Audit Report

INPATIENT DATA SUPPORTING THE DOD MILITARY RETIREMENT HEALTH BENEFITS LIABILITY ESTIMATE

Report No. D-2000-090 March 1, 2000

Office of the Inspector General
Department of Defense

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Acronyms

CHCS	Composite Health Care System
DRG	Diagnostic Related Group
RWP	Relative Weighted Product

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

March 01, 2000

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE
(HEALTH AFFAIRS)

SUBJECT: Audit Report on Inpatient Data Supporting the DoD Military Retirement Health Benefits Liability Estimate (Report No. D-2000-090)

We are providing this report for your information and use. We conducted the audit in response to the Chief Financial Officers Act of 1990, as amended by the Federal Financial Management Act of 1994. Because this report contains no recommendations, no written comments were required, and none were received. Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Charles J. Richardson at (703) 604-9582 (DSN 664-9582) (crichardson@dodig.osd.mil) or Mr. Walter R. Loder at (703) 604-9534 (DSN 664-9534) (wrloder@dodig.osd.mil). See Appendix E for the report distribution. The audit team members are listed on the inside back cover.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. D-2000-090 **March 01, 2000**
(Project No. 8FA-2016.01)

Inpatient Data Supporting the DoD Military Retirement Health Benefits Liability Estimate

Executive Summary

Introduction. The audit was performed in support of the Chief Financial Officers Act of 1990 as amended by the Federal Financial Management Act of 1994. Military retirement health benefits are post-retirement benefits that DoD provides to military retirees and other eligible beneficiaries through the Civilian Health and Medical Program of the Uniformed Services (Purchased Care) and DoD military treatment facilities. Approximately $172 billion of the $223 billion FY 1998 estimated military retirement health benefits liability represented future outpatient and inpatient medical care that the DoD military treatment facilities are expected to provide to eligible beneficiaries. About $50 billion of the $172 billion represented the inpatient portion of the liability estimate. The remaining $51 billion of the liability was provided through the Purchased Care. The $223 billion unfunded liability was 24 percent of the $948.5 billion of liabilities included on the DoD Agency-wide financial statements and 8 percent of the estimated $2.7 trillion of the Federal Employee and Veterans Benefits Payable reported on the FY 1998 consolidated Federal Government financial statements. This audit is the second audit in a series of audits to review the reliability of data elements used in the estimate of the military retirement health benefits liability. The first audit discussed the reliability of outpatient visit data that were used in the calculation of the DoD military retirement health benefits liability estimate.

The Office of Management and Budget issued Directive M-99-12, "Assuring the Year 2000 Readiness of High Impact Federal Programs," on March 26, 1999. The Office of Management and Budget guidance directs DoD to report on two areas: retiree annuitant pay and military hospitals. The inpatient workload data discussed in this report are captured in the Composite Health Care System operated by DoD hospitals and clinics. The Deputy Secretary of Defense reported to the Director, Office of Management and Budget, that "100 percent of DoD mission-critical systems will be compliant by December 1999."

Objectives. The overall audit objective was to assess the reliability and completeness of the data used to calculate the DoD military retirement health benefits liability. Specifically, we reviewed the inpatient workload data contained in the Biometrics database at Fort Detrick, Maryland, for reliability and completeness. Additionally, we reviewed the management controls as they related to the objective.

Results. The inpatient medical records coding at two military treatment facilities was generally reliable. Expert coders performed medical record coding reviews on 75 records from the 2 military treatment facilities. The medical record coding review showed that 8 percent of the inpatient medical records at the two facilities required changes in either the diagnostic related group (DRG) codes or the associated case weights, or both. We determined that the coding changes did not significantly affect the quality of the inpatient workload data and the military retirement health benefits liability. In response to Inspector General, DoD, Report No. 99-127, "Data Supporting the FY 1998 DoD Military Retirement Health Benefits Liability Estimate," April 7, 1999, which reported on the quality of outpatient data, the Assistant Secretary of Defense (Health Affairs) and the Office of the Actuary, DoD, initiated efforts to start a quality assurance program to improve the accuracy and reliability of workload data in the Composite Health Care System. The issues identified in this report were identified as areas to be included as part of the DoD medical data comprehensive quality assurance program. Because management initiated efforts to correct conditions noted in the finding, this report contains no recommendations. See the Finding section for details of the audit results.

The management controls that we reviewed were effective in that no material management control weakness was identified. See Appendix A for details on the management control program.

Management Comments. We provided a draft of this report on December 23, 1999. Because this draft report contains no recommendations, written comments were not required, and none were received. Therefore, we are publishing this report in final form.

Table of Contents

Executive Summary i

Introduction

Background 1
Objectives 2

Finding

Inpatient Data Supporting the DoD Military Retirement Health Benefits Liability Estimate 3

Appendixes

A. Audit Process
Scope 8
Methodology 9
Management Control Program 10
B. Summary of Prior Coverage 11
C. Diagnostic Related Group Coding 12
D. Statistical Sampling Methodology 14
E. Report Distribution 18

Background

Requirements for Financial Statements. Public Law 101-576, the "Chief Financial Officers Act of 1990," as amended by Public Law 103-356, the "Federal Financial Management Act of 1994," requires DoD and other Government agencies to prepare financial statements. The Inspector General, DoD, is responsible for the audit of the DoD Agency-wide financial statements. The General Accounting Office is responsible for the audit of the consolidated Federal Government financial statements.

Office of Management and Budget Form and Content Guidance. Office of Management and Budget Bulletin No. 97-01, "Form and Content of Agency Financial Statements," as amended on November 20, 1998, provides general and specific guidance to agencies on the preparation of financial statements. The Bulletin established guidance for reporting pensions, other retirement benefits, and other post-employment benefits. DoD "other retirement benefits" include all retirement benefits other than pension plan benefits. The Bulletin further states that entities that are responsible for accounting for "other retirement benefits" should calculate and report the liabilities and related expenses in accordance with Statement of Federal Financial Accounting Standard No. 5, "Accounting for Liabilities of the Federal Government," September 1995.

Military Treatment Facilities. FY 1997 was the first year that DoD reported the unfunded liability for the DoD military retirement health benefits on the DoD-wide consolidated financial statements. For FY 1998, DoD reported $223 billion for the military retirement health benefits liability. The $223 billion unfunded liability was 24 percent of the $948.5 billion of liabilities included on the DoD Agency-wide financial statements and 8 percent of the estimated $2.7 trillion of the Federal Employee and Veterans Benefits Payable reported on the FY 1998 consolidated Federal Government financial statements. Approximately $172 billion of the $223 billion FY 1998 estimated military retirement health benefits liability represented future outpatient and inpatient medical care that the DoD military treatment facilities are expected to provide to eligible beneficiaries. DoD military treatment facilities include hospitals and clinics. About $50 billion of the $172 billion represented the inpatient portion of the liability estimate. The remaining $51 billion of the $223 billion liability was provided through the Civilian Health and Medical Program of the Uniformed Services (Purchased Care). The Purchased Care program provides health care through civilian medical providers.

Armed Forces Medical Care. Section 1071 of title 10, United States Code Annotated, Armed Forces, "Chapter 55-Medical and Dental Care," requires DoD to provide a uniform program of medical and dental care for uniformed Service members, for certain former members of those Services, and for dependents.

Inpatient Workload Data Supporting Liability Calculation. The Office of the Actuary, DoD, relies on inpatient workload data reported within the

Biometrics database located at the U.S. Army Medical Information System and Services Agency, Fort Detrick, Maryland, to calculate the DoD military treatment facilities portion of the estimated liability. Inpatient workload data are captured and processed by the Composite Health Care System (CHCS) at each DoD military treatment facility that provides inpatient care. The CHCS is a comprehensive medical information system that DoD developed to provide automated support to its military treatment facilities. On a monthly basis, the inpatient workload data from the military treatment facilities are electronically transmitted to the Biometrics database at the U.S. Army Medical Information System and Services Agency. The inpatient workload data in the CHCS should agree with the Biometrics database.

Inpatient workload data are measured by diagnostic related group (DRG) codes and relative weighted products (RWPs). RWPs are used synonymously with case weights. The DRG code that is assigned to inpatient workload data is the result of an inpatient classification methodology that relates demographic, diagnostic, and therapeutic characteristics of patients to length of stay and the amount of resources consumed. Coding of medical records is accomplished at each military treatment facility by coders. Coding involves a high degree of judgment for certain aspects of coding, which can result in different coding for the same record. The RWP is a DoD measure of workload credit derived from weights assigned to DRG codes. Therefore, the RWPs assigned to an inpatient case is a measure of the relative use of resources that a patient's hospitalization consumed when compared with those of other patients. The Office of the Actuary, DoD, employs a methodology that uses the Biometrics inpatient workload data to calculate an estimated average cost to provide inpatient care in DoD military treatment facilities to eligible beneficiaries by selective age categories.

Objectives

The overall objective was to assess the reliability and completeness of the data used to calculate the DoD military retirement health benefits liability. Specifically, we reviewed the inpatient workload data contained in the Biometrics database located at Fort Detrick for reliability and completeness. Additionally, we reviewed the management controls as related to the objective. See Appendix A for a discussion of the audit scope and methodology and our review of the management control program, and see Appendix B for a summary of prior audit coverage related to the audit objectives.

Inpatient Data Supporting the DoD Military Retirement Health Benefits Liability Estimate

The inpatient medical records coding at two military treatment facilities was generally reliable. However, 8 percent of the records at the two facilities required changes in either the DRG codes or the associated case weights, or both. The degree of changes required will not significantly affect the quality of the inpatient workload data in the CHCS and ultimately the military retirement health benefit liability. Records required changes in part, because the military treatment facilities did not have either an independent quality assurance review of DRG codes, a formal training program, or a continuing education program for medical record coders. We could not determine whether the inpatient workload data within the Biometrics database were complete because of differences between CHCS and the Biometrics database. In addition, the Office of the Actuary, DoD, did not provide adequate audit trails in its collection of inpatient workload data. However, our limited review did not identify a significant detrimental effect on the quality of inpatient workload data. Also, in response to an Inspector General, DoD, Report No. 99-127, "Data Supporting the FY 1998 DoD Military Retirement Health Benefits Liability Estimate," April 7, 1999, on the quality of the outpatient data, the Assistant Secretary of Defense (Health Affairs) and the Office of the Actuary, DoD, initiated efforts to start a quality assurance program to improve the accuracy and reliability of outpatient and inpatient workload data in CHCS; therefore, this report contains no recommendations.

Medical Record Coding

We obtained the services of medical record coders to perform a coding review of the 75 inpatient records to test the DRG codes at 2 military treatment facilities. The medical record coding review showed that 8 percent of the records at two military treatment facilities, in the opinion of the medical record coders, required changes in either the DRG codes or the associated case weights, or both. The changes resulted in incorrect weights or codes, or both, assigned to 6 of the 75 records reviewed, which statistically represent 2,900 of 36,246 records at the 2 facilities. Details regarding the audit results of DRG codes are in Appendix C.

Completeness of Biometrics Data

We could not determine whether the inpatient workload data within the Biometrics database were complete because of differences between CHCS and the Biometrics database. We compared the FY 1997 inpatient workload data in the Biometrics database with similar data captured in CHCS. An inpatient discharge equals an inpatient workload unit. Except for minor adjustments, the inpatient workload data captured in the Biometrics database should equal the workload data reported in CHCS. Overall, we found a difference of 627 items, which equates to less than 1 percent difference when comparing the inpatient workload in the Biometrics database with the CHCS data. Although total workload counts had no significant difference, the accuracy of the inpatient workload counts varied by location. Specifically, two of the six military treatment facilities had about 4 percent difference rates, while four of the facilities had less than 1 percent difference rates.

The following table is a comparison of the inpatient workload data reported in the Biometrics and CHCS databases at each military treatment facility.

Discrepancies in FY 1997 Total Discharges

Military Treatment Facility	Biometrics Database	Military Treatment Facility CHCS - Patient Category	Absolute Difference
Army			
Dewitt	5,777	5,566	211
Madigan	14,751	14,760	9
Navy			
Portsmouth	25,811	25,823	12
San Diego	22,894	22,947	53
Air Force			
Malcolm Grow	7,483	7,818	335
David Grant	10,435	10,442	7
Total	**87,151**	**87,356**	**627**

The table shows that the differences were small between the FY 1997 inpatient workload data reported in the Biometrics database and CHCS. However, we believe that reconciling the database with CHCS will help ensure the accuracy and completeness of the inpatient workload data.

Management Controls Over Inpatient Workload Data

A commercial hospital that we visited conducted routine quality assurance tests of DRG codes. The commercial hospital's goal was to keep DRG coding errors at less than 5 percent. The six military treatment facilities that we visited did not have an independent quality assurance review of DRG codes used at the military treatment facilities.

In addition, DoD did not have a formal coding training program and a continuing education program to enhance the quality of coding. The lack of a formal coding training program was illustrated at the David Grant Air Force Medical Center in a November 1996 memorandum addressing issues from a comparison coding validation study at the David Grant Air Force Medical Center, performed by the Forensic Medical Advisory Service Corporation. The memorandum states that to improve the coding process, management needed to ensure that coders are more than "minimally qualified." Coders from the DoD military treatment facilities are not required to be certified, to have a degree, or to be anything other than "minimally qualified."

Improvements in Audit Trail for Inpatient Data

The FY 1997 inpatient workload data, collected by the Office of the Actuary, DoD, to calculate the FY 1998 liability estimate, did not provide adequate audit trails. Specifically, the Office of the Actuary, DoD, did not include the Defense medical information system identifier as a data element in the inpatient workload database. The Defense medical information system identifier is a unique number that identifies the military treatment facility in which the patient was hospitalized. In FY 1997, DoD provided more than 412,000 episodes of inpatient care in 116 DoD military treatment facilities. The Defense medical information system identifier is needed to locate medical files that were selected for audit verification. The Office of the Actuary, DoD, did not include the Defense medical information system identifier as part of the inpatient workload data requirements because the Office of the Actuary, DoD, did not need the identifier to calculate the liability estimate. We brought the matter to the attention of personnel in the Office of the Assistant Secretary of Defense (Health Affairs) and the Office of the Actuary, DoD. The Office of the Actuary, DoD, took action to include the identifier as one of the data elements in the inpatient data collection for the calculation of the liability estimate for FY 1999 and beyond.

Management Efforts to Improve Data Reliability and Completeness

The Office of the Assistant Secretary of Defense (Health Affairs) initiated actions to improve the reliability and completeness of the outpatient workload data. The Under Secretary of Defense (Comptroller) developed a strategic plan entitled the "Department of Defense Implementation Strategy for Auditable Financial Statements." As part of the overall implementation strategy, the Office of the Assistant Secretary of Defense (Health Affairs) took responsibility for a specific issue area, "C.3. Liabilities Issues, Post-Retirement Health Care Liabilities," to address issues related to the military retirement health benefits liability. Specific ongoing efforts to correct the impediments to achieving a favorable audit opinion include the following:

- revising procedures to ensure that all data used in calculating the liability are current;
- revising procedures to ensure that reasonably accurate, reliable, timely, and complete data required for estimating the liability are captured and reported; and
- conducting quarterly in-process reviews of the military retirement health benefits liability with principals from the General Accounting Office; the Office of the Inspector General, DoD; and the Under Secretary of Defense (Comptroller).

In addition, the Office of the Assistant Secretary of Defense (Health Affairs) established a Medical Expense Performance and Reporting System Management Improvement Group to review deficiencies related to the Expense Assignment System and to develop corrective actions. A major goal of the Group is to develop procedures for reconciling financial, workload, and labor hours to the data sources. When fully implemented, the procedures should help ensure adequate audit trails and improve the reliability of the underlying data that DoD uses to calculate an estimate of the military retirement health benefits liability.

Conclusion

In response to an Inspector General, DoD, Report No. 99-127, "Data Supporting the FY 1998 DoD Military Retirement Health Benefits Liability Estimate," April 7, 1999, the Office of the Assistant Secretary of Defense (Health Affairs) was addressing data quality issues through the establishment of a data quality assurance program. The program objectives were designed to provide reasonable assurance that inpatient workload data are being accurately recorded and reported. In addition, the quality assurance program was supposed to include testing the CHCS inpatient information to ensure use of complete and reliable inpatient data in the calculation of the military retirement health benefits liability estimate.

Appendix A. Audit Process

Scope

Work Performed. Our audit focused on the review of the FY 1997 inpatient workload data that the Office of the Actuary, DoD, used to calculate an estimate of the military retirement health benefits liability. According to the U.S. Army Medical Information System and Services Agency, the FY 1997 inpatient workload consisted of 412,049 inpatient discharges that were provided by 116 DoD military treatment facilities. We conducted our review at the following six DoD military treatment facilities:

- Madigan Army Medical Center, Tacoma, Washington;
- Dewitt Army Community Hospital, Fort Belvoir, Virginia;
- Naval Medical Center San Diego, San Diego, California;
- Naval Medical Center Portsmouth, Portsmouth, Virginia;
- David Grant Air Force Medical Center, Travis Air Force Base, California; and
- Malcolm Grow Air Force Medical Center, Andrews Air Force Base, Maryland.

The 6 DoD military treatment facilities that we visited reported 87,151 out of 412,049 inpatient discharges (21 percent) for FY 1997. We selected the six DoD military treatment facilities for review to provide audit coverage of each of the Military Departments and because of the volume of inpatient medical care that the DoD military treatment facilities provided to eligible beneficiaries.

We reviewed the procedures for recording and reporting inpatient workload data in the CHCS and the Biometrics database located at Fort Detrick, Maryland. Specifically, we selected and reviewed patients' inpatient medical treatment records and standard inpatient data records to determine whether the Biometrics database accurately reported the DRGs, RWPs, and their associated bed days.

For FY 1998, DoD reported a $223 billion unfunded actuarial estimate for the military retirement health benefits liability on the DoD and the Government-wide consolidated financial statements. Approximately $172 billion of the $223 billion of the FY 1998 estimated military retirement health benefits liability accrued from future inpatient and outpatient medical care that the DoD military treatment facilities are expected to provide to eligible beneficiaries.

External DoD Assistance. The Assistant Secretary of Defense (Health Affairs) provided 2 certified DoD medical record coders to assist us in validating DRG codes for 75 inpatient workload cases selected for review. One of the coders is

a Registered Record Administrator and the other is an Accredited Record Technician. The American Health Information Management Association certifies the coders.

The coders reviewed and re-coded medical records for 75 selected inpatient cases at the Naval Medical Center Portsmouth and the David Grant Air Force Medical Center. The DoD coders used the FY 1997 Encoder Grouper, which was also used to code those selected medical records by coders at the visited facilities. The Encoder Grouper is a DoD Medical Records software system that automates the process of entering diagnosis and procedure codes onto a patient's medical record. Encoder Grouper software analyzes the various diagnosis and procedures codes that relate to the inpatient medical care and then determines the primary DRG code.

DoD-Wide Corporate-Level Government Performance and Results Act Coverage. In response to the Government Performance and Results Act, the Secretary of Defense annually establishes DoD-wide corporate-level goals, subordinate performance goals, and performance measures. This report pertains to achievement of the following goal:

> **Performance Goal 2.5:** Improve DoD financial and information management. **(01-DoD-2.5)**

DoD Functional Area Reform Goals. Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objectives and goals.

- **Financial Management Functional Area. Objective:** Reengineer DoD business practices. **Goal:** Improve data standardization of finance and accounting data items. **(FM-4.4)**

- **Financial Management Functional Area. Objective:** Strengthen internal controls. **Goal:** Improve compliance with the Federal Managers' Financial Integrity Act of 1982. **(FM-5.3)**

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in DoD. This report provides coverage of the Defense Financial Management high-risk area.

Methodology

Use of Computer-Processed Data. We used the FY 1997 computer-processed data that the military treatment facilities used to record and report inpatient workload data. We did not validate the reliability of the CHCS and the Biometrics databases because we limited our use of the data to testing management controls and to obtaining an understanding of the procedures that

the Office of the Actuary, DoD, used to calculate the liability. However, not validating the reliability of the CHCS and the Biometrics database did not materially affect the results of our audit.

Statistical Sampling Methodology. See Appendix D for the statistical sampling methodology used in this audit.

Audit Type, Dates, and Standards. We performed this financial-related audit from January through November 1999 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We included tests of management controls considered necessary.

Contacts During the Audit. We visited or contacted organization within DoD. Further details are available on request.

Management Control Program

DoD Directive 5010.38, "Management Control Program," August 26, 1996, requires DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of Review of Management Control Programs. We reviewed the adequacy of management controls over procedures to ensure that inpatient workload data were accurately recorded and reported. We did not assess management's self-evaluation of those controls.

Adequacy of Management Controls. Management controls over the inpatient workload data were adequate in that we identified no material management control weaknesses.

Appendix B. Summary of Prior Coverage

During the last 5 years, the General Accounting Office issued two audit reports and the Inspector General, DoD, issued two audit reports discussing the CHCS issues and the DoD military retirement health benefits liability, including the quality of the outpatient workload data supporting the liability estimate.

General Accounting Office

GAO/AIMD-96-39, "Defense Achieves Worldwide Deployment of Composite Health Care System," April 5, 1996.

GAO/AIMD-94-61, "Defense's Tools and Methodology for Managing CHCS Performance Need Strengthening," July 5, 1994.

Inspector General

Inspector General, DoD, Report No. 99-127, "Data Supporting the FY 1998 DoD Military Retirement Health Benefits Liability Estimate," April 7, 1999.

Inspector General, DoD, Report No. 99-010, "DoD Military Retirement Health Benefits Liability for FY 1997," October 13, 1998.

Appendix C. Diagnostic Related Group Coding

Medical record managers at each DoD military treatment facility are responsible for ensuring the accuracy of each DRG code that is assigned to each inpatient medical case. The DRG code assigned to an inpatient medical case represents a significant computational factor that the Office of the Actuary, DoD, relies on to calculate the military retirement health benefits liability estimate. A DRG code is an indicator of the amount of resources that a hospital stay consumed. The DRG code that is assigned to an inpatient case is based on factors such as demographics, specific medical diagnosis and procedure, and therapeutic characteristics of the patient. The relative weighted product (RWP) is a DoD measure of workload credit derived from weights assigned to DRG codes. The RWP is used synonymously with the case weight that is reported on the standard inpatient data record.

Medical record coders assign the DRG codes to the inpatient records at each of the 116 military treatment facilities. We obtained the services of two DoD certified medical record coders to review and re-code 75 inpatient medical records as appropriate from 2 military treatment facilities visited. The 2 military treatment facilities had a total population of 36,246 medical records for FY 1997 inpatient discharges. The medical record coding review showed that 6 of the 75 sample records from the 2 facilities required changes in either the DRG codes or associated case weights, or both. For example, the initial coder at David Grant Air Force Medical Center assigned an inpatient case with a DRG code 144, "Other Circulatory System Diagnoses With CC," with a case weight of 0.7560. The re-coder re-coded that same inpatient case with a DRG code 011, "Nervous System Neoplasm Without CC," with a case weight of 0.6482. The initial coder coded "Infection, Central Line" as the principal diagnosis with additional diagnoses of "Bacteremia" and "Malignant Neoplasm of Brain." The initial coder also coded a procedure of "Magnetic Resonance Imaging of Brain and Brain Stem." Documentation in the record supported the "Malignant Neoplasm of Brain" as the principal diagnosis and did not support the other two diagnoses and procedures. Additionally, documentation in the record supported two procedures not coded by the initial coder, which were "Magnetic Resonance Imaging of Spine" and "Chemotherapy," which should be the principal diagnoses. Because the initial coder picked the wrong principal diagnosis and coded some conditions that were not applicable, the re-coder changed the principal diagnosis, which resulted in a change of DRG code and the associated case weight.

Similarly, the initial coder at the Naval Medical Center Portsmouth assigned an inpatient case with a DRG code 41, "Extraocular Procedures Except Orbit Age 0-17," with a case weight of 0.7072. The re-coder re-coded that same inpatient case and re-assigned a DRG code 48, "Other Disorders of the Eye Age 0-17," with a case weight of 0.3460. The initial coder coded a procedure that was not carried out based on the review of the record. Therefore, the procedure code was deleted and resulted in a change of the DRG code and the associated case weight.

We estimate that the occurrence rate for the changes at the two military treatment facilities was 8 percent. In other words, of a total population of 36,246 records at the 2 facilities, 2,900 records would require changes in either the DRG codes or associated case weights, or both. Accurate coding of inpatient medical records is essential in compiling correct inpatient workload information.

The importance of a mistake in the assignment of the DRG code is that the mistake may result in a change to the assigned case weight or RWP and a potential impact on the liability estimate. However, the 8 percent error rate at the two military treatment facilities in our review did not have a significant effect on the liability estimate.

The two military treatment facilities are not necessarily statistically representative of DoD military treatment facilities as a whole. They were selected judgmentally. The sample results applied only to the two military treatment facilities sampled.

Appendix D. Statistical Sampling Methodology

Sampling Objectives. The purpose of the statistical sampling was to assess the reliability and completeness of inpatient data used to calculate the DoD military retirement health benefits liability. In particular, we tested consistency of data and processes within and across Defense health care information systems. The sample focused on a subset of military medical facilities to test consistency of reporting and recording key elements of information on inpatient care.

Statistical Sampling Frame. The DoD military health care system cared for and discharged 412,049 retiree or retiree-dependent patients during FY 1997. The Office of the Actuary, DoD, uses care data from the fiscal year before the one being projected to have complete data for the year and also to have time for conducting the actuarial analysis necessary for computing the unfunded liability. The inpatient care was provided at 116 military treatment facilities. DoD reports inpatient care through both the Biometrics database and CHCS. The samples are based on data from the Biometrics database. Each record in the Biometrics database is related to inpatient care provided to an individual; the care ended with discharge from the reporting military treatment facility during FY 1997.

We used two samples, both drawn statistically. The larger sample is based on 6 of the 116 military treatment facilities and represents 87,151 of the 412,049 discharges in FY 1997. The second sample involves care at only 2 of the 6 military treatment facilities, representing 36,246 discharges. Results from the 2 sampling frames are representative of only the military treatment facilities from which they were drawn, not of all 116.

Definition of Error or Deviation Condition (Measurement). We have used sample data for two types of testing. In one, the sample records provide a means of examining the processes involved in recording and measuring inpatient care; they are qualitative measures and are not designed for statistical projection. The sample ensures a wide and unbiased selection of inpatient records for testing. The second involves evaluation of a resource consumption (the case weight, also referred to as the relative weighted product). The case weight is a single number summarizing the relative quantity of resources required to provide inpatient care for persons with a common overall diagnosis. The case weight is assigned by a coder based on review of inpatient care documents and stands as a proxy for cost of care. We have compared the case weight as recorded with a case weight determined by independent coders based on the same documentary information for a sample discharges at two military treatment facilities.

We used our sample of 188 records to assess data and reporting processes at the 6 judgmentally selected locations listed in the Appendix A. Selecting the discharges statistically gave us an unbiased selection for our testing. We used the 75 discharges at the David Grant and Portsmouth medical centers to test

consistency of case computed weight coding. Because the military treatment facilities in each sample are not representative of all 116 military treatment facilities, our conclusions are limited to just those military treatment facilities visited and tested.

Parameters for Statistical Sampling. We have used sampling to assess Defense health care information systems' reliability and completeness on a limited basis. Our sample of coding differences used a 90-percent confidence level. Because the objective was to test reliability, versus strict compliance with a threshold error rate, we used two-tailed testing. The aim is to measure frequency and degree of error, not to test the sample data against a standard maximum allowable error rate or quantity.

Sampling Design. We used two samples in our testing. We judgmentally selected 6 military treatment facilities and combined their inpatient care records into a single pool from which we statistically selected a simple random sample of 188 records. We used the records for qualitative testing of management controls and processes. Because we selected the military treatment facilities judgmentally, the sample results relate only to the six military treatment facilities. In our second sample, we selected a subset of the 188 records: the 75 that were drawn from 2 military treatment facilities (David Grant Air Force Medical Center and Naval Medical Center Portsmouth). The 75 were using a simple random sample design; they are statistically representative of the 36,246 records from the 2 military treatment facilities combined. We used the Statistical Analysis System programming language and its random number generators to draw the sample of 188 records. Our analysis uses the simple random sample calculation formula set forth in Cochran.[1] We used an Excel spreadsheet for our analysis.

Results of Sampling of Re-Coded Case Weights. The following results apply statistically only to the two military treatment facilities sampled. In 6 of the 75 re-coded inpatient discharges, the re-coded DRG codes or the associated case weights differed from those recorded. We evaluated the sample data to address the following three issues: the frequency of changes, the average difference of the recorded case weights from the re-coded case weights, and the possibility that the changes were on a scale that could have happened by chance.

Frequency of Changes. Using a 90-percent confidence level, we projected that between 3.7 and 15.5 percent of the records at the two military treatment facilities would have changes. The best single estimate is 2,900, or 8 percent.

Recorded vs. Re-Coded Case Weights. We compared the case weights reported on standard inpatient data records with those resulting from the re-coding. The results are summarized as follows:

[1] Cochran, William G., Sampling Techniques, 3rd Edition. New York. Wiley, 1977.

Case Weight Statistical Bounds			
	Mean RWP	Lower Bound	Upper Bound
Case weight as reported on standard inpatient data record	0.89	0.75	1.04
Case weight as re-coded	0.88	0.73	1.02

We computed the results using a 90-percent confidence level. There was no statistically significant difference between the two sets of values.[2] Both the means and their associated confidence intervals were very nearly the same. The similarities are partly because of the smallness of the difference and partly because of the large amount of variation in case weights. They range from 0.108 to 5.404 in our sample. Given the relatively small sample, along with the very limited population represented (only 2 out of 116 military treatment facilities), the sample data showed no significant difference, but did not prove there was no difference either. A conclusion on the overall inpatient data quality must be based on additional information.

Differences From Changes. Testing the average change among the 75 sample inpatient discharges yielded an average reduction in case weight of 0.012. Using a 90-percent confidence interval, the projected case weight reduction ran from 0.003 to 0.022. The conclusion is that,

[2] We tested the difference statistically, using the t-test for difference of means. The resulting test value, 0.09 percent, did not indicate a statistically significant difference between the two sets of case weights. Sampling in this type of analysis evaluated the difference in means and associated standard deviations and answered the question of whether the sample results indicate a difference greater than would happen by chance. We express 'chance' in terms of a confidence level - 90-percent for the analyses. The changes in case weights lead to a small difference in average weights; the difference was small enough that we cannot assert, with 90 percent confidence, that the average re-coded weight is different from the CHCS weight. This could mean that the re-coded scores are not significantly different, on the average, or that they are different, but our sample did not reflect that difference. That is, the sample results did not support a conclusion that the two valuation methods were the same, only that they were not different.

with 90 percent confidence, there was a reduction in case weights from re-coding that did not occur by chance.[3] The occurrence indicates the need for stronger management control to ensure the accuracy of the coding of inpatient medical records.

The three measures of re-coding combined suggest the need for further work in the area of coding. On the one hand, the mean scores before and after re-coding are not significantly different. On the other, re-coding happened 6 times among the 75 items. Re-coding reduced the case weight or did not change it. The number of changes and the consistency of direction suggest the need for better quality control. In addition, the results are based on only two medical centers, and coding should be tested across other medical centers and community hospitals.

[3] On the other hand, the value of the case weight changes falls in the range 0.003 and 0.022, at the 90-percent confidence level, indicating that the changes are greater than would have happened by chance 90 percent of the time.

Appendix E. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense (Comptroller)
  Deputy Chief Financial Officer
  Deputy Comptroller (Program/Budget)
Under Secretary of Defense for Personnel and Readiness
  Assistant Secretary of Defense (Health Affairs)
  Office of the Actuary, DoD
Director, Defense Logistics Studies Information Exchange

Department of the Army

Assistant Secretary of the Army (Financial Management and Comptroller)
Surgeon General, Department of the Army
Auditor General, Department of the Army
Commander, Walter Reed Army Medical Center
Commander, Madigan Army Medical Center

Department of the Navy

Assistant Secretary of the Navy (Manpower and Reserve Affairs)
Naval Inspector General
Surgeon General, Department of the Navy
Auditor General, Department of the Navy
Commander, Naval Medical Center Portsmouth
Commander, Naval Medical Center San Diego

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Surgeon General, Department of the Air Force
Auditor General, Department of the Air Force
Commander, David Grant Air Force Medical Center
Commander, Malcolm Grow Air Force Medical Center

Other Defense Organizations

Director, Defense Contract Audit Agency
Director, Defense Finance and Accounting Service
  Director, Defense Finance and Accounting Service Indianapolis Center
Director, Defense Logistics Agency
Director, National Security Agency
  Inspector General, National Security Agency
Inspector General, Defense Intelligence Agency

Non-Defense Federal Organizations and Individuals

Office of Management and Budget
General Accounting Office
  National Security and International Affairs Division
    Technical Information Center

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Management, Information, and Technology, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform

Audit Team Members

The Finance and Accounting Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report.

F. Jay Lane
Salvatore D. Guli
Charles J. Richardson
Walter R. Loder
Linh Truong
Dorothy L. Jones
Henry D. Barton