracted civilian HMO partner (TRICARE Extra) or those desiring complete freedom of choice in either the military or civilian community (TRICARE Standard)). Despite TRICARE Prime's limited patient choice, it is being encouraged because it is the most economical for the patient and most importantly, the MHS.

EBC is a fundamentally new method for developing budgets. The previous historical based budgeting determined an MTF's budget based upon previous expenditures. EBC is very different because it bases the budget upon population served. Following the civilian managed care principles, EBC is a prospective payment system because the facility is funded up-front based upon a per-member-per-month rate. Considering the wide variance of medical costs throughout the nation, a key element of EBC is the calculation of the MTF specific costs. These costs are to be determined from information extracted from various MHS systems; specifically, MEPRS.

The second program, Medicare Subvention, is the MHS' attempt to recoup Medicare costs associated with providing care to the eligible beneficiary population 65 and over. The reimbursable costs involve computations based upon historical level-of-effort (LOE) (OASD(HA), 1996b). The MTF's reimbursement rate will be based upon a percentage of the historical LOE. Like EBC, Medicare subvention uses MEPRS data as a critical component in its formulas.

MEPRS is a key system in many of these programs because it is the only system collecting cost information. The MEPRS consists of source (MTF specific) and replicated (service aggregated) systems. The local database system, Expense and Accounting System version III (EASIII), resides at the MTF's resource management division (RMD). There are two central databases: 1. MEPRS Central System at Fort Detrick, Maryland, and 2. MEPRS Executive Query System (MEQS), located at Health Care Systems Support Activity, San Antonio, TX. The MEQS system is newer and is used by both the Army, and most recently, by the Air Force Medical Commands as their primary source for decision support information. MEPRS Central is an older legacy system still used by the Navy Medical Command. Each service aggregates all its service MTF's data in their respective central databases (future references to MEPRS centralized databases will refer to both MEQS and MEPRS Central).

The systems adage of "Garbage In, Garbage Out" (GIGO) refers to the usefulness of the data if any system starts with poor information. This is relevant to the MHS because in order for OASD (HA) to develop and properly execute reengineering programs, the information supporting them cannot be garbage. Programs such as EBC and Medicare Subvention rely on the assumption of MEPRS accuracy and reliability. The data from MEPRS is integral to the

price calculations in both programs. Unfortunately, recent studies have revealed data quality problems within the various MHS systems.

One study compared the MEPRS against the RCMAS system. MEPRS and RCMAS both collect inpatient visits and bed-days for every MTF. Theoretically, they should both agree with one another; in reality, they rarely match. The differences between the two are attributed towards the differences in reporting methods. The patient information in RCMAS is richer<sup>1</sup> but does not contain any costing information. Any calculations requiring input from the two systems (cost per Diagnosis Related Group (DRG), patient level cost accounting (PLCA)) requires adjustments to consider these differences (OASD(HA), 1996a) (Corey, 1997).

A second study involved the collection of ambulatory workload for the TRICARE program. The TRICARE program involves a partnership between the MHS and a civilian HMO. The civilian HMO assumes financial risk for the population enrolled in its program. One required component of the HMO program is outpatient services. In order to be successful, the HMO needs to know the potential population and their utilization rates (frequency and intensity) so it can position the appropriate amount of resources. It is the responsibility of the MHS to provide this information to the contractor or else risk a monetary penalty (\$32 million per month)(Corey, 1997). Unfortunately, the MHS is having a difficult time collecting this information. The Ambulatory Data System (ADS) was fielded in 1995 and is designed to capture this specific information. To date, the MHS is still unable to capture all their ambulatory workload in ADS.

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<sup>1</sup> The RCMAS database captures patient level information while MEPRS only captures summary information.

Considering the impact these systems have on the future of the MHS, the GIGO systems adage has been humorously modified to "Garbage In, Gospel Out". The "Gospel" refers to the decisions and programs implemented based upon these systems. Data quality is very important--regardless if the data is good or bad, decisions will be made from these systems.

#### Statement of the Problem or Question

With regard to the data quality within the MHS, OASD (HA) is instituting a program directly focused on data issues. The program now underway is the Corporate Executive Information System (CEIS). This program is designed to change the way information is delivered throughout the MHS. Currently, the systems used for decision support (MEPRS centralized databases, RCMAS, DEERS) are very difficult to access and use. CEIS is restructuring these systems. An important feature of CEIS is the development of regional Integrated Databases (IDBs). Once CEIS is mature, single centralized systems will no longer exist. Instead there will be region specific IDBs aggregating information on all MTFs within its region. Furthermore, these IDBs will be supported with powerful, user-friendly, querying tools.

To promote data quality in CEIS, the Statistical Quality Control Branch (SQCB) has been created to establish metrics and benchmarks of the data supporting the IDBs. The objective is to "monitor performance, standardize reporting, and to modify behavior" (Corey, 1997). The program bases the metrics and benchmarks from central systems. The benchmarks will be used to gauge and measure an MTF's performance among one another and compared to the MHS system as a whole.

MEPRS is one of the central systems targeted for data quality improvement. As mentioned, the MEPRS system is composed of replicated databases. Each MTF has its own MEPRS system and feeds copies of their local information to the centralized systems, MEQS or

MEPRS Central. The method and systems used to replicate the data from the local system to the central system is different among the three services. The Army, Navy, and Air Force uses different agencies and systems to forward their MTF's MEPRS data to the central system. Though the local MEPRS systems will contain the most current information, the OASD (HA) utilizes the central systems for their decision making purposes. MEPRS is a critical system within the MHS because is the only source of direct care cost information.

Theoretically, the information stored at the central systems should contain the exact information located at each MTF (after considering time delays due to the reporting schedule). Unfortunately, the effect of data replication of MEPRS data has not been investigated. Data consistency between point of collection systems, MTF local MEPRS (EASIII), to the decision support systems (MEQS and MEPRS Central) has not been thoroughly studied. The MHS currently assumes the data on the central systems to be consistent with the local systems. Despite the aggressive programs in place to improve data quality, there are no programs to investigate the reliability of MEPRS information on the replicated, decision support, central databases. Until properly researched, there is the possibility that many programs relying on MEPRS central systems data might be functioning with unreliable data.

The current variability of MEPRS reporting, the use of replicated databases for corporate level decision support, and the importance of the MEPRS system prompts three research questions. All research questions are specific to the data consistency issue of the MEPRS system.

#### Research Question 1

Are there differences between the data in the local MTF MEPRS systems and the data in the centralized systems that are being used by OASD (HA) for decision support?

#### Research Question 2

Are there differences in the quality of MEPRS data among the three services?

### Research Question 3

What are the causes and impacts of these differences?

#### Literature Review

The main issue at hand is the concept of data quality. With the proliferation and growing corporate dependence on databases, data quality is an important issue in all business sectors. The issue of quality must first be defined. Juran defined quality as a "fitness of use" determined by the user (Juran, 1974). Supporting this general concept, Deming defined quality as an "interaction between three participants", the product, the customer, and training of the customer (Deming, 1986). The customer has a strong, if not exclusive, input into the definition of quality. These theories and concepts were more readily applied to physical goods and services. Only recently has quality been applied to data and information.

There is now a specific management discipline regarding quality data - Total Data Quality Management (TDQM). Researchers are trying to define a comprehensive list of data quality attributes. While there are many varying definitions regarding data quality, some are generally agreed upon. Research indicates there are four commonly used characteristics to define data quality. Klein and Rossin identified the four characteristics common in most current research literature to be: completeness, accuracy, currency, and consistency (Klein, Rossin, 1997). Supporting these findings, Berg identified the most common four to be: completeness, accuracy, timeliness, and consistency (Berg, 1997). For all practical purposes, timeliness and currency are considered synonymous. This paper will endorse the four terms espoused by Klein and Rossin (Figure 1). A good definition of the data quality terms is provided by Gardyn:

“1. Correctness: The extent to which the data matches another set of data which acts as a specification or a reference set and the extent to which the data conforms to the business rules as specified by the users

2. Completeness: All data is available to satisfy the user requirements...

3. Consistency: There is a single representation of the same data, or if more than one representation, copies are controlled and have same format and content. The format and content conform to the business rules as defined by the users.

4. Currency: Data is up to date according to the user-specified timing. This may be as close of business previous day, as at the end of last week, etc.” (Gardyn, 1997)

Considering the significance of the MEPRS system, its data must be able to properly satisfy the four basic criteria for quality data. One shortfall of this data quality model is it assumes one quality can exist in the absence of others. Specifically, reviewed literature on data quality does not present any hierarchical or dependent relationships among the data quality attributes. This shortfall become obvious when considering MEPRS is being used as a tool to measure the efficiency of the MHS. In addition to the data quality model, a second model must be considered to properly assess the quality of the MEPRS system.

A related model applicable to the MEPRS system is that of a statistical measurement tool. Statistically, a sound measurement tool must have three qualities: reliability, validity, and practicality (Cooper, Emory, 1995) (Figure 2). A tool is considered reliable if it is consistent in its measurements. A tool is valid if it reflects the true state of the object to be measured. A tool is practical if it collects and produces useful information.

Since MEPRS collects workload, cost, and expense information, the practicality requirement is met. The issue of concern becomes MEPRS reliability. From the statistical

model, reliability it is a necessary prerequisite to validity (Cooper, Emory, 1995). If a measurement tool does not produce consistent results, it can never be valid. Related to MEPRS, information extracted at the central systems should produce the exact results if they were pulled from the local systems (again, after considering reporting delays). Until MEPRS is proven to be a reliable database, statistical and workload information derived from the central systems might be inaccurate. Testing the reliability of the replicated MEPRS databases (from the centralized databases) will provide the foundation for any future data quality improvement programs.

The statistical model presents the characteristics of a sound measurement instrument. The data quality model presents the characteristics of quality data. The MEPRS system should satisfy both models. Both models do not have to be considered separately because both have the same elements. Combining the two models produces a third model which the author of this research paper calls the Data Quality System (DQS) model. A comparison of both model's qualities reveals some correlation (Figure 3). Using Deming's and Juran's emphasis on the consumer, "Practicality" is the overarching domain. The database system must produce relevant and useful information. The second domain is database system reliability and consistency—the statistical model considers both terms synonymous. Based upon the statistical model's dependency relationship between reliability and validity, the last domain is validity with its subset attributes of correctness, completeness and accuracy. The significance of the comparison and the resulting DQS model is to highlight the importance of an information system's dependence on quality data if it is to function as a tool to provide measurements about the organization. Second, it provides a hierarchical relationship between the various qualities of data. Specifically, the relevancy of some characteristics depends upon the existence of others.

Using this model can be of value because current strategic and operational decisions are being based upon organizational information systems because they are serving as measurement tools. Improving or achieving quality data is imperative so management can properly support the decision making process. The penalty of poor data is well documented. First, poor data has limited application potential. An untrusted database severely limits management's capabilities to manage the company. A 1993 CIO survey revealed that over half the CIOs believed their information to have limited capabilities because of the lack of accuracy (Nayar, 1993). Most recently, the net worth of one of the nations largest HMO's, Oxford Health Plan, dropped over fifty percent in one day (from \$68.75 to \$27.875 per share ) because their book keeping systems failed to keep accurate information (Reuters, 1997). Within the industry as a whole, a study indicated the typical data error rate of 1-5% costs the organization an estimated 10% of their revenue (Redman, 1996).

As previously mentioned, MEPRS satisfies the Practicality domain because the expense data collected is useful. Unfortunately, the Reliability issue is still largely unproved. Specifically, it is currently unknown if the data contained in the central systems is consistent with the data contained in the local systems. Reliability must first be proven to support the systems validity. Database attributes such as accuracy, completeness, and currency becomes meaningless unless the system is first reliable.

A recent study by OASD (HA) illustrated the problem of system consistency. As previously mentioned, CEIS is a new system designed to make all MHS performance data readily available to the entire organization. The system extracts information from central and local database systems and aggregates it into region specific databases. The study investigated the integrity of the data between existing systems, RCMAS and RAPS, and compared it to the

newly developed IDBs. The IDBs were expected to produce the same results as the existing systems which it scheduled to replace. Interestingly, the results revealed a differences between the two. The report attributes the deltas to differences in the calculation formulas, formatting, interpretation of data, and system rounding errors (OASD (HA), 1997). Even though the research provides some explanation of the differences, it reveals the problems of database consistency. Until this study was completed, the data generated by CEIS and other source systems were assumed to be the same. This revelation is significant to decision makers. They need to know the limitations and peculiarities of specific database system prior to making any decisions based on the data.

This study exemplifies the importance of verifying data reliability. With regard to MEPRS, strategic decisions are being made on the central systems data; unfortunately, its reliability is still unknown.

#### Purpose

The primary purpose of this study is to establish the reliability (consistency) of the entire MEPRS system from point of entry at the MTF, EASIII, to the consolidated HA corporate database systems, MEQS and MEPRS Central. Specifically, this study will analyze expense and workload information from the MEPRS system and attempt to establish data reliability by responding to the three stated research questions.

#### Research Question 1

Are there differences between the data in the local MTF MEPRS systems and the data in the centralized systems that are being used by HA for decision support? A null and alternative hypothesis is generated for this question.

$H0_1$  : There are no differences between local MTF MEPRS data and its corresponding MEPRS central system data (MEQS or MEPRS Central).

$H1_1$  : There are differences between the local MTF MEPRS data and its corresponding MEPRS central system data (MEQS or MEPRS Central).

#### Research Question 2

Are there differences in the quality of MEPRS data among the three services?

$H0_2$  : The level of MEPRS data consistency among the Army, Navy, and Air Force MTFs are the same.

$H1_2$  : The level of MEPRS data consistency among the Army, Navy, and Air Force are not the same

#### Research Question 3

What are the causes and impacts of the differences should any exist?

This is a qualitative research task. It is dependent upon the results of the first two research questions. First, it will involve a thorough analysis of the process to determine the points in the system where the values are changed. Second it will evaluate the rationale for the change and discuss the impacts resulting from the change.

## METHOD AND PROCEDURES

The MHS has 587 MTFs (107 hospitals, 480 clinics) within its system (Corey, 1997). Conducting a comparison analysis of all these facilities would be beyond the resources of this research. This study, therefore, is only selecting the Graduate Medical Education (GME) facilities of the Army, Navy and Air Force. These GME facilities are commonly referred to as Medical Centers (MEDCENS). These facilities offer the most comprehensive care available within the system. Correspondingly, the data in the MEPRS systems of these facilities are more comprehensive compared to the smaller Medical Activities (MEDDACS) that do not offer the full spectrum of care. Within the MHS, there are 14 active GME MEDCENS: 6 Army, 3 Navy, and 5 Air Force. Each MEDCEN is assigned a unique 4-digit Defense Medical Information System Identification Code (DMISID). Appendix A lists all MTFs sampled in this study with their corresponding DMISID facility code

The study will extract the most recent MEPRS close out year information from each facility. A close-out year is defined as a non-current fiscal year. Since this study started during the end of the 1997 fiscal year, it will only consider 1995 and 1996 fiscal years. The purpose of selecting close-out years is to remove the confounder of corrections and updates. A comparison of the data values between the two systems would be difficult and meaningless if the underlying data sets were still undergoing updates and corrections. A stable data source is a necessary prerequisite for the purpose of analysis. Fiscal years 1995 and 1996 satisfy the data stability requirement.

MEPRS organizes its data by work centers. The MEPRS first digit code identifies the MTF functional categories (Appendix A). Each category, in itself, is further sub-categorized. The MEPRS second digit identifies the all summary accounts within the MTF functional

categories (Appendix B). The most granular, standardized coding method for all MTFs is the 3<sup>rd</sup> digit in the MEPRS code (third level MEPRS). The MEPRS third digit code identifies the specific work center within the summary account (Appendix C). MEPRS has a fourth digit but it is not standardized and is MTF specifically defined. The fourth digit categorizes each activity within the specific work center in the facility.

The MEPRS system contains over 100 data elements. This research will restrict itself to the five significant fields: expense, occupied bed days (OBD), dispositions, inpatient visits (IPV), and outpatient visits (OPV). The expense field shows the amount of resources, in dollars, the activity has consumed while operating. The OBD and dispositions are workload measurements exclusive for inpatient care activities (MEPRS 1st Digit 'A' categories). Inpatient and outpatient visits are workload measurements exclusive to the ambulatory care activities (MEPRS 1st Digit 'B' categories). These data elements are significant because, from them, workload efficiency measurements can be derived (cost per OBD, cost per disposition, cost per visit).

The test for the first hypothesis ( $H0_1$  : Local MEPRS = Central MEPRS), will involve a comparison between the MTF local MEPRS database and its corresponding central database (MEQS or MEPRS Central) up to the work center level. There will be three levels of comparison. First, this study will compare the MEPRS database expense information at the hospital. Next, this study will compare the MEPRS expense and workload information at the functional category level (MEPRS 1st Digit categories: 'A'-Inpatient Care, 'B'-Ambulatory Care, 'C'-Dental Care, 'D'-Ancillary Services, 'E'-Support Services, 'F'-Special Programs, and 'G'-Medical Readiness). Last, this study will conduct its most detailed MEPRS expense and

workload comparison at the work center level (MEPRS 3rd Digit categories: 'Axx', 'Bxx', 'Cxx', 'Dxx', 'Exx', 'Fxx', and 'Gxx')<sup>2</sup>.

This series of comparisons will be conducted for fiscal years 1995 and 1996. Specifically, this research will compare the MEPRS Detail 1 report generated at the local facility. The MEPRS 1 is a standard report generated and archived at all the MTFs. The MEPRS 1 includes key information of the facility at the work center, the functional category and at the hospital level. The variables of this study's interest are a component of the MEPRS Detail 1 report. The study will compare the local MEPRS Detail 1 report to similar information at the central databases. MEQS has a selectable standard report that presents its information in the MEPRS Detail 1 report format. The MEPRS Central System has no such report but the information is available through the database by constructing the appropriate queries.

The reader should be aware of the specific peculiarities the MEPRS Detail 1 report presents expense information. As mentioned, the report groups the data by the seven functional categories ('A' through 'G') and also by work center in each of the functional categories. The expense information for the Ancillary Services and Support Services ('D' and 'E' accounts) show values prior to the step-down process-before its costs are distributed to the other five accounts. The information for the Inpatient Care, Ambulatory Care, Dental Services, Special Programs, and Medical Readiness ('A', 'B', 'C', 'E', and 'F' respectively) show values during the post-step down phase after expenses have been distributed. The total hospital expense in the report only summarizes the five aforementioned accounts in the post step-down phase.

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<sup>2</sup> The 'xx' refers to any subset of accounts within the specific functional category. For example, AAA is the Internal Medicine work center which is belongs the 'A' Inpatient functional category.

The null hypothesis for Research Question One will be supported if the following criteria are met:

1. At the MTF summary level:
  - a. Zero total workload difference between the two systems
  - b. Zero total dollar expense difference between the two systems.
2. At the Functional category level ('A' through 'G'):
  - a. Zero total workload difference between the two systems
  - b. Zero total dollar expense difference between the two systems.
3. At the work center level:
  - a. Zero total workload difference between the two systems
  - b. Zero total dollar expense difference between the two systems.

This study is comparing the values at three levels because in MEPRS, a difference at a lower accounting level (e.g. at the work center) may not reflect any differences at the higher accounting level (functional categories or the hospital level). Likewise, a match of expense or workload values at the higher accounting level may not necessarily mean a match of the same values at the lower accounting levels.

For the second research question, this paper will compare the expense variances of each service to determine if the differences are uniform among all three services at the significance level of  $\alpha = .05$  level. If a significant difference is found, this study will conduct an appropriate post-hoc test to determine significant expense differences of one service to the others. In this test, there are three independent samples ( $k = 3$ : Army, Navy, Air Force). The Army MTFs sample consists of 6 items ( $n_1 = 6$ ). The Navy MTFs sample will consist of 3 items ( $n_2 = 3$ ).

The Air Force MTFs sample will consist of 5 ( $n_3 = 5$ ). This study will analyze each service's expense difference at each of the seven functional categories (Inpatient, Ambulatory, Dental, Ancillary, Support, Special Programs, and Medical Readiness).

Since variance of values is the focus, magnitude difference--defined as the absolute value percentage difference between the central MEPRS data compared to the local MEPRS data, will be the metric used to compare data consistency among the three services<sup>3</sup>

Throughout this study, this paper will document the process and procedures in place supporting the MEPRS system. If a data reliability problem is identified, this paper will attempt to identify the specific deficiencies in the process contributing to the problem.

#### Limitations

This study has three limitations. First, even though this study collected data from most of the large MTFs (GME MEDCENS), the 14 facilities only represent .02% of all the MTFs within DoD. Inferences on these results can only be applied to the facilities in this study and for fiscal years 1995 and 1996.

The second limitation stems from the distribution of the sample points (Figures 4 through 27). A parametric study is not feasible due to the number of outliers and extreme points. Specifically, the outliers could not be dismissed as anomalies and had to be retained. Additionally, the key measurement metric, magnitude differences (the metric upon which all comparative analysis is to be made) assumes a Chi-square distribution. Because of the natural existence of outliers and the non-normal distribution of the samples, a non-parametric study was selected (Sanders, 1995). This study will only report median values. It will use the Kruskal-

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<sup>3</sup> Formula for magnitude calculation:  $ABS [ ( \text{central data value} - \text{local data value} ) / \text{central data value} ]$ . The data value can be either expense or workload information.

Wallis, one-way ANOVA test to compare the median magnitude expense and workload differences among the three services. If the Kruskal-Wallis test identified significant differences at the  $\alpha = .05$  level, the post-hoc, Mann-Whitney, pair-wise test will be applied on the samples. Because a multiple pair-wise comparison on 3 independent samples (Army, Navy, Air Force) using the original  $\alpha$  of .05 would increase the Type I error<sup>4</sup> to 14% (Fisher, Belle, 1993), a Bonferroni adjustment to the significance level is necessary to keep the results of the pair-wise comparison valid. Since the 3 samples would require 3 comparisons (Air Force vs. Army, Air Force vs. Navy, Navy vs. Army) the significance level for each pair-wise was adjusted to  $\alpha=.017$  (Fisher, Belle, 1993) to achieve a significance level of  $\alpha^*=.05$  for all three multiple comparisons together.

The third limitation of this study is the source of the local MEPRS data. Since this study standardized on the hard copy MEPRS Detail 1 reports submitted by the facilities, it assumes the hard copy contain the most recent information available.

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<sup>4</sup> Type I error is rejecting a true null hypothesis. Probability of a Type I error and the level of significance should be the same. (Sanders, 1995)

## THE RESULTS

### Population Sample Sizes

This study attempted to collect MEPRS data from the 14 currently active GME facilities within DoD for fiscal years 1995 and 1996. For fiscal year 1995 the final MTF sample size was  $n=12^5$ . For fiscal year 1996, the final MTF sample size was also  $n=12^6$  but with different MTFs. Table 1 shows the total sample size for this study for all MTFs, all the functional categories, and all the work centers for fiscal years 1995 and 1996. Each MTF has six functional categories ('A' through 'G'). Table 2 shows the average number of work centers per functional category. Each of the GME MTFs had an average of 177 work centers.

Analysis of expense information is going to be presented in median dollar difference and median expense percentage difference. Analysis of workload information is going to be presented in percentage of perfect matches, median workload difference, and median workload percentage difference.

### Results at the Gross MTF Level

Table 3 shows the results comparing the median expense differences at the MTF level for fiscal years 1995 and 1996. Table 4 shows the result of the one-way ANOVA to determine if a significance exists among the three services for the same fiscal years.

For 1995, 10 of the 12 MTFs (83%) had differences less than 1%. All three services had a median magnitude expense percentage difference of .04% between the local and the centralized MEPRS systems. The median percentage differences for the Air Force and Navy were 1.20%

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<sup>5</sup> Walter Reed Army Medical Center and Travis Air Force Medical Center had incomplete FY95 MEPR Detail 1 reports.

<sup>6</sup> Eisenhower Medical Center and Bethesda Medical Center were unable to provide their current 1996 MEPR Detail 1 reports

and 0.18% respectively. The Army MTFs had a difference of less than .01%. At the significance level of .05, the Kruskal-Wallis one-way ANOVA did not reveal any significant difference among the three services.

For fiscal year 1996, the median magnitude percentage difference for the three services was less than .01% comparing the local and central MEPRS system. By service, the Air Force and the Army had similar measurements; the Navy had a median magnitude percentage difference of .12%. Like FY95, the one-way ANOVA did not indicate any significant differences among the three services.

#### Results at the Functional Category Level (1<sup>st</sup> Level MEPRS)

The next set of computations involved a comparison of the six functional categories ('A' through 'G'). Each MTF distributes costs and workload among these seven accounts. This level provides a finer analysis of the MEPRS data. In addition to expense data, workload data was extracted and analyzed.

#### Expense

Table 5 shows the results comparing the three services expense information at the functional category level for fiscal years 1995 and 1996. Table 6 shows the result of the one-way ANOVA analysis comparing the magnitude expense percentage difference among the three services. Lastly, Table 7 shows the results of the Mann-Whitney, Post-hoc tests if warranted by the ANOVA.

For FY 95, the three services (n=84) had a median magnitude expense percent difference of 0.41% (Table 5). By service, the Air Force, Navy, and Army MTFs had differences of 0.92%, 0.25%, and 0.18% respectively. The ANOVA analysis at the .05 level revealed a significant P-value of 0.003 (Table 6). The post-hoc, Mann-Whitney, pair-wise tests at the 0.017 level of

significance, indicated the Air Force MTFs had significantly higher median expense percentage differences compared to the Navy and the Army (Table 7). The pair-wise comparison between the Army and Navy did not reveal any significant differences.

For 1996, the three services (n=84) had a median magnitude expense difference of 0.29% (Table 5). By service, the Air Force, Navy and Army had differences of 0.24%, 0.30%, and 0.30% respectively. The three services' median magnitude expense percentage differences was not significant among each other at the 0.05 level (see Table 6).

### Workload

The workload analysis applied only to the inpatient and ambulatory functional categories ('A' and 'B' accounts). Table 8 shows the results of the inpatient care functional category workload differences while Table 9 shows the results of the ambulatory care functional category workload differences for fiscal years 1995 and 1996. Inpatient care workload comparisons consisted of occupied bed day and disposition workload. Ambulatory care workload comparisons consisted of inpatient and outpatient visit workload.

For FY95, workload comparisons at the functional level resulted in very low median percentage differences. The median workload magnitude workload percentage differences for occupied bed days, dispositions, and inpatient visits were all less than .01% (see Tables 8 and 9). An ANOVA analysis on all the workload comparisons did not result in any significant p-value (see Table 12). Unlike expense comparisons, there was a high rate of perfect matches: 83.30% occupied bed day comparisons, 91.70% disposition comparisons, 83.30% inpatient visit comparisons, and 91.70% outpatient visit comparisons were perfect matches at the functional category level for FY95 (see Tables 10 and 11). Of note, all Navy MTFs had perfect matches on all their workload accounts.

For FY96, the workload comparisons also resulted in very low variances. The median workload percentage difference for all workload measurements were all less than .01% (see Tables 8 and 9). Like in FY95, an ANOVA analysis did not result in any significant differences among the three services. Rates of perfect matches were 50% for occupied bed day comparisons, 75% for disposition comparisons, 91.70% for inpatient visit comparisons, and 91.70% for outpatient visit comparisons at the functional category level for FY96. Of note, all occupied bed day comparisons for the three services had perfect matches.

#### Results at the Work Center Level (3<sup>rd</sup> Level MEPRS)

Analysis at the work center level, MEPRS 3rd digit, had to be divided in two separate groups because of the structure of the MEPRS Detail 1 report. As previously stated, the expense values of the 'Axx', 'Bxx', 'Cxx', 'Fxx', and 'Gxx' work centers are after the step-down process. The values in the 'Dxx' and 'Exx' (ancillary and support) work centers, though, are prior to the step down process. At step-down, all the 'Dxx' and 'Exx' work centers have their expenses distributed to the other 5 accounts. Therefore, the expense values contained in the step down accounts already contain the ancillary and support work centers expenses. Since evaluating all seven groups together would double count ancillary and support work centers, the two groups need to be analyzed separately.

#### Ancillary and Support Accounts

Table 13 shows the results comparing the three services expense information of all the 'Dxx' and 'Exx' work centers for fiscal years 1995 and 1996. Table 14 shows the result of the ANOVA analysis comparing the median magnitude expense percentage difference among the three services. If warranted by the ANOVA, Table 15 shows the results of the post-hoc, Mann-Whitney, pair-wise comparisons of the same measurements.

For 1995, the median magnitude expense percentage difference for the three services (n=699) was 0.24%. By service affiliation, the Air Force, Navy, and Army had differences of 0.67%, 0.25%, and 0.09% respectively. The ANOVA analysis, at the .05 level, resulted in a significant P-value of less than .001 (see Table 14). The post-hoc, Mann-Whitney, pair-wise test at the .017 level indicated the Air Force MTFs to have the significantly higher expense differences compared to the Army and the Navy. Furthermore, a pair-wise test between the Army and Navy resulted in the Army having a significantly lower expense difference (see Table 15).

For 1996, the median magnitude expense percent difference for the three services (n=694) was 0.21% (Table 13). By service affiliation, the Air Force, Navy, and Army had median differences of 0.17%, 0.20%, and 0.24% respectively. The ANOVA analysis for this group did not result in a significant P-value (see Table 14).

Since the ancillary and support services do not contain patient workload information, a workload comparison is not applicable.

#### Step Down Accounts

Screening of expense information resulted in removal of 4 items in fiscal year 1995 samples and 9 items in fiscal year 1996 samples. This study relies on two assumptions for a proper analysis. First, expense values must be all positive<sup>7</sup>. Second, there must be values in both the local and central MEPRS system<sup>8</sup>. For 1995, the 4 anomalies included 2 work centers with negative expense values and 2 with zero expense values in their local MEPRS database. For

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<sup>7</sup> In MEPRS, negative expense values should never exist for any active work center.

<sup>8</sup> If there is a value in one database, there must be a corresponding non-zero value in the corresponding database. An active work center will have an expense value. A work center cannot be active in one database and inactive in the other.

1996, the 9 anomalies included 4 work centers with zero expense values in their local MEPRS, 3 work centers with zero expense values in their central MEPRS, 1 work center with a negative expense value in its local MEPRS, and 1 work center with a negative expense in its central MEPRS' database. The sample sizes for these work centers (n=1401 for 1995 and n=1425 for 1996) reflect these adjustments (see Table 1).

#### Expense analysis

Table 16 shows the results comparing the three services expense information of all the 'Axx', 'Bxx', 'Cxx', 'Fxx', and 'Gxx' work centers for fiscal years 1995 and 1996. Table 17 shows the result of an ANOVA analysis comparing the median magnitude expense percentage differences among the three services. If warranted by the ANOVA, Table 18 has the results of the post-hoc, Mann-Whitney, pair-wise tests for the same measurements.

For 1995, the median magnitude expense percentage difference for the three services (n=1401) was 1.01%. By service affiliation, the Air Force, Navy, and Army had differences of 1.86%, 0.78%, and 0.75% respectively. The ANOVA analysis at the 0.05 level resulted in a significant P-value of less than .001 (see Table 17). The post-hoc, Mann-Whitney, pair-wise comparison at the 0.017 showed the Air Force MTFs to have significantly higher expense differences compared to the Navy and the Army (see Table 18). The differences between the Army and the Navy MTFs were not significant.

For 1996, the median magnitude expense percent difference for all three services (n=1425) was 1.04% (see Table 16). By service affiliation, the Air Force, Navy, and Army had differences of 1.30%, 0.84%, and 1.01%. The ANOVA analysis at the 0.05 level resulted in a significant P-value of .001 (see Table 17). The post-hoc, Mann-Whitney, pair-wise test at the 0.017 indicated the Air Force MTFs to have significantly higher differences compared to the

Navy MTFs (see Table 18). No other pair wise comparisons resulted in any significant differences.

#### Workload analysis

Workload analysis was only applicable to the inpatient and ambulatory care work centers ('Axx' and 'Bxx'). Table 19 shows the results of inpatient care work center workload differences (occupied bed days and dispositions) while Table 20 shows the results of ambulatory care work center workload differences (inpatient visits and outpatient visits) for fiscal years 1995 and 1996.

Similar to the workload comparisons at the functional category level, work center workload comparisons resulted in very low differences. For both fiscal years, all workload comparisons resulted in a median magnitude workload percent difference of less than .01% for all the three services (see Tables 19 and 20). The statistical program, SPSS version 8.0, would not report anything past the 5th significant digit. Despite this extremely low percentage, variance among the services produced significant differences.

For FY95, the Kruskal-Wallis test at the .05 level of significance identified significant differences among the three services workload variance in occupied bed day, inpatient visits, and outpatient visit comparisons (see Table 21). Since the majority of service median values were less than the .01% reportable values, the results of the pair-wise comparison had to be paired with the boxplot distributions to infer direction of significance (higher, lower). The pair-wise comparisons for occupied bed day workload differences were significant between the Army MTFs and both the Navy and the Air Force (see Table 22a); direction of significance appears to be higher for the Army (see Figure 20). The pair-wise comparisons for inpatient visit workload differences was significant between the Air Force MTFs and both the Army and the Navy MTFs (see Table 22b); direction of significance appears to be higher for the Air Force (see Figure 24).

Lastly, the pair-wise comparisons for outpatient visit workload differences were significant between the Air Force and the Navy MTFs only (see Table 22c); direction of significance appears to be higher for the Air Force (see Figure 26). The level of significance was at the .017 for each pair-wise comparison. Other than those reported, no other comparisons resulted in significant differences.

The workload comparisons for fiscal year 1996 also resulted in very low median differences. As mentioned, for all three services, the median magnitude percentage differences for all workload comparisons were less than .01%. The Kruskal-Wallis test only found significant differences in disposition workload differences for this fiscal year (see Table 21). Again, due to the limitations of the reports, the results of the post-hoc, Mann-Whitney, pair-wise tests had to be compared to the boxplot distribution to infer direction of significance. The pair-wise comparison for disposition workload differences was significant between the Air Force MTFs and both the Army and Navy MTFs (see Table 23); direction of significance appears to be higher for the Air Force (see Figure 23). Level of significance during the pair-wise was at .017.

The extremely low differences was primarily due to the very high percentage of perfect matches in both fiscal years (see Tables 24 and 25). In FY95, 93.40% (n = 366) of occupied bed day comparisons, 99.70% (n = 391) of disposition comparisons, 97.50% (n = 576) of inpatient visit comparisons, and 97.50% (n=580) of the outpatient visit comparisons were perfect matches (see Tables 21 and 22). In FY96, 100% (n=400) of occupied bed day comparisons, 95.30% (n=381) of disposition comparisons, 99.07% (n=591) inpatient visit comparisons, 99.20% (n=588) outpatient visit comparisons were perfect matches (see Tables 24 and 25).

## DISCUSSION

### Interpretation of Results

The results of this study reveal discrepancies between the local MEPRS and corresponding service affiliated MEPRS central system (MEPRS Central or MEQS). The degree of variance between source and replicated database varies depending upon the level of MEPRS detail analyzed. At the highest summary level, the MTF, the expense data from MEPRS replicated central database is expected to vary from its source MTF by a median value of 0.04% and less than .01% for fiscal years 1995 and 1996 respectively (see Table 3). At the more granular, post-step down, work center level (MEPRS 3rd digit), the median expense percentage variance is expected to be 1.01% and 1.04% for the same fiscal years. Discrepancy variances are over 50% times greater at the work center level as compared to the same analysis at the MTF level. Clearly, a gross analysis at higher summary levels (MTF or functional categories) may not reveal the actual state of data inconsistencies existing at the lower levels.

Assessment of data integrity at the MTF summary level can be misleading because positive and negative deltas negate each other at the lower accounting levels. Specifically, at the work center level, a \$1,000 positive difference at one work center will negate a \$1,000 negative difference from another work center. Simply comparing summary information at the hospital level will not reveal the true degree of variance within the system. Analysis at the work center level provides a more accurate state of data quality within the MEPRS system. Additionally, the results of work center expense analysis is the more significant because it involves a higher sample population ( $n > 1400$ ) compared to the analysis at both the MTF level and functional category level.

Though this research focused on percentages as the standard benchmark metric, dollar differences are also significant. At the MTF summary level, the median magnitude expense difference for fiscal year 1995 was \$133,836. For 1996, the difference dropped dramatically to \$427.23. At the work center level, the median magnitude expense difference was \$6,738.45 for fiscal year 1995 and \$7,631.92 for fiscal year 1996. This analysis exemplifies the possible misleading status of data quality if one solely relies on summary level views. Even though it appears the MTFs had dramatically lower discrepancies in 1996 compared to 1995 at the MTF summary level; analysis at the work center level indicates the opposite. Using the step down work centers, the dollar discrepancy grew slightly by \$1,000. For 1996, each work center is expected to deviated by a median of \$7, 631. Accurate analysis of MEPRS data consistency requires analysis at the lowest level and balancing percentage metrics to actual dollar differences.

During the course of the data collection, many of the MTF's MEPRS staff regarded the MEQS or the MEPRS Central system to have the exact information as their local systems. This study suggests this assumption is false for fiscal years 1995 and 1996. Expense variance ranged from 0 to 4,000%. Service affiliation also had an impact on the degree of expense variation. When the Kruskal-Wallis identified significant median magnitude expense percentage differences, the post-hoc, Mann-Whitney, pair-wise test indicated the Air Force affiliated MTFs had significantly higher expense variances in the majority of comparisons in both fiscal years 1995 and 1996.

Interestingly, workload data, did not produce the same degree of variation as seen with expense data comparisons. All the workload comparisons for both fiscal years resulted in a median magnitude workload percentage difference of less than .01% between the local and the central MEPRS systems. Differences among the services did exist though. In the majority of the

pair-wise comparisons for both fiscal years 1995 and 1996, the Air Force MTFs median workload differences were significantly different compared to the other two services. Unfortunately, due to the limitation of the statistical reports (difference lower than the reportable .01 level), we can only infer from visual distributions that the Air Force MTFs workload differences were higher.

MEPRS' reliability problems appears to stem from the expense information while the workload information remains fairly consistent.

#### Causes of Variance

Prior to this research, data consistency problems between the local and MEPRS systems were mostly anecdotal. Using the GME facilities, this study suggests variances do exist; data consistency must be considered as part of the variables affecting data quality within the MEPRS system. In the course of this research, interviews were conducted to identify the possible causes and to investigate rumors concerning the reliability between the MEQS and the MEPRS Central database.

First, there has been a standing debate concerning which decision support MEPRS system is more reliable than the other. MEQS is a newer program and assumptions have been made about its superior data quality levels compared to the MEPRS Central. In fact, the Army made their transition to MEQS in 1993, the Air Force in 1997, and the Navy has recently agreed to start selectively using MEQS in 1998 (M. Ireland, Office of the Surgeon General, April 17, 1998). From the perspective of data reliability, there does not appear to be any conclusive evidence the MEQS system is any better than the MEPRS Central system. As earlier mentioned, when the Kruskal-Wallis ANOVA test indicated a significant expense and workload difference among the three services, the post-hoc, Mann-Whitney, pair-wise test showed the Air Force

MTFs, based on MEQS, to have significantly higher variances in the majority of the comparisons in both fiscal years 1995 and 1996. Also, the reverse could not be supported—MEPRS Central is not any more reliable than MEQS). The majority of expense and workload comparisons between the Navy MTFs, based on MEPRS Central, and the Army MTFs, based on MEQS, for fiscal years 1995 and 1996, did not result in any significant differences. The hardware platform of the decision support database does not appear to be a dependent variable on the quality of data MEPRS data consistency.

Variance can result from the rounding differences between the local and the central MEPRS systems. The information from the local MEPRS Detail 1 rounds the expenses to the nearest dollar while the central systems rounds expense information to the nearest cent. These rounding differences would make it impossible for the dollar values between the local and MEPRS system to perfectly match. If this were the only cause of expense difference, the levels of expense variance would be uniform for each MTF and among the three services. From this study, the varying level of MEPRS expense consistency indicates the involvement of other factors.

The significant levels of variance appears to be due to the complex data processing and reporting procedures of the MEPRS system (R. K. Bacon, USA MISA MEPRS Office, March 27, 1998 and U. Henry, USA MISA MEPRS Office, April 16, 1998). Figure 4 diagrams the process involved in completing a monthly report at the local facility. Data is collected and reported in monthly increments. Each monthly computation involves a reconciliation of the various data subsystems feeding the main MEPRS server (Expense and Accounting System III - EAS III). This is followed by some quality control through edits and data inspections to remove or correct erroneous data. Afterwards, computations are performed to distribute costs to the

appropriate accounts and to calculate all secondary data elements (productivity measurements, ratios). Third, hard copy reports are produced for local reference. Lastly, that month's data and all calculated fields are transmitted forward to the respective service aggregated data centers.

Unfortunately, the process is very resource intensive and does not easily support off cycle reporting for ad-hoc data requests. In fiscal years 1995 and 1996, the average monthly computation could take between 3 to 6 hours depending on the type of hardware supporting the MEPRS office (R. K. Bacon, USA MISA MEPRS Office, March 27, 1998 and U. Henry, USA MISA MEPRS Office, April 16, 1998). For a year-to-date or annual computation, the process could take between 6 - 12 hours. If any data element had to be corrected or updated, reports reflecting the change could not be produced until a re-computation for the month had been done. Additionally, a correction to one month often requires re-computations to all following months. Each month's re-computation required a separate transmission to the service data center to update the replicated database's records.

Since there are no recalculations being done on the replicated databases<sup>9</sup>, the strongest evidence for data inconsistency is that the MTFs fail to appropriately retransmit some or all their corrections. If a facility did make changes to a previous month's data but failed to submit it, there would be inconsistencies to that specific month, year-to-date, and annual reports generated by the two systems.

A second cause for data inconsistencies is the heavy reliance on the hard copy reports. All reports are completed and printed at the time of computations. As long as the underlying data does not change (e.g. no corrections) the hard copy is good reference. Since the local

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<sup>9</sup> The only thing done differently is rounding. The local MEPRS rounds to the dollar while MEQS and MEPRS Central round to the penny.

MEPRS has very weak querying tools, the hard copy is the primary reference for all data requests at the facility. Unfortunately, as this research has verified, some facilities fail to make or properly maintain a current hard copy after making changes. As should be expected, the hard copy will show discrepancies if matched against the central MEPRS database.

A third factor is the system limitations of the EASIII. The system can only maintain the two most current fiscal year's information. Access to previous year data on the local system is either very difficult or impossible. The third year is archived, and any data over four years old is no longer accessible. The archived data is very difficult to install because the skills required for this task is not present at the local facility and the task itself is very resource intensive<sup>10</sup>. For any fiscal year data not actively maintained on the system, the hard copy becomes the defacto primary local source reference. If the hard copy reference was not current, the data becomes inconsistent with the information at the central MEPRS database.

The reliance on hard copy information at the local facility can cause problems as witnessed during this research. One MTF was dropped from the study because they were unaware of a gross inaccuracy of their FY96 local MEPR Detail 1 report. The copy provided was prior to a significant annual correction. In 1997, a correction of \$400 million dollars was made to the 1996 record. The update was transmitted to MEPRS Central but the facility failed to maintain a hard copy. Unfortunately, FY96 information is now archived. Since they are unwilling to go through the painful archive restoration procedure, they do not have local records of the status of their database for that fiscal year. Interestingly, they submitted the old report believing it to be the most current report.

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<sup>10</sup> Madigan Army Medical Center currently attempted this task. It took 2 weeks to re-install FY 96 data on their EAS III.

## Research Questions

### Research question 1

#### Expense Information

The null hypothesis is rejected. Expense data at the local and central MEPRS databases are not consistent. At the MTF, the functional category, and work center level, there are notable median magnitude expense differences between the local MTF MEPRS system compared to the hospitals service affiliated central MEPRS (MEPRS Central or MEQS).

#### Workload Information

The null hypothesis is rejected. Even though the reported median workload percentage difference was less than .01% for all workload comparisons for both fiscal years, differences did exist. The extremely low rate of difference suggests the workload information, though not always a consistent match between the local and central MEPRS system, is much more reliable than the expense information.

### Research question 2

#### Expense Information

The null hypothesis is rejected. Expense variances between the three services is not the same. MEPRS data consistency is significantly different among the three services at  $\alpha = .05$  at the functional level for FY95, at the step down work center level for both fiscal years, and at the ancillary and support work center level for FY95. The post-hoc, Mann-Whitney, pair-wise comparison at the 0.017 significance level indicated the Air Force MTFs to have the higher expense variances for the majority of tests for fiscal years 1995 and 1996.

### Workload Information

The null hypothesis is rejected. Due to the very small workload percentage difference (less than .01%) and the limitation of the statistical reports, direction of significance could only be inferred. Comparing the significant results from the pair-wise comparisons with the workload boxplot distributions, it appears that the Air Force MTFs had a higher percentage of workload variance compared to the Army and Air Force for most of the workload comparisons for both fiscal years 1995 and 1996.

### Research question 3

Causes of variance could not be definitively identified but this study's research strongly suggests two likely causes. The first likely cause of variance may stem from the failure of the MTF to transmit re-computations of all monthly corrections to the MEQS or MEPRS Central. The second likely cause of the variance may stem from the failure to maintain current hard copy MEPRS reports for primary reference.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

The purpose of this research study was to investigate one aspect of data quality within the MEPRS system. Prior to this research, most in the MHS assumed that MEPRS accurately replicated the data between the local MTF and its centralized systems. Correspondingly, inaccurate information was attributed to poor data entry. But, until MEPRS reliability (consistency) has been verified, any resources invested to improve data input accuracy might not adequately solve the data quality problems plaguing MEPRS. MEPRS reliability must first be validated in order for other data quality improvement efforts to be successful. This research investigated MEPRS reliability by comparing expense and workload information of the 14 GME MEDCENS between the local and centralized MEPRS systems for fiscal years 1995 and 1996.

The results of this study indicate there are problems with MEPRS reliability. Specifically, the data between the local MEPRS system at the MTFs (EASIII) is inconsistent with the same data at the replicated databases at the central systems (MEPRS Central and MEQS). The problem is more pronounced with expense data while workload information is relatively consistent. Additionally, the more granular the analysis, the greater the variance. The median expense difference between the local and central MEPRS systems at the 3rd digit, work center level, was up to 50% greater than the difference at the MTF summary level.

Even though this paper identified consistency problems with the MEPRS database for fiscal years 1995 and 1996, the median differences reported (approximately 1% for expenses and less than .01% for workload) is considerably lower compared PASBA's 5% benchmark data quality threshold. Unfortunately, the stronger parametric measurements of means and standard deviations could not be reported because of the outliers within the sample group. Despite the

low aggregate median differences, the outliers had expense differences as great as 4,000%. Since these data points could not be dismissed as anomalies, managers and leaders should expect similar outliers to re-occur in the population.

This research also found significant differences between the services. For the majority of the expense and workload comparisons for both fiscal years 1995 and 1996 (when significant differences occurred) the post-hoc, pair-wise comparisons identified the Air Force MTFs to have higher variances compared to the Army and the Navy MTFs.

The cause of the differences could not be definitively identified but investigation into the MEPRS reporting and data replication procedures suggests the cause to be from the complexity and rigidity of the MEPRS reporting process. Based upon interviews with USA MISA and local MTF MEPRS staff, differences between the local and central systems can be attributed to the failure of the local MTF to properly submit monthly updates and/or fail to maintain current hard copy reports for their local primary reference.

#### Recommendations

The data driven programs such as Medicare Subvention, TRICARE, and Enrollment Based Capitation has made the MEPRS database a critical system for corporate decision making. Unfortunately, as indicated by this research, the database used for decision support (centralized MEPRS systems) contains different information compared to local systems. This research has three recommendations to help correct the data consistency problems and improve overall data quality within the MEPRS system.

First, leadership must be aware of consistency problems between local MTF MEPRS and their corresponding centralized systems. Even though the median percentage variance is approximately 1%, the prevalence of outliers requires special consideration at the work center

level. The very low variance at the MTF summary level should cause little concern if resources are distributed based upon MTF summary performance. However, due to the higher expense variations at the 3rd digit, MEPRS work center level, some departments or clinics might be improperly punished or rewarded if resources are distributed according to work center performance. Any critical management decisions based upon centralized MEPRS information should be cross-checked with the local MEPRS system.

Second, this research recommends the inclusion of MEPRS data comparison into its data quality management efforts. This effort should include both monthly and annual MEPRS data comparisons. Regular data comparisons should improve the system in two ways: 1) it will either correct the data reliability problems within the MEPRS system and/or, 2) help identify the specific system shortfalls causing the consistency problems. Either outcome will benefit the MHS because it will ensure Health Affairs is working on current information and help identify the source of data reliability problems. Additionally, this study can be the foundation of future data quality improvement programs. The results of this research can be used as baseline metrics to monitor the progress of future data quality improvement efforts.

Third, this research recommends an improvement to the local MEPRS EASIII system. The reliance on historic, hard copy information and the inability to generate ad-hoc query reports are obstacles in any data quality improvement program. Department chiefs should have readily accessible data on demand and should not have to rely on dated hard copy information. Additionally, improved access to the system for managers and leaders within the MTF will enable them to become more educated concerning MEPRS. It will provide them the tools to be more proactive in the management of their own data. Despite the importance of MEPRS in the MHS, the only people operationally familiar with the system are the scarce MEPRS staff clerks.

Regardless, since EASIII is not Year 2000<sup>11</sup> compliant, the MTFs will soon have a new local MEPRS system. It is hoped EASIV will live up to the promises made.

These recommendations are consistent with the current efforts underway to make the operational leadership (MTF commanders and executive staff) more aware and responsible for their data. As an example, the Corporate Executive Information System (CEIS) is a new program that extracts hospital information from many different system (including MEPRS) and repackages it into a more user-friendly system. The purpose of CEIS is to assist the MTF leadership in evaluating the performance of their hospitals through a user friendly and robust information system with extensive querying and reporting capabilities. As mentioned, the two programs putting an impetus to 'data awareness' are Enrollment Based Capitation and Medicare Subvention. Both programs will establish operational budgets based upon the information produced by the MEPRS system. CEIS can be an effective tool in this endeavor but is subject to the same weaknesses of MEQS and MEPRS Central. CEIS is only useful if it accurately reflects the same information collected from the various source systems.

In conclusion, despite the shortfalls within the MEPRS, it is the only expense accounting system available to the MHS. MEPRS is now being used in ways it was never originally designed. Additionally, external agencies, such as the Government Accounting Office (GAO) and the Health Care Finance Agency (HCFA), are using MEPRS to audit the MHS. It is the MHS best interest to insure MEPRS contains the highest quality data possible. This research has provided valuable information that can be used to help improve one of the foundations of MEPRS data quality – data reliability.

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<sup>11</sup> EASIII cannot properly resolve any calculations with date data elements involving 2000 and beyond.

Figure 1

The Data Quality Model

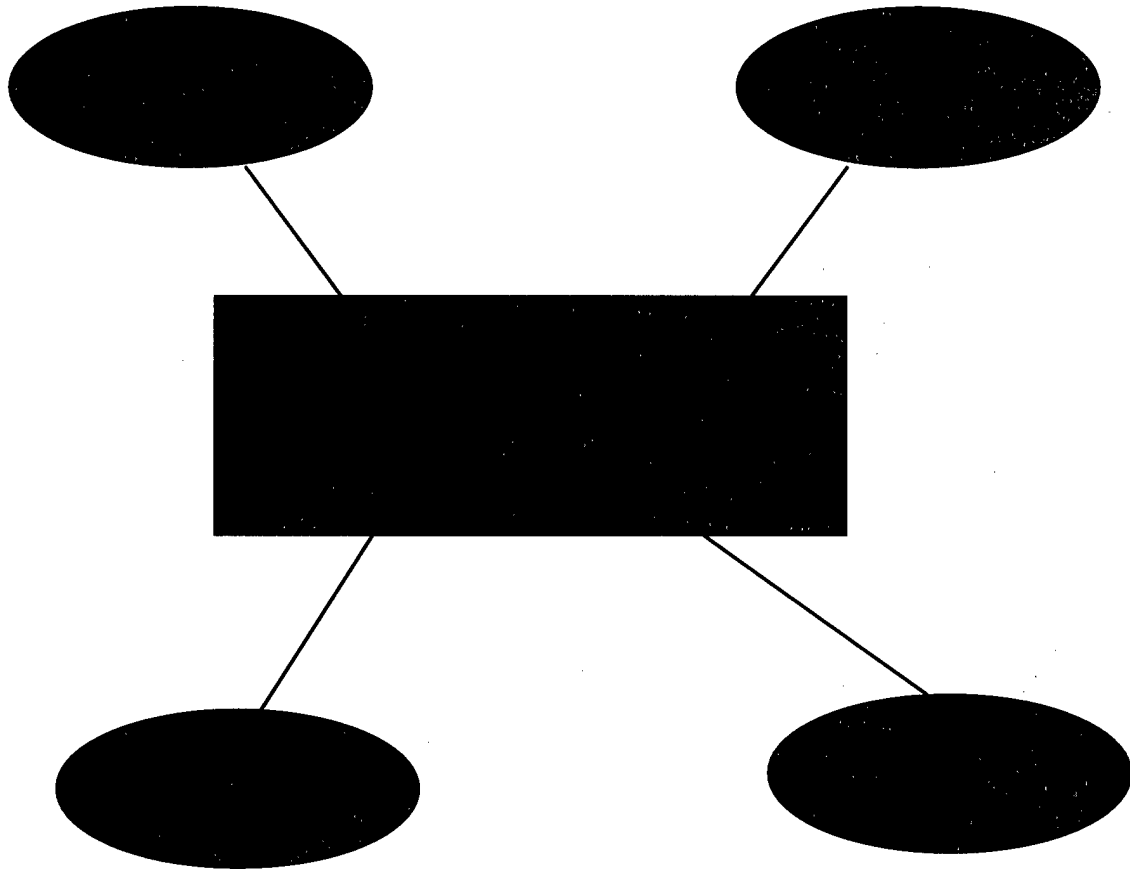


Figure 2.

The Statistical Measurement Tool Model

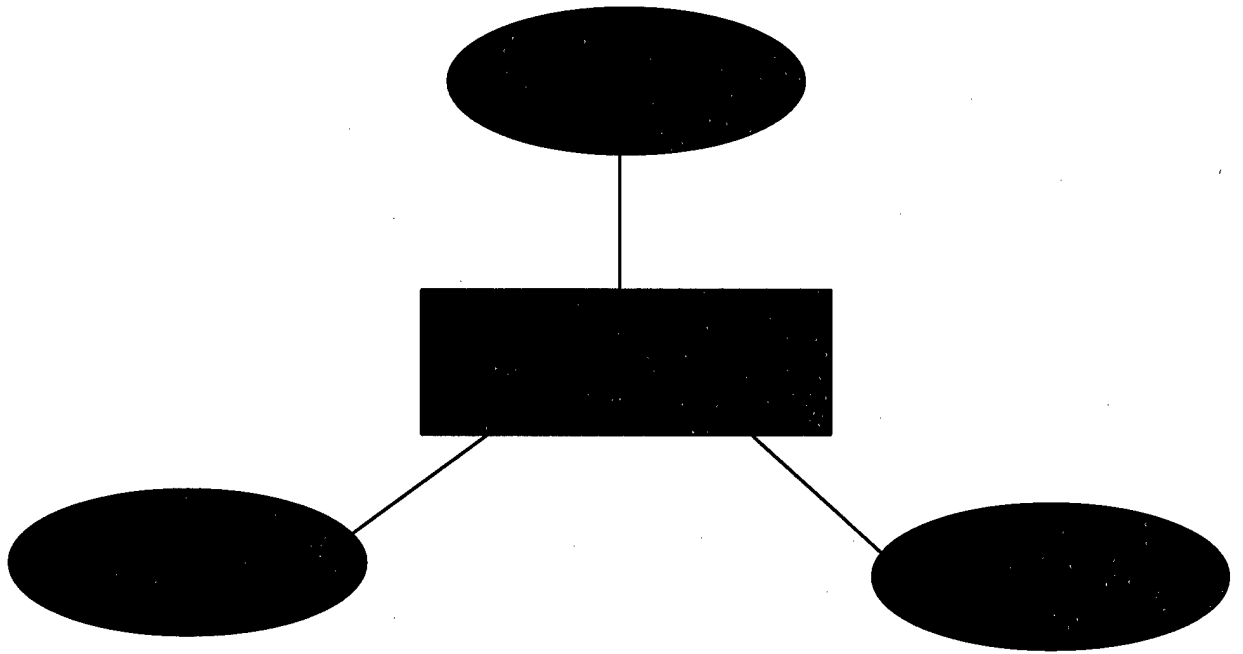
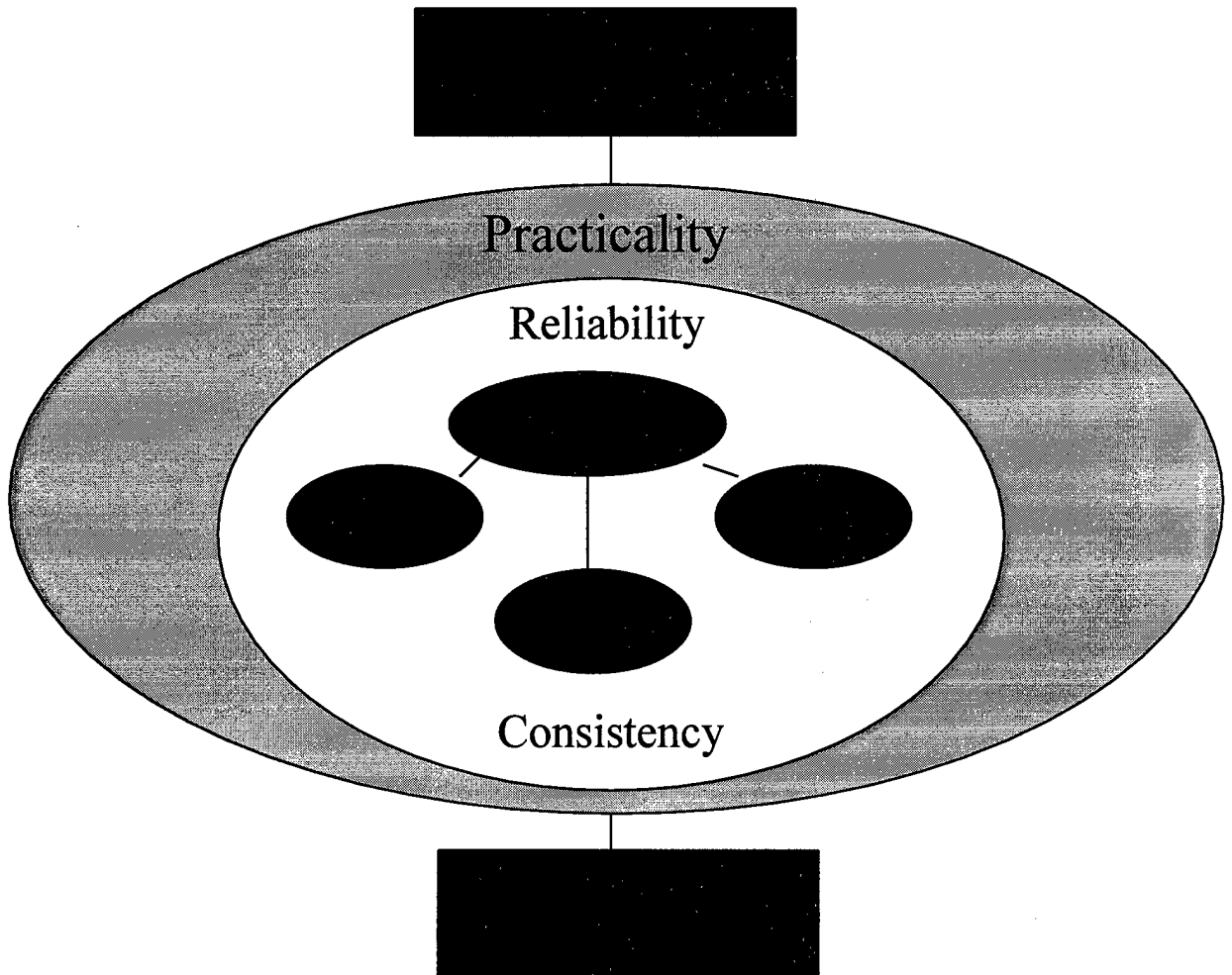


Figure 3

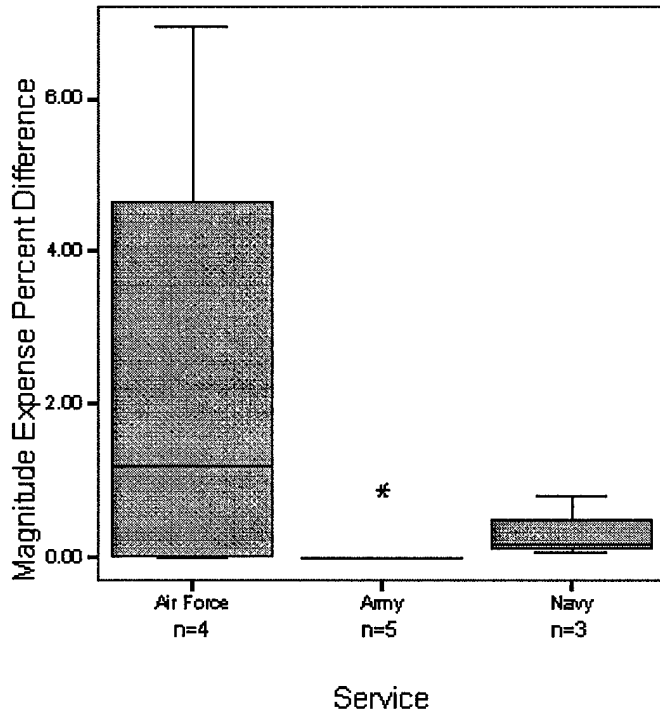
The Data Quality System (DQS) Model



\* Each inner circle attribute has a dependency relationship with the outer circle attribute

Figure 4

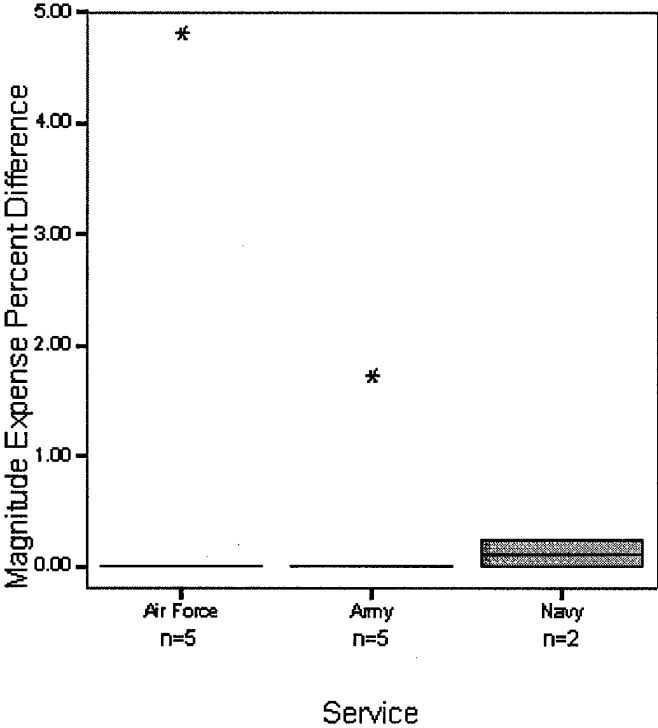
Boxplot distribution of FY95 expense differences at the MTF summary level



\* - Represents extreme data points  
 o - Represents outlier data points

Figure 5

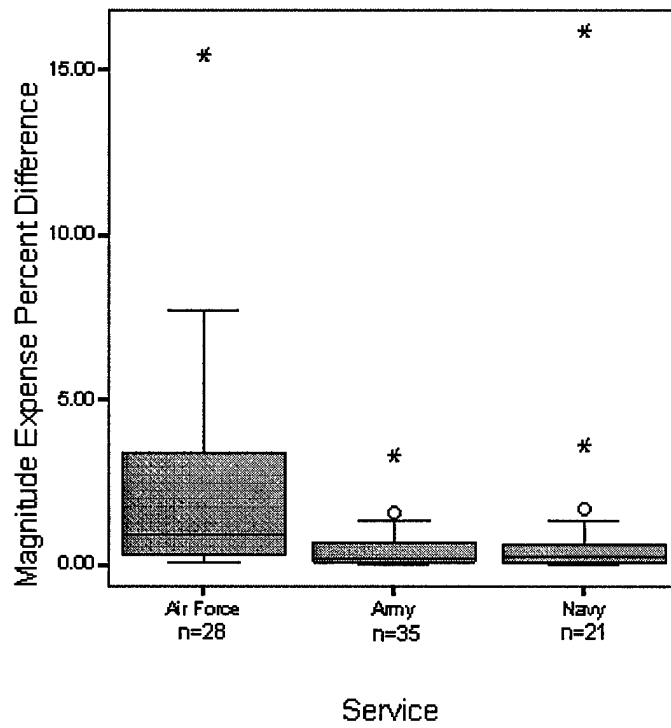
Boxplot distribution of FY96 expense differences at the MTF summary level



\* - Represent extreme data points in the sample  
o - Represent outlier data points in the sample

Figure 6

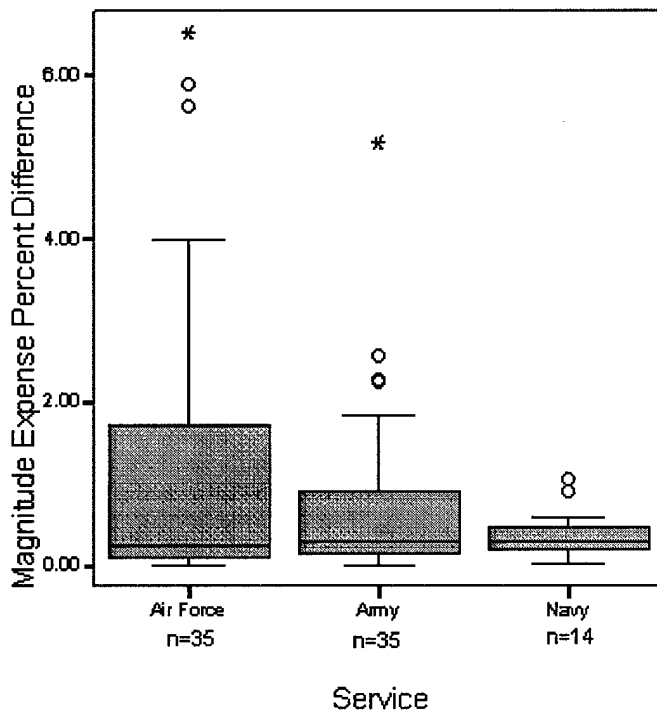
Boxplot distribution of FY95 expense differences at the functional category level



\* - Represent extreme data points  
 o - Represent outlier data points

Figure 7

Boxplot distribution of FY96 expense differences at the functional category level

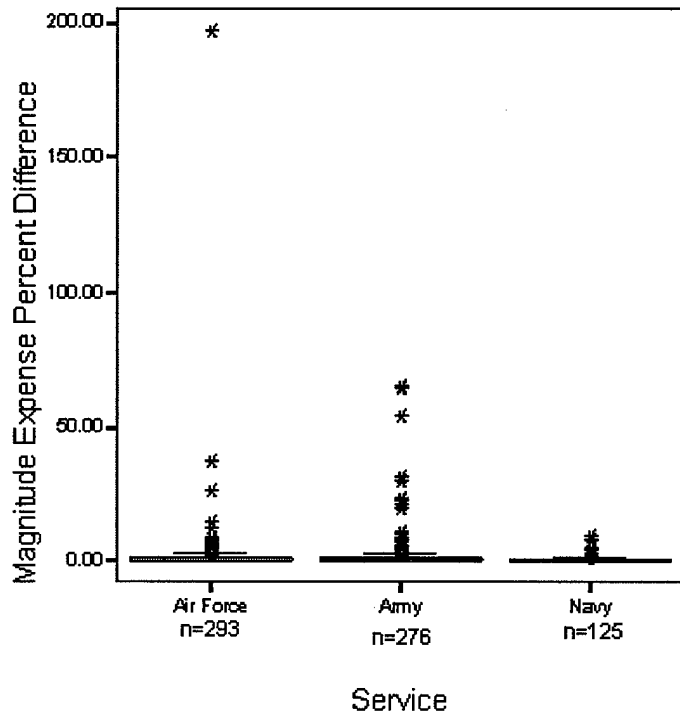


- \* - Represent extreme data points
- o - Represent outlier data points



Figure 9

Boxplot distribution of FY96 expense differences at the ancillary and support work center level ('D' and 'E' accounts)

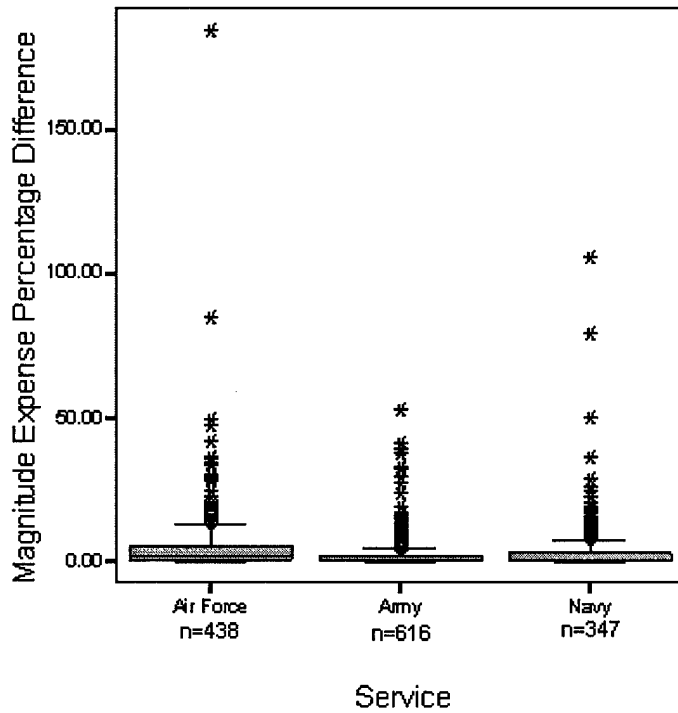


\* - Represent extreme data points

o - Represent outlier data points

Figure 10

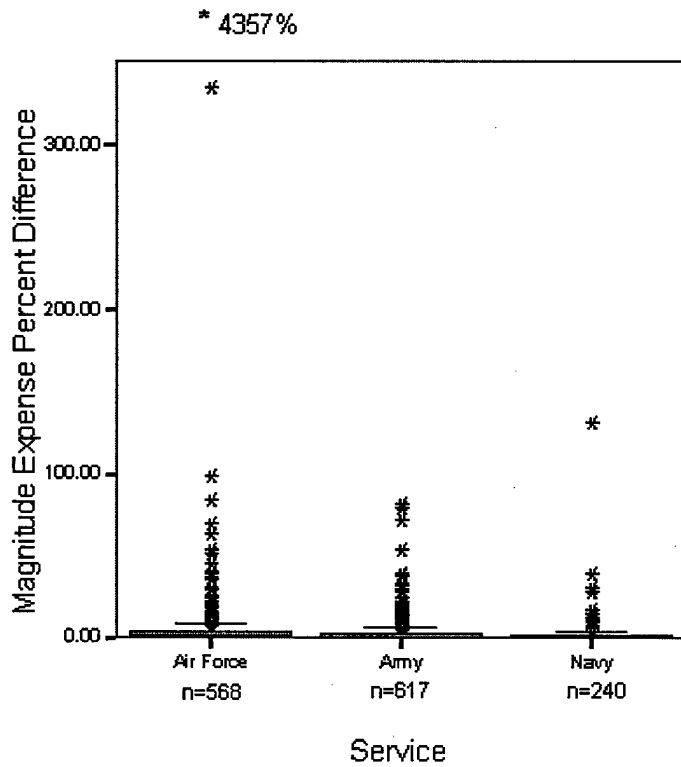
Boxplot distribution of FY95 expense differences at the step-down work center level ('A', 'B', 'C', 'F', and 'G' accounts)



\* - Represents extreme data points  
 o - Represents outlier data points

Figure 11

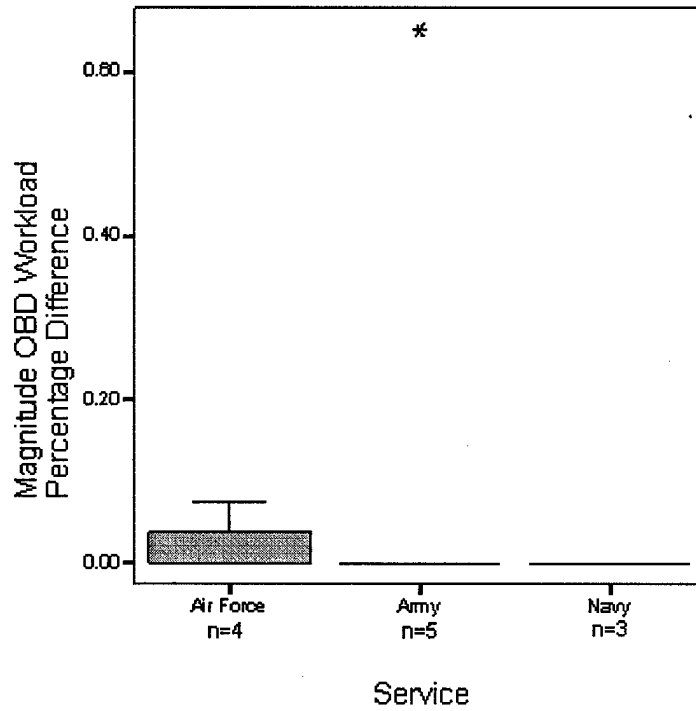
Boxplot distribution of FY96 expense differences at the step-down work center level ('A', 'B', 'C', 'F', and 'G' accounts)



\* - Represents extreme data points  
 o - Represents outlier data points

Figure 12

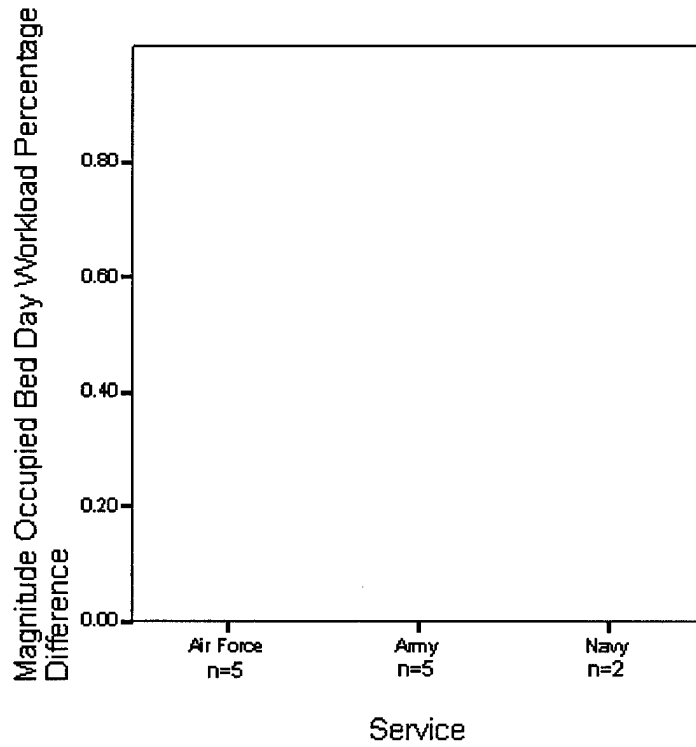
Boxplot distribution of FY95 Occupied Bed Day workload differences at the functional category level



\* - Represents extreme data points  
 o - Represents outlier data points

Figure 13

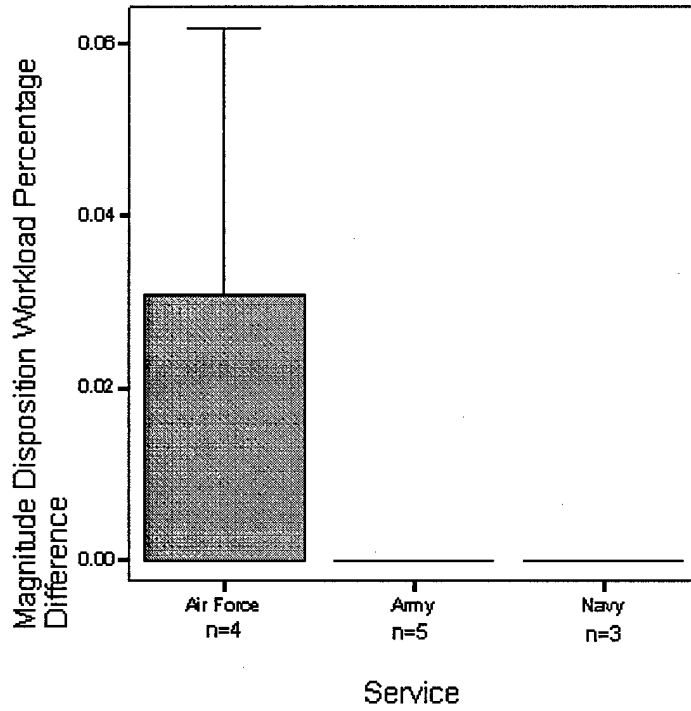
Boxplot distribution of FY96 Occupied Bed Day workload differences at the functional category level



- \* - Represents extreme data points
- o - Represents outlier data points

Figure 14 .

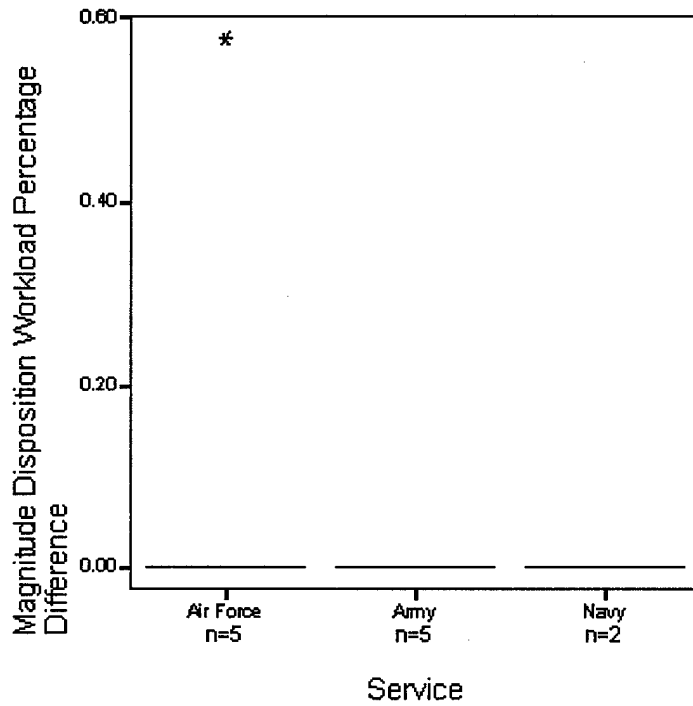
Boxplot distribution of FY95 Disposition workload differences at the functional category level



- \* - Represents extreme data points
- o - Represents outlier data points

Figure 15

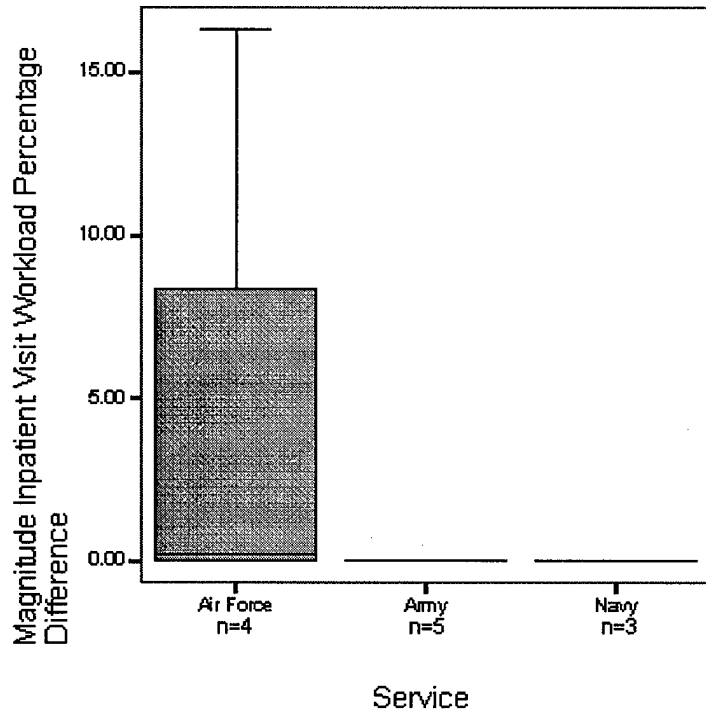
Boxplot distribution of FY96 Disposition workload differences at the functional category level



- \* - Represents extreme data points
- o - Represents outlier data points

Figure 16

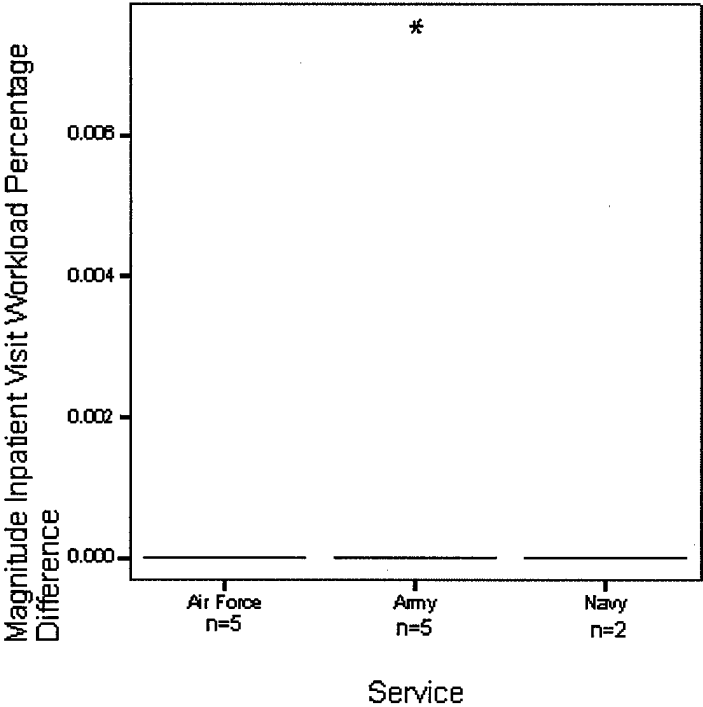
Boxplot distribution of FY 95 Inpatient Visit workload differences at the functional category level



\* - Represents extreme data points  
 o - Represents outlier data points

Figure 17

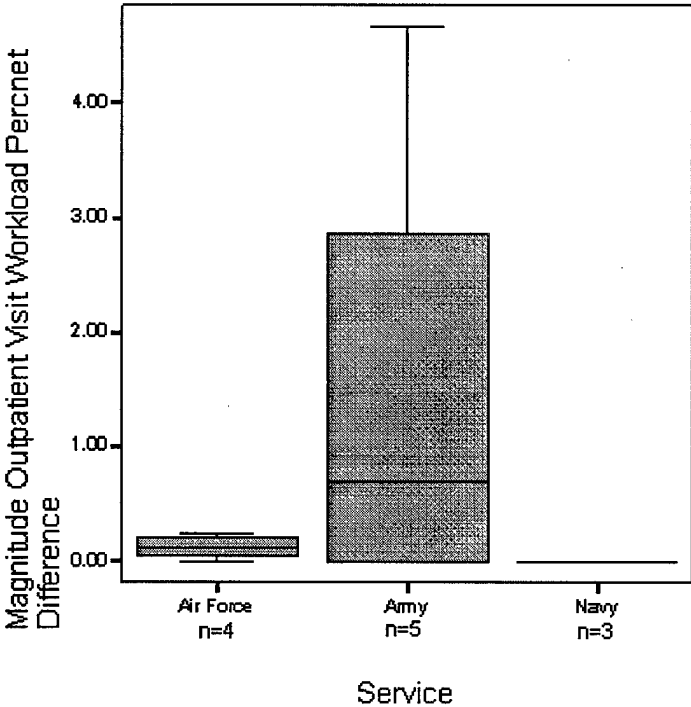
Boxplot distribution of FY 96 Inpatient Visit workload differences at the functional category level



\* - Represents extreme data points  
o - Represents outlier data points

Figure 18

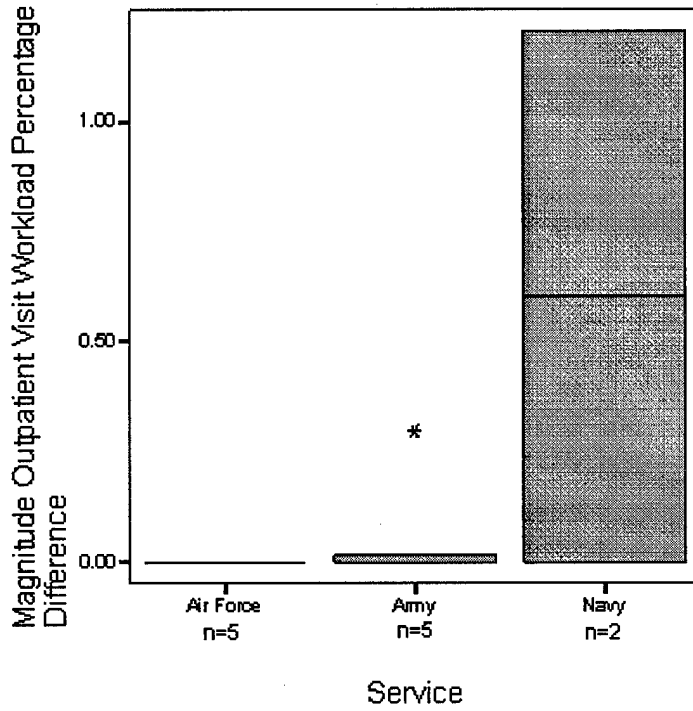
Boxplot distribution of FY95 Outpatient Visit workload differences at the functional category level



\* - Represents extreme data points  
o - Represents outlier data points

Figure 19

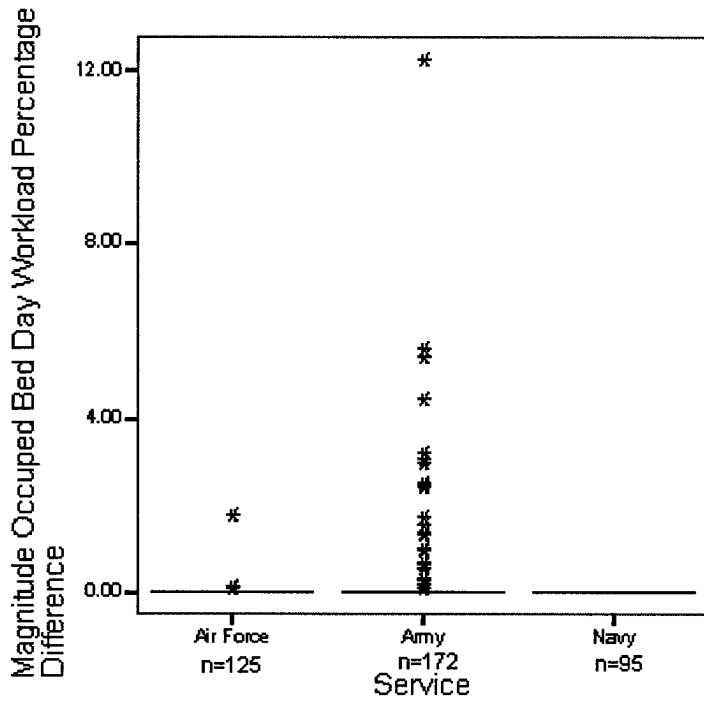
Boxplot distribution of FY96 Outpatient Visit workload differences at the functional category level



- \* - Represents extreme data points
- o - Represents outlier data points

Figure 20

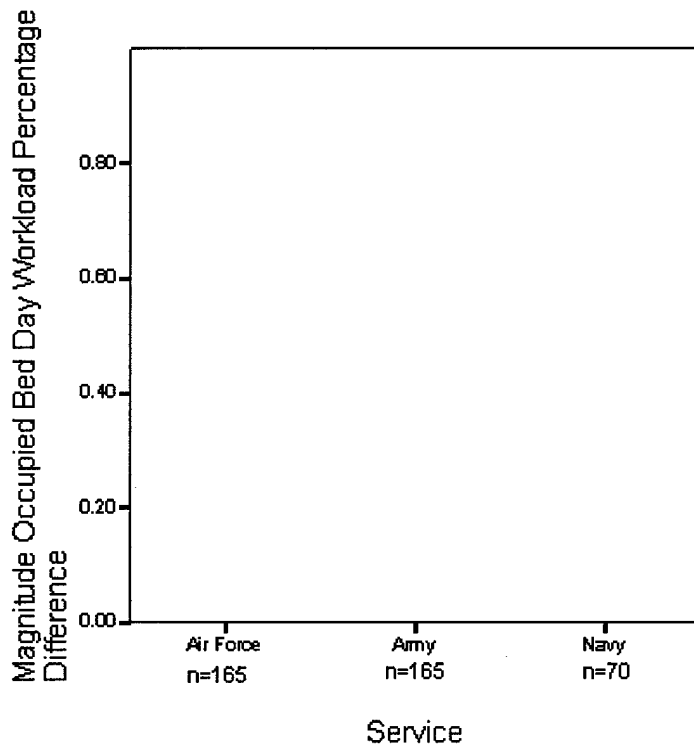
Boxplot distribution of FY95 Occupied Bed Day workload differences at the work center level



\* - Represents extreme data points  
o - Represents outlier data points

Figure 21

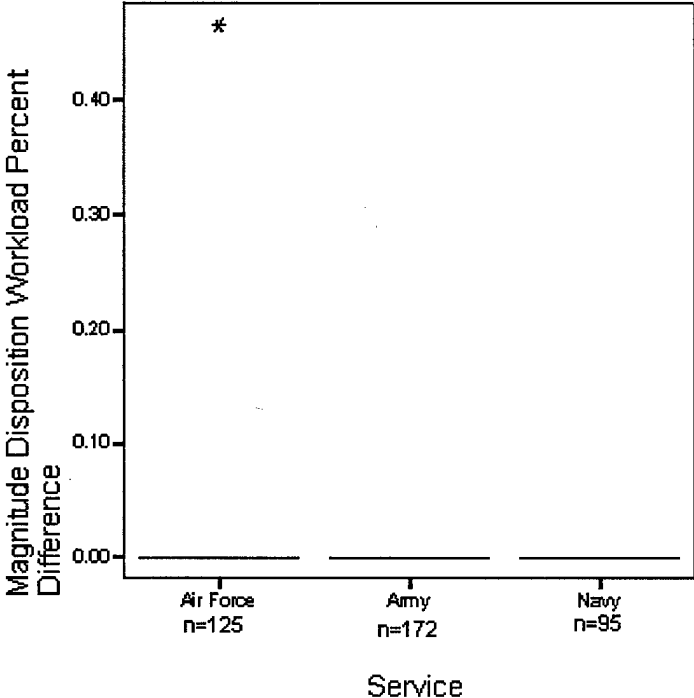
Boxplot distribution of FY96 Occupied Bed Day workload differences at the work center level



- \* - Represents extreme data points
- o - Represents outlier data points

Figure 22

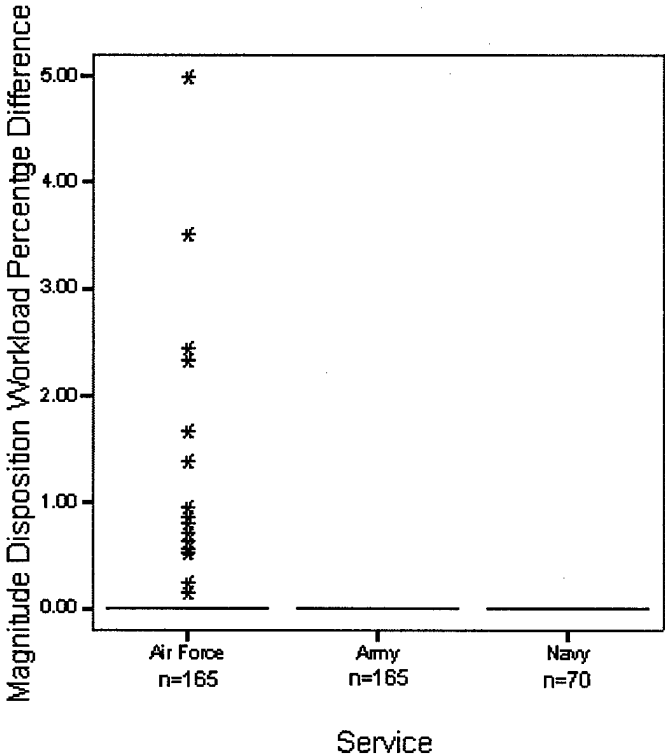
Boxplot distribution of FY95 Disposition workload differences at the work center level



- \* - Represents extreme data points
- o - Represents outlier data points

Figure 23

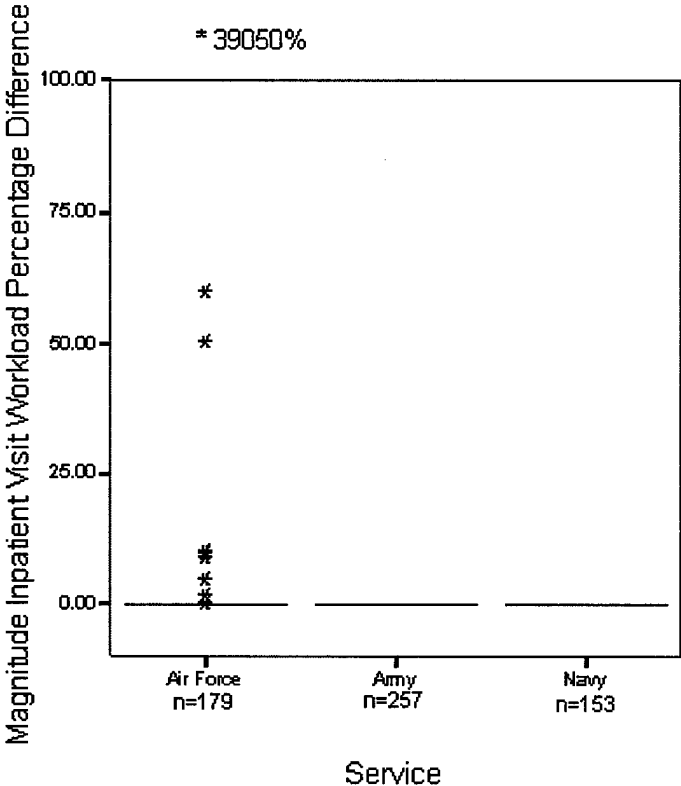
Boxplot distribution of FY96 Disposition workload differences at the work center level



\* - Represents extreme data points  
o - Represents outlier data points

Figure 24

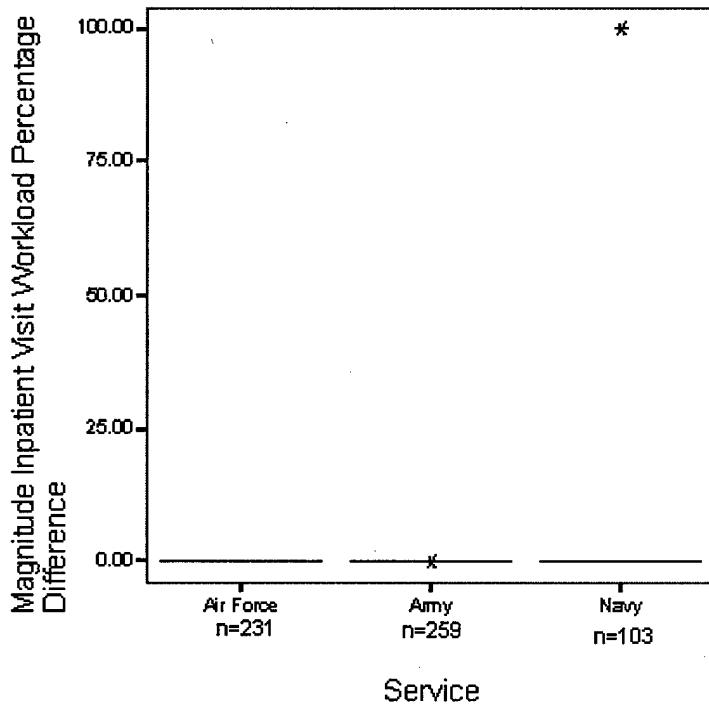
Boxplot distribution of FY 95 Inpatient Visit workload differences at the work center level



\* - Represents extreme data points  
o - Represents outlier data points

Figure 25

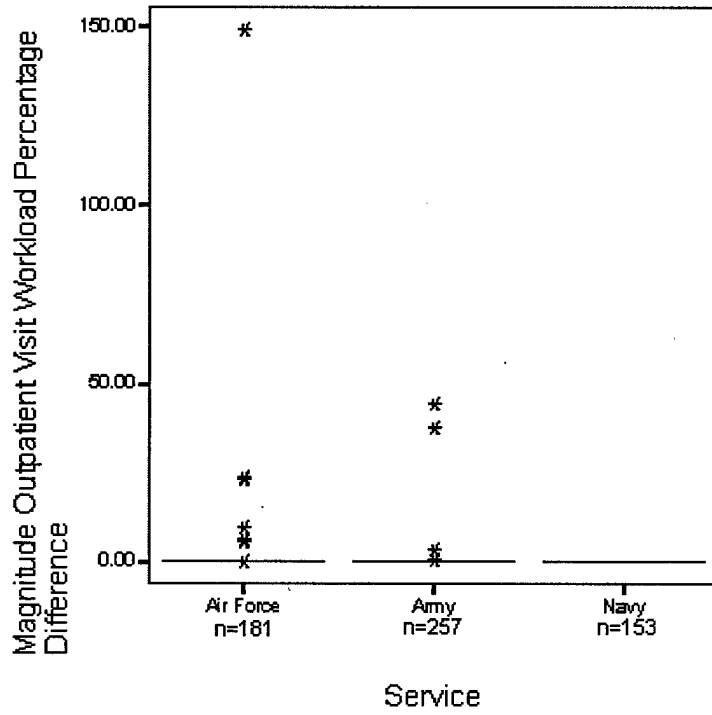
Boxplot distribution of FY 96 Inpatient Visit workload differences at the work center level



\* - Represents extreme data points  
 o - Represents outlier data points

Figure 26

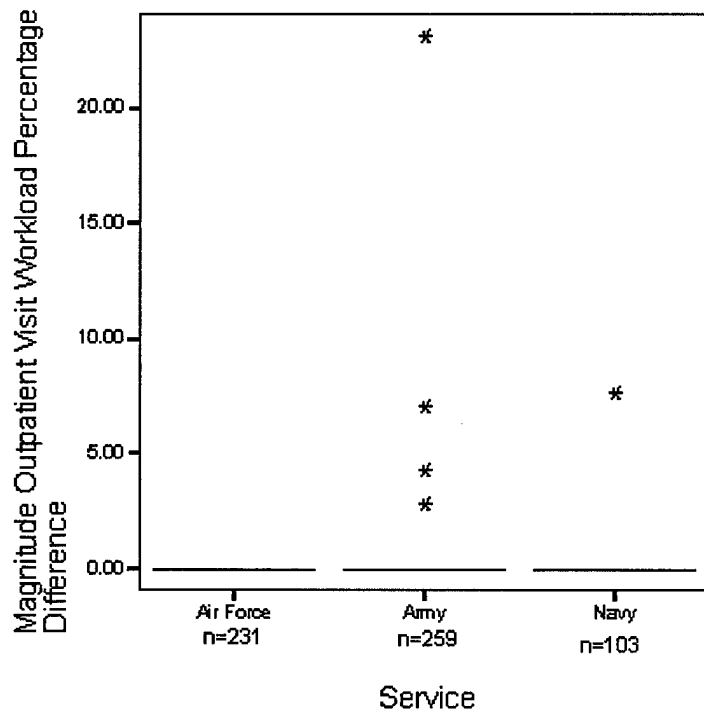
Boxplot distribution of FY95 Outpatient Visit workload differences at the work center level



- \* - Represents extreme data points
- o - Represents outlier data points

Figure 27

Boxplot distribution of FY96 Outpatient Visit workload differences at the work center level



\* - Represents extreme data points  
 o - Represents outlier data points



Table 1  
 Sample sizes for all analysis by service

Sample Category	Fiscal Year 1995			Fiscal Year 1996			
	Air Force	Navy	Army	Air Force	Navy	Army	Total
Expense MTFs	4	3	5	5	2	5	12
Data Functional Accounts <sup>a</sup>	28	21	35	35	14	35	84
Work Centers <sup>b</sup>							
Ancillary <sup>c</sup>	439	350	616	572	242	620	1434
Step Down <sup>d</sup>	229	177	293	293	125	278	696
Workload MTFs <sup>e</sup>	--	--	--	--	--	--	--
Data Functional Accounts <sup>a</sup>	8	6	10	10	4	10	24
Work Centers <sup>b</sup>							
Inpatient Services <sup>f</sup>	125	95	172	165	70	165	400
Ambulatory Services <sup>g</sup>	181	153	257	231	103	259	593

Note: All values are prior to normalization and removal of outliers

<sup>a</sup> 1st Level MEPRS ( A through G accounts )

<sup>b</sup> 3rd Level MEPRS

<sup>c</sup> 'Dxx' and 'Exx' work centers

<sup>d</sup> 'Axx', 'Bxx', 'Cxx', 'Fxx', and 'Gxx' work centers

<sup>e</sup> Workload data was not analyzed at the MTF Level

Table 2  
Average number of work centers per category

<u>Functional Account</u>		<u>Average Number of Workceters</u>
A	Inpatient	33
B	Ambulatory	49
C	Dental	2
D	Ancillary	24
E	Support	34
F	Special Programs	27
G	Medical Readiness	7
EACH MTF		177

Note: The averages listed include both fiscal years 1995 and 1996

Table 3  
MTF level gross expense information comparison

Service	Measurement	Fiscal Year 1995		Fiscal Year 1996	
		Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>	Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>
Air Force	median	\$ 1,342,261.15	1.20%	\$ 223.88	< .01%
	N	4	4	5	5
Navy	median	\$ 497,528.84	0.18%	\$ 400,810.72	0.12%
	N	3	3	3	3
Army	median	\$ 1,121.15	< .01%	\$ 449.97	< .01%
	N	5	5	5	5
Total	median	\$ 133,836.18	0.04%	\$ 427.23	< .01%
	N	12	12	12	12

Note: All measurements are median magnitude measurements

a Expense Difference = Absolute Value (central MEPRS expense value - local MEPRS expense value)

b Magnitude Difference = Absolute Value ( ( Expense Difference / central MEPRS value ) \* 100 )

Table 4

Kruskal-Wallis test of the three services' expense differences at the MTE  
summary level

---

	Fiscal Year	Magnitude Expense Percent Difference
1995	Chi-Square	4.154
	df	2
	P-Value	0.125
1996	Chi-Square	1.154
	df	2
	P-Value	0.562

---

Table 5  
Functional category expense information comparison.

Service	Measurem	Fiscal Year 1995		Fiscal Year 1996	
		Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>	Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>
Air Force	median	\$ 333,625.88	0.92%	\$ 95,644.74	0.24%
	N	28	28	35	35
Navy	median	\$ 153,128.07	0.25%	\$ 296,553.25	0.30%
	N	19	21	14	14
Army	median	\$ 77,743.14	0.18%	\$ 150,761.96	0.30%
	N	34	35	35	35
Total	median	\$ 120,675.39	0.41%	\$ 136,068.31	0.29%
	N	84	84	84	84

Note: All values are magnitude expressions

a Expense Difference = ABS (central MEPRS expense value - local MEPRS expense value)

b Percent Difference = ABS ( ( Expense Difference / central MEPRS value ) X 100 )

Table 6

Kruskal-Wallis test of the three services' expense differences at the Functional Category level

Fiscal Year		Magnitude Expense Percent Difference
1995	Chi-Square	11.352
	df	2
	P-Value	0.003*
1996	Chi-Square	0.163
	df	2
	P-Value	0.992

\* Significant  $p < .05$

Table 7

Mann-Whitney, post-hoc, pair-wise comparison of expense differences at the Functional category level

Fiscal Year	Independent Sample 1	Independent Sample 2	Mann-Whitney U	Z	P-Value
1995	Air Force (n=28)	Navy (n=21)*	164	-2.626	0.009
	Air Force (n=28)	Army (n=35)*	265	-3.112	0.002
	Navy (n=21)	Army (n=35)	358	-0.161	0.872
1996	Not Applicable, Test not warranted				

\* significant at  $p < .0170$

Table 8  
 Inpatient service functional category workload comparisons

Service	Fiscal Year 1995						Fiscal Year 1996					
	Occupied Bed Day (OBD)			Disposition Percent Difference <sup>d</sup>			Occupied Bed Day (OBD)			Disposition Percent Difference <sup>d</sup>		
	Difference <sup>a</sup>	OBD Percent Difference <sup>b</sup>	Disposition Difference <sup>c</sup>	Difference <sup>d</sup>	OBD Percent Difference <sup>b</sup>	Disposition Difference <sup>c</sup>	Difference <sup>a</sup>	OBD Percent Difference <sup>b</sup>	Disposition Difference <sup>c</sup>	Difference <sup>d</sup>	OBD Percent Difference <sup>b</sup>	Disposition Difference <sup>c</sup>
Air Force	0	< 0.01%	0	< 0.01%	0	< 0.01%	0	0.00%	0	< 0.01%	0	< 0.01%
	4	4	4	4	4	4	5	5	5	5	5	5
Navy	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	< 0.01%	0	< 0.01%
	3	3	3	3	3	3	2	2	2	2	2	2
Army	0	< 0.01%	0	< 0.01%	0	< 0.01%	0	0.00%	0	< 0.01%	0	< 0.01%
	5	5	5	5	5	5	5	5	5	5	5	5
Total	0	< 0.01%	0	< 0.01%	0	< 0.01%	0	0.00%	0	< 0.01%	0	< 0.01%
	12	12	12	12	12	12	12	12	12	12	12	12

Note: All values are magnitude measurements

<sup>a</sup> OBD Difference = central MEPRS OBD Value - local MEPRS OBD Value

<sup>b</sup> OBD Magnitude Difference = Absolute Value ( ( OBD Difference / central MEPRS OBD value ) X 100 )

<sup>c</sup> Disposition Difference = central MEPRS disposition value - local MEPRS disposition value

<sup>d</sup> Disposition Magnitude Difference = Absolute Value ( ( Disposition Difference / central MEPRS disposition value ) X 100 )

Table 9  
 Ambulatory service functional category workload comparisons

Service	Fiscal Year 1995						Fiscal Year 1996					
	Inpatient Visit (IPV)			Outpatient Visit (OPV)			Inpatient Visit (IPV)			Outpatient Visit (OPV)		
	Difference <sup>a</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>	Difference <sup>c</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>	Difference <sup>a</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>	Difference <sup>c</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>
Air Force	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%
	4	4	4	4	4	4	5	5	5	5	5	5
Navy	0	0.00%	0.00%	0	0.00%	0.00%	0	< 0.01%	< 0.01%	10388	0.60%	0.60%
	3	3	3	3	3	3	2	2	2	2	2	2
Army	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%
	5	5	5	5	5	5	5	5	5	5	5	5
Total	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%
	12	12	12	12	12	12	12	12	12	12	12	12

Note: All values are magnitude measurements

<sup>a</sup> IPV Difference = central MEPRS IPV value - local MEPRS IPV value

<sup>b</sup> IPV Magnitude Difference = Absolute Value ( ( IPV Difference / central MEPRS IPV Value ) X 100 )

<sup>c</sup> OPV Difference = central MEPRS OPV Value - local MEPRS OPV value

<sup>d</sup> OPV Magnitude Difference = Absolute Value ( ( OPV Difference / central MEPRS OPV value ) X 100 )

Table 10

Summary of all Inpatient functional category comparisons with matching workload data

Fiscal Year	Occupied Bed Day (OBD) Account Matches	Percentage OBD Matches	Disposition Account Matches	Percentage Disposition Matches
1995 (n = 12)	10	83.3%	11	91.7%
1996 (n = 12)	12	100.0%	11	91.7%

Note: numbers and percentages represent all the inpatient functional accounts with the same OBD or Disposition workload values in both the local and central MEPRS databases.

Table 11

Summary of all Ambulatory functional category comparisons with matching workload data

Fiscal Year	Inpatient Visit (IPV) Account Matches	Percent IPV Matches	Outpatient Visit (OPV) Account Matches	Percent OPV Matches
1995 (n = 12)	10	83.3%	6	50.0%
1996 (n = 12)	11	91.7%	9	75.0%

Note: numbers and percentages represent all the Ambulatory functional accounts with the same IPV or OPV workload values in both the local and central MEPRS databases.

Table 12

Kruskal-Wallis test of the three service's workload differences  
at the Functional category

Fiscal Year		Occupied Bed Day Percent Difference	Disposition Percent Difference	Inpatient Visit Percent Difference	Outpatient Visit Percent Difference
1995	Chi-Square	0.73	2.000	4.364	3.402
	df	2	2	2	2
	P-Value	0.69400	0.368	0.113	0.183
1996	Chi-Square	0.000	1.400	1.400	2.876
	df	2	2	2	2
	P-Value	1.00000	0.497	0.497	0.237

Note: Analysis is based upon median magnitude measurements

Table 13  
Ancillary and Support work center expense comparisons.

Service	Measurement	Fiscal Year 1995		Fiscal Year 1996	
		Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>	Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>
Air Force	median	\$ 5,035.07	0.67%	\$ 2,023.93	0.17%
	N	229	229	293	293
Navy	median	\$ 2,355.10	0.25%	\$ 2,145.06	0.20%
	N	177	177	125	125
Army	median	\$ 1,093.48	0.09%	\$ 3,952.78	0.24%
	N	293	293	276	276
Total	median	\$ 2,362.05	0.24%	\$ 2,659.52	0.21%
	N	699	699	694	694

Note: All values are magnitude expressions

a Expense Difference = ABS (central MEPRS expense value - local MEPRS expense value)

b Percent Difference = ABS ( ( Expense Difference / central MEPRS value ) X 100 )

Table 14

Kruskal-Wallis test of the three services' expense differences at the Ancillary Support work center level.

Fiscal Year		Magnitude Expense Percent Difference
1995	Chi-Square	54.366
	df	2
	P-Value	0.000*
1996	Chi-Square	1.59
	df	2
	P-Value	0.452

\* Significant at  $p < .05$

Table 15

Mann-Whitney post-hoc, pair-wise comparison of expense differences at the Ancillary and Support workcenter level

Fiscal Year	Independent Sample 1	Independent Sample 2	Mann-Whitney U	Z	P-Value
1995	Air Force (n=229)	Navy (n=177)*	15168	-4.35	< 0.001
	Air Force (n=229)	Army (n=293)*	21407	-7.133	< 0.001
	Navy (n=177)	Army (n=293)*	21805	-2.901	0.004
1996	Not Applicable, Test not warranted				

\* Significant a P < .0170

Table 16

Step-down work centers expense comparisons

Service	Measurement	Fiscal Year 1995		Fiscal Year 1996	
		Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>	Expense Difference <sup>a</sup>	Percent Difference <sup>b</sup>
Air Force	median	\$ 12,653.53	1.86%	\$ 6,892.25	1.30%
	N	438	438	568	568
Navy	median	\$ 7,487.57	0.78%	\$ 8,720.92	0.84%
	N	347	347	240	240
Army	median	\$ 4,103.35	0.75%	\$ 7,749.04	1.01%
	N	616	616	617	617
Total	median	\$ 6,738.45	1.01%	\$ 7,631.92	1.04%
	N	1401	1401	1425	1425

**Note:** All values are magnitude expressions

a Expense Difference = ABS (central MEPRS expense value - local MEPRS expense value)

b Percent Difference = ABS ( ( Expense Difference / central MEPRS value ) X 100 )

Table 17

Kruskal-Wallis test of the three services' expense differences at the Step-Down work center level.

Fiscal Year		Magnitude Expense Percent Difference
1995	Chi-Square	65.232
	df	2
	P-Value	0.000*
1996	Chi-Square	15.159
	df	2
	P-Value	0.001*

\* Significant at  $P < .05$

Table 18

Mann-Whitney, post-hoc, pair-wise comparison of expense differences at the Step-Down workcenter level

Fiscal Year	Independent Sample 1	Independent Sample 2	Mann-Whitney U	Z	P-Value
1995	Air Force (n=438)	Navy (n=347)*	59544	-5.213	< 0.001
	Air Force (n=438)	Army (n=616)*	95514	-8.088	< 0.001
	Navy (n=347)	Army (n=616)	102107.5	-1.151	0.25
1996	Air Force (n=568)	Navy (n=240)*	56575.5	-3.821	< 0.001
	Air Force (n=568)	Army (n=617)	163018.5	-2.075	0.038
	Navy (n=240)	Army (n=617)	66424.5	-2.34	0.019

\* Significant at  $P < 0.0170$

Table 19  
Inpatient service work center workload comparisons

Service	Fiscal Year 1995						Fiscal Year 1996					
	Occupied Bed Day (OBD)			Disposition Percent			Occupied Bed Day (OBD)			Disposition Percent		
	Difference <sup>a</sup>	OBD Percent	Disposition Difference <sup>c</sup>	Difference <sup>d</sup>	OBD Percent	Disposition Difference <sup>c</sup>	Difference <sup>a</sup>	OBD Percent	Disposition Difference <sup>c</sup>	Difference <sup>d</sup>	OBD Percent	Disposition Difference <sup>d</sup>
Air Force	0	< 0.01%	0	< 0.01%	0	0.00%	0	0.00%	0	< 0.01%	0	< 0.01%
N	125	125	125	125	165	165	165	165	165	165	165	165
Navy	0	< 0.01%	0	< 0.01%	0	0.00%	0	0.00%	0	< 0.01%	0	< 0.01%
N	95	95	95	95	70	70	70	70	70	70	70	70
Army	0	< 0.01%	0	< 0.01%	0	0.00%	0	0.00%	0	< 0.01%	0	< 0.01%
N	172	172	172	172	165	165	165	165	165	165	165	165
Total	0	< 0.01%	0	< 0.01%	0	0.00%	0	0.00%	0	< 0.01%	0	< 0.01%
N	392	392	392	392	400	400	400	400	400	400	400	400

Note: All values are magnitude measurements

<sup>a</sup> OBD Difference = ABS (central MEPRS OBD Value - local MEPRS OBD Value)

<sup>b</sup> OBD Magnitude Difference = ABS ( ( OBD Difference / central MEPRS OBD value ) X 100 )

<sup>c</sup> Disposition Difference = ABS ( central MEPRS disposition value - local MEPRS disposition value )

<sup>d</sup> Disposition Magnitude Difference = ABS ( ( Disposition Difference / central MEPRS disposition value ) X 100 )

Table 20  
Ambulatory service work center workload comparison.

Service	Fiscal Year 1995						Fiscal Year 1996					
	Inpatient			Outpatient			Inpatient			Outpatient		
	Visit (IPV) Difference <sup>a</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>	Visit (OPV) Difference <sup>c</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>	Visit (IPV) Difference <sup>a</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>	Visit (OPV) Difference <sup>c</sup>	IPV Percent Difference <sup>b</sup>	OPV Percent Difference <sup>d</sup>
Air Force	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%
N	181	179 <sup>e</sup>	181	181	181	181	231	231	231	231	231	231
Navy	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	10388	< 0.01%	< 0.01%
N	153	153	153	153	153	153	103	103	103	103	103	103
Army	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%
N	257	257	257	257	257	257	259	259	259	259	259	259
Total	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%	0	< 0.01%	< 0.01%
N	591	589 <sup>e</sup>	591	591	591	591	593	593	593	593	593	593

Note: All values are magnitude measurements

<sup>a</sup> IPV Difference = ABS ( central MEPRS IPV value - local MEPRS IPV value )

<sup>b</sup> IPV Magnitude Difference = ABS ( ( IPV Difference / central MEPRS IPV Value ) X 100 )

<sup>c</sup> OPV Difference = ABS ( central MEPRS OPV Value - local MEPRS OPV value )

<sup>d</sup> OPV Magnitude Difference = ABS ( ( OPV Difference / central MEPRS OPV value ) X 100 )

<sup>e</sup> The analysis had two missing values because the central MEPRS OPV value was zero.

Table 21  
Kruskal-Wallis test of the three services' workload differences  
at the work center level

Fiscal Year		Occupied Bed Day Percent Difference	Disposition Percent Difference	Inpatient Visit Percent Difference	Outpatient Visit Percent Difference
1995	Chi-Square	23.239	2.136	30.392	7.008
	df	2	2	2	2
	P-Value	0.000*	0.344	0.000*	0.030*
1996	Chi-Square	0.000	28.317	2.033	3.497
	df	2	2	2	2
	P-Value	1.000	0.000*	0.362	0.174

Note: Analysis is based upon median magnitude measurements

\* - Significant < .05

Table 22 A

Mann-Whitney, post-hoc, pair-wise comparison of FY95 occupied bed day differences at the work center level.

Fiscal Year	Independent Sample 1	Independent Sample 2	Mann-Whitney U	Z	P-Value
1995	Air Force (n=125)	Navy (n=95)	5795	-1.517	0.129
	Air Force (n=125)	Army (n=172)*	9551	-3.347	0.001
	Navy (n=95)	Army (n=172)*	7077.5	-3.716	< 0.001
1996	Not Applicable, Test not warranted				

Table 22 B

Mann-Whitney, post-hoc, pair-wise comparison of FY95 inpatient visit differences at the work center level.

Fiscal Year	Independent Sample 1	Independent Sample 2	Mann-Whitney U	Z	P-Value
1995	Air Force (n=179)	Navy (n=153)*	12699	-3.395	0.001
	Air Force (n=179)	Army (n=257)*	21331	-4.38	< 0.001
	Navy (n=153)	Army (n=257)	19660	0.000	1.000
1996	Not Applicable, Test not warranted				

Table 22 C

Mann-Whitney, post-hoc, pair-wise comparison of FY95 outpatient visit differences at the work center level.

Fiscal Year	Independent Sample 1	Independent Sample 2	Mann-Whitney U	Z	P-Value
1995	Air Force (n=181)	Navy (n=153)*	13311	-2.455	0.014
	Air Force (n=181)	Army (n=257)	22727	-1.52	0.128
	Navy (n=153)	Army (n=257)	19354	-1.549	0.121
1996	Not Applicable, Test not warranted				

Note: Pair-wise comparisons based upon median magnitude workload percentage differences

\* Significant < .0170

Table 23

Mann-Whitney, post-hoc, pair-wise comparison of FY96 disposition workload differences at the work center level

Fiscal Year	Independent Sample 1	Independent Sample 2	Mann-Whitney U	Z	P-Value
1995	Air Force (n=165)	Navy (n=70)*	5110	-2.952	0.003
	Air Force (n=165)	Army (n=165)*	12045	-4.481	< 0.001
	Navy (n=70)	Army (n=165)	5775	0.000	1.000
1996	Not Applicable, Test not warranted				

Note: Pair-wise comparisons based upon median magnitude workload percentage differences

\* Significant < .0170

Table 24

Summary of all Inpatient service work centers with matching workload data

Fiscal Year	Occupied Bed Day (OBD)		Disposition Account Matches	Percentage Disposition Matches
	Account Matches	Percentage OBD Matches		
1995 (n = 392)	366	93.4%	391	99.7%
1996 (n = 400)	400	100.0%	381	95.3%

Note: numbers and percentages represent all the inpatient service work centers with the same OBD or Disposition workload values in both the local and central MEPRS databases.

Table 25  
Summary of all Ambulatory service work centers with matching workload data.

Fiscal Year	Inpatient Visit (IPV) Account Matches	Percent IPV Matches	Outpatient Visit (OPV) Account Matches	Percent OPV Matches
1995 (n = 591)	576	97.5%	580	98.1%
1996 (n = 593)	591	99.7%	588	99.2%

Note: numbers and percentages represent all the Ambulatory service workcenters with the same IPV or OPV workload values in both the local and central MEPRS databases.

**APPENDIX A**Active GME MEDCENS by Defense Medical Information System Identification (DMISID)  
Facility Code

<u>DMISID</u>	<u>Facility Name</u>	<u>Location</u>
0014	60 <sup>th</sup> Medical Group (David Grant)	Travis Air Force Base, CA
0029	San Diego Naval Medical Center	San Diego, CA
0037	Walter Reed Army Medical Center	Washington, DC
0047	Eisenhower Army Medical Center	Fort Gordon, GA
0052	Tripler Army Medical Center	HI
0066	89 <sup>th</sup> Medical Group (Malcom Grow)	Andrews Air Force Base, MD
0067	Bethesda Naval Medical Center	Bethesda, MD
0073	81st Medical Group	Keesler Air Force Base, MS
0095	74 <sup>th</sup> Medical Group	Wright-Patterson Air Force Base, OH
0108	William Beaumont Army Medical Center	Fort Bliss, TX
0109	Brooke Army Medical Center	San Antonio, TX
0117	59 <sup>th</sup> Medical Wing (Wilford Hall)	Langford Air Force Base, TX
0124	Portsmouth Naval Medical Center	Portsmouth, VA
0125	Madigan Army Medical Center	Fort Lewis, WA

**APPENDIX B**  
**MEPRS 1-Digit Category**  
**Functional Categories**

Code   Functional Category

- A   Inpatient Care
- B   Ambulatory Care
- C   Dental Care
- D   Ancillary Care
- E   Support Services
- F   Special Programs
- G   Medical Readiness

**APPENDIX C**  
**MEPRS 2 Digit Categories**  
**Summary Accounts**

Code Summary Account

AA	Medical Care
AB	Surgical Care
AC	Obstetrical and Gynecological Care
AD	Pediatric Care
AE	Orthopedic Care
AF	Psychiatric Care
AG	Family Practice
BA	Medical Care
BB	Surgical Care
BC	Obstetrical and Gynecological Care
BD	Pediatric Care
BE	Orthopedic Care
BF	Psychiatric/Mental Health Care
BG	Family Practice Care
BH	Primary Medical Care
BI	Emergency Medical Care
BJ	Flight Medicine Care
BK	Underseas Medicine Care
BL	Rehabilitative Ambulatory Services
CA	Dental Services
CB	Dental Laboratory Services
CC	Dental Prosthetic Laboratory
DA	Pharmacy
DB	Pathology
DC	Radiology
DD	Special Procedures Services
DE	Central Sterile Supply/Material Services
DF	Surgical Services
DG	Same Day Services
DH	Rehabilitative Services
DI	Nuclear Medicine
DJ	Intensive Care
EA	Depreciation
EB	Command, Management, Administration
EC	Support Services-Nonreimbursable (NR)
ED	Support Services-Funded/Reimbursable
EE	Material Services
EF	Housekeeping
EG	Biomedical Equipment Repair Services

Code Summary Account

EH	Laundry Service
EI	Dietetics
EJ	Inpatient Affairs
EK	Ambulatory Care Administration
FA	Specified Health Related Programs
FB	Public Health Services
FC	Health Care Services Contract
FD	Military Unique Medical Activities
FE	Patient Movement & Military Patient Administration
FF	Veterinary Services Army Only
GA	Readiness Planning & Administration
GB	Readiness Exercises
GC	Readiness Training
GD	Unit or Personnel Deployments
GE	Readiness Logistics Management
GF	Readiness Physical Training
GG	National Disaster Medical System (NDMS)

**APPENDIX D**  
**MEPRS 3-Digit Category**  
**Work Centers**

Code   Work Center

AAA	Internal Medicine
AAB	Cardiology
AAD	Dermatology
AAE	Endocrinology
AAF	Gastroenterology
AAG	Hematology
AAI	Nephrology
AAJ	Neurology
AAK	Oncology
AAL	Pulmonary/Upper Resp
AAM	Rheumatology
AAN	Physical Medicine
AAO	Clinical Immunology
AAP	HIV III (AIDS)
AAQ	Bone Marrow Transplant
AAR	Infectious Disease
AAS	Allergy
AAX	Medical Care Cost Pools
AAZ	MedCare Not Elsewhere Classified
ABA	General Surgery
ABB	Cardiovascular & Thoracic Surg
ABD	Neurosurgner
ABE	Ophthalmology
ABF	Oral Surgery
ABG	Otorhinolaryngology
ABH	Pediatric Surgery
ABI	Plastic Surgery
ABJ	Proctology
ABK	Urology
ABL	Organ Transplant
ABM	Burn Unit
ABN	Peripheral Vascular
ABX	Surgical Care Cost Pools
ABZ	Surgical Care Not Elsewhere Classified
ACA	Gynecology
ACB	Obstetrics
ACX	Obstetrical and Gynecological Care Cost Pools
ACZ	Obstetrical/Gynecological Care Not Elsewhere Classified
ADA	Pediatrics

Code Work Center

ADB Newborn Nursery  
ADD Adolescent Pediatrics  
ADX Pediatric Care Cost Pools  
ADZ Pediatric Care Not Elsewhere Classified  
AEA Orthopedics  
AEB Podiatry  
AEC Hand Surgery  
AEX Orthopedic Care Cost Pools  
AEZ Orthopedic Care Not Elsewhere Classified  
AFA Psychiatry  
AFB Substance Abuse Rehabilitation  
AFX Psychiatry Care Cost Pools  
AFZ Psychiatry Care Not Elsewhere Classified  
AGA Family Practice Medicine  
AGB Family Practice Surgery  
AGC Family Practice Obstetrics  
ABD Family Practice Pediatrics  
AGE Family Practice Gynecology  
AGF Family Practice Psychiatry  
AGG Family Practice Orthopedics  
AGH Family Practice Nursery  
AGX Family Practice Cost Pools  
BAA Internal Medicine Clinic  
BAB Allergy Clinic  
BAC Cardiology Clinic  
BAE Diabetic Clinic  
BAF Endocrinology (Metabolism) Clinic  
BAG Gastroenterology Clinic  
BAH Hematology Clinic  
BAI Hypertension Clinic  
BAJ Nephrology Clinic  
BAK Neurology Clinic  
BAL Nutrition Clinic  
BAM Oncology Clinic  
BAN Pulmonary Disease Clinic  
BAO Rheumatology Clinic  
BAP Dermatology Clinic  
BAQ Infectious Disease Clinic  
BAR Physical Medicine  
BAX Medical Care Cost Pools  
BAZ Medical Care Not Elsewhere Classified  
BBA General Surgery Clinic  
BBB Cardiovascular & Thoracic Surgery Clinic

Code   Work Center

BBC   Neurosurgery Clinic  
BBD   Ophthalmology Clinic  
BBE   Organ Transplant Clinic  
BBF   Otorhinolaryngology Clinic  
BBG   Plastic Surgery Clinic  
BBH   Proctology Clinic  
BBI   Urology Clinic  
BBJ   Pediatric Surgery Clinic  
BBX   Surgical Care Cost Pools  
BBZ   Surgical Care Not Elsewhere Classified  
BCA   Family Planning Clinic  
BCB   Gynecology Clinic  
BCC   Obstetrics Clinic  
BCX   Obstetrical and Gynecological Care Cost Pools  
BCZ   Obstetrical/Gynecological Care Not Elsewhere Classified  
BDA   Pediatric Clinic  
BDB   Adolescent Clinic  
BDC   Well Baby Clinic  
BDX   Pediatric Care Cost Pools  
BDZ   Pediatric Care Not Elsewhere Classified  
BEA   Orthopedic Clinic  
BEB   Cast Clinic  
BEC   Hand Surgery Clinic  
BEE   Orthotic Laboratory  
BEF   Podiatry Clinic  
BEX   Orthopedic Care Cost Pools  
BEZ   Orthopedic Care Not Elsewhere Classified  
BFA   Psychiatry Clinic  
BFB   Psychology Clinic  
BFC   Child Guidance Clinic  
BFD   Mental Health Clinic  
BFE   Social Work Clinic  
BFF   Substance Abuse Rehab Clinic  
BFX   Psychiatric/Mental Health Care Cost Pools  
BFZ   Psychiatric Care Not Elsewhere Classified  
BGA   Family Practice Clinic  
BGX   Family Practice Care Cost Pools  
BGZ   Family Practice Care Not Elsewhere Classified  
BHA   Primary Care Clinics  
BHB   Medical Examination Clinic  
BHC   Optometry Clinic  
BHD   Audiology Clinic  
BHE   Speech Pathology

Code Work Center

BHF Community Health Clinic  
BHG Occupational Health Clinic  
BHH PRIMUS/NAVCARE Clinic  
BHI Immediate Care Clinic  
BHX Primary Medical Care Cost Pools  
BHZ Primary Medical Care Not Elsewhere Classified  
BIA Emergency Medical Clinic  
BIX Emergency Medical Care Cost Pools  
BIZ Emergency Medical Care Not Elsewhere Classified  
BJA Flight Medicine Clinic  
BJX Flight Medicine Care Cost Pools  
BJZ Flight Medicine Care Not Elsewhere Classified  
BKA Underseas Medicine Clinic  
BKX Underseas Medicine Care Cost Pools  
BKZ Underseas Medicine Care Not Elsewhere Classified  
BLA Physical Therapy Clinic  
BLB Occupational Therapy Clinic  
BLC Neuromusculoskeletal Screening  
BLX Rehabilitative Ambulatory Services Cost Pools  
CAA Dental Clinic  
CAX Dental Services Cost Pools  
CAZ Dental Services Care Not Elsewhere Classified  
CBA Dental Laboratory  
CBX Dental Laboratory Services Cost Pools  
CBZ Dental Laboratory Not Elsewhere Classified  
CCA Dental Laboratory  
DAA Pharmacy  
DAX Pharmacy Cost Pools  
DAZ Pharmacy Not Elsewhere Classified  
DBA Clinical Pathology  
DBB Anatomical Pathology  
DBC Blood Bank  
DBX Pathology Cost Pools  
DBZ pathology Not Elsewhere Classified  
DCA Diagnostic Radiology  
DCB Therapeutic Radiology  
DCX Radiology Cost Pools  
DCZ Radiology Not Elsewhere Classified  
DDA Electrocardiography  
DDB Electroencephalography  
DDC Electroneuromyography  
DDD Pulmonary Function  
DDE Cardiac Catherterization

Code Work Center

DDX Special Procedures Services Cost Pools  
 DDZ Special Procedures Services Not Elsewhere Classified  
 DEA Central Sterile Supply  
 DEB Central Materiel Supply  
 DEX Central Sterile Supply/Materiel Services Cost Pools  
 DEZ Central Supply/Material Services Not Elsewhere Classified  
 DFA Anesthesiology  
 DFB Surgical Suite  
 DFC Recovery Room  
 DFX Surgical Services Cost Pools  
 DFZ Surgical Services Not Elsewhere Classified  
 DGA Same Day Surgery  
 DGB Hemodialysis  
 DGC Hyperbaric Medicine  
 DGD Peritoneal Dialysis  
 DGX Same Day Services Cost Pools  
 DGZ Same Day Services Not Elsewhere Classified  
 DHA Inhalation/Respiratory Therapy  
 DHX Rehabilitation Services Cost Pools  
 DHZ Rehabilitation Services Not Elsewhere Classified  
 DIA Nuclear Medicine  
 DIX Nuclear Medicine Cost Pools  
 DIZ Nuclear Medicine Not Elsewhere Classified  
 DJA Medical Intensive Care Unit  
 DJB Surgical Intensive Care Unit  
 DJC Coronary Care Unit  
 DJD Neonatal Intensive Care Unit  
 DJE Pediatric Intensive Care Unit  
 DJX Intensive Care Cost Pools  
 EAA Inpatient Depreciation  
 EAB Ambulatory Depreciation  
 EAC Dental Depreciation  
 EAD Special Programs Depreciation  
 EAE Medical Readiness Depreciation  
 EAX Depreciation Cost Pools  
 EAZ Depreciation Not Elsewhere Classified  
 EBA Command  
 EBB Special Staff  
 EBC Administration  
 EBC Clinical Management  
 EBE Graduate Medical Education Support  
 EBF Education & Training Program Support  
 EBG Peacetime Exercises/Disaster Preparedness

Code   Work Center

EBH Third Party Collection  
 EBX Command, Management, Administration Cost Pools  
 EBZ Command, Management, Administration Not Elsewhere Classified  
 ECA Plant Management-NR  
 ECB Operation of Utilities-NR  
 ECC Maintenance of Real Property-NR  
 ECD Minor Construction-NR  
 ECE Other Engineering Support-NR  
 ECF Lease of Real Property-NR  
 ECG Transportation-NR  
 ECH Fire Protection-NR  
 ECI Police Protection-NR  
 ECJ Communications-NR  
 ECK Other Base Support Service-NR  
 ECX Support Services-NR Cost Pools  
 ECZ Support Services-NR Not Elsewhere Classified  
 EDA Plant Management-Funded  
 EDB Operation of Utilities-Funded  
 EDC Maintenance of Real Property- Funded  
 EDD Minor Construction- Funded  
 EDE Other Engineering Support- Funded  
 EDF Lease of Real Property- Funded  
 EDG Transportation- Funded  
 EDH Fire Protection- Funded  
 EDI Police Protection- Funded  
 EDJ Communications- Funded  
 EDK Other MTF Support Services- Funded  
 EDX Support Services-Funded/Reimbursable Cost Pools  
 EDZ Support Services-F/R Not Elsewhere Classified  
 EEA Material Services  
 EEX Material Services Cost Pools  
 EEZ Material Services Not Elsewhere Classified  
 EFA Housekeeping-In house  
 EFB Housekeeping-Contract  
 EFX Housekeeping Cost Pools  
 EFZ Housekeeping Not Elsewhere Classified  
 EGA Biomedical Equipment Repair-In house  
 EGB Biomedical Equipment Repair-Contract  
 EGX Biomedical Equipment Repair-Cost Pools  
 EGZ Biomedical Equipment Repair Services Not Elsewhere Classified  
 EHA Laundry-In House  
 EHB Laundry-Contract  
 EHX Laundry Services Cost Pools

Code Work Center

EHZ Laundry Services Not Elsewhere Classified  
 EIA Patient Food Operations  
 EIB Combined Food Operations  
 EIC Inpatient Clinical Dietetics  
 EIX Dietetics Cost Pools  
 EIZ Dietetics Not Elsewhere Classified  
 EJA Inpatient Care Administration  
 EJX Inpatient Affairs Cost Pools  
 EJZ Inpatient Affairs Not Elsewhere Classified  
 EKA Ambulatory Care Administration  
 EKX Ambulatory Care Administration Cost Pools  
 EKZ Ambulatory Care Administration Not Elsewhere Classified  
 FAA Area Reference Laboratories  
 FAB Area Reference Laboratories  
 FAC Ophthalmic Fabrication and Repair  
 FAD DoD Military Blood Program  
 FAF Drug Screening and Testing Program  
 FAH Clinical Investigation Program  
 FAI Physiological Training/Support  
 FAK Student Expenses  
 FAL Continuing Health Education  
 FAX Specified Health Related Programs Cost Pools  
 FAZ Specified Health Related Programs Not Elsewhere Classified  
 FBB Preventive Medicine  
 FBC Industrial Hygiene Program  
 FBD Radiation Health Program  
 FBE Environmental Health Program  
 FBF Epidemiology Program  
 FBI Immunizations  
 FBX Public Health Services Cost Pools  
 FBZ Public Health Services Not Elsewhere Classified  
 FCA Supplemental Care  
 FCB Guest Lecturer and Consultant Program  
 FCC CHAMPUS Beneficiary Support  
 FCD Support to Other Military Activities  
 FCE Support to Other Federal Agencies  
 FCF Support to Non-Federal Activities  
 FCG Support to NonMEPRS Reporting Medical Activities  
 FCX Health Care Services Support Cost Pools  
 FCZ Health Care Services Support Not Elsewhere Classified  
 FDB Base Operations-Medical Installations  
 FDC Nonpatient Food Operations  
 FDD Decedent Affairs

Code   Work Center

FDE Initial Outfitting  
FDF Urgent Minor Construction  
FDG TDY/TAD Enroute to PCS  
FDH Military Funded Emergency Leave  
FDI In-place Consecutive Overseas Tour Leave  
FDX Military Unique Medical Activities Cost Pools  
FDZ Military Unique Medical Activities Not Elsewhere Classified  
FEA Patient Transportation  
FEB Patient Movement Expenses  
FEC Transient Patient Care  
FED Military Patient Personnel Administration  
FEE Military Patients (Salaries)  
FEF Aeromedical Staging Facilities  
FEX Patient Movement & Military Patient Administration Cost Pools  
FEZ Patient Movement & Military Patient Administration Not Elsewhere Classified  
FFA Deputy Commander for Veterinary Services Army  
FFB Commissary Food Inspection Army Only  
FFC Troop Issue Supply Food Inspection  
FFD Supply Point Food Inspection Army  
FFE Depot Food Inspection Army Only  
FFF Origin Food Inspection Army Only  
FFG Veterinary laboratory Army Only  
FFH Animal Disease Prevention & Control Facility  
FFX Veterinary Services Army Only  
FFZ Veterinary Services Not Elsewhere Classified  
GAA Readiness Planning & Administration  
GAB Other Readiness Planning & Administration  
GAX Readiness Planning & Administration Cost Pools  
GBA Readiness Exercises  
GBB Other Readiness Exercises  
GBX Readiness Exercises Cost Pools  
GCA Readiness Training  
GCB Other Readiness Training  
GCX Readiness Training Cost Pools  
GDA Unit or Personnel Deployment  
GDY Unit or Personnel Deployment Cost Pools  
GEA Prepositioned War Reserve  
GEB Contingent Patient Care Areas  
GEC Contingent Patient Blocks/Packs  
GEX Readiness Logistics Management Cost Pools  
GFA Readiness Physical Training  
GFX Readiness Physical Training Cost Pools  
GGA NDMS Planning & Administration

Code Work Center

GGB NDMS Exercises

GGX National Disaster Medical System Cost Pools

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