REPORT OF THE COMPTROLLER GENERAL OF THE UNITED STATES

Better Communication, Cooperation And Coordination Needed In Department Of Defense Development Of Its Tri-Service Medical Information System Program

The Department of Defense's Tri-Service Medical Information System--an automated medical information program--is estimated to cost over $504 million to develop and operate through fiscal year 1982.

The design and development effort for this program was started without the unified support from the three services needed to assure its successful development.

As a result, specific information requirements necessary to support and satisy user needs have yet to be established even though

--development has been underway for more than 2 years and

--over $14 million has been spent.

LCD-76-117

OCT. 6,1976

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-182666

The Honorable William Proxmire
United States Senate

Dear Senator Proxmire:

This is our report on the problems being experienced by the Department of Defense in designing and developing its Tri-Service Medical Information System Program.

We made our review in response to your request for information on this system development effort. Upon instructions from your office, we have not requested comments from the Secretary of Defense. However, the results of our review were discussed with various Department of Defense personnel, including the Assistant Secretary of Defense (Health Affairs) and their comments have been considered in preparing this report. We are sending a copy of this report to the Secretary of Defense.

As agreed with your office, copies of this report will subsequently be sent to the House and Senate Committees on Appropriations and Government Operations. Copies of this report will also be sent to the House and Senate Committees on Armed Services because of their responsibilities with respect to Department of Defense activities.

Sincerely yours,

Comptroller General
of the United States

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ABBREVIATIONS

DOD	Department of Defense
GAO	General Accounting Office
TRIMIS	Tri-Service Medical Information System

REPORT OF THE COMPTROLLER GENERAL

BETTER COMMUNICATION, COOPERATION AND COORDINATION NEEDED IN DEPARTMENT OF DEFENSE DEVELOPMENT OF ITS TRI-SERVICE MEDICAL INFORMATION SYSTEM PROGRAM

D I G E S T

The Department of Defense has experienced problems in designing and developing its Tri-Service Medical Information System, an automated medical information program.

The Department has estimated that the program will cost over $504 million to design, develop, and operate through 1982. (See pp. 22 to 24.) However, the three services have not cooperated in the establishment of uniform definitions for data elements and functional reporting requirements. Although 2 years have passed and over $14 million has been expended detailed user requirements have yet to be established. (See p. 4.)

The development of uniform user information requirements is essential if this system is to be used by all three services. However, the three services are not working cooperatively to achieve this goal. Thus, each of the three services continues to use differing report formats for the same information. (See pp. 14 and 15.) This condition is not conducive to the speedy and economical development of a major system development effort such as this one.

Without the establishment of detailed user requirements there is little assurance that the automated medical information program can be developed successfully. (See p. 15.)

These problems are at least partially attributable to Defense's starting the program without establishing realistic milestones for its management and review (see pp. 10 and 11.), conducting an appropriate economic analysis of costs and benefits (see pp. 12 and 13), and the absence of a full-time project manager. (See p. 10.) Insufficient consideration is being given to how the program will meet the

needs of hospitals smaller than the hospital at the Walter Reed Army Medical Center, a prototype site for the program. Walter Reed, which has an operating capacity of 1,280 beds, is one of the two largest military hospitals. (See pp. 20 and 21.)

Defense's objective of developing an interservice system is logical and its accomplishment should produce operational, training, and automated support economies.

Some corrective actions are now underway. (See pp. 16 and 17.) However, it is essential that the individual services' narrow viewpoints on standards and management control displayed in this program (see p. 13 and pp. 15 and 16), be dissipated. The inability of the three services to agree on uniform medical information processing requirements for this program is the sole result of interservice differences in viewpoint. Unless these parochial differences can be resolved, the program should be terminated. (See p. 4.)

If they can be resolved, GAO recommends that the Secretary of Defense direct the Assistant Secretaries of Defense (Health Affairs) and (Comptroller) to

--complete the reorganization of the Tri-Service Medical Information System and designate a full-time project manager with authority to manage the program, control its funding, including the centralization of financial management controls and records, and be responsible for its progress;

--establish program evaluation criteria in sufficient detail to measure program progress effectively;

--formulate uniform definitions of data elements and information reporting procedures for its health care providers; and

--conduct an economic analysis of the alternatives that meet identified user needs and support program development actions.

These actions should be started promptly. The Congress should limit funding to the amounts necessary to bring the recommended actions to successful completion. When a sound basis has been established for developing the Tri-Service Medical Information System, the Secretary of Defense should require the Assistant Secretaries to

--review and control the program through frequent contacts with the project manager,

--reevaluate information concerning available systems and select those that closely meet established user requirements for additional study before deciding how development of the program will be pursued,

--base the program on machine transferrable software to encourage future competition and reduce conversion costs, and

--apply uniform reporting procedures and data element definitions as developed in this program to the military health services system, to the maximum extent possible. (See pp. 31 and 32.)

Comments from the Secretary of Defense have not been requested in accordance with instructions received from Senator William Proxmire's office, which requested GAO's study. However, the matters discussed in this report have been presented to the Assistant Secretary of Defense (Health Affairs) and members of his staff and their comments have been considered and included in this report.

CHAPTER 1

INTRODUCTION

The Department of Defense (DOD) has a Military Health Services System which is composed of Army, Navy, and Air Force medical resources that provide the health services necessary to support and maintain our military forces. The Military Health Services System is intended to provide a comprehensive, high quality and uniform program of health services for all eligible beneficiaries. Active duty service members, their dependents, retired military members and their dependents, and survivors of both active duty and retired members make up the nine million eligible beneficiaries receiving military supported health care.

To provide this health care DOD annually budgets over $3 billion for the worldwide operation of about 190 hospitals, 120 clinics, and its Civilian Health and Medical Program of the Uniformed Services, commonly called CHAMPUS.

IMPROVING HEALTH CARE DELIVERY WITH AUTOMATED SUPPORT

In 1968, the Secretary of Defense initiated a study to determine the feasibility of improving DOD's health care delivery through the use of automated data processing. This study resulted in the Assistant Secretary of Defense (Health Affairs) 1/ in 1971, tasking the Air Force to develop an automated medical system to support a hospital facility, to be built at Travis Air Force Base, California. This facility was to be a prototype for implementing and evaluating the latest concepts and technology in health care delivery. The emphasis of the effort was to be placed on reducing hospital costs and improving the quality of health care provided eligible beneficiaries.

In late 1973, an apparent duplication of effort surfaced within DOD. The Air Force was working on its New Generation Military Hospital project for Travis Air Force Base. The Army was pursuing a similar project for the new Walter Reed Army Medical Center, and the Navy was pursuing the phased development of automated information systems intended to improve health care delivery in naval hospitals. This apparent duplication was brought to the attention of

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1/Effective March 5, 1976, the Assistant Secretary of Defense (Health Affairs) was established to replace the Assistant Secretary of Defense (Health and Environment).

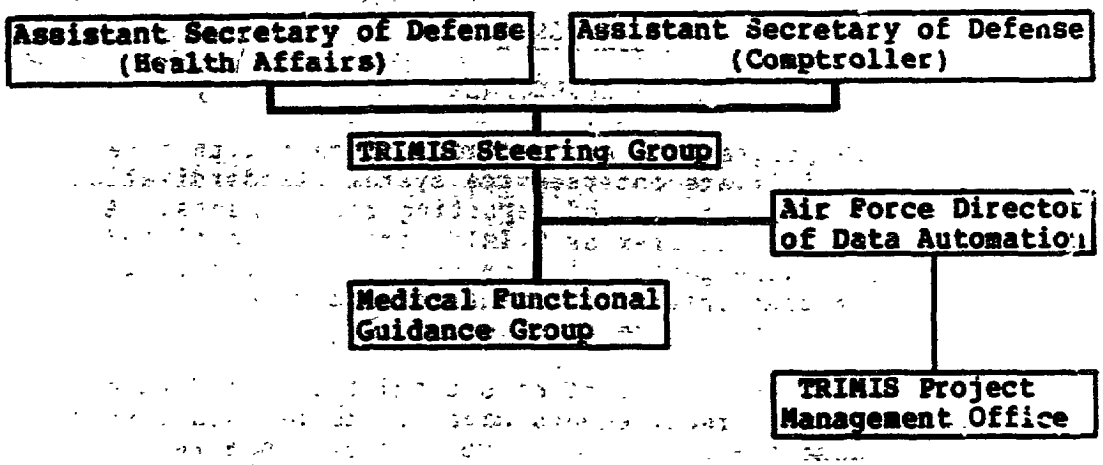
the Defense Systems Acquisition Review Council. In November 1973, the Council recommended that the automated medical information system development efforts of the three services be combined into a single tri-service effort. The Surgeons General of the Army, Navy, and Air Force concurred and recommended that the Air Force undertake the development of the Tri-Service Medical Information System (TRIMIS). The Air Force was instructed to give priority to using the new Walter Reed Army Medical Center as the prototype location for testing the new system.

ORGANIZING THE TRI-SERVICE PROGRAM

These recommendations were adopted on July 11, 1974, when the Deputy Secretary of Defense established the TRIMIS program. The TRIMIS program was first and foremost intended to represent a concerted effort to enhance the health care delivery through the use of computer technology. The program was also intended to represent a major initiative in the area of interservice systems standardization. Thus, the program was to represent a major opportunity to increase both the effectiveness of health care delivery and the efficiency of automated systems design and development.

To implement the TRIMIS program, the Assistant Secretaries of Defense (Health Affairs) and (Comptroller) were assigned a joint responsibility for establishing the overall policies and procedures for program management. This responsibility was to be fulfilled through a TRIMIS Steering Group composed of the three Surgeons General and the President of the Uniformed Services University of the Health Sciences. Among other things, the TRIMIS Steering Group's responsibilities included determining specific or detailed user requirements, insuring a complete interchange and access to pertinent DOD-owned medical hardware and software in support of TRIMIS, approving detailed functional specifications of subsystems, setting priorities for performing the work, and approving development schedules. To assist the TRIMIS Steering Group in fulfilling these responsibilities a Medical Functional Guidance Group was established. Personnel with medical and automated data processing experience from each of the three services were assigned to this group.

The Air Force Director of Data Automation was assigned the actual responsibility for the design, development, and testing of TRIMIS. To assist the Director in fulfilling this responsibility he established a TRIMIS Project Management Office. The interrelationship of these organizational elements is depicted in the diagram on the following page.



As we will describe in subsequent chapters, the three services have not provided the unified support needed to successfully develop TRIMIS.

CHAPTER 2

TRIMIS DEVELOPMENT

The TRIMIS program is intended to enhance health care delivery and to initiate interservice system standardization for medical data processing and reporting requirements. A program as large and complex as TRIMIS cannot be completed within any reasonable period of time or cost until clearly defined uniform user information requirements have been developed for use by all three services.

After more than 2 years of effort and the expenditure of $14 million, user requirements have yet to be established primarily because the differing viewpoints of the three servic s have not been resolved. These differences threaten TRIMIS' successful development. The design, development, implementation, and operation of a standard or uniform information system is feasible if the parochialism displayed by the three services in defining their medical information requirements can be overcome. If this cannot be accomplished, the program should be terminated.

To standardize medical information among hospital facilities of the three services, greater consideration should be given to systems already developed for use in other Government and non-Government facilities. The availability and use of these systems by various hospitals indicate that there is some standardization and uniformity of medical information; otherwise these systems could not be used in more than one hospital facility. Similarities in processing data for health care services exist regardless of whether those services are provided by a military or nonmilitary facility.

SIMILARITY OF HOSPITAL OPERATIONS

To maintain a physically and mentally fit, operationally ready military force the military's health services system must provide a comprehensive and high quality service that covers the full spectrum of medical care.

To fulfill this responsibility, military hospitals generally provide the same type of major medical services. These services include but are not limited to activities such as laboratory, pharmacy, radiology, food service, and patient administration. Some military hospitals supplement these basic services by providing specialized health care in areas such as nephrology, infectious disease, rheumatology, or organ transplant. Similar services are provided by nonmilitary Government hospitals such as the Veterans Administration and the National Institutes of Health. These

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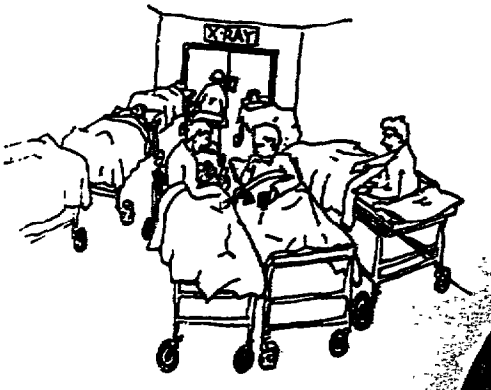

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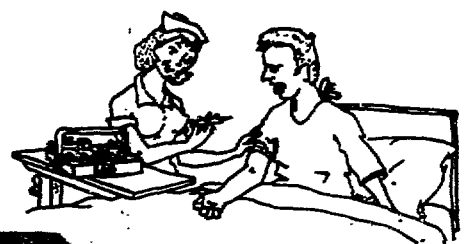

major medical services are also available at over 2,000 private hospitals. The Joint Commission on Accreditation of Hospitals requires that hospitals have the major medical services available as a basis for accreditation.

The major medical and other services and their relationships to patients' health care are illustrated in the exhibit on page 5. As shown, patients are generally more closely associated with clinical services than those of the auxiliary medical and support services or those listed as hospital operations. In order for health care to be properly delivered, proper communication between these services and operations is necessary if their supportive roles are to be effective. Although the same major medical services were provided by all the hospitals visited, the extent of automated support, as well as the manner of support, varied greatly.

INITIAL TRIMIS DEVELOPMENT EFFORTS

In December 1974, the TRIMIS Steering Group provided the Air Force Director of Data Automation a document entitled "TRIMIS Functional Description Document - Walter Reed Army Medical Center." This document generally described the basic TRIMIS functions and subsystems as they are summarized below.

Patient data base management and communications subsystem will organize the patient centered data base, provide the communications link and interface among the other subsystems, maintain a patient directory, interact with all other subsystems' ordering, reporting, and patient file inquiring and updating processes; and transmit data to other subsystems, or to any authorized user terminal.

Patient administration subsystem will provide the capabilities to establish a patient data base record as the patient visits the health care facility, and for the preadmission, admission, patient paper record location and control, disposition, medical service accounting, and other related administrative support activities.

Patient appointments subsystem will match the needs and demands of patients to available health care providers and services.

Ward and clinics subsystem will provide the health care provider ordering, reporting, inquiring, and review support; nursing care plan support; problems lists; and other patient record update capabilities.

Pharmacy subsystem will accept medical orders from health care providers, prepare medication labels and unit dose cart fill lists, permit drug interaction screening, assist in prevention of drug administration to patients with known drug allergies, record medications in a patient's medications profile data base, and provide inventory control.

Food service subsystem will accept diet orders from health care providers, accept specific daily patient menu selections within prescribed diet limits, provide inventory and production control, maintain recipe and menu files, facilitate nutritional analysis of diets, permit screening for food allergies, and provide data for automatic tray loading.

Clinical laboratory subsystem will accept requests for laboratory tests; prepare worksheets for obtaining specimens; provide positive identification of samples; include production control, results analysis, reporting, audit, inquiry, and interfaces with automated hematology, chemistry and urinalysis equipment; and report test results to the patient data base.

Radiology subsystem will accept requests for radiological procedures from health care providers, schedule diagnostic radiology procedures, assist in film library and patient processing management, and report X-ray interpretations to the patient data base.

Logistics subsystem will insure that health care supply points will be restocked; accept requests and schedule issues of routine hospital supplies; determine the presence, location and availability of necessary health care equipment; and provide support for maintenance and repair of medical equipment, transportation, communications, and custodial and building maintenance.

Although these functional descriptions were originally developed for the Walter Reed Army Medical Center, the TRIMIS Steering Group stated they were to serve as a framework for the initial TRIMIS development effort. However, health care providers in other service hospitals were not consulted to determine whether the system designed for Walter Reed would meet their needs and requirements. Thus, the TRIMIS program started without specific users or their information needs being identified or uniform reporting procedures being recognized as a prerequisite for developing standard automated systems.

Each of the three services maintains separate and independent information systems. As a result, unless all three

services agree on the nature and extent of their information requirements it is impossible to design and develop a single system that will adequately serve the needs of all three services. (See p. 14.)

IMPROVED MANAGEMENT NEEDED

Since TRIMIS' initiation, decisive management direction has not been exercised or formulated to guide and direct TRIMIS efforts. This has resulted in problems in program planning, executing organizational responsibilities, and communicating with and between the various organizational groups.

To guide Federal agencies in the development of automated data systems, the General Services Administration requires, in Federal Management Circular 74-5 "Management, Acquisition, and Utilization of Automatic Data Processing (ADP)," agencies to conduct studies that determine and document

--the feasibility for automating the function,

--actions taken to determine the possibility of improving the performance of existing systems through upgrade or system or operations modifications, and

--whether new systems, procedures, and methods will achieve the highest practicable degree of effectiveness and operational economy.

These studies are to be made at the beginning of a system's development effort. Also, a comparative cost analysis of the alternative methods of acquisition are to be made so that management can determine the lowest overall cost.

DOD has adopted and amplified this guidance in several instructions and directives 1/ that characterize good

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1/These instructions include but are not limited to: Department of Defense Directive Number 5100.40, 9-28-63 (revised through 8-19-75) Responsibility for the Administration of the DOD Automatic Data Processing Program.

Department of Defense Instruction Number 5010.27, 7-8-70 (revised through 11-9-71) Management of Automated Data System Development.

Department of Defense Instruction Number 7041.3, 2-26-69 (revised through 10-18-72) Economic Analysis and Program Evaluation for Resource Management.

management as including a number of factors, not the least of which are

--developing a plan that can serve as both a guide and as a basis for measuring progress during the system development cycle,

--reviewing and monitoring progress so that prolonged and costly system development can be avoided,

--identifying alternatives and selecting the most cost beneficial method of proceeding with the development effort, and

--appointing a full-time manager for the project with sufficient authority and responsibility so that costs can be minimized and system development efforts properly controlled.

Although sound management, in itself, cannot assure a successful development effort, its absence weakens that effort and the ability to control costs. Also, unless the procedures contained in the Federal and DOD guidelines are followed, development efforts can be started before management knows (1) whether automation is the best approach to meeting agency needs, (2) whether the benefits from the new system justify their costs, and (3) whether portions or all of the system should be automated and implemented.

In the past the failure of governmental and business organizations to follow sound management guidance and procedures has resulted in extended periods of development, unnecessary expenditures of resources, and systems that did not satisfy the demands placed upon them. These examples were cited to the Congress in "Ways to Improve Management of Automated Data Processing Resources," LCD-74-110, Apr. 16, 1975; "Improved Planning - A Must Before a Department-wide Automatic Data Processing System is Acquired for the Department of Agriculture," LCD-75-108, June 3, 1975; and "Improved Planning and Management of Information Systems Development Needed," LCD-74-118, Aug. 18, 1975.

In this instance, the TRIMIS program has been started without following several of these recommended managerial and development concepts. This, along with service parochial interests, has contributed to program delays, unresolved differences between the services, the lack of centralized management and has made it necessary for DOD to reorganize the TRIMIS management structure and redefine the program objectives.

Weaknesses in TRIMIS management

Since the onset of TRIMIS, the Assistant Secretaries of Defense have been responsible for guiding the program including establishment of the overall policies and procedures for program management, control, and monitoring. Such guidance should include the identification of the organizations involved in the program, a clear definition of program objectives and organizational goals that will support the accomplishment of these objectives, the formulation of policies and procedures that will guide the work of these organizations, and the development of an action program that specifies strategies and schedules necessary to insure objectives are met.

Although the Deputy Secretary's authorization for TRIMIS generally required these actions, we found that they had not been properly implemented. Instead, the TRIMIS Steering Group, which was required to develop policy and procedures for the program's management and control, delegated this responsibility to its Medical Functional Guidance Group. When such policies and procedures were drafted and presented for approval, the Air Force Director of Data Automation disagreed with certain aspects, such as not giving full responsibilities for automatic data processing matters to his office as developer. In April 1975 he recommended the matter be presented to the Assistant Secretary of Defense (Health Affairs) for adjudication. The TRIMIS Steering Group chose not to involve the Assistant Secretary in anticipation of a DOD directive being issued that would resolve these differences. This directive was not issued until June 1976, almost 14 months later.

Also, the TRIMIS program has been subjected to divided managerial responsibilities and diverse functional groups instead of being controlled through a full-time manager with sufficient authority and responsibility to make functional versus technical trade-offs in the development of the system and to be held accountable for the system's progress and capability.

We also found that the program has lacked an approved set of milestones specifying dates or occurences, that would aid management in reviewing the program's progress. Although several of the program's functional groups individually developed and utilized milestone dates, these milestones were not consistent or coordinated nor were they used by management for program control. Also, some milestones were related only to the needs of the new Walter Reed Army Medical Center and not to TRIMIS specifically.

These separately established milestones may not be realistic for development and implementation of the TRIMIS program. As early as October 1974, the Air Force Director of Data Automation informed the TRIMIS Steering Group that a delay in developing a set of detailed functional descriptions for the Walter Reed hospital had placed the January 1977 TRIMIS initial operating date for that location on a day-to-day slippage since July 1, 1974. Nevertheless, the TRIMIS milestone dates remained unchanged until September 1975, when a draft development plan presented operational dates for individual subsystems at Walter Reed ranging from October 1976 for the food service and logistics subsystems to October 1978 for the integrated system.

Also, in mid-October 1975, two different sets of dates were being used by the Assistant Secretaries and the functional group. We were told that the functional group was using dates contained in a revised draft development plan, while the Assistant Secretary (Comptroller) indicated he was using dates presented in an October 16, 1975, TRIMIS program review meeting by a representative of the Assistant Secretary (Health Affairs). The following comparison shows substantial differences in these dates.

	Walter Reed Army Medical Center Prototype start dates	
Subsystem	Revised development plan	Program review meeting
Laboratory	10-75	11-75
Patient scheduling	10-76	11-75
Pharmacy	10-76	11-75
Patient administration	10-76	12-75
Radiology	2-77	12-75
Food service	10-76	3-76
Logistics	10-76	3-76
Wards/clinics	-	3-76
Integrated hospital system	10-78	-

These two sets of dates for the same occurrences illustrate the need for establishing a standard set of approved milestones so that all program groups can direct their individual efforts in a coordinated manner.

Selecting the development approach

According to current DOD guidelines the initiation of a systems development effort should not be authorized until management has sufficient information on which to base its

decision. DOD guidance states that such information should support the development effort to be pursued and include identification of feasible alternative courses of action to the present system, an analysis of the costs and benefits associated with each alternative, and the manner in which the progress of the development effort will be measured.

In the TRIMIS program, general functional requirements for the new Walter Reed Army Medical Center were accepted by the Steering Group in December 1974 as representing the basic or general requirements of the three services. In January 1975 the Air Force stated that these requirements could be technically satisfied using minicomputers. However, the Air Force considered such an approach to be risky if the short-term program objectives were to be met. In March 1975 the Air Force accepted contractual assistance to develop detailed functional requirements, to conduct an indepth study of commercially available systems, and to develop a feasible implementation approach to meet the program's short-term requirements. This assistance continues, at a cost expected to exceed $4.4 million by November 1976, even though it was not competitively selected or economically justified. (Chapter 6 discusses this contract in further detail.)

At the completion of our review, a partial economic analysis for the TRIMIS program had been conducted. This analysis, issued in June 1975, identified only the operational benefits of TRIMIS support of the Walter Reed Army Medical Center even though TRIMIS costs were equally divided among 10 hospital sites, 9 of which were not identified. This analysis concluded that TRIMIS, over a 10-year life cycle, would provide a $26.6 million benefit.

The validity of this analysis is questionable. It was made without the total TRIMIS program being specifically defined; thus its scope was limited to only a comparison of the TRIMIS Steering Group requirements being operated in a totally manual mode versus total automation. Also, it was based on the assumption that minicomputers would be used even though efforts to define detailed functional requirements, started before June 1975, emphasized the use of large-scale computers. In addition, the analysis was completed before detailed functional requirements had been specified and agreed to by each of the three services and it failed to identify and analyze feasible alternative approaches that were available. Also, the analysis did not contain the criteria that could be used to evaluate the system's impact on a hospital's ability to provide improved health care services to its patients.

Without having an adequate economic analysis, we believe the TRIMIS program lacks sufficient information for determining if the program is cost beneficial or whether large-scale computers or minicomputers should be used. We also believe there is insufficient information to determine which TRIMIS functions should be supported with capabilities already available from commercial vendors and which need to be developed by contractor or Government capabilities. TRIMIS representatives have told us that some of these determinations have already been made based on the knowledge and experience of the TRIMIS staff. We have no doubt that the TRIMIS staff is knowledgeable and experienced, but these staff qualities, in our judgment, are no substitute for an adequate economic analysis where large and complex systems, such as TRIMIS, are involved. We believe the TRIMIS program should be reexamined when information becomes available that identifies the feasible alternatives, analyzes the associated costs and benefits, and identifies the manner in which the progress of the TRIMIS development effort is to be measured.

PAROCHIAL DIFFERENCES NEED RESOLUTION

It was apparent during our review that DOD still needed to resolve several service differences before TRIMIS' functional requirements could be established. These differences existed even though representatives of the three services had been trying to agree on TRIMIS requirements. In addition, an Air Force contractor has as yet been unable to assist the services in resolving these differences. (See p. 27.) Examples are

- --the Air Force and Army differ considerably as to functions, methodologies, and information requirements associated with the patient administration subsystem;
- --the Air Force is considering a logistics system which could perform functions in excess of those required by the Army;
- --the Air Force disagrees considerably with the proposed Walter Reed food service system; and
- --The Navy, in contrast to Air Force and Army philosophy, wishes to have a stand-alone laboratory system which will not interface with patient administration.

As a result, TRIMIS currently has more than one laboratory system being prototyped and the possible duplication of effort for automating food services, logistics, and patient scheduling systems.

UNIFORM REPORTING PROCEDURES ARE NEEDED

At the military hospitals visited during our review, we found a large number of local forms being used, in addition to the numerous DOD and service standard forms. These documents reported similar data elements but in different formats. Because these similar data elements have been designed with differing definitions, their potential value to top-level DOD management and health care providers is greatly reduced and considerable difficulty has been experienced whenever attempts are made to compare the quality of the health care provided by the services.

This difficulty with DOD's medical information reporting procedures was discussed in some detail in a December 1975 "Report of the Military Health Care Study." 1/ This report stated that each of the military service's medical departments maintained separate and independent information systems and data bases for health care information. In addition, each of these systems and data bases applied different definitions to common data elements. 2/ Further, the report stated that there was no central monitoring activity to insure compatibility of the interpretations given to data elements used in the information systems, nor was there adherence to basic DOD uniform policies and procedures governing the use of these elements. For example, there appeared to be little justification for reporting clinical laboratory test results for a complete blood count 3/ in three different formats or for the three services being unable to agree on the content and format of reports used for patient and hospital administration. These differing practices have reduced the potential value of automated information systems

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1/Prepared by the Department of Defense; the Department of Health, Education, and Welfare, and the Office of Management and Budget.

2/A data element represents the smallest form that usable information can take. Examples are age, sex, race, and home address.

3/A complete blood count usually includes cell counts of the red blood corpuscles and white blood corpuscles, determining the hematocrit (the proportion of blood cells to plasma in a premeasured volume of blood), and measuring the hemoglobin (the red coloring matter of the red blood corpuscles). Thus, such a count always produces similar information.

and caused difficulty when attempting to compare or use the reports produced by the different systems.

In order for TRIMIS to be the uniform system for satisfying the automated health care information requirements of the three military medical departments, we believe implementation of uniform reporting procedures using data elements with common definitions must be established. The establishment of uniform requirements is essential if subsequent automation is to be accomplished with a minimum expenditure of resources and if the data manipulated and produced by the system is to be of benefit to the military health care providers. Also, we believe that the needs of the TRIMIS users cannot be identified or agreed to until the differences of the services are resolved. Unless these differences are resolved, TRIMIS' capabilities will not satisfy user needs effectively or economically.

STRONGER ORGANIZATIONAL CONTROL IS NEEDED

Although the Deputy Secretary of Defense assigned to various groups specific functions and responsibilities thought necessary to achieve TRIMIS objectives, the Assistant Secretaries of Defense (Health Affairs) and (Comptroller) did not organize these groups so that effective performance of their functions and responsibilities was assured. Thus, problems in communication, cooperation, and coordination have existed amoung and between the various groups and the Assistant Secretaries. Also, the progress of the TRIMIS program has been impeded, decisions have been made without adequate review, problems have arisen without proper referral to the Assistant Secretaries for resolution, and some groups have had overlapping responsibilities.

This lack of communication, cooperation, and coordination has existed at all TRIMIS management levels. As examples:

> The Navy's limited participation in developing user requirements has not assured the Navy its needs will be fully considered. A TRIMIS representative from the Navy stated that its full participation in developing tri-service user requirements was not essential since the Navy would have ample time to object to the agreed requirements of the Army and the Air Force.
>
> The Air Force Director of Data Automation recommended that TRIMIS have more than one prototype site. The TRIMIS Steering Group approved this course of action without consulting its technical advisors, the Medical Functional Guidance Group, even though several

of the Group's members questioned the need to prototype systems that were already operational at other hospitals.

The Air Force Director of Data Automation was unable to obtain needed clarification of the TRIMIS purpose, scope, definition, roles, and responsibilities (see p. 10) as well as a realistic availability schedule for the Walter Reed Army Medical Center because the three services were not actively cooperating in the development of this program.

The Air Force Director of Data Automation accepted a contractor's assistance in delineating user functional requirements even though the Deputy Secretary of Defense made the TRIMIS Steering Group responsible for determining those requirements. The Director of Data Automation is responsible for selecting and acquiring the computer equipment and programs necessary to satisfy these requirements. However, this task cannot be completed until the functional requirements are identified and agreed to by the three services. This duplication of effort, or assumption of responsibility, inappropriately conflicted with a basic TRIMIS objective by replacing the preeminent role of medical leadership and direction with the system developer.

The TRIMIS Steering Group did not make these problems known to the Assistant Secretaries although several of the problems appear to have needed their attention.

Consequently, it was not until May 1975 that the Assistant Secretary of Defense (Health Affairs) became personally aware of the problems contributing to TRIMIS' slow progress.

MANAGEMENT IMPROVEMENTS UNDERWAY

In September 1975 the Assistant Secretary of Defense (Health Affairs) began a reorganization of the TRIMIS management structure to strengthen the program through direct management at the Assistant Secretary level. Also an audit survey report, dated October 6, 1975, by the Office of the Assistant Secretary of Defense (Comptroller) (Audit) reported that the objectives, organization structure, and management responsibilities for TRIMIS should be specifically delineated, and that Office of Secretary of Defense staff offices should be represented on the TRIMIS Steering Group. The report also pointed out the need for a single program manager.

In November 1975, a modified TRIMIS authorization was issued. This authorization placed policy and operational responsibility for TRIMIS, including the designing, developing and/or procuring, installing, testing and evaluating of automated medical systems, with the Assistant Secretaries (Health Affairs) and (Comptroller). The TRIMIS Steering Group was directed to provide advice to the Assistant Secretaries and the Air Force Director of Data Automation was no longer responsible for the development of TRIMIS.

In January 1976 a TRIMIS Program Office was established to support the Assistant Secretaries in their roles and responsibilities, including the assurance of TRIMIS program continuity. Also, on January 20, 1976, a Request For Quotation was issued to

--obtain executive management capabilities to assist the Government in organizing the TRIMIS program,

--provide appropriate training to assist in the management of the complex data processing system, and

--insure obtaining the expertise to develop capabilities needed to manage the complex TRIMIS data base and TRIMIS implementation requirements.

However, these actions and managerial realinements do not address the basic problems described in this report. For example, the managerial realinement does not provide a means for resolving the parochialism that inhibits the development of uniform user requirements nor does it provide a single program manager with the authority and responsibility necessary to make the TRIMIS program successful.

CHAPTER 3

WILL TRIMIS MEET USER NEEDS?

Although detailed user requirements have yet to be established, generalized functional descriptions for TRIMIS have existed since October 1974. However, these descriptions were based on the functional needs of the new Walter Reed Army Medical Center. TRIMIS' development efforts have emphasized the functional requirements for this hospital; thus it is uncertain whether the needs of other military hospitals will be met because

--specific user requirements have not been obtained from the military services, and

--consideration has not been given to the need to scale down TRIMIS to meet the needs of hospitals smaller than Walter Reed.

During our review, we evaluated information on automated health care systems developed by 16 commercial vendors and by Federal or federally funded activities. Of the systems reviewed, none appeared to meet all the functional requirements in each of the major operational health care areas to be supported by TRIMIS. However, some systems appeared to provide the automated support needed to meet several of the functional requirements in more than half of the operational areas.

One of these systems was selected in June 1975 for use at a 511-bed Government hospital. The total estimated cost of this system, through fiscal year 1980, will be about $8.3 million, including $2 million to be spent during system implementation. The present target date for this system providing support to this hospital's operations is October 1976, a period of 16 months.

HOW HAS DOD EVALUATED AVAILABLE SYSTEMS?

To provide DOD with information on how automated medical information systems were supporting the operations of Government, institutional, and private hospital operations, Air Force personnel made 134 visits to public and private organizations. However, many of these visits were made to obtain knowledge on hospital information requirements and not to determine if the hospitals' systems could be used in TRIMIS. Also, all of these visits were made in January 1975 or before, when only generalized functional requirements were known.

After efforts were started to determine detailed functional requirements, requests for descriptive information on automated medical information systems were given to 51 organizations; 11 automated medical systems were selected for additional evaluation. Because the information obtained from these requests and visits was received and evaluated before the establishment of detailed functional requirements, such evaluations were based on incomplete knowledge of the capabilities needed to meet TRIMIS user requirements.

For example, over 400 health service information systems are in various stages of development or operation within DOD. However, these systems have not been comprehensively evaluated for possible inclusion in the TRIMIS program.

FEDERALLY FUNDED SYSTEMS HAVE BEEN CONSIDERED

TRIMIS personnel have reviewed automated systems developed by Federal or federally funded activities to support health care delivery. Several of these systems appeared to satisfy some of the evolving requirements of TRIMIS in such functional areas as administration, patient appointment scheduling, pharmacy, laboratory, wards, and clinics and have been tentatively selected as prime candidates for TRIMIS use although modifications will probably be required.

DOD also reviewed a system that it considered inappropriate for TRIMIS because

- --it was not readily exportable; i.e., transferable to another computer system, 1/
- --it was not expandable to handle an outpatient workload, and
- --it did not have the capability to handle the expected TRIMIS patient record workload.

This system supports the District of Columbia's Veterans Administration hospital, 708-bed operation. It was an integrated hospital information system forerunner when its subsystems, such as patient administration, laboratory, radiology, wards, and clinics, were installed in 1968

1/This condition is primarily attributable to the use of machine-dependent software that can not be readily recoded and/or recompiled for use on two or more general purpose computers.

and 1969. These subsystems have only been operational at the prototype hospital and development of a complete system design has never been accomplished. The computer programs in this system could be modified and the experiences gained in designing this system could be of considerable use to DOD in the TRIMIS program.

TRIMIS APPLICABILITY TO SMALLER MILITARY HOSPITALS

The heavy emphasis on requirements for the Walter Reed Army Medical Center raises a serious question as to the applicability of these requirements to other military hospitals. The new Walter Reed Hospital will be the second largest DOD military hospital, with an operating capacity of 1,280 beds. Only three other military hospitals are comparable with it in size--San Diego Naval Regional Medical Center with 1,554 beds; Wilford Hall U.S. Air Force Medical Center with 1,000 beds; and the Portsmouth (Virginia) Naval Regional Medical Center with 985 beds. As shown in the table below, 47 percent of DOD's 186 military hospitals in the United States and overseas have only 50 beds or less and most of the others range from 51 to 440 beds.

DOD Hospitals Worldwide
Fiscal year 1975

Number of beds	Number of hospitals				Percent of total
	Army	Navy	Air Force	Total	
50 and under	17	4	66	87	47
51 to 100	11	7	16	34	18
101 to 200	7	7	5	19	10
201 to 400	16	7	8	31	17
401 to 600	6	2	-	8	4
601 to 800	-	2	-	2	1
801 to 1,000	-	2	1	3	2
Over 1,000 (note a)	1	1	-	2	1
	58	32	96	186	100

a/ Includes new hospital under construction at Walter Reed.

A proposed development plan identifies 35 of these hospitals as possible sites for implementation of one or more of the TRIMIS subsystems. As shown below, these hospitals range in size from 80 beds to 1,554 beds, with the heaviest concentration in the 201 to 400 bed range.

Number of beds	Number of hospitals
80 to 100	2
101 to 200	5
201 to 400	16
401 to 600	5
601 to 800	2
801 to 1,000	3
1,001 to 1,600	2
Total	35

In addition to proposing the implementation of TRIMIS at these sites, the deveopment plan provides for its implementation at 22 other hospitals that are unidentified as to name or size.

During our review, DOD was unable to demonstrate how the TRIMIS design and development effort was considering the kinds of information that would be responsive to all user needs, other than at Walter Reed, or how TRIMIS would be scaled to meet these varying needs. Unless the TRIMIS program can be proportioned to meet the needs of hospitals smaller than Walter Reed, its implementation could provide medical information support that far exceeds the smaller hospital's foreseeable needs and available resources.

CHAPTER 4

TRIMIS FUNDING AND ITS EFFECT ON PROJECT MANAGEMENT

The total costs expended through March 31, 1976, for the development of TRIMIS are not readily available.

When TRIMIS was started, the Air Force Director of Data Automation was directed to maintain consolidated TRIMIS manpower utilization and financial accounting records. At the completion of our review, no single office maintained records on manpower consumed, obligations, expenditures, availability of funds, or forecasts of future financial needs for developing TRIMIS. Also, each of the services obtained, controlled, and managed its own funding but not in the same detail. To develop TRIMIS, funding information estimates from each of the services had to be obtained.

HOW MUCH HAS TRIMIS COST?

As of March 31, 1976, DOD estimated that over $14 million had been spent on TRIMIS. This total by fiscal year and appropriation consisted of the following:

Appropriation	1974	1975	a/1976	Total
	(000 omitted)			
Operations and Maintenance	$ 857	$4,507	$5,269	$10,633
Military pay	540	1,146	1,795	3,481
Procurement	121	74	-	195
Total	$1,518	$5,727	$7,064	$14,309

These totals are also separated by service

Service	1974	1975	1976	Total
	(000 omitted)			
Air Force	$1,138	$2,481	$5,477	$ 9,096
Army	-	2,504	1,054	3,558
Navy	380	742	533	1,655
Total	$1,518	$5,727	$7,064	$14,309

a/As of March 31, 1976.

These costs were primarily for personnel and contractual services involved in determining functional requirements.

In August 1975 the Assistant Secretary of Defense (Comptroller) became concerned with the lack of clearly defined objectives and progress toward determining TRIMIS requirements. As a result, he directed that fiscal year 1976 expenditures be held at the fiscal year 1975 level of $5.7 million until TRIMIS objectives and requirements were clearly defined.

Our review showed that by the end of the third quarter approximately $7 million had been expended during fiscal year 1976 on this program. The Assistant Secretary of Defense (Comptroller) rescinded the August 1975 funding restriction on this program because a concerted effort was underway at all management levels to redirect the program and to redefine management objectives. However, this concerted effort was not directed to clearly defining the program's objectives or user requirements. Instead, top program management was being reorganized, program responsibilities were being reassigned, and assistance in developing executive management was being sought. Thus, DOD continues to spend on a program where user requirements have not been clearly defined. This leaves the developer, in this case the Air Force, guessing what it is they are to design and implement.

WHAT WILL TRIMIS COST?

As of May 7, 1976, DOD estimated the TRIMIS program will cost over $504 million to develop and operate through fiscal year 1982, including the $14 million already spent. Operations and Maintenance appropriations will fund $473 million of the $504, with the remainder of the costs being funded through military personnel, procurement, and construction appropriations. The total estimated program cost of $504 million includes funds for acquiring and using computer equipment. However, the extent to which the equipment will be leased or purchased has not as yet been determined.

During our review nearly every major document containing cost data presented differing amounts for future cost estimates. For example, in June 1975 a TRIMIS economic analysis estimated that program costs for fiscal years 1976 through 1981 would be $249.2 million while a draft TRIMIS Development Plan in September 1975 estimated $202 million for the same period. This development plan, revised in October 1975, contained a revised cost estimate of $233.6 million, the same amount reported on October 16, 1975, in a DOD TRIMIS program review. Also, a DOD internal audit report on TRIMIS stated that the 5-year financial plan, for this same period,

programed the TRIMIS project at about $250 million, including about $45 million for operating costs. These TRIMIS budget projections were based on the development and use of a minicomputer network. In effect, it was assumed that individual minicomputers would be dedicated to a specific functional data base such as patient administration, clinical laboratory, radiology, or dietetics. These individual data bases were to be tied together by a communications network which was to use other minicomputers to give a health care provider access to all the information needed for dispensing effective and efficient patient care. If these assumptions or other conditions changed, so would future budget estimates. It should be noted that these assumptions had the effect of developing TRIMIS based on a distributed data base concept.

Such a change was reflected in the Assistant Secretary of Defense's (Health Affairs) May 7, 1976, TRIMIS budget estimate for fiscal years 1978 through 1982. This estimate reflected not only the specific hospitals to be supported by TRIMIS, but also DOD's decision to provide such support until 1985, when an integrated hospital system is supposed to be available. These changes have caused DOD to increase its TRIMIS cost estimates from about $250 million for fiscal years 1974 through 1981 to over $504 million for fiscal years 1974 through 1982, even though a revised TRIMIS program economic analysis has yet to be completed.

HOW WILL TRIMIS FUNDING AFFECT PROGRAM MANAGEMENT?

Since its inception, the TRIMIS program's budget has been formulated, submitted, and justified by the services and no single office has maintained records or controlled the obligation, expenditure, or availability of funds, or forecast its anticipated financial needs. Although the Assistant Secretary of Defense (Health Affairs) has continually reviewed the TRIMIS budget requests, the services have been responsible for obtaining, controlling, and managing TRIMIS funding. As long as this practice continues, we believe TRIMIS program management will be impaired.

Although TRIMIS' management has been reorganized to provide more positive direction through a full-time project manager, his effectiveness will be limited until he has funding and financial control of the program and he has established reasonably accurate and complete program cost estimates. His ability to properly manage and control the program must be based on established requirements and identified potential TRIMIS users. Also, these cost estimates, if they are to have management value, need to be specifically identified as to the various development and operation phases.

with statements of he resources required to complete each phase. We believe that as long as the services fund the acquisition and operation of approved systems, TRIMIS effectiveness and the project manager's ability to control program progress will be limited.

CHAPTER 5

CONTRACTOR SUPPORT FOR TRIMIS

In February 1975 the Air Force received an unsolicited proposal to provide support services for TRIMIS' development. In March 1975 the Air Force accepted this proposal as a modification to an existing contract, stating that the contractor was the only firm qualified to perform this effort. This sole source award was justified by the Air Force on the basis of the contractor's experience and unique manpower capability in this highly specialized field of automation development. Our review showed that the Air Force made this noncompetitive award even though an Air Force team had recently completed 134 visits (see p. 18) to Government and civilian locations using or developing automated health care systems. At least 15 of these visits were to commercial firms or their prototype installations. Also, many of the visits were to locations that operated systems developed by other Government agencies, such as the Veterans Administration and to non-Government firms.

WAS A SOLE SOURCE CONTRACT IN THE GOVERNMENT'S BEST INTEREST?

Purchases of property and services generally should be made on a competitive basis to insure that the Government receives the best available product at the lowest possible price. When procurements, expected to cost more than $10,000, are made, section 2304 of title 10, U.S.C. requires that proposals be solicited from the maximum number of qualified sources, consistent with the nature and requirements of the supplies or services to be procured. Because of these requirements, GAO has held that contract modifications may not provide for additional work of considerable magnitude, unrelated to the original contract, when a competitive procurement is practicable.

Further, section 2306 of title 10, U.S.C. generally requires that the contractor provide certified cost and pricing data prior to the award of a noncompetitive contract or the modification of any contract when the cost of the contract or modification is expected to exceed $100,000.

In March 1975 the Air Force accepted an unsolicited proposal and modified a software support contract for its Defense Support Program missions so that TRIMIS could be provided design and development support by the vendor. This work was to be accomplished over a 4-month period for an estimated cost of $99,210. In May 1975 the contractor's price was increased by $400,000 because a higher

level of effort was needed. A month later, in June 1975, the contractor's price was increased by an additional $400,000 and the contract period was extended 3 months so that the work could be continued by the contractor. As of March 1976, after expending $2.1 million the contractor was still providing assistance for TRIMIS development. DOD has estimated that an additional $2.3 million will be paid to the contractor by November 1976, for a total of $4.4 million.

Because this work was originally estimated to cost under $100,000, the contractor was not required to certify the accuracy of his cost estimates before receiving the award. In addition, the DOD regulation relating to the level of approval required for negotiation of contracts over $100,000 was not applicable. Certified cost and pricing data were obtained for each of the two $400,000 increases to the modification. However, approval from the Assistant Secretary of Defense (Financial Management) was not sought until the second increase was proposed. By this time the Air Force Director of Data Automation had already committed about $500,000 to the sole source contract and a decision to discontinue the effort could have impaired the program's progress.

Sole source procurements of supplies and services are appropriate in situations where it is impracticable to obtain competition. However, since the Air Force was aware of other commercial firms involved in automated health care systems being operated at Government and civilian locations, the Air Force's judgment that the contractor was the only contractor qualified to perform the TRIMIS work appears to be questionable. In addition, since the TRIMIS work was procured on a sole source basis, there is no assurance that the lowest possible price was obtained.

CONTRACTOR'S ROLE IN TRIMIS' DEVELOPMENT

Since March 1975 the contractor's support has been directed toward

--generating general system functional requirements for TRIMIS,

--evaluating available systems and insuring their maximum use in TRIMIS, and

--establishing a general systems architecture to meet TRIMIS needs.

Approximately 70 DOD/contractor personnel have been involved in accomplishing these tasks. Of this number, 20 were contractor personnel with systems management, engineering, and/or analysis capabilities who must rely on the 50 DOD personnel for health care delivery expertise.

To generate the general specifications, the contractor was required to assist DOD personnel in the definition of their requirements. Although personnel from all three military services were involved, the needs of the new Walter Reed Army Medical Center provided the focus for such definitions. Also, because the three services were involved, the contractor was put in the role of arbitrator when service differences arose even though the Deputy Secretary, in July 1974, assigned the Assistant Secretaries of Defense (Health Affairs) and (Comptroller) such responsibilities.

In order to insure that maximum use of available systems would be considered in meeting TRIMIS requirements, the contractor, who is a vendor of medical information systems and a major manufacturer of computer equipment, had to evaluate his competitors' health information systems. This evaluation was based on a total of 11 systems. Eight systems were selected by the Air Force and three additional systems the contractor selected for review. Of the 11 systems reviewed, 5 depend on the contractor's equipment for their operation. Following is a summary of the contractor's conclusions.

Evaluation	Systems using the contractor's central processors	Systems using central processors of other firms	Total
Favorable	4	2	6
Unfavorable comment	1	1	2
Noncommital	1	2	3
Total	6	5	11

The contractor's computers are in widespread use for medical information systems that are developed by various vendors. These systems are generally machine dependent--the systems will operate only on the contractor's computers. Accordingly, we believe the Air Force's sole source selection of this contractor to evaluate the suitability fo competitors' product is questionable. One way for DOD to maintain competition for the development of TRIMIS and minimize future software conversion costs, when an integrated system or other major system change occurs, is to insure that TRIMIS is developed using machine transferable software, even though such software presently does not necessarily

optimize the unique operating characteristics of every machine on which it is used. However, in our opinion, the benefits received and cost savings realized through the use of machine transferable software generally more than offset any operational inefficiencies associated with its use. Machine transferable software is capable of being used on two or more vendors' computers.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

DOD started an intensive design and development effort without using several procedures intended to foster good management practices and prevent unnecessary expenditures of Government funds. As a result, 2 years have passed, over $14 million has been spent, specific information requirements necessary to support and satisfy user needs have yet to be established, and DOD has had to reorganize the TRIMIS management structure and redefine management responsibilities and program objectives.

We believe that DOD can improve the ability of its hospital staffs to deliver patient care if computer support is properly pursued and implemented. To do this, DOD must insure that the information used to administer this care and monitor patient progress is readily available, complete, and accurate and fosters better communication and coordination among the hospital's nurses, doctors and supporting departments. This can only occur when the information needs of the user are identified and the information system is designed to be responsive to these needs.

Although no available system appears to meet all of the perceived TRIMIS requirements and DOD is taking positive action to establish management control of this important program, we believe that DOD needs to establish uniform reporting procedures that will be responsive to and satisfy its health care providers' needs before further automation efforts are authorized or undertaken. Also, DOD needs to insure that key characteristics of effective management, such as appropriate economic analysis, approved milestones, established policies and procedures, and centralized financial control, are included in its TRIMIS management reorganization. Finally, to minimize the cost of converting from today's equipment to the equipment it may be using tomorrow, DOD should give more consideration to developing large integrated or multiservice systems using machine transferable software. Such a procedure would enhance the exportability of large systems.

RECOMMENDATIONS

Comments from the Secretary of Defense have not been requested in accordance with instructions received from Senator William Proxmire's office. However, the matters discussed in this report have been presented to the Assistant Secretary of Defense (Health Affairs) and members of his staff and their comments have been considered and included in this report. Although some corrective actions are now underway, it is apparent that unless the parochialism displayed in this program can be dissipated or resolved there is little assurance the program can be successfully developed. DOD's objective of developing a standard interservice system is sound. If the parochialism can be dissipated or resolved, GAO recommends that the Secretary of Defense direct the Assistant Secretaries of Defense (Health Affairs) and (Comptroller) to

--complete the reorganization of TRIMIS and designate a full-time project manager with authority to manage the program, control its funding including the centralization of financial management controls and records, and be responsible for its progress;

--establish program evaluation criteria in sufficient detail to provide an effective means of measuring program progress;

--formulate uniform definitions of data elements for TRIMIS and information reporting procedures for its health care providers; and

--conduct an economic analysis of the alternatives that meet identified user needs and support program development actions.

These actions should be initiated promptly. The Congress should limit funding to the amounts necessary to bring the recommended actions to successful completion.

When a sound basis had been established for developing TRIMIS, the Secretary of Defense should require the Assistant Secretaries to

--review and control the program through frequent contact with the project manager;

--reevaluate information concerning available systems, and select those systems that closely meet established user requirements for additional study before deciding how development will be pursued;

--base the program on machine transferrable software to encourage future competition and reduce conversion costs; and

--apply uniform reporting procedures and data element definitions developed in TRIMIS to the military health services system, to the maximum extent possible.

The Assistant Secretary of Defense (Health Affairs) has initiated actions that are partially responsive to these recommendations. These actions should improve TRIMIS planning and management control if properly implemented. We intend to continue evaluating the progress of this program during these critical periods of its development.

CHAPTER 7

SCOPE

Our review was directed toward obtaining and evaluating information on the management and progress of the TRIMIS program, and on the type of automated medical information systems in existence and available at Government and non-Government facilities. We visited the Walter Reed Army Medical Center, National Naval Medical Center, Malcom Grow U.S. Air Force Medical Center (Bolling Air Force Base, Maryland) and Martin Army Hospital (Fort Benning, Georgia). We visited other Government hospitals such as the Clinical Center of the National Institutes of Health, Veterans Administration Hospital in the District of Columbia, and the Public Health Service Hospital, Baltimore, Maryland. We also obtained information by visiting or contacting 11 private hospitals and clinics, community organizations, a health care plan, and universities.

We reviewed pertinent records and documents and obtained other information on the TRIMIS program from officials at the offices of the Assistant Secretaries of Defense (Comptroller) and (Health Affairs), the Medical Functional Guidance Group, the TRIMIS Army Group, the Air Force TRIMIS Program Management Office, the Air Force Data Systems Design Center, and the system's engineering and integration contractor. We obtained information on automated medical information systems from commercial vendors and the headquarters offices of the Department of Health, Education, and Welfare; the Public Health Service; National Institutes of Health; Veterans Administration; National Bureau of Standards; National Aeronautics and Space Administration; National Science Foundation; Smithsonian Institution; and the medical departments of the three military services.

APPENDIX I

United States Senate

COMMITTEE ON BANKING, HOUSING AND URBAN AFFAIRS

WASHINGTON, D.C. 20510

January 23, 1975

The Honorable Elmer Staats
Comptroller General of the United States
Washington, DC

Dear Mr. Staats:

After a discussion between representatives of your office and my staff, I believe it would be prudent to continue the investigation into the Trimis medical system.

In particular, fruitful areas of research might include the following:

1. Similarities and common functions with other systems including the Veterans Administration and National Institutes of Health.

2. Comparisons of system description with service requirements.

3. Analysis of how to reduce redundance or duplication with other government or commercial systems.

4. The adequacy of Air Force advanced planning.

5. Flow of funding -- from what accounts and how justified.

I hope that any subsequent research would be conducted on a phased basis so that the committment of GAO resources need not be overextended and that the project can be easily terminated if proved unproductive.

Sincerely,

William Proxmire, U.S.S.

WP:rtg

APPENDIX II

PRINCIPAL OFFICIALS OF THE DEPARTMENT OF DEFENSE RESPONSIBLE FOR ADMINISTERING ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
DEPARTMENT OF DEFENSE		
SECRETARY OF DEFENSE:		
Donald H. Rumsfeld	Nov. 1975	Present
James R. Schlesinger	July 1973	Nov. 1975
ASSISTANT SECRETARY OF DEFENSE: (HEALTH AFFAIRS) 1/		
Vernon McKenzie (acting)	Mar. 1976	Present
James R. Cowan, M.D.	Feb. 1974	Mar. 1976
Vacant	Sept. 1973	Feb. 1974
Richard S. Wilbur, M.D.	July 1971	Sept. 1973
ASSISTANT SECRETARY OF DEFENSE: (COMPTROLLER)		
Terence E. McClary	June 1973	Present
DEPARTMENT OF THE ARMY		
SECRETARY OF THE ARMY:		
Martin R. Hoffman	Aug. 1975	Present
Norman R. Augustine (acting)	July 1975	Aug. 1975
Howard H. Callaway	May 1973	July 1975
SURGEON GENERAL:		
Lieutenant General Richard R. Taylor	Oct. 1973	Present
DEPARTMENT OF THE NAVY		
SECRETARY OF THE NAVY:		
J. William Middendorf II	June 1974	Present
J. William Middendorf II (acting)	Apr. 1974	June 1974
John W. Warner	May 1972	Apr. 1974
SURGEON GENERAL:		
Vice Admiral Donald L. Custis	Mar. 1973	Present

1/Effective March 5, 1976, the Assistant Secretary of Defense (Health Affairs) was established to replace the Assistant Secretary of Defense (Health and Environment).

APPENDIX II

	Tenure of office	
	From	To
DEPARTMENT OF THE AIR FORCE		
SECRETARY OF THE AIR FORCE:		
Thomas C. Reed	Jan. 1976	Present
James W. Plummer (acting)	Nov. 1975	Jan. 1976
John L. McLucas	May. 1973	Nov. 1975
SURGEON GENERAL:		
Lieutenant General George E. Schafer	Aug. 1975	Present
Lieutenant General Robert A. Patterson	Aug. 1972	July 1975
DIRECTORATE OF DATA AUTOMATION:		
Brigadier General Frederick L. Maloy	July 1975	Present
Major General Jack B. Robbins	Sept. 1971	July 1975
UNIVERSITY OF THE HEALTH SCIENCES		
PRESIDENT:		
Anthony R. Curreri, M.D.	Jan. 1974	Present