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United States General Accounting Office

GAO

Briefing Report to the
Honorable Daniel K. Inouye
United States Senate

March 1986

DOD HEALTH CARE

Lengths of Stay in Defense Hospitals Compared to Civilian Hospitals



129432



UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

HUMAN RESOURCES
DIVISION

March 26, 1986

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The Honorable Daniel K. Inouye
United States Senate

Dear Senator Inouye:

As you requested, we have completed an analysis to determine whether there were significant differences between the lengths of stay for civilian patients in military hospitals and the lengths of stay for comparable patients in civilian hospitals. Our analysis covering about 150,000 civilian patients in Department of Defense hospitals found no appreciable difference between their average lengths of stay and those of comparable patients in civilian hospitals. More recent information indicates, however, that between 1983 and 1984 lengths of stay in civilian hospitals may have declined more rapidly than in Defense hospitals. This briefing report presents the results of our analysis in more detail.

The data used in the analysis were obtained from computer tapes provided by the National Center for Health Statistics, Department of Health and Human Services, and the Army, Navy, and Air Force medical commands. Calendar year 1983 was chosen for the analysis because it was the most recent year for which both Defense and the Center could provide complete data.

Our analysis did not include active duty military patients or civilian patients in overseas Defense hospitals. According to Defense officials, care for active duty patients may not be comparable to care for patients in civilian hospitals. Active duty patients, for example, may have to be admitted for less serious illnesses or for longer periods of time because living in barracks precludes the kind of home care many civilians can receive. Data were not available from the Center concerning civilian overseas patients; therefore, all patients in overseas military hospitals were excluded from our analysis. We did not examine the propriety of admissions or the reasons for differences in lengths of stay. This would have required a case-by-case review at individual hospitals.

The Department of Defense, in commenting on a draft of this briefing report, generally agreed with the methodology and findings. (See app. X.) The Department cautioned against drawing inappropriate conclusions from our statement that between 1983 and 1984 the lengths of stay may have declined more rapidly in civilian hospitals than in military hospitals. The Department pointed out that the rates of decline have been more rapid in the civilian sector because that sector had a higher average rate to start with. In addition, the Department claimed that the higher rate of decrease was probably due to utilization review pressures in the Medicare program and that the smaller percentage of elderly patients in military hospitals would further invalidate such a comparison.

We agree with the Department that the reasons for the recent apparent faster rate of decline in civilian hospitals' lengths of stay need to be fully explored before conclusions are made from the data that were available at the time of our analysis.

Copies of this document are being provided to the Chairmen of the Senate and House Armed Services and Appropriations Committees, the Department of Defense, the Department of Health and Human Services, and other interested parties.

If you have any questions or wish to discuss the analysis in more detail, please contact me on 275-6207.

Sincerely yours,



David P. Baine
Associate Director

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ABBREVIATIONS

DOD Department of Defense
GAO General Accounting Office

LENGTHS OF STAY IN DEFENSE

HOSPITALS COMPARED TO

CIVILIAN HOSPITALS

INTRODUCTION

In response to a request from Senator Daniel Inouye and later discussions with his office, we analyzed the lengths of stay in military and civilian hospitals for selected comparable patients. This briefing report summarizes the results of that analysis.

Objective, Scope, and Methodology

The objective of our analysis was to determine whether lengths of stay for civilian patients in military hospitals differed significantly from stays for comparable patients in civilian hospitals. To perform the analysis, we obtained from the Army, Navy, and Air Force medical commands computer tapes of 1983 treatment files. These files contain medical information, including diagnosis and length-of-stay data, for patients who had been provided inpatient health care in military hospitals during the year. The National Center for Health Statistics, Department of Health and Human Services, also provided a computer tape of the 1983 National Hospital Discharge Survey. The survey contains similar information for inpatients treated in 1983 at a sample of 418 hospitals representative of the 8,130 civilian short-stay hospitals in the nation.

We used calendar year 1983 data because they were the most recent available when we began our analysis in November 1984. We did not validate the data on the computer tapes but discussed the data's reliability with cognizant statisticians from the Center and the three services. Based on these discussions, the computer data are, in our opinion, reliable for length-of-stay analysis.

We compared lengths of stay for civilian patients in military hospitals in the United States to those for patients in civilian hospitals included on the discharge survey computer tape. The analysis did not include (1) active duty military patients or (2) civilian patients in overseas military hospitals. According to Department of Defense (DOD) officials, care for active duty patients may not be comparable to that for civilian patients. Active duty patients, for example, may have to be admitted to hospitals for less serious illnesses or for longer periods of time because living in barracks precludes the kind of home care many civilians can receive. Because the

Center's discharge survey does not include overseas patients, DOD overseas patients were excluded from our analysis.

The analysis did not examine the propriety of admissions or the reasons for differences in lengths of stay. This would have required extensive case-by-case review at individual hospitals. In addition to analyzing overall average length of stay, we also made a limited analysis to identify patterns where DOD lengths of stay were over or under those of civilian hospitals for specific diagnoses or types of patients.

We selected 107 diagnoses for comparison because of their (1) frequency of occurrence in military hospital discharges and (2) usage of military hospital inpatient days. The 107 diagnoses represented 60.5 percent of the 1983 DOD patient discharges and 53.6 percent of the inpatient days. Overall data used in our comparisons are shown in appendix II. We analyzed these data further to consider other factors, including hospital size, patient age, single or multiple diagnoses for the hospital stay, and the presence or absence of surgery. Considering these factors resulted in the identification of almost 12,000 potential comparison groups for the 107 diagnoses, as follows: 107 diagnoses x 7 hospital size groups x 4 age groups x 4 diagnosis/surgery groups = 11,984 potential comparison groups. (For example, one comparison group consisted of patients with a primary diagnosis of asthma, aged 15-44 years, treated in a hospital with 100-199 beds, having no other diagnoses during this stay, and with no surgery.)

Most of the potential comparison groups did not appear enough times on the discharge survey tape to permit statistically valid length-of-stay comparisons. For example, the diagnosis "single liveborn, born in hospital," is assigned to a newborn infant and would be only in the 0 to 14 year age group, thus eliminating 84 of the potential comparison groups¹ for this diagnosis. In other cases the comparison groups had some patients, but not enough for statistically valid analysis. Our final analysis included patients in 254 comparison groups within 48 diagnoses; these patients represented about 28 percent of the DOD civilian patients and about 23 percent of the DOD civilian inpatient days. (See app. III for distribution of comparison groups among diagnoses.)

¹Computed as follows: 3 age groups x 7 hospital size groups x 4 diagnosis/surgery groups = 84 comparison groups that were eliminated.

As stated, our analysis did not include all civilian DOD patients discharged in 1983, but only those whose primary diagnosis was among the 107 we selected for review. Thus, we are not able to reach a conclusion about differences in lengths of stay between civilian DOD patients and civilian hospital patients in general. We can conclude, however, that if there are identifiable major differences in lengths of stay between civilian DOD patients and civilian hospital patients, such differences occur in diagnoses other than those that account for the majority of DOD civilian patient days.

Our methodology for sample selection, length-of-stay analysis, computations of sampling errors, statistical significance and confidence intervals, and assessment of data reliability are discussed more thoroughly in appendix I.

OVERALL DOD AND CIVILIAN HOSPITAL
AVERAGE LENGTHS OF STAY WERE
ABOUT THE SAME FOR 1983

Overall the DOD civilian patients in our analysis had about the same average lengths of stay as comparable patients in civilian hospitals during 1983. There was little net difference in the overall average lengths of stay for the DOD civilian patients included in our analysis and comparable patients in civilian hospitals. Table 1 summarizes the analysis results for the 254 analyzed comparison groups.

Table 1:
Difference in DOD and Civilian
Hospital Average Lengths of Stay
for 254 Comparison Groups

	Number of			DOD inpatient days over (under) ^a
	<u>Comparison groups</u>	<u>DOD civilian patients</u>	<u>DOD inpatient days</u>	
DOD average length of stay:				
Longer	82	77,673	275,227	43,281
Shorter	79	45,635	169,714	(40,892)
The same ^b	<u>93</u>	<u>26,638</u>	<u>134,852</u>	<u>0</u>
Total	<u>254</u>	<u>149,946</u>	<u>579,793</u>	<u>2,389</u>

^aThe DOD patient days over (under) those for comparable civilian hospital patients were computed by determining the difference in the DOD and civilian hospital average lengths of stay and multiplying the difference by the number of DOD civilian patients in the comparison groups.

^bThroughout this briefing report, the term "the same" means that our analysis did not indicate any statistically significant differences.

The net difference of 2,389 days represents 0.41 percent of the total bed-days used by all the DOD civilian patients in our analysis. Overall, the average length of stay for the 149,946 DOD civilian patients in 254 comparison groups was 2,389 bed-days (or 0.016 days per patient) longer than for civilian hospitals during 1983. A more detailed breakout of the analysis is shown in appendix IV.

Although there was little difference in the overall average lengths of stay between the DOD patients and comparable civilian patients, there were differences among comparison groups when examined on the basis of diagnosis, patient age, hospital size, and surgical category involved. In brief, the analysis showed the following:

- Within the 48 diagnoses, DOD lengths of stay were always longer for all comparison groups in six diagnoses, shorter for four, and the same for all comparison groups in four diagnoses. Data pertaining to the other 34 diagnoses showed mixed results when analyzed by comparison group. (See app. III.)

- Regarding patient age, the two youngest groups, 0-14 and 15-44, accounted for most of the DOD patients in our analysis. DOD patients in these age groups experienced overall lengths of stay that were about the same as comparably aged patients in civilian hospitals. However, within these age groups as well as within the two older groups, 45-64 and 65 and over, DOD and civilian hospital lengths of stay varied when compared on the basis of hospital size. (See app. V.)
- Regarding hospital size, the difference in average lengths of stay between DOD and civilian hospitals varied between size categories. Hospitals with under 100 beds and those with 1,000 beds and over had longer DOD average lengths of stay across all age groups. Hospitals with between 100 and 999 beds, except for those in the 200-299 bed category, had shorter DOD average lengths of stay. The lengths of stay for patients in DOD hospitals with 100 to 999 beds varied between age groups when compared to similar size civilian hospitals. (See app. V.)
- For patients in both categories with surgery (i.e., those with single and multiple diagnoses), the average overall DOD length of stay was longer than that of the civilian sector. For patients without surgery the average lengths of stay in DOD hospitals was longer for those with a single diagnosis and shorter for those with multiple diagnoses. The difference was larger for those without surgery than those with surgery. However, when analyzed by hospital bed size and patient age group, variations between the DOD and civilian hospital lengths of stay were mixed. (See apps. VI through IX.)

RECENT INFORMATION INDICATES
THAT LENGTHS OF STAY MAY BE
DECLINING FASTER IN CIVILIAN
THAN IN MILITARY HOSPITALS

Both civilian and military hospitals have experienced reductions in their overall lengths of stay in recent years. However, as discussed below, lengths of stay in civilian hospitals declined more rapidly between 1983 and 1984.

According to Economic Trends, published jointly by the Hospital Research and Education Trust and the American Hospital Association, civilian hospital lengths of stay have been declining since the 1970's. The Spring 1985 issue reported that changing environmental forces and incentives for efficiency improvements helped accelerate the rate of decline in lengths of

stay from 2.0 percent between 1982 and 1983 to 5.1 percent between 1983 and 1984.

Compared to the civilian hospitals, military hospitals have also reduced the lengths of stay for civilian patients, but to a lesser extent. Between 1983 and 1984 the average lengths of stay declined by 1.7 percent and 1.9 percent for the Army and Air Force, respectively. Table 2 reflects the average lengths of stay for civilian patients in Army and Air Force hospitals for the period 1980-84.

Table 2:
Average Lengths of Stay for Civilian Patients
in Army and Air Force Hospitals, 1980-84

<u>Year</u>	<u>Army</u>		<u>Air Force</u>	
	<u>Average stay</u>	<u>Percent decline</u>	<u>Average stay</u>	<u>Percent decline</u>
	(days)		(days)	
1980	6.0	-	5.4	-
1981	5.9	1.7	5.4	-
1982	5.9	-	5.2	3.7
1983	5.8	1.7	5.2	-
1984	5.7	1.7	5.1	1.9
Percent decline between 1980 and 1984		5.0	5.6	

The Navy does not publish length-of-stay data on a yearly basis for all civilians; instead it computes lengths of stay quarterly for specific populations. Table 3 provides data available for the retired and dependent patient populations in fiscal years 1983 and 1984.

Table 3:
Average Lengths of Stay for Retirees
and Dependents in Navy Hospitals, 1983-84

<u>Population</u>	<u>Average lengths of stay</u>		<u>Percent change</u>
	<u>Fiscal year</u> <u>1983</u>	<u>Fiscal year</u> <u>1984</u>	
Retirees:			
First quarter	7.7	7.4	-3.9
Second quarter	7.3	7.0	-4.1
Third quarter	7.1	7.3	+2.8
Fourth quarter	7.0	7.0	-
Dependents:			
First quarter	4.2	4.1	-2.4
Second quarter	4.1	4.1	-
Third quarter	4.2	3.9	-7.1
Fourth quarter	4.1	4.0	-2.4

Except for the third quarter comparison for dependents, the declines are below the civilian sector's 5.1-percent decline between 1983 and 1984.

SAMPLE SELECTION, ANALYSIS
METHODOLOGY, AND RELIABILITY
OF COMPUTER DATA

This appendix describes the way we selected our comparison groups for analysis, the methodology for determining sampling errors associated with the 1983 National Hospital Discharge Survey, and the reliability of the data on the military and discharge survey computer tapes.

SELECTION OF COMPARISON GROUPS

We compared data from the three services' inpatient treatment file computer tapes to data on the discharge survey tape. The service tapes contain data on all patients treated during 1983. We combined the information to develop one DOD-wide data base for civilian patients treated in DOD hospitals in the United States. The discharge survey tape contains information from a sample of about 206,000 medical records from 418 hospitals chosen to be representative of the 8,130 civilian short-stay hospitals in the United States. The information from the tape, published by the National Center for Health Statistics, is intended as a source document for researchers and others who need such data. The two data bases contain similar information taken from patient medical records, including such demographics as age and sex, and medical information, such as diagnosis, whether there was surgery, and dates of admission and discharge.

Our analysis compared data for patients who had the same primary diagnosis¹ identified on the tapes. The diagnoses are identified on each tape by codes. However, the DOD tape uses codes from the World Health Organization's International Classification of Diseases, Ninth Revision, and the discharge survey tape uses codes from the International Classification of Diseases, Ninth Revision, Clinical Modification, which is a version of the classification's ninth revision that has been expanded to provide greater specificity. Because the two tapes use different codes, we traced the diagnosis codes for each classification system to its coding manual and compared the description for each code to assure compatibility for our length-of-stay analysis. GAO's chief medical advisor also reviewed the diagnosis code and description for each diagnosis in our analysis

¹The diagnosis that was the primary reason for the patient's admission.

and confirmed that the diagnosis from the DOD and discharge survey computer tapes represented comparable illnesses.

To select diagnoses for analysis, we ranked the diagnoses on the DOD tape on the basis of their (1) frequency of occurrence for patients and (2) usage of inpatient days. From the DOD tape, we selected the 75 diagnoses that occurred most frequently and the 75 that accounted for the most inpatient days. When the lists were combined, because some diagnoses appeared on both lists, they totaled 107 diagnoses and represented 60.5 percent of the 527,527 patients and 53.6 percent of the 2,546,922 inpatient days on the calendar year 1983 DOD tape. The results of our analysis of lengths of stay for patients in these 107 diagnoses are shown in appendix II.

However, factors other than diagnosis can affect length of stay. According to GAO's chief medical advisor, one of the most important is age. In general, older patients require longer stays due to several factors, including a higher frequency of multiple diagnoses associated with each stay. Likewise, patients in larger hospitals may stay longer because such hospitals tend to be teaching or public hospitals, which often admit patients with more complicated illnesses. We included the following additional factors in our detailed analysis of lengths of stay for patients with the 107 diagnoses: the size of the hospital, patient age, whether there was a single diagnosis or multiple diagnoses, and whether there was surgery.

The discharge survey published data are stratified based on the following seven hospital sizes:

- 6 to 49 beds.
- 50 to 99 beds.
- 100 to 199 beds.
- 200 to 299 beds.
- 300 to 499 beds.
- 500 to 999 beds.
- 1,000+ beds.

And the following four age groups:

- 0 to 14 years.
- 15 to 44 years.
- 45 to 64 years.
- 65 and over.

For our analysis, we stratified the DOD hospital data to include the Center's hospital size and age groups and the four surgical categories: single diagnosis with surgery, single diagnosis without surgery, multiple diagnoses with surgery, and multiple diagnoses without surgery. For the 107 diagnoses, there were 11,984 potential comparison groups in our length-of-stay analysis; that is: 7 hospital sizes x 4 age groups x 4 surgical categories = 112 potential comparison groups for each of the 107 diagnoses, or a total of 11,984 groups (112 x 107).

Our final analysis included 254 of the 11,984 groups. For many of the potential comparison groups, no patients were expected to be included. For example, the diagnosis "single live-born, born in hospital," is assigned to a newborn infant and appears only in the 0 to 14 year age group. Therefore, the maximum number of potential comparison groups for that diagnosis would be 28 rather than 112, or 7 hospital sizes x 1 age group x 4 surgical categories. Also the statistician responsible for the discharge survey said that comparison groups without at least 60 patients should be considered unreliable for analysis purposes. Consequently, we eliminated potential groups with fewer than 60 patients on the discharge survey tape because these groups would not have permitted sufficiently precise estimates for our analysis. The DOD tape included all civilian patients treated in military hospitals; therefore, it was not necessary to eliminate groups to obtain precise estimates.

Thus, our detailed analysis of lengths of stay for comparable patients in DOD and civilian hospitals included 254 comparison groups with patients of similar diagnosis, age, and surgical characteristics and in similar sized hospitals. These 254 groups represented 28.4 percent of the DOD civilian patients treated in the United States in 1983 and 22.8 percent of total inpatient days occupied, rather than the approximate 61 percent of patients and 54 percent of inpatient days represented by all patients with the 107 originally selected diagnoses.

SAMPLING ERRORS

To make our detailed analysis, we calculated statistically significant differences between the lengths of stay for comparable patients in military and civilian hospitals. Because the length-of-stay data in the 1983 National Hospital Discharge Survey are from a statistical sample of patient records, we calculated a sampling error for each of the 254 comparison groups. A sampling error is the maximum amount by which the estimate obtained from a statistical sample can be expected to differ from the actual universe value. Using the sampling error, a confidence interval was computed for the civilian hospital average length of stay. The military hospital average length of stay was considered different only if it fell outside the confidence interval for the civilian hospital length of stay.

Sampling errors are usually stated as involving a calculated level of confidence--in this case 95 percent. This means the chances are 19 out of 20 that, if we computed the average length of stay for a selected comparison group in civilian hospitals using all patients with that diagnosis, the results would differ from an estimate we obtained for the sample by less than the sampling error calculated for that estimate. Thus, we can say with 95-percent certainty that the average length of stay calculated for a particular comparison group in civilian hospitals would differ from the average obtained from the discharge survey sample by less than the sampling error of such estimate.

The military data are for all military hospitals in the United States and for all civilian patients treated therein. Thus, the mean length of stay for DOD patients in each comparison group was calculated with certainty, and a confidence interval was not needed. Sampling errors would have been computed for the patients in military hospitals if the analysis results were to be projected to other years. However, the analysis was performed only to determine whether there were significant differences in lengths of stay between DOD and civilian hospitals for 1983.

RELIABILITY OF DATA USED IN ANALYSIS

The data on the computer tapes used in our length-of-stay analysis were not verified to patient medical records. This assessment would have required time-consuming visits to selected private hospitals in the Center's survey and to DOD hospitals in the contiguous United States, Alaska, and Hawaii. In lieu of

this assessment, we discussed the computer edits and other controls and procedures to ensure that reliable data are included on the computer tapes with cognizant statisticians from the Center and from the Army, Navy, and Air Force.

The Center's statistician said the National Academy of Sciences' Institute of Medicine verified the 1977 National Hospital Discharge Survey and found that although such nonmedical data as age, sex, and admission/discharge dates were highly reliable, diagnosis errors occurred in about 37 percent of the records. The statistician told us that no further verification of the survey data has been performed since that time. He believes, however, that the data are reliable because they are now collected from the medical record face sheet as well as the hospital discharge summary, as recommended by the Institute after the verification of the 1977 survey. In addition, the data are reviewed by medical records specialists to ensure that diagnoses are compatible with patient age and sex. Various computer edits also ensure that the number of days in a month and the number of months in a year are correct.

The Army, Navy, and Air Force statisticians were not aware of any studies that would reveal the presence of data errors on their inpatient treatment computer tapes. We were informed that medical records specialists enter data from patient medical records, and computer edits are used to ensure that such data as patient sex, age, and diagnosis are correct and that discrepancies are rejected. The Army and Navy also occasionally verify data from the computer tapes to patient records.

Although neither the Center nor the services could provide information to estimate the extent of errors in their data, the respective statisticians told us that any errors would be random rather than systematic. Therefore, if errors occur randomly, they should not distort the results in any particular direction. For example, errors that overstate lengths of stay for some patients would presumably be counteracted by errors that understate the stays for other patients.

AVERAGE LENGTHS OF STAYIN DOD AND CIVILIAN HOSPITALSFOR 107 SELECTED DIAGNOSESBY FREQUENCY OF OCCURRENCE^a

<u>Diagnosis</u>	<u>DOD hospitals</u>		<u>Discharge survey</u> <u>civilian hospitals</u>	<u>DOD average</u> <u>over (under)</u>
	<u>Cases</u>	<u>Average stay</u>	<u>Average stay</u>	
	(days)			
Single liveborn, born in hospital	89,882	3.5	3.6	(0.1)
Delivery in a completely normal case	26,582	3.1	2.8	0.3
Inguinal hernia, without mention of obstruction or gangrene	7,043	3.4	3.9	(0.5)
Asthma	6,830	3.8	5.4	(1.6)
Sterilization	6,143	2.2	1.9	0.3
Spontaneous abortion	5,270	1.3	1.6	(0.3)
Other specified antenatal screening	5,140	1.1	b	b
Uterine scar from previous surgery	4,857	5.2	5.4	(0.2)
Chest pain	4,692	3.6	3.0	0.6
Fetal distress	4,529	3.6	4.6	(1.0)
Cataract unspecified	4,311	3.4	2.5	0.9
Coronary atherosclerosis	4,247	7.0	7.7	(0.7)
Abdominal pain	4,202	3.9	3.3	0.6
Other noninfective gastroenteritis and colitis	3,976	3.1	4.3	(1.2)
Second-degree perineal laceration	3,608	3.0	2.8	0.2
Third-degree perineal laceration	3,565	3.3	3.1	0.2
Pneumonia, organism unspecified	3,347	5.3	7.2	(1.9)
Chronic airways obstruction, not elsewhere classified	3,372	7.8	8.8	(1.0)
Hyperplasia of prostate	3,233	5.5	7.6	(2.1)
Diabetes mellitus without mention of complication, adult-onset or unspecified as to type	3,227	7.8	7.8	0
First-degree perineal laceration	3,194	3.0	2.6	0.4
Unspecified otitis media	3,118	2.0	3.1	(1.1)
Calculus of gallbladder with other cholecystitis	3,058	7.8	8.6	(0.8)
Acute myocardial infarction	3,036	12.5	11.9	0.6
Excessive or frequent menstruation	2,950	3.9	4.2	(0.3)
Angina pectoris	2,810	4.6	5.4	(0.8)
Threatened premature labor	2,629	2.4	2.9	(0.5)
Observation for other specified suspected condition	2,613	3.1	2.7	0.4
Cord around neck, with compression	2,518	3.1	3.3	(0.2)

<u>Diagnosis</u>	<u>DOD hospitals</u>		<u>Discharge survey</u> <u>civilian hospitals</u>	<u>DOD average</u>
	<u>Cases</u>	<u>Average stay</u>	<u>Average stay</u>	<u>over (under)</u>
	----- (days) -----			
Forceps or vacuum extractor delivery without mention of indication	2,459	3.6	3.2	0.4
Viral infection in conditions classified elsewhere and of unspecified site, unspecified	2,455	2.9	4.0	(1.1)
Uterine leiomyoma	2,252	6.2	6.8	(0.6)
Convulsions	2,251	3.6	3.2	0.4
Fourth-degree perineal laceration	2,232	3.3	3.0	0.3
Chronic serous otitis media	2,180	1.2	1.4	(0.2)
Calculus of gallbladder without mention of cholecystitis	2,162	6.3	7.2	(0.9)
Early onset of delivery	2,079	4.5	5.0	(0.5)
Congestive heart failure	1,873	8.0	9.0	(1.0)
Malignant neoplasm of female breast, unspecified	1,870	9.5	8.6	0.9
Essential hypertension, unspecified	1,835	5.4	5.9	(0.5)
Chronic tonsillitis	1,825	2.1	1.8	0.3
Alcohol dependence syndrome	1,801	12.7	10.8	1.9
Other disorders of menstruation and other abnormal bleeding from female genital tract	1,787	2.8	3.2	(0.4)
Maintenance chemotherapy	1,777	3.6	b	b
Malignant neoplasm of bronchus and lung, unspecified	1,759	13.1	9.3	3.8
Acute appendicitis without mention of peritonitis	1,731	4.4	4.2	0.2
Chronic ischemic heart disease, unspecified	1,695	6.9	7.4	(0.5)
Premature rupture of membranes	1,680	4.2	3.8	0.4
Fetopelvic disproportion	1,666	5.4	5.4	0
Intestinal infections due to other organism, not elsewhere classified	1,648	2.6	3.6	(1.0)
Breech presentation without mention of version	1,586	4.8	4.7	0.1
Postmenopausal bleeding	1,534	2.2	2.8	(0.6)
Urinary tract infection, site not specified	1,509	5.5	6.6	(1.1)
Mild or unspecified pre-eclampsia	1,502	5.4	5.2	0.2
Unspecified pain and other symptoms associated with female genital organs	1,482	3.7	4.1	(0.4)
Intracranial injury of other and unspecified nature without mention of open intracranial wound	1,416	1.9	3.4	(1.5)

<u>Diagnosis</u>	<u>DOD hospitals</u>		<u>Discharge survey</u> <u>civilian hospitals</u>	<u>DOD average</u> <u>over (under)</u>
	<u>Cases</u>	<u>Average stay</u>	<u>Average stay</u>	
	(days)			
Hemorrhage of gastrointestinal tract, unspecified	1,411	6.7	7.2	(0.5)
Cardiovascular disease, unspecified	1,408	7.2	7.2	0
Pyelonephritis or pyonephrosis, not specified as acute or chronic	1,399	5.5	6.2	(0.7)
Diffuse cystic mastopathy	1,371	2.5	2.8	(0.3)
Carpal tunnel syndrome	1,345	2.4	2.6	(0.2)
Twin, mate liveborn, born in hospital	1,324	6.4	10.4	(4.0)
Dysplasia of cervix (uteri)	1,268	3.6	3.2	0.4
Nonsuppurative otitis media, not specified as acute or chronic	1,267	1.2	1.4	(0.2)
Other and unspecified cord entanglement without mention of compression	1,267	3.3	3.2	0.1
Mild hyperemesia gravidarum	1,264	3.6	3.6	0
Malignant neoplasm of prostate	1,245	10.9	8.8	2.1
Diverticula of colon	1,233	8.3	8.0	0.3
Other and unspecified uterine inertia	1,216	3.8	3.8	0
Atrial fibrillation	1,200	4.7	5.6	(0.9)
Other injury to pelvic organs	1,158	3.0	2.9	0.1
Ventral [incisional] hernia of abdominal cavity without mention of obstruction or gangrene	1,112	5.6	6.4	(0.8)
Stress incontinence, female	1,106	7.4	7.9	(0.5)
Lumbago	1,098	7.9	7.4	0.5
Other and unspecified ovarian cyst	1,088	4.6	5.3	(0.7)
Redundant prepuce and phimosis	1,069	1.6	1.9	(0.3)
Calculus of ureter	1,062	4.8	4.2	0.6
Syncope and collapse	980	4.3	3.0	1.3
Follow-up examination following surgery	976	7.3	b	b
Infertility, female, of unspecified origin	955	2.4	2.8	(0.4)
Unspecified intestinal obstruction	946	9.3	7.4	1.9
Acute but ill-defined cerebrovascular disease	932	12.8	14.4	(1.6)
Deflected nasal septum	927	2.3	2.2	0.1
Other cellulitis and abscess, leg, except foot	852	7.2	9.4	(2.2)
Atherosclerosis of arteries of the extremities	811	10.5	13.5	(3.0)
Postoperative infection	759	8.8	7.6	1.2
Acute pancreatitis	744	9.8	8.1	1.7
Malignant neoplasm of bladder, part unspecified	744	8.0	7.3	0.7

<u>Diagnosis</u>	<u>DOD hospitals</u>		<u>Discharge survey</u> <u>civilian hospitals</u>	<u>DOD average</u> <u>over (under)</u>
	<u>Cases</u>	<u>Average stay</u>	<u>Average stay</u>	
	----- (days) -----			
Cesarean delivery, without mention of indication	695	6.4	5.6	0.8
Displacement of thoracic or lumbar intervertebral disc without myelopathy	693	11.7	8.4	3.3
Lack of expected normal physiological development	693	7.1	b	b
Hypertrophy of tonsils and adenoids	636	2.1	1.8	0.3
Pregnant state, incidental	633	1.7	1.7	0
Phlebitis and thrombophlebitis of superficial vessels of lower extremities	618	11.3	10.5	0.8
Infections of genitourinary tract in pregnancy, not delivered	609	3.7	3.3	0.4
Other diseases of lung, not elsewhere classified	558	7.8	7.2	0.6
Prolonged pregnancy, delivered	552	3.7	4.2	(0.5)
Acute appendicitis with generalized peritonitis	535	9.7	10.2	(0.5)
Malignant neoplasm of cervix uteri, unspecified	474	11.5	8.5	3.0
Malignant neoplasm without specification of site, other	440	12.2	b	b
Rheumatoid arthritis	429	10.1	9.0	1.1
Obesity	400	11.3	7.0	4.3
Schizophrenic psychoses, paranoid type	335	11.7	16.1	(4.4)
Malignant neoplasm of rectosigmoid junction	307	14.5	b	b
Malignant neoplasm of rectum	301	16.4	14.2	2.2
Radiotherapy session	267	16.1	b	b
Prolonged pregnancy, not delivered	163	1.1	b	b
Total (107 diagnoses)	<u>318,903</u>			

^aAverage length-of-stay data contained in this appendix are derived from gross mathematical computations. They do not factor for differences in hospital size, patient age, or surgical categories and have not been subjected to tests for statistical significance.

^bThere were fewer than 60 patients for this diagnosis on the discharge survey; the National Center for Health Statistics considers the number to be insufficient for a reliable length-of-stay comparison.

DISTRIBUTION OF 254 ANALYZEDCOMPARISON GROUPS AMONG DIAGNOSES^a

<u>Diagnosis</u>	Number of comparison groups where DOD average length of stay is			
	<u>Longer</u>	<u>Shorter</u>	<u>Same</u>	<u>Total</u>
Single liveborn, born in hospital	9	11	4	24
Delivery in a completely normal case	9	1	4	14
Inguinal hernia, without mention of obstruction or gangrene	2	1	4	7
Asthma	0	4	5	9
Sterilization	1	0	2	3
Uterine scar from previous surgery	0	1	4	5
Fetal distress	0	2	0	2
Cataract unspecified	9	0	0	9
Coronary atherosclerosis	2	5	4	11
Other noninfective gastroenteritis and colitis	0	7	3	10
Second-degree perineal laceration	1	1	0	2
Third-degree perineal laceration	1	0	1	2
Pneumonia, organism unspecified	0	10	3	13
Chronic airways obstruction, not elsewhere classified	0	4	4	8
Hyperplasia of prostate	0	5	1	6
Diabetes mellitus without mention of complication, adult-onset or unspecified as to type	1	1	4	6
First-degree perineal laceration	1	1	0	2
Unspecified otitis media	0	1	0	1
Calculus of gallbladder with other cholecystitis	0	0	2	2
Acute myocardial infarction	4	2	8	14
Excessive or frequent menstruation	2	0	1	3
Angina pectoris	0	2	3	5
Forceps or vacuum extractor delivery without mention of indication	4	0	1	5
Uterine leiomyoma	2	0	2	4
Fourth-degree perineal laceration	1	0	1	2
Early onset of delivery	1	0	1	2
Congestive heart failure	1	4	3	8
Malignant neoplasm of female breast, unspecified	2	0	2	4
Essential hypertension, unspecified	0	1	6	7
Chronic tonsillitis	9	0	4	13
Alcohol dependence syndrome	0	2	0	2
Other disorders of menstruation and other abnormal bleeding from female genital tract	0	0	2	2

<u>Diagnosis</u>	Number of comparison groups where DOD average length of stay is			
	<u>Longer</u>	<u>Shorter</u>	<u>Same</u>	<u>Total</u>
Malignant neoplasm of bronchus and lung, unspecified	4	0	0	4
Acute appendicitis without mention of peritonitis	1	0	2	3
Chronic ischemic heart disease, unspecified	0	8	2	10
Premature rupture of membranes	2	0	0	2
Fetopelvic disproportion	0	1	2	3
Breech presentation without mention of version	1	1	1	3
Urinary tract infection, site not specified	0	1	0	1
Mild or unspecified pre-eclampsia	0	0	2	2
Unspecified pain and other symptoms associated with female genital organs	0	0	2	2
Malignant neoplasm of prostate	1	0	1	2
Diverticula of colon	1	0	0	1
Acute but ill-defined cerebrovascular disease	1	1	0	2
Deflected nasal septum	1	0	1	2
Cesarean delivery without mention of indication	2	0	0	2
Displacement of thoracic or lumbar intervertebral disc without myelopathy	6	0	0	6
Prolonged pregnancy, delivered	<u>0</u>	<u>1</u>	<u>1</u>	<u>2</u>
Total	<u>82</u>	<u>79</u>	<u>93</u>	<u>254</u>

^aThis appendix shows the distribution among diagnoses of the 254 comparison groups that were included in our detailed length-of-stay analysis and how many had average lengths of stay over, under, or the same as the comparable civilian group. Although there were 112 potential comparison groups for each diagnosis, when hospital size, patient age, and surgical category were considered, data were insufficient for most groups because there were no, or only a limited number of, patients in the discharge survey data base. The DOD data represent civilian patients in DOD hospitals in the United States.

RANGE OF DIFFERENCES IN AVERAGE LENGTHS OF STAYFOR CIVILIAN PATIENTS IN DOD HOSPITALSAND PATIENTS IN CIVILIAN HOSPITALSIN 254 ANALYZED COMPARISON GROUPS

	<u>Comparison groups</u>	<u>DOD patients</u>	<u>Number of</u>		<u>Average DOD patient days</u>
			<u>Total DOD patient days</u>	<u>Net DOD patient days over/under</u>	
DOD average stay longer by:					
0.0 to 0.5 day	30	55,619	173,975	18,662	0.3
0.6 to 1.0 day	19	17,209	55,593	12,373	0.7
1.1 to 1.5 days	10	2,538	15,376	3,144	1.2
1.6 to 2.0 days	3	289	2,469	538	1.9
2.1 to 2.5 days	1	113	1,484	271	2.4
Over 2.5 days	<u>19</u>	<u>1,905</u>	<u>26,330</u>	<u>8,293</u>	4.4
Total	82	77,673	275,227	43,281	0.6
DOD average stay shorter by:					
0.0 to 0.5 day	7	16,312	48,408	(4,182)	(0.3)
0.6 to 1.0 day	20	15,771	53,850	(11,241)	(0.7)
1.1 to 1.5 days	13	7,600	33,026	(10,169)	(1.3)
1.6 to 2.0 days	16	2,024	10,431	(3,464)	(1.7)
2.1 to 2.5 days	9	2,540	15,679	(6,211)	(2.4)
Over 2.5 days	<u>14</u>	<u>1,388</u>	<u>8,320</u>	<u>(5,625)</u>	(4.1)
Total	79	45,635	169,714	(40,892)	(0.9)
DOD and civilian average stay the same					
	<u>93</u>	<u>26,638</u>	<u>134,852</u>	<u>0</u>	0
Total	<u>254</u>	<u>149,946</u>	<u>579,793</u>	<u>2,389</u>	0.016

DIFFERENCES IN DOD AND CIVILIANAVERAGE LENGTHS OF STAY FOR PATIENTSIN THE ANALYSIS BY HOSPITAL SIZE AND AGE GROUP^a

Hospital bed size	0 to 14 years		15 to 44 years		45 to 64 years		65 and over		Total		DOD average days over (under)
	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	
		over (under)		over (under)		over (under)		over (under)		over (under)	
0 to 49	13,164	8,917.8	5,854	3,512.4			105	136.5	19,123	12,566.7	0.7
50 to 99	12,329	3,251.9	5,073	1,530.3	456	152.4	34	82.7	17,892	5,017.3	0.3
100 to 199	25,272	(5,545.3)	8,251	3,657.8	666	(215.8)	1016	(787.1)	35,205	(2,890.4)	(0.1)
200 to 299	5,419	167.3	1,980	663.7	113	271.2	405	(278.3)	7,917	823.9	0.1
300 to 499	10,094	(3,761.3)	5,948	1,313.2	2,653	624.9	1,654	(1,110.2)	20,349	(2,933.4)	(0.1)
500 to 999	11,829	(10,353.5)	6,817	(2,564.4)	1,245	2,453.3	1,597	(1,210.0)	21,488	(11,674.6)	(0.5)
1,000 ^b	793	885.2	541	594.4					1,334	1,479.6	1.1
Total	78,900	(6,437.9)	34,464	8,707.4	5,133	3,286.0	4,811	(3,166.4)	123,308	2,389.1	0.019
Average days over (under)	(0.1)		0.2		0.6		(0.7)		0.019		

^aThis appendix presents the results of an analysis which combined the comparison groups that had statistically significant differences in average length of stay into age groups by hospital size. The data represent the total DOD patients in the combined groups, the net difference in bed days used by the DOD patients, and the net difference in average length of stay. For example, in the 50-99 bed category for patients aged 15-44, the 5,073 patients were in five comparison groups, three of which had average stays over that of civilian patients and two under. Groups with no difference are not included. In total, the data represent 161 of 254 groups with a statistically significant difference in average length of stay. There was no difference for the remaining 93 comparison groups. The DOD data represent civilian patients in DOD hospitals in the United States.

^bRepresents one DOD hospital.

DIFFERENCES IN DOD AND CIVILIAN AVERAGE

LENGTHS OF STAY FOR PATIENTS

WITH SINGLE DIAGNOSIS WITH SURGERY^a

Hospital bed size	0 to 14 years		15 to 44 years		45 to 64 years		65 and over		Total		DOD average days over (under)
	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	
		over (under)		over (under)		over (under)		over (under)		over (under)	
0 to 49	5,378	2,689.0							5,378	2,689.0	0.5
50 to 99	4,422	1,768.8							4,422	1,768.8	0.4
100 to 199	6,720	722.4	1,391	553.7	329	296.1	213	276.9	8,653	1,849.1	0.2
200 to 299	53	21.2	61	88			153	76.5	267	185.7	0.7
300 to 499	2,415	(483.0)	153	348.2	700	497.6	323	193.8	3,591	556.6	0.2
500 to 999	3,120	(1,872.0)	140	127.9	243	(289.1)	519	(225.5)	4,022	(2,258.7)	(0.6)
1,000+											
Total	22,108	2,846.4	1,745	1,117.8	1,272	504.6	1,208	321.7	26,333	4,790.5	0.182
Average days over (under)	0.1		0.6		0.4		0.3		0.182		

^aThis appendix presents an analysis similar to that presented in appendix V (see notes a and b), but includes only comparison groups with patients with single diagnosis and with surgery. In total it presents data on 23 comparison groups with DOD average lengths of stay over that of the civilian sector and 6 under. The other 16 groups in this surgical category did not have statistically different average lengths of stay.

DIFFERENCES IN DOD AND CIVILIAN AVERAGE

LENGTHS OF STAY FOR PATIENTS WITH
SINGLE DIAGNOSIS WITHOUT SURGERY^a

Hospital bed size	0 to 14 years		15 to 44 years		45 to 64 years		65 and over		Total		DOD average days Over (Under)
	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	DOD patients	DOD days	
		over (under)		over (under)		over (under)		over (under)		over (under)	
0 to 49	7,786	6,228.8							7,786	6,228.8	0.8
50 to 99	6,400	2,387.3							6,400	2,387.3	0.4
100 to 199	10,023	2,178.6							10,023	2,178.6	0.2
200 to 299	4,050	810							4,050	810.0	0.2
300 to 499	4,367	(647.3)							4,367	(647.3)	(0.1)
500 to 999	5,029	(1,508.7)							5,029	(1,508.7)	(0.3)
1,000+	722	288.8							722	288.8	0.4
Total	38,377	9,737.5							38,377	9,737.5	0.254
Average days over (under)	0.3		-0-		-0-		-0-		0.254		

^aThis appendix presents an analysis similar to that presented in appendix V (see notes a and b), but includes only comparison groups with patients with single diagnosis and without surgery. In total it presents data on 5 comparison groups with average lengths of stay over that of the civilian sector and 12 under. Two other groups in this surgical category did not have statistically different average lengths of stay.

DIFFERENCES IN DOD AND CIVILIAN AVERAGE

LENGTHS OF STAY FOR PATIENTS WITH

MULTIPLE DIAGNOSES WITH SURGERY^a

Hospital bed size	0 to 14 years		15 to 44 years		45 to 64 years		65 and over		Total		DOD average days over (under)
	DOD patients	DOD days									
		over (under)									
0 to 49			5,854	3,512.4					5,854	3,512.4	0.6
50 to 99			4,395	1,758.0					4,395	1,758.0	0.4
100 to 199	3,979	(5,002.6)	4,698	2,383.3			287	(103.0)	8,964	(2,722.3)	(0.3)
200 to 299	27	16.2	1,919	575.7			108	(2.0)	2,054	589.9	0.3
300 to 499	33	19.8	5,795	965.0	1,149	1,732.6	631	1,052.5	7,608	3,769.9	0.5
500 to 999	1,819	(4,415.9)	6,677	(2,692.3)	1,002	2,742.4	638	346.2	10,136	(4,019.6)	(0.4)
1,000+			540	594.0					540	594.0	1.1
Total	5,858	(9,382.5)	29,878	7,096.1	2,151	4,475.0	1,664	1,293.7	39,551	3,482.3	0.088
Average days over (under)	(1.6)		0.2		2.1		0.8		0.088		

^aThis appendix presents an analysis similar to that presented in appendix V (see notes a and b), but includes only comparison groups with patients with multiple diagnosis and with surgery. In total it presents data on 44 groups with DOD average lengths of stay over that of the civilian sector and 15 under. The other 34 groups in this surgical category did not have statistically different average lengths of stay.

DIFFERENCES IN DOD AND CIVILIAN AVERAGELENGTHS OF STAY FOR PATIENTS WITHMULTIPLE DIAGNOSES WITHOUT SURGERY^a

Hospital bed size	0 to 14 years		15 to 44 years		45 to 64 years		65 and over		Total		DOD average days over (under)
	DOD patients	DOD days									
		over (under)									
0 to 49							105	136.5	105	136.5	1.3
50 to 99	1,507	(904.2)	678	(227.7)	456	152.4	34	82.7	2,675	(896.8)	(0.3)
100 to 199	4,550	(3,443.7)	2,162	720.8	337	(511.9)	516	(961.0)	7,565	(4,195.8)	(0.6)
200 to 299	1,289	(680.1)			113	271.2	144	(352.8)	1,546	(761.7)	(0.5)
300 to 499	3,279	(2,650.8)			804	(1,605.3)	700	(2,356.5)	4,783	(6,612.6)	(1.4)
500 to 999	1,861	(2,556.9)					440	(1,330.7)	2,301	(3,887.6)	(1.7)
1,000+	71	596.4	1	0.4					72	596.8	8.3
Total	12,557	(9,639.3)	2,841	493.5	1,710	(1,693.6)	1,939	(4,781.8)	19,047	(15,621.2)	(0.820)
Average days over (under)	(0.8)		0.2		(1.0)		(2.5)		(0.820)		

^aThis appendix presents an analysis similar to that presented in appendix V (see notes a and b), but includes only comparison groups with patients with multiple diagnosis and without surgery. In total it presents data on 10 comparison groups with average lengths of stay over that of the civilian sector and 46 under. The other 41 groups in this surgical category did not have statistically different average lengths of stay.

ADVANCE COMMENTS FROM
THE DEPARTMENT OF DEFENSE

Note: A GAO comment supplementing those in the report text appears at the end of this appendix.



THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D. C. 20301-1200

19 FEB 1986

Mr. Frank C. Conahan
Director, National Security and
International Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

This is the Department of Defense (DOD) response to the General Accounting Office (GAO) draft briefing report, "Lengths Of Stay In Defense Hospitals Compared To Those In Civilian Hospitals," dated January 15, 1986, (GAO Code 101303), OSD Case 6922.

The Department agrees in general with the methodology and findings contained in the Report as it relates to the comparison of lengths of stay for civilian patients in military hospitals in 1983 with lengths of stay for a comparable group of patients in civilian hospitals in 1983. The finding of no significant difference between the lengths of stay for these two groups reflects the similarity between military medicine and the mainstream of American medicine.

Now on p. 10.

See comment 1.

There does appear to be a calculation error in Table 2, page 8 of the Report. The percent decline between 1980 and 1984 in average stay is reported for the Army as 5.0, whereas our calculations based on a 1980 rate of 6.1 and a 1984 rate of 5.7 indicate the correct rate of decline to be 6.6.

In addition, there is one summary comment in the Report which the Department believes to be inconsistent with the careful statistical and analytical considerations evidenced throughout the majority of the document. The comment in question states that ". . . more recent information indicates that, lengths of stay in civilian hospitals may have declined more rapidly than in Defense hospitals between 1983 and 1984." The source of this information is credited to the Spring 1985 issue of "Economic Trends."

This publication purportedly reported a decline in average length of stay in civilian sector hospitals of 5.1 percent between 1983 and 1984. The Report then compares this to declines in average length of stay for civilians in military hospitals during the same time period, which were minus 1.7 and minus 1.9 respectively for the Army and Air Force. Implicit in this comparison is the question of why military rates have not been declining as rapidly as civilian sector rates. Left unmentioned is that fact that it is clearly easier to make greater reductions

in average length of stay given a higher average rate to start with. In 1983, the National Center for Health Statistics reported the civilian sector average length of stay at 6.9 days. This contrasts with average civilian patient rates for 1983 of 5.8 and 5.2 respectively for the Army and Air Force.

In addition, closer examination of the civilian sector decrease from 1983 to 1984 would probably show a proportionally higher rate of decrease in Medicare age patients, reflecting the utilization review pressures applied by the Medicare program during the past couple of years. The relatively smaller percentage of 65 year and over patients in the military patient population would further serve to invalidate this type of comparison.

DoD's intent is not to disparage the GAO draft report, but simply to caution against drawing conclusions from comparisons of statistics which upon closer examination may lose a measure of their validity for that purpose.


William Mayer, M.D.

GAO COMMENT

1. The 5.0-percent decline in the Army's average length of stay from 1980 through 1984 is correct. The 1980 average length of stay was incorrectly listed in the draft report as 6.1 days. The report has been changed to show the correct 1980 average stay of 6.0 days.

(101303)

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