REPORT TO THE CONGRESS

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

Cost-Effectiveness Analysis Of Two Military Physician Procurement Programs: The Scholarship Program And The University Program

Department of Defense

GAO's analysis compares the cost effectiveness of the Armed Forces Health Professions Scholarship Program and the Uniformed Services University of the Health Sciences as methods of procuring physicians for military service.

Alternatives are presented by which the Department of Defense could obtain levels of physician services expected in fiscal year 1984 at lower overall costs per staff-year of expected service.

The Department said certain additional costs should be attributed to the Scholarship Program when it is compared to the University and indicated that a more appropriate analysis would be one which assigns dollar values to the intangible benefits of the programs.

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

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To the President of the Senate and the
Speaker of the House of Representatives

This report describes our analysis comparing the cost effectiveness of the Department of Defense's Uniformed Services University of the Health Sciences and the Armed Forces Health Professions Scholarship Program. The report also includes several alternatives to the present complementary operation of both programs.

We made our review at the joint request of Senators Wendell H. Ford and William Proxmire. Our review was conducted pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of Defense; and the Chairman of the Board of Regents and the President of the Uniformed Services University of the Health Sciences.

Comptroller General
of the United States

Contents

ABBREVIATIONS

AMA	American Medical Association
DOD	Department of Defense
GAO	General Accounting Office
NAVFAC	Naval Facilities Engineering Command

GLOSSARY

Cost-benefit analysis	An analytical approach to solving problems of choice when the benefits or outputs are measurable in dollar terms.
Cost-effectiveness analysis	An analytical approach to solving problems of choice when the benefits or outputs are specified and a least cost alternative is sought for achieving such results. This approach is used when the benefits of the alternatives cannot be quantified in dollars.
Incremental cost	The cost associated with a change in the level of output.
Opportunity cost	The measurable advantage foregone through rejection of the best alternative use of resources.
Sensitivity analysis	A procedure employed because of uncertainty concerning the actual value of parameters included in an analysis. The procedure is used to test the sensitivity of conclusions to variations in the parameters.
Unincurred investment cost	The cost which has not already been incurred and will be increased or decreased by any present or future decision.

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

COST-EFFECTIVENESS ANALYSIS OF TWO MILITARY PHYSICIAN PROCUREMENT PROGRAMS: THE SCHOLARSHIP PROGRAM AND THE UNIVERSITY PROGRAM
Department of Defense

D I G E S T

The Uniformed Services Health Profession Revitalization Act of 1972 (Public Law 92-426) authorized the Department of Defense to procure physicians by establishing the Armed Forces Health Professions Scholarship Program (10 U.S.C. 2121) and the Uniformed Services University of the Health Sciences (10 U.S.C. 2112).

Since this legislation was enacted, several studies have been made to help the Congress determine the cost effectiveness of both programs. Studies by the House Appropriations Committee's Surveys and Investigations Staff and the Defense Manpower Commission concluded that the University Program was substantially less cost effective than the Scholarship Program. However, a Uniformed Services University study concluded that the University Program was more cost effective. (See pp. 5 and 6.)

The debate over which program was more cost effective continued during the fiscal year 1976 military construction budget hearings. After $64.9 million was appropriated for building the second increment of the University's medical school facility, two Senators requested GAO to ascertain which program was more cost effective.

GAO's cost-effectiveness analysis differs from the previous studies in that GAO attempted to show the full costs of the Department's procuring and retaining physicians. (Prior studies were limited to procurement costs; they did not consider costs for pay and retirement.) (See ch. 2.)

GAO's analysis specifically addresses the future uses of resources and considers only those costs which are directly attributable

to the implementation of each alternative (i.e., incremental costs).

The Department disagreed with GAO's exclusion of non-Defense Federal subsidies to civilian medical schools as a cost attributable to the Scholarship Program. Also, the Department pointed out that GAO's analysis was a cost-effectiveness rather than a cost-benefit analysis. The Department stated that a cost-benefit analysis would recognize the intangible benefits which will be derived from establishing the University. (See p. 13.)

GAO did not include non-Defense Federal subsidies to civilian medical schools because this Federal assistance:

--Was provided before and has been provided since the establishment of the Scholarship Program.

--Would continue regardless of whether the Scholarship Program continues or is completely abandoned.

GAO performed a cost-effectiveness--rather than a cost-benefit--analysis because of the subjectivity involved in quantifying the numerous intangible benefits that could be identified in connection with either program. (See p. 13.)

GAO's primary unit of measurement was the estimated cost per staff-year of expected service from graduates of each program. Interim measurement steps were also included in the analysis to show (1) the estimated educational cost per graduate from each program and (2) the estimated educational cost per staff-year of expected service of each program's graduates. (See p. 9.)

University officials contend that (1) University and Scholarship Program graduates differ in their ability to fulfill required military medical needs and (2) an expanded Scholarship Program would decrease the Nation's ability to meet the civilian sector's need for physicians. (See pp. 35 and 37.)

These contentions are nonquantifiable and were not included in GAO's cost-effectiveness analysis. GAO believes, however, that these are important concerns which must be considered along with the programs' cost effectiveness. (See p. 35.)

GAO's analysis showed that in fiscal year 1984--the first full year of simultaneous operation of both programs:

--The estimated educational cost will be $36,784 for each of 988 graduates of the Scholarship Program and $189,980 for each of 175 University graduates.

--The estimated educational costs per staff-year of expected service will be $4,362 for the Scholarship Program graduates and $10,232 for University graduates.

--The total cost per staff-year of expected service (including anticipated pay and retirement costs) will be $21,444 for Scholarship Program graduates and $26,236 for University graduates. (See pp. 17 and 22.)

The Department's estimates of potential costs and expected benefits under each program are subject to change. Some of these estimates--particularly those for the University Program--have already changed often. Because of these uncertainties, GAO conducted several sensitivity tests to show how changes in certain assumptions affect the programs' cost effectiveness. For example, one test shows that, as civilian medical school tuitions increase, the cost effectiveness of the Scholarship Program decreases. (See ch. 4.)

This report should help the Congress in (1) assessing the actual cost effectiveness of each program, (2) understanding the uncertainties involved in determining cost effectiveness, and (3) deciding whether to reconsider its position on the authorization and funding of the University Program.

Also, the Congress might apply the overall GAO methodology used and described in this

report to assess the appropriateness of future requests from the Department of Defense or other Federal agencies for expanding or initiating health profession procurement programs. (See p. 40.)

Further, in the event the Congress wishes to consider alternatives to the University, GAO has developed three alternatives which could produce equivalent numbers of expected staff-years of physician services more cost effectively than both programs operating concurrently. (See ch. 5.)

Each alternative would require action by the Congress to terminate the University program and action by the Congress and/or the Department to

--expand the Scholarship Program (see p. 30),

--"fully sponsor" any Scholarship Program participant taking civilian residency training (see p. 31), or

--increase the initial active duty obligation for Scholarship participants (see p. 32).

If the University Program were terminated, funds could be made available to provide grants to help expand civilian medical schools to accommodate additional Scholarship Program students. (See ch. 5.)

CHAPTER 1

INTRODUCTION

In response to a November 1975 request from Senators Proxmire and Ford (see app. I), we analyzed the potential costs involved in the Department of Defense's (DOD's) procurement of physicians under the Uniformed Services Health Professions Revitalization Act of 1972 (Public Law 92-426). The act authorized two methods of procuring physicians--the Armed Forces Health Professions Scholarship Program and the Uniformed Services University of the Health Sciences. The act was intended to enable DOD to more effectively compete for the services of physicians and other health professionals after the draft ended.

AUTHORIZATION AND IMPLEMENTATION OF THE SCHOLARSHIP PROGRAM

The act authorized DOD to provide up to 5,000 scholarships (at any one time) at accredited institutions for education leading to degrees in medicine, dentistry, and other health professions.

To be eligible for the Scholarship Program, a student must be enrolled in or accepted for enrollment in an accredited institution. Program participants are commissioned in a Reserve component of the services at the pay grade of O-1 (equivalent to 2d lieutenant), with full pay and allowances of that grade for 45 days active duty during each year of participation in the program. Except when serving on active duty, participants receive a monthly stipend of $400 in addition to funds needed to cover all educational expenses, including tuition, fees, books, and laboratory expenses.

The act requires participants to serve at least 1 year of active duty for each year of participation in the Scholarship Program. The Secretary of Defense has prescribed a minimum obligation of 2 years, and those in the program who participate for more than 2 years incur a year-for-year obligation with periods of 6 months or more counted as 1 year and periods of less than 6 months counted on a day-for-day basis. The Secretary of Defense may relieve participants of their active duty obligations. In this event, they may be assigned to civilian health manpower shortage areas as designated by the Secretary of Health, Education, and Welfare for the rest of their obligated service.

Time spent in the program is not creditable for retirement purposes. In addition, time spent in either military or civilian graduate medical education programs (internship and residency programs) is not creditable to satisfy the service obligation incurred as a result of participation in the program. However, time spent in military graduate medical education programs is creditable for retirement purposes.

DOD began awarding scholarships in early 1973. At the end of fiscal year 1975, 4,730 persons were enrolled in the program. About 72 percent of the outstanding scholarships were medical scholarships. Most of the rest were awarded to persons studying dentistry. Medical scholarships have been awarded to students at all 114 medical institutions eligible to participate in the program.

In June 1975 DOD estimated that all 5,000 scholarships would be outstanding in fiscal year 1976 and that the total costs would amount to about $46.3 million (about $9,265 per student per year). Of this total, $45.5 million represents direct scholarship payments, and about $845,000 represents advertising and recruiting costs.

The act authorized DOD to provide additional payments to institutions which have increased their total enrollments solely to accept students under the program and which have, as a result, incurred increased costs not covered by their normal tuition and fees. Since the program's inception, DOD has not had to use this provision of the legislation.

AUTHORIZATION AND IMPLEMENTATION OF THE UNIVERSITY PROGRAM

The act authorizes the University and provides that:

--The University is to be a degree-granting Federal institution to educate physicians and other health professionals and is to be located within 25 miles of the District of Columbia.

--Not less than 100 medical students are to be graduated annually, with the first class to graduate no later than 1982.

--The faculty is to consist of military and civilian professors, with the civilians receiving salaries comparable to those paid by accredited schools of the health professions in the District of Columbia vicinity.

--Student selection procedures are to be prescibed by the Secretary of Defense.

--Students are to be officers of a uniformed service, commissioned in pay grade 0-1 with full pay and allowances of that grade.

--Time spent as a student is not creditable towards retirement.

--Graduates are required to serve on active duty for at least 7 years, and not more than 20 percent of the graduates of any one class may perform civilian Federal duty in lieu of military service.

--Time spent in military graduate medical education is not creditable toward satisfying the active duty obligation. 1/

--The Secretary of Defense is to submit periodic reports to the House and Senate Committees on Armed Services concerning the feasibility of establishing similar educational institutions at other locations; the last report is to be submitted by June 30, 1976.

The concept of constructing a military medical university was first considered in 1947 and was reconsidered several times before becoming a reality under the act. The legislative history of the authorization and funding acts for the University indicates that the concept had in recent years aroused considerable debate, much of which centered around whether such a Federal undertaking was a cost-effective method of procuring military health professionals.

The legislative history also indicates that the University's proponents intended that the University complement the Scholarship Program; the latter was to meet the military's shorter term physician needs, while the former was to meet its longer term needs for a cadre of experienced military physicians.

The implementation of the legislation as it related to the University began with the Presidential appointment of a Board of Regents in May 1973. In the following December

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1/According to DOD regulations, time spent in military graduate medical education is creditable for military retirement purposes.

the Board selected the National Naval Medical Center in Bethesda, Maryland, as the site for the University, and in January 1974 the Secretary of Defense appointed the University president. In April 1974, the Secretary formally established the University as an independent agency within the Department responsible directly to the Secretary.

Originally, the University was to be constructed in four increments with congressional approval and funding authorization required for each. The first three increments were for building the school of medicine's facilities; the final increment included building the facilities needed for the University's other schools--dental, pharmacy, nursing, veterinary medicine, and allied health services.

In June 1974 the Naval Facilities Engineering Command (NAVFAC) awarded a contract for the planning and design of both the University and a new naval hospital at the National Naval Medical Center. As of March 1976, planning and design funds of about $5.6 million had been obligated for the University from funds appropriated to NAVFAC.

Plans for the University included modifying the existing Armed Forces Institute of Pathology at Walter Reed Army Medical Center to provide interim facilities for the University's charter class. Facilities to be constructed at the Bethesda site include classrooms, teaching laboratories, faculty and administrative offices, faculty research laboratories, anatomy areas, animal facilities, and related parking and other service facilities. Current plans call for the medical school facilities to be constructed in two rather than three increments. The status of these increments is as follows:

--In fiscal year 1975 the Congress appropriated $15 million for the first increment. A contract for $9.3 million was awarded in May 1975 for the major portion of the increment, which includes construction of the basic science building and some classroom and teaching laboratories. As of March 1976, $10.4 million had been obligated for all construction involved in this increment, and the total cost of the increment was expected to be about $10.9 million. Completion is anticipated in February 1977.

--In November 1975 the Congress approved funding totaling $64.9 million for the second increment, which includes the main University building. The notification of award for the major portion of this increment was made in March 1976 in the amount of $35.4 million.

According to current estimates, this increment will cost about $53.3 million and will be completed in September 1978.

DOD officials no longer see a need for building University facilities to train dentists, pharmacists, or veterinarians. However, University officials plan to request funding for another facility to educate nurses, physician assistants, and related health professionals. This facility, although part of the University, is not considered by University officials to be part of the medical school. As of March 1976 no estimates had been made of either the size or the cost of the facility. Funding for the facility is expected to be requested in DOD's fiscal year 1978 budget requests.

As of March 1976 the University expected to enroll its charter class of 36 students and to begin operations in August 1976 at the interim facility. Original plans had called for operations to begin in January 1976. The University has hired some and is interviewing other applicants for its key departmental chairperson positions and has interviewed over 200 applicants for its charter class. Also the University is preparing to meet the provisional accreditation requirements of the Liaison Committee on Medical Education. This committee, made up of representatives from the American Medical Association (AMA) and the Association of American Medical Colleges, is responsible for accrediting all the Nation's medical schools.

STUDIES COMPARING COSTS OF GRADUATING STUDENTS FROM THE TWO PROGRAMS

In 1975--during congressional deliberations on whether to authorize funding for the major construction increment of the University--several reports were prepared comparing the estimated costs to educate a student under the Scholarship and University Programs.

One was a May 1975 interim report prepared by the Defense Manpower Commission, established by the Congress in 1973 to make a comprehensive study of DOD's overall manpower requirements. This report concluded that the University was an unjustifiably costly method to meet current and future procurement and retention goals for military professional medical personnel and recommended that the University be terminated. The Commission reached its conclusion primarily because it estimated that a University graduate would cost between $150,000 and $200,000 to train whereas a Scholarship Program graduate would cost about $34,000. Furthermore, according to a Commission official, the Commission did not make

a full cost-effectiveness analysis because "the only point in such an exercise would be to determine the size of the negative rate of return on the Government's investment in the University."

University officials presented cost figures to the Subcommittee on Military Construction, Senate Committee on Appropriations, in June 1975 and concluded that the University was a cost-effective method of meeting current retention and future procurement goals for military professional medical personnel. University officials reached their conclusion through an analysis based on productive staff-years of service from each graduate. This was a multiple-step process leading to a comparison of the expected cost per staff-year of service based on estimated retention rates of physicians under each program. The staff-year cost calculation showed that the University cost was less than the Scholarship Program cost.

In preparing their analyses, the two groups used different assumptions and cost estimates for different years and, therefore, reached predictably different conclusions. Pursuant to a request from the Chairman, Subcommittee on Military Construction, Senate Appropriations Committee, we prepared a July 1975 statement of facts, which discussed differences in the two groups' studies. A copy of this document was made part of the Subcommittee hearing record.

A third group, the Surveys and Investigations Staff of the House Appropriations Committee, prepared a July 1975 report, in which it observed that the University would be a much more costly method of producing physicians for the military than the Scholarship Program. The staff's analysis used many of the same assumptions used by the Defense Manpower Commission study.

SCOPE OF REVIEW

We analyzed the Scholarship and University Programs by using cost-effectiveness analytical techniques and did not perform a cost-benefit analysis. The difference between these types of analyses is spelled out in the glossary. In conducting our analysis, we accepted the accuracy of DOD's estimates of program costs and expected retention rates for graduates.

We obtained information concerning several factors which were discussed during the 1975 congressional debate on the funding of the major University increment but which do not lend themselves to inclusion in our analysis. In response to the Senators' request, we also identified (1) possible

alternative methods of procuring and retaining physicians and (2) the estimated costs associated with terminating the University.

We examined the legislative histories associated with the authorization and funding of the University and Scholarship Programs. We also reviewed appropriate DOD, Army, Navy, and Air Force directives, regulations, and reports as well as other pertinent Federal Government reports.

Discussions were held with and documents obtained from officials of the University; the Offices of the Assistant Secretaries of Defense (Health Affairs and Legislative Affairs); the Offices of the Surgeon Generals of the Army, Navy, and Air Force; and NAVFAC to obtain data and other information. Our work was conducted at DOD's and the services' headquarters in Washington, D.C., and at the headquarters of the University in Bethesda, Maryland.

CHAPTER 2

BASIC ASSUMPTIONS AND KEY FACTORS CONSIDERED IN OUR ANALYSIS

As previously stated, to analyze the potential costs to the Department of Defense of the two physician procurement programs, we used cost-effectiveness analytical techniques which attempted to show the expected costs of each program in the first year when both are fully operational. These techniques are particularly useful in addressing problems which involve choosing one alternative over another to accomplish an objective. Moreover, this type of analysis (1) specifically addresses the future uses of resources since past expenditures are viewed as being outside the decision process and (2) considers only those potential costs which are directly attributable to the implementation of each alternative (i.e., incremental costs).

BASIC ASSUMPTIONS

As with the previous studies on this subject (see p. 5), our analysis involved certain basic assumptions. For example, we assumed that:

--The programs will produce basically comparable physicians who will help meet the military's needs.

--Neither program will seriously disrupt the overall supply of or demand for physicians in the civilian sector.

These assumptions are discussed in greater detail in chapter 6.

OTHER KEY FACTORS

In developing our analytical approach, we also had to make decisions regarding the following key factors:

--The appropriate unit of analysis against which to compare the estimated costs for each program.

--The appropriate methods of treating various components of each program's costs.

--The appropriate year to use as the base year for analytical purposes.

--The appropriate methods of dealing with the many uncertainties involved in the projected costs for each program.

Each factor is discussed below with particular reference to (1) the differences in the approaches taken by the Defense Manpower Commission and the University in their 1975 analyses of potential costs of the programs and (2) our reasons for selecting a particular approach concerning each factor.

Unit of analysis

The Commission used the expected number of graduates as the measure of benefits from each program and the cost per graduate as the basic unit of analysis. The University used the number of staff-years of military service expected to be obtained from the graduates of each program as the measure of benefit and the estimated cost per staff-year of service as its unit of analysis. The University expects that its environment will cause a larger proportion of its graduates to choose military medicine as a career than graduates of the Scholarship Program.

To the extent that the University's assumption is correct, the cost per graduate would no longer be a meaningful cost-effectiveness measurement, since graduates from the two programs would not have the same potential for providing medical services to the military. Because of this, we used the estimated total cost per expected staff-year of service as the unit of cost-effectiveness measurement. We have, however, included as interim steps in our analysis the estimated educational cost per graduate and the estimated educational cost per staff-year of expected service of graduates from both programs.

Treatment of cost factors

The Commission and the University, in conducting their analyses, differed in their treatment of three significant cost elements of the physician procurement programs:

--Amortization of investment costs incident to building the University.

--Treatment of portions of the University's expected operating costs.

--Treatment of Federal funding (other than Scholarship Program funding) to medical schools having Scholarship Program students.

In addition, the Commission addressed potential differences in salary and retirement costs applicable to graduates of each program, but it did not include these costs in its analysis. We have included estimated pay and retirement costs as

a separate step in our analytical framework to try to measure the full estimated costs per expected staff-year of service from graduates of each program.

Amortization of investment costs

The Commission included as a cost of the University an item it labeled as "depreciation." The Commission stated that, since the University facilities would be new, their construction costs were incremental costs which should be included as part of the total University costs when the University Program is compared to other alternatives. The University officials did not include the depreciation costs of University facilities because they did not believe that considering depreciation of Federal buildings was a standard practice in measuring program costs and they were not aware of any other medical school study which included depreciation in its cost per graduate calculations.

We have computed the equivalent annual investment cost on that portion of the total University construction costs that had not been incurred as of April 1, 1976. 1/ This approach permits the analysis to show the inclusion of the unincurred investment cost spread over a facility's entire useful life and, thus, be attributed equally to all graduates benefiting from it.

We excluded from the analysis those costs for construction which had been completed or begun as of April 1, 1976, since such costs are not incremental costs for the purposes of the analysis. In this regard, we excluded $4.6 million from the costs associated with the construction contract awarded for the second increment. According to NAVFAC officials, this amount would be unrecoverable if the contract were terminated as of April 1, 1976. A detailed discussion of termination costs is included as appendix II.

Treatment of program costs

The Commission and University officials took different approaches in including certain program costs of both programs. The Commission calculated the estimated cost per graduate under the Scholarship Program from the viewpoint of the total cost to DOD. The University, on the other hand, projected the total costs to the Federal Government of graduating

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1/Office of Management and Budget Circular A-94, as revised, requires inclusion of all relevant costs for decisionmaking purposes. An official of the Office told us that unincurred investment costs are relevant costs for the purposes of an analysis such as ours.

students from the Scholarship Program by including an estimate of total Federal assistance to civilian medical schools. The Commission believed that including total Federal subsidies to civilian medical schools as a cost attributable to the Scholarship Program is inappropriate since these subsidies would not be saved if the University is built nor increased if it is not.

Our analysis did not include Federal funding to civilian medical schools not related to the Scholarship Program as an incremental cost attributable to that program. This funding is made available to civilian schools for reasons totally unrelated to the Scholarship Program. The Federal funding to civilian schools will continue regardless of whether the Scholarship Program continues.

The Scholarship Program will initially deprive the civilian sector of medical graduates but will later provide that sector with trained physicians when graduates complete their military obligations. Filling civilian school positions with students who initially will not serve in the civilian sector may involve a "cost" to society. However, we were unable to assign a cost or value to the opportunities foregone. We believe this to be an important consideration and have addressed it in chapter 6.

In another area, the Commission included more of the estimated costs of the University as costs of producing University graduates than were included in the University's analysis. University officials claimed that many expected University expenditures were not related to the instructional or educational activities of the school and should not be considered as part of the costs of educating University students. The University analysis showed that about 40 percent of the total estimated University costs were attributable to its educational mission and the remainder were attributable to its noneducational activities (such as research performed by faculty members). Accordingly, the University analysis compared the expected "net" costs of the University with the expected "net" costs of the Scholarship Program.

Cost-effectiveness analysis techniques require using all future incremental costs attributable to the implementation of an alternative. Since all University costs represent new activity costs, they are--with one exception--treated as incremental costs in our analysis. The exception is that the estimated costs of the salaries of military faculty and staff members, while not an incremental cost, should be included in the analysis because they represent an opportunity cost to DOD. Information we gathered shows that the University's military faculty and staff will be transferred from operating

units. This transfer represents a cost to DOD in terms of lost service to the military and, therefore, is a cost attributable to the establishment of the University.

University officials pointed out that, although civilian faculty costs were included in our analysis, no allowance was made for the benefits which would accrue to the military for the patient care which the civilian faculty will render in addition to their teaching. The officials were unable to assign a value to this benefit.

Base year for analysis

The Commission based its estimate of the costs per graduate from the University on the fiscal year 1980 cost projections contained in DOD's January 1975 Five-Year Defense Plan, whereas the University based its calculations on information contained in the Defense Plan updated to reflect fiscal year 1981 estimates.

In deciding on a base year for our analysis, we were guided by the need to compare the estimated costs of the programs in the first year when both are fully operational. University officials currently estimate that the University will be fully operational when it is able to graduate classes of 175 students. The University's plans call for the full complement of 700 students (175 per class) to be first enrolled in fiscal year 1984. We have selected that year as the base year although the Scholarship Program will have been fully operational for several years by then. The estimates of the component costs of the programs were stated in terms of fiscal year 1977 dollars because DOD's budget estimates are stated in those dollar terms.

Treatment of numerous uncertainties involved in the programs

When analyzing the comparative cost effectiveness of the programs, one must recognize that several major factors regarding both programs remain uncertain. Although students have been entering the Scholarship Program for about 3 years, DOD has had no experience regarding retention of program graduates. DOD has also had no experience with students entering the University, which is in its early implementation stages and for which the estimates of operational costs, needed facilities, and potential graduates have changed often. (See p. 23.)

In view of the uncertainties of many of the estimates that we had to use in our analysis, we developed an analytical model showing the effects that changes in the estimates

have on the analysis results. In this connection, we have attempted to develop a basic description of the programs using DOD's most recent estimates of component costs and potential benefits for each program. We have then shown--by sensitivity testing--the effects on the basic presentation of changes in the most significant of these estimated cost and potential benefit factors. (See ch. 4.)

AGENCY COMMENTS AND OUR EVALUATION

In commenting on our report by letter dated April 27, 1976 (see app. VI), DOD did not agree that the financial support provided to civilian medical schools by the Department of Health, Education, and Welfare and the Veterans Administration should be excluded from the Scholarship Program costs considered in our analysis. DOD stated that exclusion of such costs eliminates a significant portion of the Federal Government's contribution to medical education and that if both agencies' contributions were included, the Scholarship Program costs "could well be above" those of the University.

DOD stated also that a cost-benefit study would have given analytical consideration to the intangible benefits derived from establishing the University.

We understand DOD's concern regarding the exclusion from our cost-effectiveness analysis of the Federal contributions to medical schools that are not related to the Scholarship Program. However, non-DOD Federal assistance was provided before and has been provided since the establishment of the Scholarship Program for reasons not related to the existence of the program. Furthermore, such Federal contributions would continue regardless of whether the Scholarship Program continues or is completely abandoned. Because cost-effectiveness analysis deals only with those potential costs directly attributable to the implementation of each program (incremental costs), we did not include non-DOD-related contributions to civilian medical schools in our analysis.

In regard to DOD's second comment, we conducted, as stated on p. 6, a cost-effectiveness--rather than cost-benefit--analysis because of the subjectivity involved in quantifying the numerous intangible benefits that could be identified in connection with either program. We did, however, include in chapter 6 a discussion of two important benefits which have been identified as attributable to the creation of the University.

CHAPTER 3

RESULTS OF OUR ANALYSIS OF THE PROGRAMS

Our analysis, which compared the estimated fiscal year 1984 costs for both programs and used DOD's current estimates of costs and potential benefits, 1/ showed that the Scholarship Program is more cost effective than the University.

Our analysis showed that in fiscal year 1984:

--The educational cost per graduate will be $36,784 for the Scholarship Program and $189,980 for the University. 2/

--The educational cost per staff-year of expected service will be $4,362 for Scholarship Program graduates and $10,232 for University graduates.

--The total cost per staff-year of expected service (including anticipated pay and retirement costs) will be $21,444 for Scholarship Program graduates and $26,236 for University graduates.

SCHOLARSHIP PROGRAM ESTIMATES

The principal elements of the Scholarship Program considered in our analysis were estimates of educational costs; retention rates for program graduates; and military pay, bonus, and retirement considerations.

Educational costs

The estimated educational costs of the program include (1) stipends paid to scholarship recipients, (2) medical school tuition and related fees, and (3) DOD's costs of administering the program. The current authorization allows DOD to have 5,000 students under scholarship at any time. About 72 percent of these scholarships have been made available to medical students. Because DOD gives scholarships

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1/The portion of the analysis which was based on DOD's current estimates is hereinafter referred to as the "base analysis."

2/Throughout chapters 3, 4, and 5, the costs cited are stated in terms of fiscal year 1977.

to both first-year and upperclass medical students, DOD officials have estimated that the program will produce about 988 medical school graduates per year during fiscal year 1981 and beyond. However, in the absence of DOD estimates of the number of scholarships to be given to upperclassmen, we have assumed, for the purpose of our analysis, that the 988 medical school scholarships will be 4-year scholarships.

Student stipend costs

Scholarship recipients are to receive monthly stipends of $400 per month for 10-1/2 months and pay and allowances at the grade of O-1 for the 45 days per year they are obligated to serve on active duty. Accordingly, student compensation is estimated to amount to $5,588 annually in fiscal year 1984 1/--a total of about $5.5 million per year for the 988 medical students. This amounts to a 4-year total of about $22.1 million.

Medical tuition and related fees

Our analysis of DOD's most current estimates of its fiscal year 1981 program costs showed that its estimated costs for medical school tuition and related fees (such as for books and microscopes) would amount to about $3,000 per student per year. Therefore, the estimated fiscal year 1984 costs for the 988 expected medical school graduates would be about $2.96 million and the 4-year costs would amount to about $11.9 million.

Administrative costs

DOD's costs to administer the program include the services' recruiting and advertising costs and other administrative costs. Based on DOD's estimates, we calculated that the fiscal year 1984 recruiting and advertising costs would amount to $176 per student per year. Using the University's 1975 estimates of DOD's administrative costs for the program, we calculated that such costs would amount to about $432 per year. These estimates, when accumulated for the 988 expected graduates, amount to a 1-year total of about $600,000 and a 4-year total of about $2.4 million. 2/

1/Under DOD's budgetary process, operation and maintenance and personnel cost estimates cannot be inflated. We have followed this procedure and have applied it consistently in our analysis of both programs.

2/An inflation factor of 3.9 percent was used in the calculations to arrive at these estimates as stated in fiscal year 1977 dollar terms.

Retention rates

We included in our analysis estimates of the probabilities of graduates from both programs remaining in the military services for 20-year and longer careers. These estimates are greatly dependent on the amount of time that a graduate would be obligated to the services as a result of receiving DOD's assistance in obtaining a basic medical education and residency training (internship training does not affect a person's service obligation). Therefore, the estimated retention rates for the program are strongly influenced by the potential "career paths" followed by its graduates.

Scholarship Program graduates--after their 1-year internship--may be either (1) assigned to a service as a general medical officer 1/ or (2) selected for either civilian or military residency training. Those assigned as general medical officers or selected for civilian residency training are obligated to serve a total of 4 years. On the other hand, those selected for military residencies would be obligated for 5-1/2 years, assuming an average residency period of 3 years with a 1/2-year payback obligation for each year in residency. The time spent in both military internship and residency is considered creditable service for retirement purposes.

DOD's experience has shown that 8.7 percent of the military's physicians with 4 years of accumulated service decide to continue their service for at least 20 years. On the other hand, 35 percent of the physicians with 10 years of accumulated service have chosen to remain in the service for 20-year or longer careers. However, DOD had no experience concerning the retention of physicians who graduate under the program.

Using these retention rates, we estimate that the 988 program graduates would provide 8,332 staff-years of medical service to the military over a 30-year period. This estimate was derived using the following steps:

--We ascertained the number of graduates expected to follow each of the several available career paths and therefore expected to incur obligations of various lengths. We then multiplied these factors to arrive at the staff-years of obligated service expected from graduates in each career path.

1/The military does not provide residency training to these individuals.

--We multiplied the number of persons in each career path by the expected retention rates to determine the number of persons expected to continue to 20-year careers. (Retention rates for persons who continue beyond 20 years are not affected by career paths but are included in estimates of staff-years of service expected from program graduates.)

Military compensation, bonus, and retirement considerations

In addition to costs to educate military physicians, DOD incurs salary, variable incentive pay, 1/ and retirement costs which need to be considered in developing the full costs per staff-year of expected service from graduates of the programs.

Using the retention rates discussed above, we factored into our analysis the estimated pay and retirement costs for the 988 medical students expected to graduate from the Scholarship Program in fiscal year 1984. We developed those costs using DOD's expected promotion profiles for health service officers and its mortality tables for all military officers. Cost estimates were developed for the year 2004--20 years after the first full year of operation of both programs--and discounted to fiscal year 1984. 2/ These costs amounted to about $142.3 million, which, when divided by the 8,332 staff-years of expected service from the 988 program graduates, amounts to $17,082 per staff-year of expected service.

Summary of program costs

The table on the following page summarizes the results of our analysis concerning the expected costs of the Scholarship Program: 3/

1/Under Public Law 93-274, the Congress in May 1974 authorized DOD to provide incentives of up to $13,500 per year to physicians to encourage them to remain in the military. DOD has developed a schedule of incentive payments dependent on the length of time an eligible physician elects to remain in military service.

2/A discount rate of 7.87 percent was used to develop these estimates.

3/All figures are estimates for fiscal year 1984.

Items	Amount	Cost per graduate (note a)	Total cost per staff-year of expected service (note b)
Educational costs:			
Student stipends	$ 22,083,776	$ 22,352	$ 2,651
Medical tuition and fees	11,856,000	12,000	1,423
DOD's administrative costs (includes recruiting and advertising)	2,402,816	2,432	288
	36,342,592	36,784	4,362
Military compensation:			
Salary and bonuses	135,334,815	136,975	16,242
Retirement costs	7,001,790	7,087	840
	142,336,605	144,062	17,082
Total (note c)	$178,676,197	$180,846	$21,444

a/Based on 988 expected graduates.

b/Based on 8,332 staff-years of expected service from 988 graduates over a 30-year period.

c/These costs are discounted to represent fiscal year 1977 present value. See appendix III for the undiscounted total costs that will have to be appropriated over time, stated in fiscal year 1977 dollar terms.

UNIVERSITY PROGRAM ESTIMATES

We obtained estimates for University Program elements similar to those discussed in connection with the Scholarship Program.

Educational costs

The estimated educational costs of the University include (1) student stipends, (2) operating costs, and (3) amortization of unincurred investment costs. University officials estimate that the medical school will have an

enrollment of 700 students in fiscal year 1984 and will be graduating classes of 175 students. We were told, however, that the University expects that 2 of every 175 graduates will be selected to serve in the Public Health Service, leaving 173 graduates to serve in the military.

Therefore, in computing the interim unit of analysis involving the estimated educational costs per graduate, we included all 175 expected graduates in the calculation since the Federal Government will receive the benefit of services from all graduates. We then computed DOD's estimated costs per staff-year of service expected to be provided by the 173 graduates to be assigned to the military.

Student stipends

University students enter and remain in the grade 0-1 with a monthly compensation averaging approximately $890 per month (about $925 per month as expressed in fiscal year 1977 dollars). 1/ Accordingly, the annual stipend costs would amount to $11,100 per student, or $1.95 million annually for the 175 students in the University. This amounts to a 4-year total of about $7.8 million.

Operating costs

The University's budget includes funds for operations and maintenance (for example, civilian faculty and administrative salaries), procurement, and research necessary to operate the medical school. Further, as stated on p. 11, we believe that costs for military personnel in faculty and staff positions must be included in the analysis. University officials estimate that $19,518,000 will be needed to operate the medical school--with an expected enrollment of 625 students--in fiscal year 1981. This figure does not include military faculty and staff costs, which we calculated as $1,829,500.

The University plans to have an enrollment of 700 students in fiscal year 1984; therefore, portions of the operation and maintenance budget are expected to increase. The

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1/An inflation factor of 3.9 percent was used in these calculations.

table below shows DOD's fiscal year 1981 estimates and our corresponding estimates computed for fiscal year 1984. 1/

	Fiscal year 1981	Fiscal year 1984
Operations and maintenance	$17,016,000	$17,220,192
Procurement	602,000	602,000
Research and development	1,900,000	1,900,000
	19,518,000	19,722,192
Military faculty and staff costs	1,829,500	1,829,500
Total	$21,347,500	$21,551,692

According to University officials, the fiscal year 1981 estimates for procurement, research, and military faculty and staff costs are expected to remain constant beyond fiscal year 1981, even though the enrollment is expected to increase.

Amortization of unincurred investment costs

Based on information obtained from NAVFAC and University officials, we calculated that, as of April 1, 1976, DOD had not incurred about $48.7 million 2/ of the total estimated construction costs of $64.2 million for the two University construction increments. Since for purposes of our analysis all University graduates should benefit equally from this cost, an annual expense of about $3.9 million should be included in the cost of the University. This figure is based on the amount of the unincurred investment ($48.7 million) and the imputed interest foregone on that investment (at an interest rate of 7.87 percent over the expected 50-year life of the facility). The imputed interest charges amount to approximately $147.54 million.

1/Some minor personnel costs--such as permanent change of station costs and unfunded retirement costs associated with the University's faculty--are not included in the above estimates.

2/NAVFAC officials estimate that the second increment will cost $53.3 million. This amount less the estimated termination costs of $4.6 million results in the unincurred investment cost for the University's medical school.

Retention rates

University graduates will have the opportunity to follow the same career paths as graduates of the Scholarship Program. (See p. 16.) However, to provide a basic description of the two programs for the purpose of our analysis, we assumed, based on information obtained from University officials, that all University graduates would be selected for participation in the military internship and residency training programs. University graduates following this career path would have military obligations of 8-1/2 years and would have accumulated 12-1/2 years of creditable service toward retirement at the end of their obligated service. University officials were unable to provide us with data regarding the potential for University graduates to be selected for other career paths.

Information provided by University officials showed that, of all the military physicians who have completed 13 years of service, 75 percent have elected to remain in the military for at least 20 years. Officials in the Office of the Assistant Secretary of Defense (Health Affairs) supported this information. We have used this expected retention rate in our analysis to describe the basic programs; however, we note that DOD has had little or no experience with officers whose first opportunity to leave the military occurred after 13 years of service. Using the 75-percent retention rate, we estimate that the 173 University graduates who will provide service to the military will contribute 3,212 staff-years of medical service over a 30-year period.

Military compensation, bonus, and retirement considerations

As with the Scholarship Program, DOD's estimated costs involved in providing compensation, variable incentive pay, and retirement benefits were included as part of the costs of the University. We developed an estimate of these costs in fiscal year 2004 for the 173 University graduates ultimately to be assigned to the military and discounted this figure to fiscal year 1984. We estimate that such costs would amount to $51.4 million, which, when divided by the 3,212 staff-years of expected service from the 173 graduates, amounts to $16,004 per staff-year of service.

Summary of program costs

The table below summarizes the results of our analysis of the University using DOD's and the University's most current estimates of expected costs. 1/

Items	Amount	Cost per graduate	Total cost per staff-year of expected service (note a)
Education costs:			
Student stipends	$ 7,770,000	$ 44,400	$ 2,391
Operating costs	21,551,692	123,153	6,633
Amortization of unincurred investment costs	3,924,786	22,427	1,208
	33,246,478	b/189,980	10,232
Military compensation:			
Salaries and bonuses	46,670,900	269,774	14,530
Retirement costs	4,732,660	27,356	1,474
	51,403,560	c/297,130	16,004
Total (note d)	$84,650,038	$487,110	$26,236

a/Based on 3,212 staff-years of expected service from 173 graduates over a 30-year period, as calculated using the following formula:

$$\frac{\text{cost per graduate X number of graduates supplying service to DOD (173)}}{\text{expected staff-year of service provided to DOD (3,212)}}$$

b/Based on 175 graduates.

c/Based on 173 graduates expected to supply service to the military.

d/These costs are discounted to represent fiscal year 1977 present value. See appendix III for the undiscounted total costs that will have to be appropriated over time, stated in fiscal year 1977 dollar terms.

1/All figures are estimates for fiscal year 1984.

CHAPTER 4

RESULTS OF SENSITIVITY ANALYSIS

The estimates of DOD's potential costs and expected benefits under each physician procurement program are subject to change. Because of this, we conducted sensitivity tests on several key data elements of each program. These tests were intended to determine the impact on the cost effectiveness of the programs when changes were made in the estimates for these elements.

CHANGES IN PROGRAM ESTIMATES

DOD's operating costs for the Scholarship Program and its potential to retain program graduates may be much different from that currently estimated. Also, changes during the past 2 years in the University's estimates of both (1) the numbers of expected graduates and (2) operating and construction costs illustrate the uncertainties involved in an analysis involving the University.

University officials, during testimony in June 1975 before the Subcommittee on Military Construction, Senate Appropriations Committee, stated that in fiscal year 1981 the University would be fully operational and would have sufficient enrollment to produce 150 graduates per year. In the analysis which it presented to the Subcommittee, the University arrived at a per graduate cost by dividing its estimated fiscal year 1981 annual operating costs of $29.1 million by an enrollment of 625 students (representing an anticipated 150 graduates per year plus an additional 25 students to allow for those who would not graduate).

In July 1975 the University presented a new estimate of its projected student enrollment. This new estimate envisions a student enrollment of 700 students (175 graduates per year with no allowance for student attrition). Under the new plan the University will not become fully operational until fiscal year 1984. The new estimate envisioned an enrollment of 625 students in fiscal year 1981; however, this figure did not--unlike the previous estimate--include a factor for student attrition.

In December 1975 the University lowered its estimates of operating costs for fiscal year 1981 by $837,000--from its original estimate of $29.1 million for 625 students to about $28.3 million. University officials said the decrease resulted from a reanalysis of its estimated requirements. They added that they expected the estimates to change again in May 1976 when the University submits updated information as part

of the normal DOD budgetary process associated with the Defense Plan for the 5-year period ending in fiscal year 1981.

The University's plans for constructing facilities have also changed greatly since its June 1975 presentation before the Subcommittee. Initial plans, as described in chapter 1, called for building medical school facilities in three increments and building other health profession schools in a fourth increment. The third and final medical school increment was to have been an addition to the second increment facility discussed on p. 4. It was to have housed faculty offices and research facilities which, according to the June 1975 statement of the University president, "will be absolutely necessary if quality teachers are to be attracted to the University." The original estimate for the third increment--$16.3 million--had later been lowered to $9.8 million.

On December 12, 1975, the University president requested the Deputy Secretary of Defense to consider building the University in only three increments. Because of overall funding reductions, the need for the University to train dentists, pharmacists, and veterinarians was questioned; however, the need to train other medical personnel, such as nurses, medical technicians, and physician assistants, was stressed. On December 22, 1975, the Deputy Secretary of Defense approved this course of action. To accomplish this, the Board of Regents voted on February 9, 1976, to not construct the University's third increment of the school of medicine facility. Rather, this increment is to be redesigned to accommodate the training of these other medical personnel.

According to University officials, the third increment was originally designed for the school of medicine with most of its space dedicated to research laboratories and faculty offices. Because of cost constraints, University officials reevaluated their space requirements and determined that the 175 medical students could be educated in the first and second increment space if some constraint were placed on the research area.

However, during this reevaluation, NAVFAC issued an invitation for bids on December 19, 1975, for the major construction portions of the second and third increments, recognizing in the invitation that the contract award for the third increment would be contingent upon the Congress appropriating funds for that increment. NAVFAC officials estimated that the second increment would constitute 86 percent of the ultimate contract value.

Because of the Board of Regents' decision, NAVFAC issued a modification to the December 1975 invitation for bids on

February 18, 1976, requesting that prospective contractors restrict their bids to the portion of the invitation relating to the second increment. Bids on the modified invitation were opened on March 17, 1976, and a notification of award of the major contract of the second increment was issued 2 days later. The contract was awarded for $35.4 million, considerably less than anticipated by NAVFAC. According to a NAVFAC official, because of the lower than anticipated contract award, the overall estimate for second increment was decreased from $62.9 million to $53.3 million.

Discussion of our sensitivity tests follows. The details of each test are presented in tabular form in appendix IV.

Scholarship Program

The elements of the program on which we conducted sensitivity analyses are discussed below.

Program costs

Projected costs of the Scholarship Program for fiscal year 1977 included tuition and fees at medical schools. The costs have increased rapidly in recent years. Further increases would be added to program costs and would cause costs per staff-year of expected service to increase as follows:

	Estimated program costs	Total cost per staff-year of expected service
Base analysis	a/$3,608	$21,444
	4,608	21,918
	8,608	23,815

a/This base analysis program cost represents the annual educational costs, excluding student stipend, for each program graduate. It is computed by taking one-fourth of the total cost per graduate of the medical tuition and fee and DOD administrative expenses shown on the table on page 18.

As shown above, a $5,000 increase per participant in program costs would result in a total cost of $23,815 per staff-year of expected service, which is less than the estimated cost of the University--$26,236.

Student stipend costs

Increases in the present $400 per month student stipend would also cause large increases in the program's costs--

primarily because of the large number of expected participants. Such increases would have to be authorized by the Congress. Each $200 increase in participants' monthly stipends would result in about a $1,000 increase in the cost per staff-year of expected service from these participants.

Retention rates for students selected for civilian residencies or as general medical officers

About 60 percent of program graduates are expected to follow this "career path," and they will incur a military obligation of 4 years. Retention rates of these graduates will affect the amount of service which can be expected from the program graduates and, therefore, the cost per staff-year of expected service, as illustrated below:

	Retention rate	Staff-years of expected service (note a)	Total cost per staff-year of expected service
	1.0%	7,477	$22,232
Base analysis	8.7	8,332	21,444
	15	9,051	20,883

a/Assumes a constant retention rate of 35 percent for program graduates taking military residencies.

Retention rates for students selected for military residencies

Approximately 40 percent of program students are expected to be selected for this career path, and they will have completed 9-1/2 creditable years toward retirement when they have fulfilled their military obligations. DOD's statistics indicate that, currently, 35 percent of physicians with 10 years service elect to remain for 20-year careers. The chart below shows the effects of variations in the retention rates for these Scholarship Program graduates.

	Retention rate	Staff-years of expected service (note a)	Total cost per staff-year of expected service
	10%	6,945	$22,942
	30	8,052	21,712
Base analysis	35	8,332	21,444
	40	8,613	21,206
	60	9,715	20,375

a/Assumes a constant retention rate of 8.7 percent for those program graduates taking civilian residencies or assigned as general medical officers.

University Program

We conducted sensitivity tests on three principal elements--budget, numbers of students and graduates, and retention rates--of the University, as discussed below.

University operating budget

Our tests on the University's estimated operating budget for fiscal year 1984 showed that each $1 million increase or decrease in the estimate would cause a corresponding change of approximately $300 in the total cost per expected staff-year of service from University graduates.

Numbers of University students and graduates

Current plans call for the University in full operation to accommodate 700 students and to graduate annually 173 students who will remain in the military service. As discussed previously, these estimates have been increased several times since original plans were made. Our tests showed that (1) a decrease in enrollment to 600 students would result in an increase of about $1,350 per total cost of staff-year of expected service and (2) an increase in enrollment to 800 students would result in a decrease of about $975 per total cost of staff-year of expected service.

Retention rates for University graduates

University officials predict that 75 percent of University graduates will pursue 20-year military careers after their 12-1/2 years of creditable service brought about by their selection for military internship and residency training and their service obligations. The actual retention rates may vary greatly from that prediction. As illustrated below, changes in the retention rates will affect both the amounts of expected service from the University Program and the estimated costs per staff-year of expected service.

	Retention rate	Staff-years of expected service	Total cost per staff-year of expected service
	50%	2,749	$28,382
	60	2,932	27,455
Base analysis	75	3,212	a/26,236
	90	3,487	25,251

a/This figure is shown in the table in appendix IV as $26,237, which is an unrounded figure resulting from a long series of computer calculations.

The sensitivity of the expected costs of various individual elements of each program to changes in those elements varies widely, as shown in the tables in appendix IV. Moreover, changes in a combination of several elements of each program could cause that program's expected costs to be significantly different from those discussed in our basic description of the programs. The ultimate cost effectiveness of either program will depend greatly on the reasonableness of DOD's and the University's most current estimates of the programs' costs and expected benefits at the time both become fully operational.

CHAPTER 5

POSSIBLE ALTERNATIVE METHODS FOR DOD TO OBTAIN EQUIVALENT LEVELS OF PHYSICIAN SERVICES

As part of our analysis, we attempted to ascertain whether DOD could obtain about the same level of physician services as that expected from the currently authorized programs by expanding or restructuring either program.

From purely a cost-effectiveness viewpoint, DOD's development of additional in-house capability by building more medical schools does not seem feasible or practical. DOD would have to construct five additional universities, each graduating about 200 students per year, to produce the number of graduates currently expected from the Scholarship Program. In this regard, the University president, in response to our inquiry of February 6, 1976, stated that DOD intends to comply with Public Law 92-426 by reporting to appropriate congressional committees concerning the feasibility of building additional military medical schools in other parts of the country. The president stated that, based on preliminary considerations, this action would not be recommended in the foreseeable future.

On the other hand, our analysis showed that a restructured or expanded Scholarship Program could provide the same number of staff-years of physician services at the same or better levels of cost effectiveness as that currently estimated for the combination of both programs in their first full year of operation. We identified three of perhaps numerous alternative methods by which the Scholarship Program could be expanded or restructured to achieve this result. All three methods would require changes in the program's authorizing legislation, changes in DOD's directives, or a combination of both.

When in full operation, the Scholarship Program will supply a projected 988 medical graduates per year with the potential for providing 8,332 staff-years of physician service. The University anticipates supplying 175 graduates per year with 173 of these graduates supplying 3,212 staff-years of service to the military. Therefore, both programs operating concurrently in fiscal year 1984 are projected to provide 1,161 physicians to DOD and 11,544 staff-years of service over a 30-year period. 1/ The total

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1/Retention rates are expected to be identical for participants under both programs who remain in the military for between 20 and 30 years.

cost per staff-year of expected service for the concurrently operating programs is estimated to be $22,777.

Three alternatives to the concurrent operation of both programs are discussed below.

INCREASE THE SIZE OF THE SCHOLARSHIP PROGRAM

Based on DOD's current retention rate projections, the number of participants in the Scholarship Program would have to be increased to permit graduation of an additional 379 students per year to compensate for the expected staff-years of service lost if the University were terminated. Therefore, this change would necessitate awarding an additional 1,516 four-year medical school scholarships.

Since the authorizing legislation limits DOD health profession scholarships to 5,000 overall, legislative action would be required to increase this limitation. The size of the increase would depend upon certain DOD administrative determinations.

For example, in considering the size of the increase, DOD would have to make certain determinations regarding whether scholarships were needed to obtain individuals in certain or all of the other health professions--dentistry, veterinary science, optometry, podiatry, and clinical psychology--currently obtaining military service scholarships. If enough people in all these health professions could be obtained through direct commissioning programs, the program limit would only need to be increased by about 500 to provide the required staff-years of military medical service. However, if none of the individuals in the other health profession scholarship categories could be obtained without scholarships, the total program limitation would have to be increased by about 1,500. In either case, the cost per expected staff-year of service of increasing the program limitation would be $21,444.

This alternative would involve annually taking 379 more medical school graduates from initial practice in the civilian sector and would annually reduce the Nation's pool of available physicians by 175--the number of expected graduates from the University.

However, an option is available under the program's enabling legislation. Under the act, the Secretary of Defense can provide any accredited institution with additional payments necessary to cover the increased costs to that institution caused solely by increases in its

total enrollment due to acceptance of members of the Scholarship Program.

This option could be used to (1) overcome the military's drain on physicians from the civilian sector's training spaces and (2) increase the overall number of physicians in the Nation. Such an option assumes that each of the 114 accredited civilian medical schools could train 3 to 4 additional medical students per year, if additional funding were available.

Assuming that funding would be limited to that needed to cover expected University costs, we calculated that about $10,247 per year could be paid to the civilian schools for each of the 379 additional students. This annual payment would be in addition to the normal scholarship-related expenses (stipend and educational expenses) associated with Scholarship Program students. In effect, the use of the total funding needed to train the 175 graduates the University would produce at full operation could be used to train 379 physicians in civilian schools.

FULLY SPONSOR SCHOLARSHIP PROGRAM PARTICIPANTS WHO TAKE CIVILIAN RESIDENCY TRAINING

This alternative would require that the law be changed with regard to those scholarship participants who, upon completing their internship training, entered civilian sector facilities at the direction of the respective military services to receive their residency training. The law prohibits participants in civilian residency training from serving on active duty status during this training. Therefore, civilian medical institutions receive the services of program graduates assigned to civilian residencies in return for paying the residents' salaries. Upon completing their residency training, these graduates begin serving in the military services.

Changing the law to permit program graduates to remain on active duty--with full military pay and allowances--while serving civilian residencies would result in the participants being "fully sponsored" by DOD and thereby subject to increased active duty payback obligations. DOD has drafted a proposed directive which, if implemented, would allow DOD to fully sponsor physicians--other than program graduates--who take civilian residencies. With a change in the law, such a directive could also apply to program graduates.

With the increased active duty obligations for Scholarship Program graduates who take civilian residencies, the

number of physicians needed to produce the staff-years of service expected from graduates of both programs could be reduced from 1,161 to 1,094. To meet the expected need for 1,094 physicians annually to produce the expected amount of service, it would be necessary--in addition to fully sponsoring those program graduates who take civilian residencies--to increase the number of medical school scholarships by a total of 424, or 106 per year.

Increasing the number of medical scholarships would require the same considerations discussed above in connection with the first alternative. (See pp. 30 and 31.) This alternative would require increased personnel costs by the amounts of pay and allowances given to participants selected for fully sponsored civilian residency training. Including these additional costs would result in an estimated total cost per staff-year of expected service of $21,523--a figure lower than that expected for the costs of the combined programs as currently authorized.

If DOD were to provide additional funding to civilian medical schools to help them accommodate the additional 106 scholarship students per year, about $34,023 per year for each of these students could be granted to civilian medical schools (in addition to that normally provided for each of the 988 program students) without exceeding the total estimated costs for the combined program as presently authorized. If this method were adopted, nearly all the 114 medical schools would have to admit one additional student per year.

If DOD were to increase the number of medical scholarships administratively (at the expense of scholarships in the other health professions) rather than by legislation to increase the overall size of the civilian medical schools' enrollments, the Nation's supply of physicians would be decreased annually by 175 because of the termination of the University Program. On the other hand, providing incentives to 106 of 114 civilian medical schools to annually increase their class sizes by 1 would restore 106 physicians to the Nation's pool.

INCREASE THE INITIAL ACTIVE DUTY OBLIGATION

We determined the length of initial active duty obligations of Scholarship Program participants that would be required to provide the 11,544 staff-years of physician service expected from the operation of both programs. In making these calculations, we used the expected retention rates supplied to both the University and us by officials

in the Office of Assistant Secretary of Defense (Health Affairs). Our analysis showed that the 11,544 staff-years of expected service (see p. 29) could be obtained by increasing--for the estimated 988 Scholarship Program graduates--the initial active duty obligations from 4 years to between 5 and 6 years. Also, as indicated in the following table, the educational costs of the program per staff-year of expected service would be reduced as the initial active duty obligations were increased.

Potential for Increasing Initial Active Duty Obligations for 988 Program Graduates

Years of initial active duty obligation	Estimated staff-years of expected service	Educational cost per staff-year of expected service
4 (currently authorized)	8,332	$4,362
5	10,839	3,353
6	12,275	2,961
7	13,568	2,678

The act provides that the initial active duty obligation of the program participants shall be at least 1 year for each year of participation in the program. This alternative would require that DOD administratively increase the initial active duty obligation of program participants. It would not provide the Nation with any of the physicians lost through the termination of the University. Also, the civilian sector would initially not have access to graduates of the Scholarship Program since they would be serving in the military.

On the other hand, the alternative would--based on 988 expected graduates from the program incurring initial obligations of 6 years--provide more staff-years of service than concurrent operation of the complementary programs at no additional cost to the Government. Further, this alternative would help achieve the military's stated objective of increasing the retention of physicians.

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Selecting any of the above or other similar alternatives would--from a purely analytical viewpoint--be equally or more cost effective than the combination of the fully operational Scholarship and University Programs as they are currently authorized and being operated and/or planned. Moreover, any of the alternatives could seemingly produce the total benefits expected from the two programs more

quickly than were DOD to wait for the fully operational University.

As indicated, however, certain "social costs" involved in implementing any of these alternatives make the decision to alter the programs more complicated.

CHAPTER 6

ADDITIONAL ISSUES TO BE CONSIDERED IN EVALUATING THE PROGRAMS

As indicated in Chapter 2, certain assumptions served as a basis for our analysis of the potential cost effectiveness of the Scholarship and University Programs. We recognize that these assumptions have been the subject of considerable debate during congressional deliberations concerning funding the University. We did not attempt to quantify the elements of these issues in terms of "social costs" or "social benefits" since the values assigned would necessarily be arbitrary.

If one program were chosen over the other to use exclusively to provide physicians for the military, the following issues should be carefully considered along with the cost-effectiveness of the two programs:

--Whether a difference exists between the two programs' graduates in terms of their ability to fulfill the required medical needs in a military environment.

--Whether an expanded DOD Scholarship Program would greatly lessen the Nation's ability to meet the civilian sector's need for physicians.

These issues were mentioned by the University president in his March 31, 1976, letter to us concerning the difficulty in quantifying the benefits to be derived from establishing the University (see app. V).

ABILITY OF THE PROGRAMS' GRADUATES TO MEET THE MILITARY'S PHYSICIAN NEEDS

University officials believe that the University will produce graduates who, because of their selection for training in a military environment, will be "global physicians" capable of meeting DOD's needs for a cadre of career-oriented military physicians, whereas the Scholarship Program will produce graduates who will--because of their shorter payback obligations--serve primarily to meet the military's shorter-term needs for physicians.

In this connection, the University's School of Medicine Bulletin for 1976-77 states that:

> "* * * educational objectives encompassed in [the University's] curriculum will include not only those aspects of the biomedical sciences which are traditionally required of graduates to meet the responsibilities for providing both preventive and curative health care but also will include those aspects which are required by the military and public health services to meet their global requirements for providing total health care in adverse physiological and psychological environments both in peacetime and in war. * * *"

To accomplish this objective, University officials expect the medical students to spend 11 months per year in a student capacity, compared to their estimate of 9 months per year for their Scholarship student counterparts at the civilian medical schools. Officials expect to use some of this additional time to (1) emphasize tropical medicine, (2) expose students to different kinds of public health environments, (3) train students in handling mass casualties, (4) emphasize treatment of the whole individual rather than specific diseases, and (5) teach military logistics.

University officials believe that, if the University is successful in using such a curriculum, its graduates will acquire certain information which would generally not be acquired--at least to the same extent--in a civilian medical school. Furthermore, they believe that many faculty members will be military medical personnel who, by virtue of their experience in the field, have acquired special knowledge which they can pass on. Overall, the officials believe that these factors will make University graduates better equipped to serve in the military than graduates of a civilian medical school.

However, others believe that Scholarship Program graduates are quite able to adequately meet the military's medical needs. For example, advocates of civilian medical school training believe that the principles obtained in civilian schools are easily adapted to the military environment and, historically, have not had any noticeable effect upon the quality of military health care in peacetime or wartime. Also, several civilian schools, like the University, have curriculums which occupy 10 to 11 months of the year; therefore, the difference between the amount of overall knowledge assimilated by a University student and that obtained by a civilian medical school student might be minimal.

Also, participants in the Scholarship Program are required, by law, to spend about 6 weeks per year on military active duty performing medical duties. During the course of their active duty participation, the students obtain training involving military patients. According to military officials, this training prepares them for the full-time military medical positions they will fill upon graduation.

The ability of graduates from each program to meet the military's physician needs is highly speculative, since DOD has had no experience with retention of graduates from either program and since the University has not begun following the proposed curriculum. This is, however, a factor that should be closely examined in evaluating the two programs.

AVAILABILITY OF QUALIFIED PHYSICIANS

While it is apparent that one university cannot meet DOD's needs for physicians, it is less apparent that the Scholarship Program could not be expanded to meet those needs--at least to the extent of producing an additional 175 graduates annually. The question of whether the program should be expanded depends primarily on the larger issue of whether there is now, and will be in the next decade and thereafter, a shortage of physicians in the civilian sector. This issue continues to be the subject of considerable debate.

For example, public statements on physician shortages have referred to a deficit of 50,000 physicians estimated by the U.S. Public Health Service in 1969. This estimate later appeared in the Department of Labor's "1970 Manpower Report of the President" and in the Carnegie Commission's 1970 report, "Higher Education and the Nation's Health," on medical education.

Those who believe that a physician shortage exists cite, as further evidence, the continual demands for admissions to medical schools and the sustained influx of foreign-trained physicians into the United States to fulfill the Nation's medical needs.

DOD concluded in the early 1970s that, due to forecasts of physician shortages and the scheduled end of the physician draft in 1973, the best long-term way to obtain and retain military physicians was to establish the Uniformed Services University of the Health Sciences. DOD believes that this approach will somewhat alleviate the "social costs" associated with obtaining military physicians solely from an already strained pool of available civilian physicians.

The American Medical Association appears to believe that a physician shortage exists and that both short- and long-range solutions are needed to alleviate it. In a July 1975 paper prepared for Members of Congress, AMA stated that the best short-range way to obtain more physicians is to expand enrollments at existing medical schools and the best longer range solution is to develop new medical schools.

AMA contended that progress has been made on both fronts and cites the statistics shown below.

School year	Number of medical schools	Total enrollment	First-year enrollment	Physicians per 100,000 population
1968-69	99	35,833	9,863	161
1974-75	a/114	b/53,554	b/14,763	182

a/An additional 6 schools were reported by AMA to be in the planning and organizational stages.

b/Estimated.

AMA estimated in July 1975 that since 1964 the physician population had grown 33.6 percent while the overall population was up only 9.1 percent. AMA further estimated that in 1975 there were about 380,000 medical doctors in the United States. This represented an increase of about 13,300 from the 1974 total. Of this total, active physicians numbered about 329,000, of whom about 300,000 (91 percent) were engaged in patient care.

Those who contend that the physician shortage is being alleviated cite a statement of the Secretray of Health, Education, and Welfare. In his November 1975 letter to the Congress transmitting the Health Professions Education Amendments of 1975 for consideration, the Secretary referred to the Comprehensive Health Manpower Training Act of 1972 (Public Law 92-157, 42 U.S.C. 292 et seq.). According to the Secretary this act was passed to help health professions schools to increase the numbers of students enrolled, in order to meet what was then seen as a serious aggregate shortage of health professionals and to attempt to place these schools on a solid financial footing. The Secretary added that in the intervening 4 years enrollments had increased by 34 percent and graduates by 45 percent and that further increases in graduates would be forthcoming in the next few years.

The Secretary felt that, with the maintenance of this training capacity, adequate numbers of health professionals will soon be in practice. Instead of an overall shortage,

he pointed to two apparently more pressing problems--geographic and specialty maldistribution. He concluded that, without Federal efforts to alter institutional and individual incentives, correction of these imbalances is likely to occur slowly, if at all.

Those who believe that there are enough physicians conclude that, even if there were an aggregate shortage of physicians, this is probably a short-run problem calling for short-run solutions. They believe that alternatives to correct this short-run problem would include continuing the liberal policy toward the immigration of foreign-trained physicians and striving harder to increase physician productivity. Furthermore, they believe that an inherent danger in building or expanding training facilities is that such an approach might result in a long-range physician oversupply.

Whether or not there is and will be an overall national physician shortage and, more particularly, whether or not an expanded DOD Scholarship Program would aggravate such a shortage are questions not amenable to definitive answers. Nevertheless, these questions affect the decision concerning the practicality of continuing the University Program. In this regard, DOD is authorized to compensate civilian medical schools for expanding their enrollments and presumably could (as discussed in chapter 5) use this authority to replace the graduates from the University Program if it were terminated.

CHAPTER 7

CONCLUSIONS

The Congress has authorized and funded both the Scholarship and University Programs. Officials of DOD, the University, and other Federal and non-Federal organizations provided data and analyses for the Congress to use in making decisions concerning these programs.

Apparently, however, on no occasion was the Congress given an analysis which identified and compared the potential total costs involved in both procuring medical professionals through each program and then retaining some of those individuals for various periods, taking into consideration their service payback obligations. In our opinion, had such an analysis been provided to the Congress, it would have shown that the Scholarship Program is a more cost-effective method of procuring and retaining medical professionals than the University.

There are, however, issues which, even though they do not lend themselves to quantitative analysis, affect the decision regarding the methods DOD should use to procure physicians. These issues involve questions for which there are no apparent definitive answers and factors requiring public policy determinations. However, these issues need to be considered in light of whether they outweigh the potential cost differentials shown in a full cost-effectiveness analysis.

The University's authorizing legislation indicated that the Congress viewed the current University as a potential forerunner of other military health profession training institutions. According to DOD, it has no plans for additional universities in the foreseeable future. We believe, however, that if such an institution is initiated or later expanded by DOD or any other Federal departments or agencies, the Congress should (1) utilize the analytical technique employed in this review to determine the cost effectiveness of such actions and (2) concurrently consider any subjective factors which cannot be measured by such an analysis.

Any such analysis should be based on available historical data to minimize the uncertainty of future estimates. Such an analysis, for example, might be appropriate if DOD (probably in the fiscal year 1978 budget hearings, assuming that the University Program goes forward) requests funding for that portion of the University to be used in training nurses, medical technicians, and other health professionals.

If, on the other hand, the Congress should wish to reconsider the continuation of funding for the present University, we believe that alternatives are available under which DOD could procure the same number of medical professionals as the University will provide at a lower cost per expected staff-year of service.

Adopting any of the alternatives would require congressional action--both to terminate the construction and starting up of the University and, perhaps, to adjust the legislative requirements for the Scholarship Program. The costs of terminating the University will increase as time passes and the construction of facilities progresses. Any decision to adopt an alternative to the University must consider the potential costs of terminating the University at the time the alternative is to become effective.

APPENDIX I

United States Senate
COMMITTEE ON APPROPRIATIONS
WASHINGTON, D.C. 20510

November 17, 1975

B-133316

The Honorable Elmer Staats
Comptroller General of the United States
Washington, D. C.

Dear Mr. Staats:

We have followed the funding for the Uniformed Services University of the Health Sciences with a great deal of concern. You may recall that we offered an amendment to the FY 1976 Military Construction Appropriations Bill which would have delayed release of the construction funds for a period of 90 days during which the General Accounting Office would have been called upon to conduct a cost benefit study of the University vs. other alternatives.

Even though this amendment passed the Senate, it failed to gain acceptance in the Conference Committee. Therefore, the full $64.9 million in construction funding for the University has been appropriated.

Our research into this matter, including the analysis performed by the Investigations and Surveys staff of the House Appropriations Committee and the Defense Manpower Committee, convinces us that the University is a highly questionable project. Yet a thorough cost benefit study supporting such a view, or any view, has not been conducted by any agency of government.

Therefore, we now request that the General Accounting Office undertake a thorough cost benefit analysis of the University program in comparison with the scholarship program and other alternatives. We hope that such a study could be coordinated with our staffs and released to us during the budget hearings for the FY 1977 bill.

In view of the conflicting claims, we request that you make distinct recommendations as to continuing construction of the University, including termination costs, compared to using the scholarship program or other alternatives to provide medical doctors.

Our staffs are available to outline some of the more contentious problems regarding this issue.

Sincerely,

Wendell H. Ford, U.S.S. William Proxmire, U.S.S.

ESTIMATED TERMINATION COSTS OF THE UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

Termination costs can be viewed from two perspectives. One would include only those prospective costs involved in terminating ongoing construction contracts; the other would include both the prospective costs and those costs which have already been incurred to begin implementing the University Program.

PROSPECTIVE COSTS TO TERMINATE THE UNIVERSITY PROGRAM

NAVFAC has awarded contracts for (1) the planning and design of several new facilities at the National Naval Medical Center and (2) the construction of the University's medical school in two increments.

The contracts can be terminated at the convenience of the Government if the contracting officer determines that such is in the Government's best interest. According to NAVFAC officials, if such termination were to occur, negotiated agreements between the contractors and the Government would be the most expeditious method of settling the contractors' termination claims. To make such a settlement, such factors as the special circumstances concerning the stoppage of work, the settling of all outstanding liabilities and claims arising out of the termination of subcontracts, and the disposition of any inventory would have to be considered and dealt with before final termination costs could be ascertained.

The planning and design of University facilities is essentially complete--about $5.6 million has been obligated for this effort. Contracts involving $10.4 million of an estimated $10.9 million have been awarded for the construction of the first increment facilities. Construction under these contracts is estimated to be about 20-percent complete.

NAVFAC and University officials were unable to estimate the prospective termination costs of this increment. However, a NAVFAC official indicated that termination might be more costly than completion.

A NAVFAC official said that, were the project terminated, DOD could probably find another use for the first increment building because of the large-scale construction planned for the adjacent National Naval Medical Center.

Because of the likelihood that the buildings could be used after termination, we did not include in our analysis any of the first increment costs when we amortized the University costs.

Notification of the award of the principal construction contract in the amount of $35.4 million for the second increment was made on March 19, 1976. A University official estimated that if this contract were terminated on April 1, 1976, termination costs would amount to about $4.6 million.

Therefore, the potential amount recoverable by the Federal Government by virtue of termination for the second increment would be $48.7 million. This amount--the unincurred investment cost--would be derived by subtracting the second increment's termination cost of $4.6 million from the $53.3 million (which includes the $35.4 million major construction contract) estimated by NAVFAC officials to be needed for full completion of the second increment.

The $48.7 million was amortized in our analysis over the 50-year expected useful life of the University.

ESTIMATED TOTAL COSTS TO TERMINATE THE UNIVERSITY PROGRAM

Termination costs may be viewed as also including all costs which have already been incurred in implementing the University Program. The table below summarizes estimates of the total costs (as of April 1, 1976) of program termination as provided to us by NAVFAC and University officials.

		Amount (000 omitted)
Operation and maintenance		$ 3,192
Procurement		450
Construction-related activities:		
Environmental impact statement	$ 100	
Construction of interim facilities	141	
Planning and design	a/5,554	
Increment I	b/2,400	
Increment II (prospective termination costs)	c/4,587	12,782
Total		$16,424

a/Estimated obligations provided by a NAVFAC official.

b/Estimated billings provided by a NAVFAC official. $10.4 million has been obligated for this increment.

c/Prospective termination costs provided by a University official and agreed to by a NAVFAC official.

APPENDIX II

The costs of terminating the program would depend greatly on when termination occurred. DOD has no plans to follow this course of action, and activities relating to the University's implementation are proceeding. Moreover, costs will be incurred even faster when the University begins building its major facility, seeks its provisional accreditation, and hires additional faculty and staff in anticipation of enrolling its first class in the fall of 1976.

TABLE OF EDUCATIONAL AND UNDISCOUNTED MILITARY COMPENSATION COSTS

Undiscounted Costs of the Scholarship Program

	Amount	Cost per graduate	Total cost per staff-year of expected service
Educational costs (See p. 18)	$ 36,342,592	$ 36,784	$ 4,362
Military compensation:			
Salary and bonuses	257,171,188	260,294	30,866
Retirement costs	99,120,639	100,325	11,896
	356,291,827	360,619	42,762
Total	$392,634,419	$ 397,403	$47,124

Undiscounted Costs of the University

	Amount	Cost per graduate	Total cost per staff-year of expected service
Educational costs (See p. 22)	$ 33,246,478	$ 189,980	$10,232
Military compensation:			
Salary and bonuses	108,440,883	626,826	33,761
Retirement costs	67,046,003	387,549	20,874
	175,486,886	1,014,375	54,635
Total	$208,733,364	$1,204,355	$64,867

SENSITIVITY ANALYSIS TABLES

SCHOLARSHIP PROGRAM

Program Costs

Tuition, etc.	Cost/grad.	Staff-years	Educational cost/staff-year	Pay and retirement cost/ staff-year	Total cost/ staff-year of expected service
$3,608	$36,784	8,332	$4,362	$16,242 + $840	$21,444
4,608	40,784	"	4,836	"	21,918
5,608	44,784	"	5,310	"	22,392
6,608	48,784	"	5,785	"	22,867
7,608	52,784	"	6,259	"	23,341
8,608	56,784	"	6,733	"	23,815

Student Stipend Costs

Monthly stipend	Cost/grad.	Staff-years	Educational cost/staff-year	Pay and retirement cost/ staff-year	Total cost/ staff-year of expected service
$400	$36,784	8,332	$4,362	$16,242 + $840	$21,444
600	45,184	"	5,358	"	22,440
800	53,584	"	6,354	"	23,436

APPENDIX IV

Retention Rates for Students Selected for Civilian Residencies or as General Medical Officers

Retention rate	Cost/grad.	Staff-years	Educational cost/staff-year	Pay and retirement cost/staff-year	Total cost/staff-year of expected service
1%	$36,784	7,477	$4,861	$16,653 + $ 717	$22,231
2	"	7,612	4,774	16,591 + 738	22,103
3	"	7,722	4,706	16,535 + 757	21,998
4	"	7,816	4,650	16,481 + 770	21,901
5	"	7,930	4,583	16,438 + 787	21,808
6	"	8,040	4,520	16,381 + 805	21,706
7	"	8,160	4,454	16,317 + 819	21,590
8	"	8,254	4,403	16,269 + 831	21,503
8.7	"	8,332	4,362	16,242 + 840	21,444
10	"	8,483	4,284	16,166 + 860	21,310
15	"	9,051	4,015	15,941 + 927	20,883
20	"	9,578	3,794	15,761 + 983	20,538
25	"	10,151	3,580	15,572 + 1,035	20,187
30	"	10,683	3,402	15,416 + 1,079	19,897

APPENDIX IV

Retention Rate for Students Selected for Military Residencies

Retention rate	Cost/grad.	Staff-years	Educational cost/staff-year	Pay and retirement cost/staff-year	Total cost/staff-year of expected service
10%	$36,784	6,945	$5,233	$17,230 + $ 479	$22,942
15	"	7,221	5,033	16,996 + 562	22,591
20	"	7,496	4,849	16,791 + 637	22,277
25	"	7,782	4,670	16,594 + 713	21,977
30	"	8,052	4,513	16,418 + 781	21,712
35	"	8,332	4,362	16,242 + 840	21,444
40	"	8,613	4,219	16,084 + 903	21,206
45	"	8,894	4,086	15,929 + 956	20,971
50	"	9,185	3,957	15,777 + 1,008	20,742
55	"	9,445	3,848	15,654 + 1,054	20,556
60	"	9,715	3,741	15,534 + 1,100	20,375

APPENDIX IV

UNIVERSITY PROGRAM

University Operating Budget

Budget	Cost/ grad.	Staff-years	Educational cost/staff-year	Pay and retirement cost/ staff-year	Total cost/ staff-year of expected service
$16,551,692	$161,408	3,212	$ 8,695	$14,530 + $1,473	$24,698
17,551,692	167,123	"	9,003	"	25,006
18,551,692	172,837	"	9,311	"	25,314
19,551,692	178,551	"	9,618	"	25,621
20,551,692	184,266	"	9,926	"	25,929
21,551,692	189,980	"	10,234	"	26,237
22,551,692	195,694	"	10,542	"	26,545
23,551,692	201,408	"	10,850	"	26,853
24,551,692	207,123	"	11,157	"	27,160
25,551,692	212,837	"	11,465	"	27,468
26,551,692	218,551	"	11,773	"	27,776

Numbers of University Students and Graduates

Number of students: graduates	Cost/ grad.	Staff-years	Educational cost/staff-year	Pay and retirement cost/ staff-year	Total cost/ staff-year of expected service
600:148	$214,243	2,742	$11,566	$14,545 + $1,479	$27,590
700:173	189,980	3,212	10,234	14,530 + 1,473	26,237
800:198	171,782	3,677	9,251	14,531 + 1,477	25,259

APPENDIX IV

Retention Rates for University Graduates

Retention rate	Cost/grad.	Staff-years	Educational cost/staff-year	Pay and retirement cost/ staff-year	Total cost/ staff-year of expected service
50%	$189,980	2,749	$11,956	$15,272 + $1,154	$28,382
55	"	2,834	11,597	15,118 + 1,223	27,938
60	"	2,932	11,212	14,950 + 1,293	27,455
65	"	3,011	10,914	14,834 + 1,360	27,108
70	"	3,114	10,554	14,670 + 1,416	26,640
75	"	3,212	10,234	14,530 + 1,473	26,237
80	"	3,292	9,985	14,430 + 1,529	25,944
85	"	3,389	9,698	14,308 + 1,583	25,589
90	"	3,487	9,427	14,190 + 1,634	25,251

APPENDIX IV

UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
OFFICE OF THE SECRETARY OF DEFENSE
6917 Arlington Road
Bethesda, Maryland 20014

Office of the
President

31 March 1976

Mr. Thomas P. McCormick
Assistant Director
Manpower and Welfare Division
United States General Accounting Office
Washington, D. C. 20548

Dear Mr. McCormick:

I appreciate the opportunity to discuss in writing the position of the Uniformed Services University of the Health Sciences concerning methodology of analyzing costs of its program in relation to those of the Armed Forces Health Professions Scholarship Program.

Before entering into a discourse on approaches to cost analysis, I think it important to realize that the University and the Scholarship Program are complementary, not competitive, programs which together are designed to help alleviate the chronic military physician shortage that has been further exacerbated by the termination of the draft. Both programs were authorized in 1972 by the enactment of Public Law 92-426. The intent of the Scholarship Program is to provide the military with a relatively large number of physicians who can be expected to remain in the Service a relatively short period of time. The Uniformed Services University is established to annually provide the military with 165 - 170 career medical officers, 75 percent of whom can be anticipated to remain on active duty a minimum of 20 years.

In addition to assisting the military to meet its physician requirements in terms of numbers, the two programs help the medical departments to develop and retain pyramidal structures of organization: that is, a large number of people who have relatively little medical experience at the junior level with decreasing numbers but increasing experience and expertise at the intermediate and senior echelons. Only those physicians who have proven to be outstanding clinicians, teachers, and/or researchers will become senior military medical officers.

It is important to realize that the proposition is not the University or the Scholarship Program. Both are requisite

if the military is to have any chance to achieve the desired quantity and quality of physicians. (Even with the Scholarship Program, the Variable Incentive Pay Program, and the University functioning at or near their anticipated optimum, the Department of Defense still projects a slight physician shortage.)

In analyzing the costs of the University and Scholarship Program, two approaches have been used. One takes into consideration only the cost to the Department of Defense of getting a physician into uniform. Another approach considers the total cost to the Federal Government to train a physician and the subsequent amount of service which is rendered to the military in return for that investment. The University feels the latter methodology is far more comprehensive and accurately reflects the real costs of the two programs. The Congress has indicated that it is concerned with the total Federal costs of these programs. (See Congressional Records, July 28, 1975, pages H7646 - H7654; October 8, 1975, page H9788 and pages H9794 - H9807; and November 6, 1975, pages S19465 - S19471.)

The employment of the analysis which concerns itself only with costs to the Department of Defense is misleading as to total Federal support to medical education and total costs to educate a physician. It omits, for example, the fact that the Federal Government is already subsidizing in excess of 50 percent of the cost to educate a physician. If one were to consider the financial support given medical schools by the Veterans Administration, in addition to that from the Department of Health, Education and Welfare, the Federal contribution would approximate 60 to 65 percent.

Civilian medical schools are filled to their capacities. In order to increase the supply of physicians, existing facilities must be enlarged and/or additional medical schools constructed, both of which would require substantial Federal financial support.

A second significant shortcoming in the use of this analysis is that no attention is given to the amount of service which the two products can be anticipated to render to the military, or what the return is on the investment. Based on sound historical data compiled by the Department of Defense on the retention of physicians in the military, it can be reasonably projected that Scholarship graduates will

APPENDIX V

serve an average of 7.5 years; University graduates 16.3 years. In any complete cost analysis, it is important to include this factor.

The attribution of total construction costs in the cost analysis of the Uniformed Services University makes the school unique in that no civilian medical school includes these costs or amortizes its facilities as part of its total costs. The inclusion of this cost will be misleading unless so noted when comparing the Uniformed Services University with civilian medical schools.

If the University and the Scholarship Program are analyzed in terms of total Federal costs and the amount of service which is provided, the two programs are virtually identical.

Realizing that it is difficult to quantify many of the benefits to be derived from the establishment of the University and thus include them in the cost analysis, I think it important that they be recognized. Firstly, the University will add to the supply of needed doctors providing health care to Americans. There will be heavy emphasis on the training of primary care physicians.

Secondly, the school will assist the military to retain outstanding physicians in two ways. The University will provide military physicians the opportunity to pursue careers in academic medicine while remaining on active duty. Also, the University will be the vehicle by which academic and professional recognition is given for accomplishments and contributions. Many excellent physicians leave the military because either or both of these factors have been lacking heretofore.

Because the University is unique in certain aspects from civilian medical schools, it has an opportunity to engage in studies and programs which ultimately can benefit all of medicine. For example, this institution is in a position to develop models in medical education and health care delivery systems.

In addition to training "global" physicians, the University will be a repository of knowledge on worldwide medical problems, making the school a truly national health resource.

Again, it is realized that it is difficult, if not altogether impossible, to fix a dollar value on these benefits. However, they should not be overlooked.

We at the University are committed to developing an outstanding medical school at the most reasonable cost. This has been reflected in our planning, be it in facilities or the academic program. There is every intention to give the American public true value for their dollar.

Again, thank you for this opportunity to express the University's position on the cost analysis of its program. The courtesies and considerations which you and your staff have extended to the school while reviewing this matter are greatly appreciated.

If I may be of further help, please do not hesitate to call upon me.

With best wishes, I am

Sincerely,

A. R. Curreri, M.D.

Anthony R. Curreri, M.D., D.Sc.
President, Uniformed Services
University of the Health Sciences

UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
OFFICE OF THE SECRETARY OF DEFENSE
6917 Arlington Road
Bethesda, Maryland 20014

Office of the
President

April 27, 1976

Mr. Gregory J. Ahart
Director
Manpower and Welfare Division
United States General Accounting Office
Washington, D. C. 20548

Dear Mr. Ahart:

The Secretary of Defense has requested that we respond to your draft report of April 12, 1976, entitled "Cost-Effectiveness Analysis of Two Physician Procurement Programs by the Military: The Scholarship Program and the University Program" (OSD Case No. 4336).

There is a basic area of disagreement as to the analysis of costs of the University and Scholarship Programs. In a March 31, 1976, letter addressed to the Government Accounting Office (GAO), the University argued that a truly comprehensive and accurate cost analysis of the two programs should reflect total costs to the Federal Government, not just to the Department of Defense (DoD), to educate and train a physician in each program. The Congress, in Committee hearings and in floor debate, has also indicated a keen interest in considering total Federal costs of these programs.

The GAO did not analyze the amount of Federal financial assistance exclusive of the Scholarship Program given to civilian medical schools, which has been estimated to be in excess of 50 percent of the cost of the education of a medical graduate. A cost analysis which includes the financial support given by the Department of Health, Education and Welfare and the DoD demonstrating an amortization of the costs over the years of service reveals that the programs are virtually identical. If the Veterans Administration's contribution to civilian medical education were included, then the costs could well be above that of the Uniformed Services University of the Health Sciences.

It is important to note that the GAO report gave no analytical consideration to the numerous benefits - some of

which are quantifiable; others more intangible - that will be accrued from the establishment of the Uniformed Services University.

The conclusions which have been reached after reading the report are as follows:

1. Considering solely the cost to the DoD of procuring a physician from these two sources and amortizing that cost over the anticipated time of service, the University Program is 22.3 percent more expensive than the Scholarship Program.

2. While the Scholarship Program is less expensive to the DoD, there are non-quantifiable benefits to be accrued from the establishment of the University which must be considered when reviewing these two programs in their totality.

In our March 31st letter, it was pointed out that the establishment of the Uniformed Services University would provide many benefits to which a dollar value was difficult to assign but which were important to consider in a total cost analysis. For example, the University will add to the supply of needed doctors, particularly in the primary care area, providing health care to Americans. Further, the University will assist the military in retaining outstanding physicians by offering opportunities to pursue careers in academic medicine while remaining on active duty. Also, the school will serve as the vehicle by which military physicians will receive professional and academic recognition for significant accomplishments and contributions in medicine. This institution is in a unique position to develop models in medical education and health care delivery systems. The University will train global military physicians as well as being a repository of knowledge on worldwide medical problems. All these benefits make the school a truly national health resource.

The cost effectiveness factor, along with the other benefits to be drived from its establishment, make the Uniformed Services University a prudent and a wise program in addition to being a requisite if the military is to meet its physician manpower needs.

The University is well down the path to becoming an outstanding medical institution, dedicated to serving the American people through service to the military.

Thank you for this opportunity to make these comments in regard to this report.

Sincerely,

A.R. Curreri, M.D.

Anthony R. Curreri, M.D., D.Sc.
President, Uniformed Services
University of the Health Sciences

Enclosure

PRINCIPAL OFFICIALS RESPONSIBLE FOR ACTIVITIES DISCUSSED IN THIS REPORT

	Tenure of office From	To
DOD		
SECRETARY OF DEFENSE:		
Donald H. Rumsfeld	Nov. 1975	Present
James R. Schlesinger	June 1973	Nov. 1975
William P. Clements, Jr. (acting)	Apr. 1973	June 1973
Elliot L. Richardson	Jan. 1973	Apr. 1973
Melvin R. Laird	Jan. 1969	Jan. 1973
UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES		
CHAIRMAN, BOARD OF REGENTS:		
David Packard	May 1973	Present
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