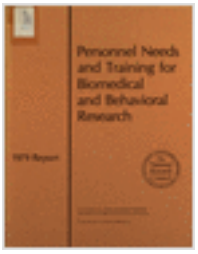

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PERSONNEL NEEDS AND TRAINING FOR BIOMEDICAL AND BEHAVIORAL RESEARCH

THE 1979 REPORT

of the

COMMITTEE ON A STUDY OF NATIONAL NEEDS
FOR BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

COMMISSION ON HUMAN RESOURCES

NATIONAL RESEARCH COUNCIL

National Academy of Sciences
Washington, D.C.
1980

NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the Councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the Committee responsible for the report were chosen for their special competences and with regard for appropriate balance.

This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

The work on which this publication is based was performed pursuant to Contract Nos. N01-OD-5-2109 and N01-OD-9-2112 with the National Institutes of Health of the Department of Health, Education, and Welfare. Support for this project came from Evaluation Set-Aside Funds (Section 513 of the PHS Act), Evaluation Project No. NIHI 75-1.

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WASHINGTON, D.C. 20418

May 7, 1980

The Honorable Patricia Harris
Secretary, Department of Health
and Human Services
Washington, D.C. 20201

My dear Madame Secretary:

I am pleased to present to the Department of Health and Human Services, for transmittal to the Congress, the 1979 Report of the Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel. This is the fifth annual report in the continuing study undertaken by the National Research Council pursuant to Title I of the National Research Act of 1974 (PL 93-348). The work has been supported under Contracts NO1-OD-5-2109 and NO1-OD-9-2112 with the National Institutes of Health.

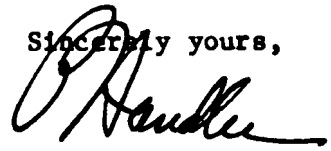
The Act states (Section 473(a))that the purposes of the study are to: "(1) establish (A) the Nation's overall need for biomedical and behavioral research personnel, (B) the subject areas in which such personnel are needed and the number of such personnel needed in each such area, and (C) the kinds and extent of training which should be provided such personnel; (2) assess (A) current training programs available for the training of biomedical and behavioral research personnel which are conducted under this Act at or through institutes under the National Institutes of Health and the Alcohol, Drug Abuse, and Mental Health Administration, and (B) other current training programs available for the training of such personnel; (3) identify the kinds of research positions available to and held by individuals completing such programs; (4) determine, to the extent feasible, whether the programs referred to in clause (B) of paragraph (2) would be adequate to meet the needs established under paragraph (1) if the programs referred to in clause (A) of paragraph (2) were terminated; and (5) determine what modifications in the programs referred to in paragraph (2) are required to meet the needs established under paragraph (1)."

As pointed out in the Preface, although the provisions of the current legislation (PL 95-622) do not require a report this year, the Committee believes that the attached report, which describes its recent activities, current recommendations and studies, and future study directions, may be of interest to those who have been following its work.

The Committee currently is engaged in a number of studies that will provide new data and information on issues central to the study mandate. The results of these studies will be included in future reports.

We hope that the present report will be helpful. We shall, of course, be pleased to discuss it and the Committee's work with you and your staff.

Sincerely yours,



Philip Handler
President

Enclosure

PREFACE

Although the current provisions of the National Research Service Award Act (NRSA, Public Law 93-348) do not require a report for 1979 from the Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel, the Committee believes that issuance of a report this year is desirable for the purpose of maintaining continuity with regard both to its recommendations, especially those concerning numbers of awards to be made during FY1980-1982, and its presentation of agency data on awards made under this program. In addition, the Committee this year presents its views on two major program developments: the new program of awards for short-term training, and the recently announced plan to increase predoctoral and postdoctoral stipends next July. Finally, the Committee believes that a brief overview of its current studies and direction of research will be of interest and some value to those who have been following the work of the Committee.

Previous reports by the Committee have been issued in accordance with the provisions of the NRSA Act that established a continuing study of the issues concerning and assessments of national needs for research personnel in the biomedical and behavioral sciences. The authorizing legislation of 1974 was amended and broadened in 1976 and again in 1978 in connection with its renewal, to include the fields of nursing research and health services research (Appendix A). These amendments, among other changes, also modified many of the administrative and management aspects of the programs.

In November 1978 the Congress renewed the NRSA legislation for 3 years through FY1981. As a result of the earlier decision by the Department of Health, Education, and Welfare to support this study from funds available to the National Institutes of Health (NIH), this extension of the legislation led to a re examination by NIH of the working relationship and particularly the longer-term administrative arrangements between the Committee and NIH. Unfortunately, the negotiations over modified arrangements proposed by NIH have been protracted. In turn, this has delayed funding for a number of studies and other activities projected by the Committee. The present report, therefore, shows less progress than the Committee had planned and anticipated.

Nonetheless, one of the important steps taken by the Committee this year was a thorough reexamination of its near-term and long-term objectives, and a reordering of its priorities to meet these objectives. An intensive 2-day meeting on November 30 and December 1, 1978, allowed Committee members and Panel chairmen to review the issues the Committee already had addressed, its current studies and directions, and the major questions that need further attention by the Committee.

Out of the approximately one dozen major topics presented and debated by the meeting's participants, four areas of inquiry were assigned the highest priority for investigation over the next 2 or 3 years: (1) extending knowledge about and improving capability for assessing research personnel needs in the field of clinical investigation; (2) assessing possible approaches for investigating the impact of training grants (and loss of training grants) on the quality of training and enrollments; (3) determining what factors affect the recruitment, productivity, and retention of scientists in the research labor force, and what role midcareer training has or can play; and (4) identifying priority fields for training.

The Committee has begun studies to collect needed data in the first two of these priority areas. Summaries of these studies are presented in Chapter 2 of this report. The results of some of these studies should be available in time for the Committee's next report. Because each of the identified priority areas is complex, the Committee recognizes that in some instances long-term studies will be required before satisfactory answers can be obtained.

The importance of developing a balanced program of studies, of establishing near-term and long-term priorities, and of being assured of having the time and the resources to accomplish the required work is evident to those experienced with the complexities of assessing personnel needs at the national level. The Committee is gratified that the Congress has acknowledged the importance of continuing the study of these issues as evidenced last year by the renewal of its mandate.

Henry W. Riecken, Ph.D.
Chairman

James B. Wyngaarden, M.D.
Vice Chairman

ACKNOWLEDGMENTS

The Committee is pleased to recognize its indebtedness to the many individuals and organizations for the assistance that it has received this past year. We are particularly pleased, however, to acknowledge once again the continuing contributions of the chairmen and members of our own four advisory panels on Basic Biomedical Sciences, Behavioral Sciences, Clinical Sciences, and Health Services Research, and the ad hoc group on Nursing Research. The members of each of these advisory groups have given generously of their time to deliberate issues, analyze and interpret data and other relevant information, and provide advice and guidance to the Committee within their special areas of expertise.

The Committee also gratefully acknowledges the assistance afforded it and its staff by the officials and other senior staff of the National Institutes of Health (NIH), the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), the Division of Nursing of the Health Resources Administration (HRA), and the National Center for Health Services Research (NCHSR). We especially wish to thank Dr. Donald S. Fredrickson, Director, NIH, and the following members of his staff: Dr. Doris Merritt, Dr. William F. Raub, Dr. William H. Batchelor, Dr. Helen H. Gee, and Dr. Solomon Schneyer. Dr. Batchelor served ably as the NIH Project Officer for this study and, thus, as the Committee and its staff's primary channel for obtaining information, data, and other assistance from the agency. Dr. Ruth L. Kirschstein, Director, and Dr. Charles A. Miller, National Institute of General Medical Sciences, NIH, also were particularly helpful in providing information and assistance on matters pertaining to the agency's programs of support for predoctoral training. Special thanks are due Dr. Harvey Wichman, Claremont Men's College, who currently is serving as an Intergovernmental Personnel Agreement Fellow in the Office of the Director, NIH, for his assistance in the development of the Behavioral Science Panel's recent workshop, "Establishing Training Programs in Behavior and Health."

The Committee wishes to express publicly its appreciation to Dr. Gerald L. Klerman, Administrator, and Ms. Michele W. Harvey, ADAMHA, for their continued interest and assistance with this study. Dr. Klerman has given generously of his time and, in his professional role, has participated in several of the Committee's workshops and symposia.

Dr. Marie J. Bourgeois, Division of Nursing, HRA, and Dr. Jean Carmody, NCHSR, have been most helpful in providing information and assistance in their special areas of responsibility.

Other individuals deserving special mention are Dr. Thomas E. Morgan, Association of American Medical Colleges, for his assistance on matters of importance to the Clinical Sciences Panel, and Dr. Harold Delaney, American Association of State Colleges and Universities, who, as consultant to the Committee, has provided oversight and guidance for the Committee's study of issues concerning minorities in the biomedical and behavioral sciences.

Within the Commission on Human Resources, the Committee expresses its appreciation to Dr. Harrison Shull, Chairman, and Dr. William C. Kelly, Executive Director, who have provided helpful counsel and needed support throughout the study. Thanks are also extended to Mrs. Shirley T. Davis and Mr. Daniel T. McHugh, Office of the Executive Director, for assistance this year with a number of particularly complex administrative problems.

The Committee is pleased to recognize the capable work and many contributions made by all the members of its staff under the overall direction of Dr. Herbert B. Pahl, Staff Director. Specifically, thanks are accorded to the senior professional staff, Drs. Allen M. Singer, Pamela C. Ebert-Flattau, Mr. Porter E. Coggeshall, and Mr. Robert G. Snyder, and to Dr. Samuel S. Herman, consultant, whose specific areas of responsibility are identified at the end of this report. Special note is also made of the extraordinary administrative load carried this year by the Staff Director and Mrs. Kay C. Harris, Administrative Associate, in connection with the renegotiation with NIH of the further support for the Committee's work.

Finally, the Committee is pleased to thank the following support staff: J. Richard Albert, Prudence W. Brown, Jesse Gary, Lori H. Thurgood, and Ingrid A. Wharton for excellent technical assistance; and Imani R. Ansari, Marie A. Clark, Jacquelyn C. Johnson, and Janie B. Marshall for outstanding secretarial assistance and other support services that frequently involved short deadlines.

The Committee expresses its warmest thanks to the above and all other persons and organizations who have contributed to its work.

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University of California at San Diego

Robert J. GLASER, M.D. (Past Chairman and Consultant)
President
The Henry J. Kaiser Family Foundation

*Members of the Executive Committee

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TABLES

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ABBREVIATIONS

AAMC	Association of American Medical Colleges
ADAMHA	Alcohol, Drug Abuse, and Mental Health Administration
AMA	American Medical Association
DHEW	Department of Health, Education, and Welfare
FY	Fiscal Year
HRA	Health Resources Administration
HSR	Health Services Research
IRS	Internal Revenue Service
MARC	Minority Access to Research Careers
MSTP	Medical Scientist Training Program
NAS	National Academy of Sciences
NCHSR	National Center for Health Services Research (Office of the Assistant Secretary for Health, DHEW)
NHLBI	National Heart, Lung, and Blood Institute (NIH)
NIA	National Institute on Aging (NIH)
NIAID	National Institute of Allergy and Infectious Diseases (NIH)
NIAMDD	National Institute of Arthritis, Metabolism, and Digestive Diseases (NIH)
NICHD	National Institute of Child Health and Human Development (NIH)
NIGMS	National Institute of General Medical Sciences (NIH)
NIH	National Institutes of Health
NIMH	National Institute of Mental Health (ADAMHA)
NRC	National Research Council
NRSA	National Research Service Award
NSF	National Science Foundation
R & D	Research and Development

SUMMARY

Legislative Developments

Some important recent legislative developments affect the training programs authorized by the National Research Service Awards (NRSA) Act of 1974. In the "Biomedical Research and Training Amendments of 1978," Congress renewed the NRSA Act for 3 years and made the following amendments.

1. At least 15 percent of training funds must be expended for individual awards, and at least 50 percent must be expended for institutional awards. Previously, the law required that a minimum of 25 percent of the funds be allocated for individual awards and specified no minimum for institutional awards.
2. The maximum period of support was extended to 5 years for predoctoral students and 3 years for postdoctoral appointees.
3. The Secretary of DHEW is required to consider cost-of-living changes in setting stipend levels.
4. A maximum of 4 percent of the total training funds obligated in any fiscal year may be used for short-term training (not exceeding 3 months) for which the recipient does not incur a service/payback obligation.
5. Applications for individual NRSA awards no longer have to be reviewed by National Advisory Councils.
6. The length of service required to discharge the payback obligation was made uniform for all types of payback activities (research, teaching, or health care delivery). Also, full credit now is provided for periods of service that constitute only partial fulfillment of the payback obligation. The conditions under which the payback requirement may be waived were made more lenient.
7. The reports formerly issued by this Committee on an annual basis are now required at least once every two years.

The details of these and other changes to the NRSA Act and its administration are presented in Chapter 1.

Endicott House Conference

At a 2-day conference on November 30 and December 1, 1978, at Endicott House, the Committee reviewed a number of fundamental topics relating to the federal role in training for biomedical and behavioral research. The issues were examined in detail and led to the development of several high priority items on the Committee's future research agenda. These high priority research items are: (a) problems involved in training clinical investigators; (b) the relationship between training grants and the quality of training in the biomedical and behavioral fields; (c) the expected decline in opportunities for academic careers and its potential impact on research productivity; and (d) determina-

tion of priority fields for training. A more complete summary of the Endicott House conference is presented in Chapter 1. The details of the on-going and planned studies designed to investigate these issues are outlined in Chapter 2.

Training Data for FY1978

The number of training grant appointments and fellowship awards made by NIH, ADAMHA, and HRA in FY1978 (the latest available data) were 13,204, slightly under the 13,775 recommended by the Committee, but up 8 percent from the 1977 level of 12,261.

The FY1978 appropriations for training grants and fellowships from NIH were up almost 18 percent over the FY1977 level. But because of increased training costs, the number of awards made by the NIH increased only 10 percent from the prior year. For ADAMHA, the FY1978 appropriations for training grants and fellowships were down 1 percent from the FY1977 levels and, hence, the number of training awards made by that agency declined by almost 5 percent.

In terms of training areas, the largest percentage increases in training awards occurred in the clinical science and nursing research fields. The basic biomedical sciences had a moderate 9 percent increase. The largest decrease occurred in the behavioral sciences due primarily to a decline of 30 percent in behavioral science training awards at NIH. While the decline in predoctoral awards in the behavioral sciences is in line with the Committee's recommendations, the switch to postdoctoral training has not occurred as fast as the Committee has recommended. Health services research awards also declined slightly.

A plan to raise training stipends has been announced by the agencies. Starting on July 1, 1980, stipends will be increased to $5,040 for predoctoral trainees, and to a base level of $13,380 for postdoctoral trainees with incremental allowances made for prior experience. The 25 percent limit for institutional allowances on training grants will be replaced by a plan that allows a maximum of $3,000 for each predoctoral trainee and $5,000 for each postdoctoral trainee. For postdoctoral fellowships, the maximum institutional allowance will be $5,000 per 12-month period at nonfederal institutions and $2,000 at federal institutions.

Other Administrative Issues

The Committee is pleased to note that in accordance with its recommendation, an Inter-Institute Review Committee has been established at NIH to coordinate predoctoral research training among the Institutes.

Effective January 1, 1980, ADAMHA no longer requires two or more years of graduate work as an eligibility requirement for appointments of predoctoral trainees under NRSA institutional grants. The Committee has recommended such a step as one means of improving opportunities for minorities to enter doctoral training programs.

Amendments have been made to the Health Services Research, Health Statistics and Medical Technology Act of 1978 (PL 95-623) to permit the use of NRSA support for training in health services research.

Committee Recommendations

The Committee has made no change in its numerical recommendations for training from those that appeared in its 1978 Report and, in general, has also affirmed its nonnumerical recommendations made last year with regard to the separate areas of research training.

1. INTRODUCTION

As an introduction to this report on the Committee's activities, the Committee believes that it would be appropriate to review (1) recent changes in the congressional mandate to the Committee as reflected in the legislative history and the 1978 Amendments to the National Research Service Award (NRSA) Act of 1974, and (2) the Committee's deliberations over its future study directions as reflected in its conference held in 1978.

RECENT DEVELOPMENTS IN LEGISLATIVE HISTORY AND COMMITTEE RECOMMENDATIONS

The NRSA legislation was renewed by Congress for 3 years on November 9, 1978. The "Biomedical Research and Research Training Amendments of 1978," of Public Law 95-622, extended the authorization of the National Research Service Awards through FY1981, and increased authorization levels from $161,390,000 for FY1978 to $197,500,000 for FY1979, $210,000,000 for FY1980, and $222,500,000 for FY1981.

In the 1978 Amendments a number of important changes were made in the substantive provisions of the Act. These were designed to minimize unnecessary hardships or eliminate certain inequities for individual recipients of NRSA awards, or to make the administration of the program more efficient.

Minimal Percentages for Individual and Institutional awards

The NRSA Act of 1974 required that at least 25 percent of the amounts appropriated be used for individual NRSA awards, i.e., fellowships, in contrast to institutional awards (training grants). This recognized the importance that the federal government attaches to individual competition at the national level as a basis for providing research training.

The experience of the agencies with the program, however, has demonstrated that in any given year the number of superior applications that are received for individual awards may be insufficient to meet this requirement. A related consequence may be that applications for outstanding institutional awards will go unfunded.

The House Committee Report for the 1978 Amendments (U.S. House of Representatives, 1978) stated that it is not the desire of Congress to withhold the funding of excellent institutional programs, a position fully supported by the Senate Committee (U.S. Senate, 1978). The 1978 Amendments,

therefore, provide that a minimum of 15 percent of research training funds be expended for individual awards while at the same time providing for a minimum of 50 percent for institutional awards. This change clearly recognizes the need to maintain the availability of both of these support instruments while assuring flexibility in the administration of the program.

While the Committee has not made specific recommendations with respect to the overall distribution of individual and institutional awards, in each of its reports it has explicitly endorsed the underlying principle of utilizing these mechanisms (NRC, 1975-1978: 1976 Report, pp. 6-8; 1977 Report, pp. 7-9; 1978 Report, p. 11). It has pointed out consistently that the appropriate usage of each of these instruments should be determined by the specific area of study in question, the level of training intended, and the extent to which the potential trainees/fellows have had prior research experience. In each of its annual reports, therefore, the Committee has set forth specific recommendations with regard to the use of fellowships and training grants for predoctorals and postdoctorals in each of the following broad areas of research training: basic biomedical sciences; behavioral sciences; clinical sciences; nursing research; and health services research.

Duration of Eligibility

In the 1974 Act, recipients were permitted to receive support for up to 3 years "in the aggregate" unless the Secretary, DHEW, waived this limit. The House Committee was informed that the language was ambiguous with respect to whether the 3-year duration of eligibility referred to predoctoral and postdoctoral support combined or separately. This ambiguity apparently deterred some individuals from seeking NRSA support for their predoctoral training because of their desire to preserve their eligibility for this support for their postdoctoral training. Although the Act authorized the Secretary to waive this limit, it generally was unclear to the average person just what constituted a sufficient basis for a request for waiver. As a consequence, the full potential of the support allowable under the provisions of the Act was not realized in some individual cases.

In its 1977 Report (NRC, 1975-1978; pp. 177-179), the Committee addressed in some detail this issue of a 3-year limitation on awards, and recommended that the agencies determine the proper interpretation of the 3-year limitation and establish the specific criteria by which requests for waiver of the limitation would be determined. It was the Committee's view that 3 years of support each at the predoctoral and postdoctoral levels would provide sufficient

flexibility to meet the needs of the NRSA programs and be consistent with the spirit of the existing legislation. At the same time, the Committee emphasized the special additional needs of minorities with regard to the amount and duration of financial support, and also the need for its availability at the start of graduate training (NRC, 1975-1978: 1977 Report, pp. 171-173).

The Congress resolved this problem in the 1978 Amendments by extending the maximum period of support available to fellows and trainees under NRSA authority to 5 years for predoctoral students and 3 years for postdoctorals. As the House Committee Report noted, this more liberal provision has the effect of providing greater freedom for predoctoral and postdoctoral students, and also permitting a more flexible utilization of research grants by freeing an individual scientist's research funds that now are used to support graduate students working on those projects. Finally, the extension in the duration of NRSA support undoubtedly will have a beneficial impact upon the recruitment and retention of promising but economically disadvantaged students (particularly women and minorities) into research training programs because of their often special needs for outside sources of support throughout their training, a point that is reflected in a recent change in training policy by ADAMHA and is discussed in Chapter 3.

Cost-of-Living Adjustments in Stipend Allowances

The NRSA Act of 1974 included no provision for stipend levels to be adjusted to continuing inflation. Without additional funds being made available, stipend levels have remained the same since 1974--$3,900 for all predoctoral students and an average of $12,000 for postdoctoral awards.

In its 1977 Report (NRC, 1975-1978; pp. 180-181), the Committee voiced great concern about these matters and recommended that stipends be increased immediately and that future legislation provide for annual cost-of-living increases. Both the House and Senate Reports strongly endorsed the need for increasing stipends now and periodically as the cost of living increases. The 1978 Amendments thus require the Secretary to consider cost-of-living changes in setting stipend levels.

In Chapter 3 the Committee comments upon the Department's recent announcement of increased stipends, effective July 1, 1980.

IRS Tax Liability of Awards

After the inception of the NRSA Act, the Internal Revenue Service (IRS) ruled that NRSA awards were payment for services and fully taxable under IRS law, and recipients no

longer would be entitled to the exclusions allowed for educational scholarships.

In its 1977 Report (NRC, 1975-1978; pp. 189-191), the Committee urged that DHEW request the IRS to withdraw its opinion. The Committee argued that the implementation of this ruling would further erode the purchasing power of the stipend and divert students from their studies to search for additional income.

The House Committee Report, although noting the possibility of resolving this problem by eliminating the service/payback provision entirely, determined that this was not the best course of action at this time. This issue was resolved temporarily through passage of separate legislation (PL 96-167), which restored the exclusions previously allowed for educational scholarships for NRSA awards made in 1979 and 1980.

Limit on Institutional Support from Training Grant Awards

With the beginning of the NRSA awards, DHEW imposed a 25 percent limit on the amount of institutional support that could be requested by individual training programs. This percentage, which was based upon the total program award, marked a decline from the average of 50 percent that NIH data show prevailed under the prior training grants program.

The House Report (U.S. House of Representatives, 1978) suggested that DHEW review its policy with respect to institutional support in light of complaints from individual institutions that actual costs sometimes exceed the permissible amount. The House urged that greater flexibility be provided in order to reflect the particular needs of individual institutions, provided such needs were adequately demonstrated.

While this Committee has not previously made recommendations on this topic, in light of past policy it endorses the House position. The recent change in DHEW policy relevant to this matter and the Committee's views are presented in Chapter 3.

Short-Term Training Without Payback Obligation

A new provision of the 1978 Amendments permits up to 4 percent of the amounts obligated in any fiscal year to be expended for NRSA support for short-term training for periods up to 3 months without having the recipient incur a service/payback obligation. The primary purpose of this exemption is to allow individuals to broaden their training experience by taking brief intensive courses in fields outside their own area of expertise.

The Committee until now has not addressed this issue except in the specialized case of the need for support for midcareer training in the area of health services research where its possible use was suggested (NRC, 1975-1978: 1978 Report, pp. 125-126). However, in Chapter 3 of the present report, the newly announced program by NIH for providing short-term research training support for students in the health professions is presented together with the Committee's endorsement and comments.

Deletion of Requirement for National Advisory Councils' Review of Individual NRSA's

In 1978 the Committee was asked informally for its view on a proposed change in the legislation that would remove the requirement that individual NRSA fellowship applications be reviewed and approved by National Advisory Councils before awards are made. It supported the proposed change because it would reduce the delay in the time before an applicant is notified of the action taken on his application, and remove from Councils a heavy administrative burden of providing a second review, but necessarily more superficial, due to the number of applications that have to be considered. This change was incorporated in the 1978 Amendments.

Removing Inequity in Service And Payback Requirements

The provisions of the NRSA Act of 1974 authorized the Secretary, DHEW, to permit clinicians and other individuals qualified to provide health care services who received NRSA support to discharge their payback obligations by providing approved health care services in lieu of engaging in health research or teaching if the Secretary determined that no suitable health research or teaching positions were available. Similarly, the Secretary was authorized to permit Ph.D. recipients who received NRSA awards to engage in other health-related activities if suitable health research or teaching positions were not available. In each of these instances, however, individuals were required to provide 20 months of service for each 12 months of NRSA support received.

Another provision of the 1974 Act established that fractional credit would be given for periods of payback service that constituted only partial repayment of the individual's total obligation. Finally, the 1974 Act authorized waivers and suspensions of the payback and service requirement in cases of "extreme hardship."

The Committee in its 1977 Report (NRC, 1975-1978; pp. 179-180) called attention to the issue of even-handed

treatment of NRSA recipients in the policies, procedures, and administration of the program. It further urged that all acceptable forms of alternative service be clearly specified.

The House Committee Report noted that the payback provision, while patterned after those established in the health manpower legislation that provided federal support for training in the medical professions, had caused much controversy. Testimony was provided to the House that research is intrinsically different from medical practice, and that finding employment in a field of training frequently is more difficult in research than it is in medicine. It was reported that a strict interpretation of the requirements of the Act deterred some students from seeking research training in more than one area, or in obtaining a position in a field different from that of their areas of training. It was also pointed out that many students received their research training support from employment on federally funded research grants (usually NIH) while incurring no payback or service obligations as do NRSA recipients.

On the basis of these considerations, three changes were made in the payback and service provisions in the 1978 Amendments. First, all recipients of NRSA support now incur the same payback obligation of one month of appropriate service for each month that support is received. Second, full credit now is provided to recipients even though their periods of service constitute only partial repayment. Third, the word "extreme" was deleted before "hardship" in the provision concerning waiver of payback and service requirement. This allows the Secretary to exempt individuals who cannot find employment in the areas in which they were trained, encourages individuals to acquire training in more than one area, and relaxes the monetary payback requirement if it would impose a genuine hardship on the individual. Together, these changes remove some of the major deterrents, especially for those in the health professions, to individuals who would like to accept NRSA support.

Reports on Studies of Needs for Research Personnel

National Academy of Sciences on its assessment of national needs for research personnel was changed in the 1978 Amendments to require a report at least once every 2 years. This change recognizes the fact that national research needs that affect manpower policy issues do not change rapidly enough to justify the annual modification of training priorities and the issuance of extensive reports.

The House and Senate Committee Reports issued in connection with the 1978 Amendments state that this Committee's reports have made a major contribution to keeping the Congress informed on relevant issues. The House Report also commended the Committee for its practice of holding public hearings following the issuance of its reports to allow interested persons and groups to present their views on the report and the Committee's work. The removal of the annual reporting requirement will permit the Committee to undertake more complex and longer range studies than would otherwise be possible.

Determination of Subject Areas for Awards--The Advisory Role of the NAS/NRC Committee

The overall purpose of the NRSA Act that led to the establishing of the NRC Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel was to provide an independent study group to evaluate the role of and need for federal training support in health research careers. In addition to that general charge, however, the Act also specified that the Secretary, DHEW, was to make awards only in those subject areas for which there is a need for personnel as determined by the Academy's study.

In reviewing this provision in connection with the proposed 1978 Amendments, the House Committee concluded it might be inappropriate for the recommendations of the National Academy of Sciences to be binding on a government agency. The Senate Committee's view was that the responsibility for determining eligible areas of research training should continue to be placed with the NAS/NRC Committee, which provides an independent assessment of national need. The Senate's view prevailed, and the role of the Academy remains unchanged in the 1978 Amendments.

Declining Interest of Physicians in Clinical Research Careers

Although a number of changes were made in the provisions of the Act by the 1978 Amendments, the Senate Committee noted that further refinements may be needed as time passes. In particular, the Senate and House Committees voiced concern about the reported recent decline in the numbers of physicians who are attracted to careers in clinical research and who are receiving research training under NRSA awards, and observed that the NAS/NRC study currently is focusing its attention on this important issue (see the discussion below of this Committee's Endicott House Conference and the

section on "Clinical Sciences" in Chapter 2). The House Committee expressed the hope that the liberalization of the payback and service provisions made in the 1978 Amendments will assist in alleviating this problem. The Senate Committee noted that it will give close attention to any statutory changes that may be indicated following a review of the conclusions drawn from these studies.

COMMITTEE'S ENDICOTT HOUSE CONFERENCE

In carrying out the Congressional mandate to assess the national need for biomedical and behavioral research personnel, and to specify the kinds and extent of training to be provided under the NRSA Act, the Committee has collected and analyzed a substantial body of data. Starting in 1975, it has presented its findings in a series of four annual reports. Each report has incorporated an increasing amount of data, reflecting the Committee's intent to gather as much information as possible about the current labor market for biomedical and behavioral scientists, about the short-term outlook, and about existing federal training programs in these fields. The Committee's last report, issued in September 1978, presented a brief cumulative summary of its findings and recommendations (NRC, 1975-1978: 1978 Report, pp. 2-4). The reader who desires such a synopsis is referred to that report.

With a growing body of data to call on and the development of some mathematical models to assist in its analysis of the data, the Committee concluded after publishing its 1978 Report that its research program for assessing the system in quantitative terms, although by no means complete, was making substantial progress. It decided then to focus on some of the long-range issues concerning the federal training programs that it had discussed previously but for which no specific research plans had been developed. For this purpose the Committee held a 2-day conference at Endicott House near Boston on November 30 and December 1, 1978. Members of the Committee and Panels were invited to submit papers on a list of issues ranging from methods for determining training priorities to the special problems involved in training clinical investigators.

As a result of the discussions at the Endicott House conference, the Committee compiled a list of issues to be investigated and assigned priorities to each. Among the issues with the highest priority were those pertaining to the training of clinical investigators, including the extent to which non-M.D.'s participate in clinical research and their potential for increased participation in this area. Another was to assess the impact of the loss of training grant support on the quality of graduate training. Summarized below are the issues accorded highest priority and major points presented in the Committee's discussion of them.

The Training of Clinical Investigators

In its previous reports, the Committee repeatedly has expressed concern over the declining interest of physicians in academic research. The evidence of this declining interest over the past 10 or 15 years is manifest in the data cited in the Committee's 1978 Report showing declining proportions of physicians as principal investigators on NIH research grants, declining numbers of physicians reporting research as a primary activity in a survey by the American Medical Association, fewer physicians participating in the research training programs of the NIH, a growing number of budgeted vacancies in clinical departments of medical school faculties, and a smaller number of recent medical school graduates expressing interest in research careers.

A major cause of these trends is believed to be the income differential between physicians in private practice and those in academic or research positions. Studies have documented the substantial net loss in lifetime income to a physician choosing a research career relative to one who chooses private practice. But there are other aspects of this issue that must be considered: the additional training required for a research career, the instability of research funding, and the limited experience in research as a basis upon which the individual must assess his/her chances of becoming a successful clinical investigator.

The Committee has also noted the increasing integration of the basic biomedical sciences and the clinical sciences. Research in the former is generally performed by Ph.D.'s and in the latter by M.D.'s. But with the growing integration of the two areas, there is apparently more opportunity for Ph.D.'s to participate in clincial research and for M.D.'s to conduct investigations in the basic sciences.

These topics were discussed at length at the Endicott House conference and were judged by the Committee to be of the greatest importance for future studies.

Training Grants and the Quality of Training

A second set of high-priority research topics concerns the contribution that training grants have made to the quality of training in the biomedical and behavioral sciences and the impact that the reduction or loss of training-grant support has had on departments and programs. At the heart of these topics is the question of the effectiveness of the training grant compared to alternative mechanisms of support.

In order to understand the special role that training grants play in the training of biomedical and behavioral scientists, it is important to recognize two distinguishing

characteristics of these fields that explain why many educators place a high value on the training grant as opposed to other support mechanisms such as research grants.

The first characteristic is that biomedical and behavioral research programs exhibit great diversity and are truly multidisciplinary. Almost all fields of science are represented to a greater or lesser degree in the research and training programs of the National Institutes of Health (NIH), the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), and the Health Resources Administration (HRA). The heaviest representation, of course, comes from the core fields such as biochemistry, physiology, psychology, and the clinical sciences. But substantial contributions also come from physics, chemistry, engineering, mathematics, and the computer sciences. Table 1.1 shows the range of fields in which scientists were employed on research grants sponsored by NIH in 1973. Note the large participation of scientists in mathematics, statistics, computer sciences, and the physical sciences. To underscore this point, it may be noted that the 1979 Nobel Prize in Physiology or Medicine was awarded to two radiological physicists for their work in developing the X-ray diagnostic technique known as computerized axial tomography (DiChiro and Brooks, 1979). Their work, furthermore, was made possible by recent developments in the computer sciences and mathematics.

Because of the diversity of biomedical and behavioral research, the federal agencies have attempted to provide flexible mechanisms for training research personnel in this area so that trainees may obtain exposure to a variety of fields and be able to understand and utilize developments in the several fields related to their own speciality. The training grant facilitates broad, multidisciplinary training, allows for interdisciplinary training at the predoctoral level, and for flexibility to specialize at the postdoctoral level.

The second distinquishing feature of biomedical research is that it requires the participation of people with degrees in the health professions, especially physicians. The training of physicians prepares them for clinical practice but not research. They rarely receive adequate training in the techniques, procedures, and methods of research during the course of their education as health professionals, since the curricula of medical, dental, veterinary, and nursing schools are designed to produce practitioners, rather than investigators. Only a very small fraction of these graduates choose a career in research, but their participation is vital to the research effort and there is a recognized need to provide them with the research training necessary for such a career. Some opportunity for research training for health professionals is provided on research grants, but the experience is usually too restricted and is narrowly focused on the research topic

TABLE 1.1 Number of Personnel Participating in NIH Research Grants in 1973, by Field of Employment

TOTAL, All Fields	**17,709**
Total, Basic Med. & Bio. Sci.	**9,875**
Anatomy	322
Bacteriology	92
Biochemistry	2,921
Biology	401
Biophysics	365
Botany	7
Cell Biology	689
Ecology	12
Entomology	52
Genetics	621
Immunology	582
Medical, General	40
Microbial Biochemistry	167
Microbiology, NEC	286
Nutrition	73
Parasitology	97
Pathology	594
Pharmacology	529
Physiology	1,351
Radiation, Nonclinical	61
Virology	396
Zoology	59
Other Basic Biomed. Sci.	158
Total, Internal Med: Clinical	**1,129**
Allergy	19
Cardiovascular Diseases	214
Endocrinology	167
Gastroenterology	71
Hematology	253
Immunology	51
Infectious Diseases	57
Internal Medicine, General	66
Metabolism	93
Pulmonary Diseases	44
Renal Diseases	60
Other Internal Medicine	34
Total Clin. Med. (except Internal)	**1,082**
Anesthesiology	36
Chemotherapy, Cancer	111
Dermatology	47
Neurology	118
Nuclear Medicine	18
Obstetrics & Gynecology	33
Oncology	116
Ophthalmology	104
Osteopathy	2
Otorhinolaryngology	28
Pediatrics, Cardiology	12
Pediatrics, NEC	137
Pharmacology, Clinical	32
Preventive Med. & Public Health	9
Psychiatry	10
Radiology	74
Surgery, Cardiovascular	17
Surgery, General	57
Surgery, Neurological	26
Surgery, Orthopedic	20
Surgery, Plastic	2
Surgery, Thoracic	18
Surgery, NEC	2
Tropical Medicine	3
Urology	35
Other Clinical Medicine	15
Total Dentistry	**84**
Clin. Dentistry, Cleft Palate	6
Clin. Dentistry, Oral Pathology	1
Clin. Dentistry, Oral Surgery	8
Clin. Dentistry, Periodontia	22
Dentistry, General	4
Other Dental Specialties	43
Total, Behav. & Social Sci.	**582**
Anthropology	10
Economics	14
Psychology, Clinical	24
Psychology, Developmental	145
Psychology, Gen. & Experim.	141
Psychology, Physiological	104
Psychology, NEC	34
Sociology	45
Other Behav. & Social Sci.	65
Total, Other Health-Related Flds.	**959**
Audiology & Speech	78
Dental Hygiene	3
Dietetics	88
Epidemiology	65
Health Administration	33
Nursing	514
Optometry	2
Pharmacy	10
Physical Therapy	3
Social Work	45
Veterinary Medicine	68
Other Health-Related Fields	50
Total, Environ. Sci. & Engineering	**405**
Air & Water Pollution	8
Engineering	91
Engineering, Biomedical	249
Engineering, Environmental	6
Other Environmental Sci.	51
Total, Math., Stat., & Computer Sci.	**621**
Biostatistics	116
Computer Applications	249
Computer & Information Systems	170
Mathematics	34
Statistics	38
Other Math. & Stat.	14
Total, Physical Sciences	**570**
Chemistry, Inorganic	40
Chemistry, Organic	226
Chemistry, Medicinal	63
Chemistry, Physical	83
Chemistry, NEC	78
Physics	70
Other Physical Sciences	10
Total, Other Fields	**202**
Arts & Humanities	19
Audio-Visual	11
Education	23
Library Science	14
Other, Specify	135
Total, Unknown Fields	**2200**

SOURCE: NIH Manpower Report, 1973. Data in this table represent an estimate of the full-time equivalent man-years of paid and unpaid personnel on NIH sponsored research grants in 1973. These data were derived from the Manpower Report Survey after adjusting for nonrespondents.

of the grant. On the other hand, the training grant affords the flexibility needed by those whose education has, so far, been practice-oriented. Thus, it is a significant aid in the recruitment of M.D.'s into research because it provides for the selection of candidates locally without their having to compete nationally for individual fellowships at a time when they have not acquired previous experience in research.

It is for these reasons that the Committee has paid special attention to training grants and is planning to examine further both their effect upon the quality of training and the impact that the loss of training grant support has had upon departments and training programs.

Specifically, the Committee plans to collect information from departments on a case-study basis with regard to what occurs when training grant support is lost, how cooperation within departments is affected, and what the impact has been with regard to innovative courses and seminars.

Research Productivity and Academic Careers

A third major issue discussed at Endicott House is the reduced prospect for academic careers that faces young investigators in the biomedical and behavioral sciences. Historically, the universities have been the major employer of such investigators. Currently, however, the universities have faculties that were expanded rapidly during the 1950's and 1960's. Accordingly, most colleges and universities have rather young faculties in tenured positions and low rates of attrition due to death and retirement. Furthermore, the rapid-expansion era of the 1960's has given way to a slow-growth period in the 1970's, which, by all current indications, will be replaced in the 1980's by a no-growth situation and possibly a contraction. Thus, the prospects for additional permanent (i.e., tenured), academic positions becoming available in the near future are poor.

On the other hand, there is a large pool of biomedical scientists, most of whom aspire to an academic career, who now occupy postdoctoral positions. They have had the most recent training and are believed to be at a very productive stage of their research careers. The Committee is concerned about this situation for two reasons: the careers of the younger cohort of scientists may be thwarted by the lack of academic opportunity; and this blockage, coupled with a gradual aging of the present faculty, may have a detrimental effect on the nation's total research productivity.

There are several important relationships that the Committee believes must be investigated and certain facts

that must be gathered before any recommendations can be formulated on this issue. A key question is the relationship between age and research productivity. Some work has been done on this question using publications and citations as productivity measures, but more study is needed to explore this relationship in the fields of concern to the Committee. More knowledge also is needed about the faculty age distributions and attrition rates in specific disciplines.

Another committee of the National Research Council has recently completed a study of this research-productivity problem in all science and engineering fields (NRC, 1979). The NRC Committee on Continuity in Academic Research Performance has concluded in its 1979 report that the 1980 and 1990 decades will bring "a substantial and sustained decline in openings for new faculty in a number of science and engineering fields," and that decline is likely to damage the nation's research effort unless steps are taken to soften its impact. That committee recommended the establishment by the National Science Foundation of a program to support academic research by means of "Research Excellence Awards." These would be 5-year, nonrenewable grants to tenured or nontenured faculty members nominated by their departments. The awards would provide partial salary support to recipients, and the university would agree to devote an equal amount to the hiring of additional faculty in the same departments, thus accomplishing the main objective of the program, i.e., to create additional academic opportunities for young researchers. This program is estimated to cost about $380 million over a 20-year period of operation and would provide for approximately 250 awards per year at its peak.

Identification of Priority Fields for Training

A fourth point that received considerable attention at the Endicott House conference involves the identification of fields or areas of research that merit higher priority in the allocation of training funds. By way of background for this issue, it will be recalled that the NRSA Act of 1974 requested the National Academy of Sciences to conduct a study of the nation's overall need for biomedical and behavioral research personnel and the subject areas in which such personnel are needed. This Committee has responded to that task by subdividing the biomedical and behavioral fields into four broad areas: basic biomedical sciences, behavioral sciences, clinical sciences, and health services research. It has made separate recommendations for training support in each area. In a few specialties such as toxicology, epidemiology, and biostatistics and in most clinical science fields, the Committee has inferred from the available data that personnel shortages exist and has recommended that these fields be given special consideration in the training programs.

The Committee has not attempted to construct a list of specific fields eligible for federal support, and indeed considers it inadvisable to do so. The rationale for this position is that the Committee believes it is impossible to foresee accurately enough where major developments and contributions will occur. Thus, it has suggested that training support be provided in accordance with its recommendations in each of the four broad areas and, within these guidelines, that training support be allocated on the basis of merit as judged by peer review of applications for the support of specific research training programs.

At the conference, the Committee reaffirmed its earlier position on this issue. But the question arose as to whether further efforts should be devoted to the problems of identifying emerging fields and of attracting students into those fields with the incentives provided by training stipends. At the predoctoral level, training should be broad; yet is there reason for considering that some of this training should be targeted or directed to areas where society's needs are clearly evident--aging, cardiovascular problems, environmental hazards, etc.? At the postdoctoral level the peer review system does better in matching training funds with relevant needs/opportunities. But should the Committee identify critical areas even in the predoctoral period and emphasize these areas for training? That is, should it be satisfied that field switching and midcareer training will accomplish all of the fine adjustments that it anticipates will occur in the postdoctoral period?

Previous attempts to identify priority fields for training have not been successful primarily because of difficulties in developing objective criteria. The resultant dependence on subjective judgment in this case is felt to be an unsatisfactory basis for decision. The question really has two aspects: (1) identifying fields in which current supply is inadequate relative to the number of positions available; and (2) identifying fields that are likely to become more or less important than they currently are in the research enterprise.

In the first case the task is one of gathering and evaluating current data on the labor-market situation in specific disciplines. The Committee has been doing this with moderate success in some cases, but ill-defined boundaries between fields and the ability of scientists in closely related disciplines to switch fields readily have prevented the Committee from making definitive statements about more than the small number of fields cited above.

The second aspect of this question, namely, the identification of emerging fields, is even more difficult due to the lack of objective criteria. Subjective judgments appear in this case to be a poor basis for recommendations by the Committee. Yet there is considerable appeal in the

notion that current training programs should try to anticipate future research needs. This means not only identifying fields that are likely to grow in importance, but also those that are likely to decline in importance. The Committee concluded that these various facets of the issue cannot be resolved readily but, because of their importance, should be accorded high priority for continuing attention.

Other Topics Discussed at the Endicott House Conference

In addition to the foregoing issues, a number of other topics were discussed, all of which were considered to be important to the Committee's task, but which for several reasons did not generate high-priority research questions. In some cases, the topic raised very general questions about the federal role in biomedical and behavioral research training that were nonquantitative in nature and not amenable to a structured research task. In other cases, the topic was considered amenable to research, but the methodology was not readily apparent or the topic simply was judged to be of somewhat lesser importance to the Committee's major tasks. These other topics and the Committee's discussion of them are summarized below.

What is the Nature of the Market for Biomedical/Behavioral Training?

In discussing this market, it is important to distinquish between the demand for the services of scientists trained in these fields and the demand for training on the part of students seeking research careers. The former involves questions about the supply of scientists compared to the number of positions available that require their skills. More is needed to be known about the costs of shortages in research personnel, induced by abrupt changes in demand, relative to the costs of having a reserve of skilled people in anticipation of future needs. The latter requires more knowledge about factors affecting career choice and the responsiveness of students to changes in employment opportunities.

Discussion of these questions led to the issues outlined above concerning the distinquishing characteristics of biomedical/behavioral research and the impact that training grants have on the quality of training provided in these fields.

Are the Biomedical/Behavioral Sciences Disproportionately Favored with Federal Support for Training?

This equity issue is difficult to address quantitatively because federal programs are so broad that it often is difficult to categorize them by field. It was noted, however, that since public policy accords high priority to health matters, it is not surprising to find a large federal effort devoted to biomedical/behavioral research and training. Different federal agencies (e.g., Defense, Agriculture) have different missions, use different strategies to accomplish them, and have different profiles for their expenditures.

To What Extent Does the Federal Government Bear a Responsibility for Maintaining the Viability/Quality of Biomedical/Behavioral Training Programs?

It was suggested that the government's responsibility in funding research derives from its responsibility for the general welfare to do that which is necessary whenever other mechanisms do not suffice. By virtue of its heavy investment in biomedical research, the federal government also has a responsibility for maintaining the quality of the research training programs. Thus, an appropriate criterion for determining the level of federal support for research training might be the desired size and vigor of the research effort, and not market perturbations in the usual sense. Ordinary market forces may work against decisions to enter scientific careers. Research training actually is research participation, and early recruitment into science is necessary to maximize research productivity.

The following questions relevant to this issue were formulated: (1) What is revealed by a comparison of the current and 1967 levels of research support, number of doctorates awarded, and rates of production of new research personnel? (2) What would have to be the training rate (e.g., in 1980) to maintain a steady-state output of new investigators? (3) How could a mixture of early-career, mid-career, and late-career support programs achieve this?

What Should be the Rationale for Federal Support of Graduate Students or Post-Professionals--Personnel Shortages, Research Need, Academic Merit, Financial Need, or Cultural Disadvantage?

The traditional rationale for federal support for research training has been to provide the capability to get research

done of the type, quality, and quantity that has been decided by the Congress through legislation and appropriation. Thus, from this point of view, the categories of personnel shortages and research needs, at least in the operational sense, are essentially identical.

While financial need and cultural disadvantage may also be appropriate reasons for providing federal support, the Committee believes these should not be superimposed on the manpower issue. Separately funded programs should be developed to meet social objectives, although, of course, purely social barriers should not bar academically meritorious students. In turn, the objectives for training programs should be clearly stated both by the supporting agency and the applicant applying for federal support, thus avoiding misunderstandings such as that which accompanied NIH-supported clinical training programs in the 1960's.

Although factors other than financial affect career decisions, it does appear that the availability of training-grant support affects decisions at the margin. Some discussants thought that basing fellowship support on financial need alone would lead undesirably to ignoring academic merit, aptitude for the occupation, and related aspects significant for scientific work.

An important aspect of the discussion of the rationale for federal support is the power of training grants to direct students to priority areas. Do students move into specialized programs (like aging and others) that have a very high priority from the federal point of view when training grants are provided? It has long been assumed without adequate evidence that financial incentives can redirect students' interests. This question deserves further study. It may be possible to look into it in connection with the Committee's plans to do case studies of departments and programs that are losing training grants.

What Is the Role of the Postdoctoral--Trainee or Provider of Research?

From the perspective of more than 50 years of experience with postdoctoral fellowships in the U.S., it is clear that they have been of tremendous benefit to the development of American science. Starting in 1919 with the National Research Fellowships (Cochrane, 1978, p. 239) and continuing today with the National Research Service Awards and other federal and private programs, these postdoctoral appointments have served the dual purpose of advancing the sciences and providing additional training opportunities for young scientists. In recent years, the role of the postdoctoral appointee as a producer of research has grown in importance

relative to the training function. The use of the postdoctoral mechanism as a holding pattern for promising young researchers for whom no immediate opening on a regular faculty or tenure-track position is available is also a recent phenomenon. These developments present difficult policy issues, e.g., whether or not it is sound policy to use funds appropriated for research training to support postdoctoral appointees whose principal function in practice would be to increase the research output of the laboratories of their mentors. The use of training funds for the support of scientists awaiting appropriate job opportunities involves similar ambiguities. On the one hand, it is a realistic adjustment to a steady state instead of the expanding universe of the 1960's. On the other hand, it may prolong unrealistic hopes and undesirably delay other individual adaptations. Further, the absorption of well-trained investigators into an "unfaculty" (Walsh, 1979) could delay the overhaul of university policies regarding scientific personnel.

The question of how productivity in research changes with age, and the difficulties inherent in evaluating publications, etc., was discussed at length, including the observation that citations may increase with the age of the publication (and therefore, obviously, with the age of the author). It was suggested that the Committee may wish to investigate these relationships and the role, if any, that midcareer training has or might play.

The effect of recent legislation on retirement age and its impact on the availability of academic positions, the costs of maintaining nontenured research faculty, and the changing concept of tenure were discussed. The Committee indicated some interest in doing a prospective study of the cost of providing support for nontenured doctoral research staff, as well as looking at the age distribution and productivity of faculties in different bioscience departments.

Summary

As can be seen by these brief summaries of the major topics discussed at the Endicott House conference, the Committee reviewed a number of basic issues relating to the training of biomedical and behavioral researchers. It is difficult to convey briefly all the points that were raised in the discussion; and, indeed, for this reason we have not attempted to summarize the extensive discussion of topics such as the marginal utility of federal funding for training, the extent to which federal funds should be used to support individuals who pursue nonresearch and/or

nonacademic careers, and the selective pattern of distribution to institutions of federal support for research training. All the topics generated considerable comment, with the discussions of one topic often overlapping that of another. The length of the summary presented for each is by no means an indication of the amount of consideration given the topic by the Committee. Overall, the conference was a useful forum for reviewing these issues and for assisting the Committee to set some priorities on its future research agenda, the details of which are presented in Chapter 2.

2. HIGHLIGHTS OF CURRENT STUDIES AND RESEARCH

As discussed in Chapter 1, considerable time this past year has been devoted by the Committee to the development of its research agenda through 1981. Studies have been designed, for example, which will address the serious issues that have arisen in connection with the training of M.D.'s, and holders of other health professional degrees, for research in the clinical sciences. A better understanding of the factors that affect the employment of bioscientists is also anticipated as a result of the more intensive market analyses that the Committee plans to undertake during the next and succeeding years. Finally, the Committee believes that completion of its national survey of health services research personnel contributes to a better understanding of the present role and overall capabilities of health services research investigators.

CLINICAL SCIENCES

In its 1978 Report, the Committee noted the likelihood that demand for clinical investigators would continue to be strong for the next few years. At the same time, the report called attention to the decline in attractiveness of a career in clinical research, and noted the financial and other disincentives that may be contributing to that trend. These implications of a potentially reduced supply of clinical investigators may portend a supply/demand imbalance in the future.

The decrease in the number of physicians being trained in research under the NIH sponsorship in recent years has stirred mounting concern (see Table 2.1). Since publication of the 1978 Report, this concern has provided a theme for addresses by the presidents of four major societies: the Central Society for Clinical Research (Kipnis, 1979), the American Federation for Clinical Research (DiBona, 1979), the Society of University Surgeons (Skinner, 1979), and the Association of American Physicians (Wyngaarden, 1979). A conference in June 1979 at the University of Chicago's Center for Policy Study explored influences affecting fundamental, as opposed to targeted, clinical research (Broad, 1979). Suggestions were offered for various forms of action to counteract the observed thinning of clinical investigators' ranks in the past decade. Also, as noted below, the Committee's Panel on Clinical Sciences convened a conference to consider problems in the training of research personnel.

TABLE 2.1 Distribution of NIH Traineeship and Fellowship Awards, 1971-1978[a]

	Fiscal Year of Funding															
	1971		1972		1973		1974		1975		1976		1977		1978	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
TOTAL	17609	100.0	16685	100.0	12692	100.0	14218	100.0	13030	100.0	10661	100.0	10836	100.0	11363	100.0
Postdoctoral Trainees	7532	42.8	7393	44.3	5466	43.1	6313	44.4	5829	44.8	4791	45.0	5224	48.2	5698	50.1
M.D.'s	4631	26.3	4466	26.8	3612	28.5	3522	24.8	2796	21.5	1915	18.0	1851	17.1	[b]	
Ph.D.'s	2901	16.5	2927	17.5	1854	14.6	2791	19.6	3033	23.3	2876	27.0	3373	31.1	[b]	
Predoctoral Trainees	10077	57.2	9292	55.7	7226	56.9	7905	55.6	7201	55.3	5870	55.0	5612	51.8	5665	49.9

[a] Includes Fogarty International Center.

[b] Data not yet available.

SOURCES: FY1971 and 1972 data: NIH, Basic Data Relating to the NIH, 1976, pp. 43-44.

FY1973-1976 data: NIH, Basic Data Relating to the NIH, 1978, p. 42.

FY1977 data: Tabulations prepared by the Office of Research Manpower, DRG, NIH, June 12, 1979.

A variety of efforts are underway in the public and private sectors to reverse the attrition in clinical research training. NIH has expanded and modified the research grant mechanism in order to encourage newly trained investigators to develop research interests and skills, and to furnish research support during the developmental stage of their careers. Several of these types of awards are intended to facilitate the transition of medical school graduates from fellowship status to a career in independent clinical investigation. Notable examples are: the National Institute of General Medical Sciences' (NIGMS) Special Grants for New Investigators (anesthesiology and trauma/burn research); the National Institute of Arthritis, Metabolism, and Digestive Diseases' (NIAMDD) Special Emphasis Research Career Awards (diabetes mellitus); and the National Heart, Lung, and Blood Institute's (NHLBI), NIAMDD's, and the National Institute on Aging's (NIA) Clinical Investigator Awards. The Committee has been informed that the National Institute of Allergy and Infectious Diseases (NIAAD) and the National Institute of Child Health and Human Development (NICHD) will be announcing similar programs. These awards provide a substantial part of a new faculty member's salary for periods from 3 to 5 years, plus some research support. The Committee also notes the recent announcement from ADAMHA by the National Institute of Mental Health (NIMH) that encourages clinicians to apply for Research Scientist Development Awards.

More recently NIH has moved to take advantage of the 1978 Amendments to the NRSA Act, which encourage short-term research training. Health professions students receiving training awards of up to 3-months' duration will not be subject to a payback provision under this program. Each institution awarded a grant for short-term research training will be expected to encourage among the trainees a sense of belonging to a community of scientists. Methods that may be used for this purpose include the provision of special seminar series on such topics as research methodology, experimental design, etc.

Some private agencies have announced programs that clearly recognize both the need to stimulate interest in clinical research careers and the economic realities of the challenge. An innovative example of these programs is the American Heart Association's Clinician Scientist Award, which is aimed at physicians without substantial research background at a stage close to the completion of residency training. Outstanding features of the program are its salary provisions, a mechanism at the end of 2 years for evaluation of the trainee's potential for independent investigation, and the availability for successful candidates of an additional grant for establishing a research laboratory toward the close of the 5-year training period.

The outlook for clinical investigation has been brightened somewhat by three recent developments. The Committee called attention last year (NRC, 1975-1978: 1978 Report) to a 7 percent increase from 1975 to 1976 in the number of physicians reporting research as a primary activity. More recent data from the American Medical Association indicate that this apparent reversal of a long-term trend has continued, with 9,786 physicians reporting research as a primary activity in 1977 compared to 8,514 in 1976 (American Medical Association, 1977). The significance of this development will be examined by the Committee during the coming year to determine, for example, its possible relationship to changes in research and development (R&D) funding.

Another potentially important development was the substantial increase, between fiscal years 1977 and 1978, in the numbers of clinical sciences traineeship and fellowship awards made by NIH (see Table 4.1, p. 51). Indeed, the number of postdoctoral traineeships very nearly matches the Committee's recommended levels for the period 1980-1982. In a few months the necessary information will become available to determine how these awards were distributed between M.D.'s and Ph.D.'s. This is an important question bearing on the possible rejuvenation of interest in research on the part of M.D.'s and on the role of Ph.D.'s in clinical investigation. Because of the growing number of biomedical Ph.D.'s and the previously noted declining interest in research on the part of physicians, these are issues to which the Committee has assigned high priority for investigation.

A resolution that the Association of American Medical Colleges (AAMC) investigate possibilities for fostering research opportunities for medical students was approved in October 1978 by the AAMC's Organization of Student Representatives (OSR). The results of surveys administered at the 1979 regional OSR meetings appear to signal a rise in medical students' interest in research and a greater inclination toward academic careers than has been evident in recent years. Prompted by the resolution, the AAMC is currently studying ways to stimulate the schools to improve opportunities for student participation in, or exposure to, research during the undergraduate medical years.

Supply and Demand Studies

The Committee recognizes the inadequacy of the data base for characterizing the market for clinical research personnel. It is therefore continuing to assign a high priority to a study of the factors influencing supply and to efforts to improve estimates of demand.

Supply Studies

Study of "Recent Deciders" At the Committee's request, Michigan State University conducted a mail survey of attitudes and values of senior residents and fellows com pleting their last year of training in internal medicine. A national sample was developed by asking chairpersons of university-related departments of medicine to select young physicians who were in a relatively advanced stage of training and who had already decided for or against a career in academic medicine. A key criterion for selection was a judgment by their mentors that these individuals possessed the knowledge, intellect, and skills for academic careers. The purpose of the study is to identify the factors that influenced their career decisions. The perceived incentives and disincentives for an academic career, compared with other career choices, will be evaluated.

If this phase of the research is successful, the study will be extended to include an additional sample from pediatrics, surgery, psychiatry and, possibly, obstetrics/gynecology.

The Role of Ph.D Investigators in Clinical Research The decline from 1968 to 1976 in the number of physician-investigators is quite remarkable when viewed in relation to increases over the decade in medical school graduates and in the clinical faculty of American medical schools. By contrast, over the 5-year period between 1972 and 1977, the number of Ph.D. biomedical researchers has continued to expand, with a net growth at this time of 560 per year in the pool of postdoctoral appointees (NRC, 1975-1978: 1978 Report, p. 42). In addition, a decreasing proportion of NIH training positions are being filled by M.D. trainees and fellows (Table 2.1, p. 24). The Committee's survey of 1971-1975 Ph.D. recipients in basic biomedical fields shows that approximately 31 percent of the respondents viewed their research as conforming to the Committee's definition of clinical research (NRC, 1975-1978: 1977 Report). Against this background it is not surprising that one of the questions seriously being asked of the Committee concerns the role of the Ph.D. scientist in clinical investigation.

The Committee has formulated a series of questions and suggested research approaches that bear on this issue. One question to be investigated this year with the cooperation of the Association of American Medical Colleges relates to changes in recent years in the frequency of employment of non-M.D. scientists in clinical departments of medical schools, as well as in distribution by age and academic rank.

A staff study is planned to shed light on trends in the extent of involvement of Ph.D.'s in projects characterized as clinical research by NIH criteria. Data from the NIH Manpower Reports from 1973-1978 on personnel receiving any salary from research grants will be analyzed. Completed annually since 1973 by principal investigators, the Report contains data on the disciplines, academic levels, types of degrees, and number of weeks worked on a grant by each participant. Finally, the Panel on Clinical Sciences and the Panel on Basic Biomedical Sciences will convene a workshop on the role of non-M.D. scientists in clinical investigation. Special attention will be devoted to the perceptions of clinical investigators (including those with joint M.D./Ph.D. degrees) regarding the nature and importance of the role the M.D. background plays in their research, as well as the means for maximizing the mutual involvement and interaction of M.D. and non-M.D. scientists in clinical research.

Medical Scientist Training Program The Medical Scientist Training Program (MSTP) supported by NIGMS represents for a selected group of physicians an important route of access to academic careers in biomedical research. Previous recommendations by the Committee for expansion of the program were kept modest, at least partly because of uncertainty about the size of the pool of qualified applicants. An attempt to estimate that pool size has recently been made (Association of American Medical Colleges, 1979). The judgments of 15 MSTP directors suggest that only 48 percent of the pool of fully qualified candidates could be funded by the program in 1976.

The authors conclude that not only could admissions to the program be increased appreciably without risk of quality dilution but also that MSTP is only slightly more expensive per graduate than the more common post-M.D. research training programs. The Committee will carefully examine the implications of these findings and other factors during the coming year in relation to possible expansion of the program.

Demand Studies

Modeling of Demand Efforts to model the demand for clinical investigators have thus far been limited to the academic sector. The Committee is awaiting receipt of data from the American Medical Association, which will enumerate physicians by primary activity and by employment sector for the 1970-1977 period. These headcounts, while somewhat less useful than full-time equivalent measures, which AMA cannot

supply at this time, are nevertheless essential for refining the present demand model to include physician-investigators in the governmental and industrial sectors. The value of these data has been enhanced for the Committee's modeling needs by a recent AMA survey that has added new information about the professional activity of physicians.

In collaboration with the Association of American Medical Colleges, a study is underway to produce estimates of the age-dependent productivity profiles of medical school faculty members. Such estimates would improve the Committee's demand model, which now relies on total clinical faculty as a surrogate measure for the subset of clinical researchers.

Veterinary Research Personnel The role of veterinary scientists in biomedical and behavioral research has expanded in the past decade. This has resulted largely from the growing importance of animal studies to an understanding of human health. It is interesting in this connection that the National Cancer Institute, in the interests of itself, the Environmental Protection Agency, the National Institute of Environmental Health Sciences, and other federal agencies, has announced a new 3-year residency training program for veterinary pathologists. Increasing constraints surrounding research on human beings, especially on children, have enhanced the value of animal models that can be used as surrogates for man in clinical studies. It seems reasonable to expect that a growing fraction of clinical research in the future will use animal models, and that scientists expert in comparative medicine will be employed increasingly in team efforts. The Committee, therefore, will extend its analyses to research training needs in veterinary medicine and its subspecialties. Also, the Committee plans to collaborate with the National Research Council's Committee on Veterinary Medical Sciences in a study of the needs for veterinary research scientists and the capacity of the veterinary educational system to meet those needs.

Invitational Conference

Through its Panel on Clinical Sciences, the Committee in June 1979 sponsored a conference on problems affecting the supply of clinical research personnel. Participants in this 1-day session consisted of 11 scheduled speakers and an additional 7 persons who offered comments during open discussion periods (Appendix D). A wide range of subject matter was covered, some of which is reflected in the following recommendations of the Committee.

Committee Recommendations

● Some training program directors have expressed concern as to the extent to which research training funds can and should be used to support clinical training activities (Association of American Medical Colleges, 1978). NRSA support of such activities, when judged essential to an individual's research training program, is in accord with recent indications of Congressional intent.[1] Moreover, support of research-related clinical training is clearly not barred by NRSA regulations. Therefore, to counteract the reported perception that such prohibitions exist, the Committee recommends that NIH publicize current policy on support of research-related clinical training.

● The Committee has noted above (page 28) the suggestion of a recent study that the output of the Medical Scientist Training Program can be significantly expanded (Association of American Medical Colleges, 1979). The Committee recommends, however, that consideration of a change in the currently recommended level should await the development of additional information by the Panel on Clinical Sciences and the NIGMS with respect to the intra-institutional impact of increased MSTP awards, the number of additional institutions with the potential for mounting an effective program, student "drop-out" rates, and the comparative costs of other research training programs for M.D.'s.

● From 80 to 85 percent of individuals completing the Medical Scientist Training Program go on to a clinical residency. Since their research training up to that point has generally been in basic science, there is an advantage in providing postdoctoral clinical research experience for those who aspire to be clinical investigators. An experience such as that provided by the NIH Clinical Associates Program can serve as a bridge for those interested in careers as clinical investigators. Since inclusion of a clinical research component will require support outside of the usual mechanism for residency funding, the Committee recommends that NIH consider a type of award mechanism for this purpose. Further, to foster movement in this direction for MSTP graduates as well as for other residents with a potential interest in clinical investigation, the Committee recommends that specialty Boards and Residency Review Committees develop policies that would facilitate combined clinical and research training programs leading to Board certification without substantially lengthening the process.

The Committee's recommended level of training in the clinical sciences area is given in Table 4.2, p. 52.

Because the training grant (as distinct from the individual fellowship) is a special, almost unique, mechanism for research training in the biomedical and behavioral sciences, questions about its role, effectiveness, and importance have had a prominent place on the Committee's agenda. Almost from the beginning of its deliberations, the Committee has sought ways to evaluate the impact of training grants upon the quality of training provided.[2]

A first effort in this direction was the 1977 Survey of Biomedical and Behavioral Science Departments, dealing with the impact of reduction in training grant support. This survey, the results of which were summarized in the Committee's 1978 Report (NRC, 1975-1978; pp. 42-45, 67-69), revealed the complexity of this issue and indicated a need for further investigation. While the loss of training grant support had the overall effect of dampening graduate enrollment increases, there was a substantial amount of variation among departments. Enrollments in some departments continued to increase unperturbed by the reduction in federal support, while enrollments in other departments dropped in apparently similar circumstances. The differential impact of loss of training grants remains unexplained. Perhaps particular local factors are at work or perhaps there are common factors that were not captured in the survey.

In addition, the 1977 Survey asked department heads to evaluate the impact of eliminations or reductions of the training grant support on such features of the training programs as colloquia, special equipment, guest speakers, and other "enrichment" aspects of the graduate curriculum. The heads of departments who responded to the survey frequently made comments that training programs had been adversely affected by loss of NIH grant support, but statistical evidence is lacking to substantiate these comments, and the extent of negative impact is unclear.

These important unanswered questions suggest that more effort should be put into assessing the impact of training grants on the quality of training. An ideal strategy for dealing with this issue would be to study whether scientists who had received training grant support were more productive as a result of having this support than those who had not. Last year the Committee reviewed some of the difficulties in devising a method and collecting data that would yield a dependable answer to this question. It decided that such an approach warranted further investigation. Now having completed this investigation, the Committee has reluctantly concluded that such an empirical study is not feasible at this time due to insurmountable difficulties related to both data collection and methodology.

First, one would have to identify and measure the various other factors (in addition to training grant support) that probably influence a scientist's productivity--innate ability and prior education, the quality of the training department, subsequent support for research, and perhaps even the tractability of the problem he/she chooses to work on. Further, it would be necessary to measure the quality of the former trainee's productivity at some reasonable point "downstream," i.e., 5-10 years after completion of training. Many of the requisite data are unavailable, and those that are available are scattered in disparate sources. Assembling them would be expensive and time-consuming, and their usefulness in assessing the impact of training grants could not be determined for several years.

Second, there is a serious analytical difficulty. Even if it were feasible to collect the needed data, it would be very difficult to distinquish the contribution that training grant support *per se* makes to productivity, and to separate that contribution from all of the other influences at work. In fact, such a separation may be impossible because training grant support is so highly correlated with many other factors related to program, department, and trainee quality. There is an understandable tendency to award training grants to high-quality departments that have faculty, educational programs, and a level of research activity judged to be superior. When several factors of this sort are highly correlated, it is difficult to isolate their individual contributions.

In addition, there appears to be considerable substitutability among the various sources of support for graduate study and research training. Departments often distribute their various sources of support diversely among students purely for reasons of educational strategy. During the course of a 4- to 6-year period of training, a graduate student may receive training grant support for 1 or 2 years, and hold a research assistantship for a time and perhaps a teaching assistantship in other years. This substitutability of sources of support further increases the difficulty in disentangling the effects of training grants from other means of helping trainees complete their preparation for research.

Finally, it seems clear that the benefits of a training grant are not always limited to the trainees formally supported out of grant monies. Instead, the opportunity to listen to distinquished visiting scientists discuss their work, to participate in special seminars, and to reap other benefits provided through the training grant device is widely shared.

These several considerations have therefore led the Committee to abandon the idea of carrying out an "ideal," statistical study that might conclusively demonstrate the

impact of training grants as such upon research productivity. The state of the art in this area of educational evaluation does not permit such an empirical study to be undertaken at this time or, it would seem, in the foreseeable future.

Meanwhile, the Committee believes that it is possible to obtain useful, if not completely compelling, evidence by further study of a sample of biomedical science departments and programs, especially those that have experienced a significant reduction in training grant support. The Committee, therefore, plans to make a series of site visits to a carefully designed group of departments/programs for the purpose of examining in detail the impact and consequences, and the changes and adaptations that occur as a result of losing training grant support.

The overall objectives of such case studies will be to understand better the contexts within which training takes place and the specific impacts, if any, that the reduction of training grant support has had within those contexts. Under what conditions are training grants an essential or merely a useful supplement? What are the deleterious or beneficial consequences of reducing training grant support? What circumstances determine the impact of such a decline? Is the impact long-term or short-term in its effect? Further, the Committee wishes to explore institutional incentives for maintaining enrollment levels, the substitutability of training grant funds with other sources of support, and contributions of trainees to the research productivity of the department.

One of the questions arising from the Committee's earlier Department Survey is whether hard data or detailed descriptions can be obtained to substantiate the opinions of those department chairpersons who perceived adverse program effects of reduction of training grant support. Defining more precisely the program activities supported by the training grant and the level of support before, during, and after the reduction in training grant support would do much to determine whether the purported ill effects can be documented. The Committee, therefore, will investigate the possibility of obtaining comparable budgetary data from departments/programs on the support of various training activities. If such data prove unavailable, then the detailed investigation of site visit teams should provide expert judgments concerning the purported ill effects of training grant cutbacks and detailed descriptions of relevant examples.

Departments to be visited will be selected from those that have lost a significant portion of their training grant support. Selection will be limited to higher quality departments in order to focus on the potential impact on centers of training excellence. Within this overall group, two groups will be examined--those that lost and those that

did not lose enrollments after cutbacks in training grant support. Additional criteria for selection will be whether departments are in a public or private institution or in a graduate or medical school.

A balanced view of the training grant must include the perspectives of many university groups associated with the operation of this program. Central to such an investigation are interviews with training program directors, department chairpersons, and faculty. The Committee will also seek the views of deans and graduate students.

In addition to providing detailed examinations of a limited, but carefully selected, group of departments, the site visits may also be useful in identifying criteria for evaluation that may be applicable over a broad range of departments. The Committee, therefore, leaves open the possibility of conducting in the future a more extensive study of the role of training grants.

BEHAVIORAL SCIENCES

In response to changing employment prospects and a growing need for skilled investigators in specialized areas of health research, the Committee and its Panel on Behavioral Sciences have recommended in previous reports a major reorientation of NRSA support to provide for predominantly postdoctoral research training (NRC, 1975-1978: 1976-1978 Reports).

The Committee has been, and continues to be, concerned that academic demand for behavioral scientists will decline in the mid-1980's due to a leveling off of growth in college and university enrollments and to the relatively young average age of tenured faculty.

Indeed, the Committee's perceptions of the academic market have been corroborated in part by the recent report of the NRC Committee on Continuity in Academic Research Performance (NRC, 1979, p. 47):

> The picture [for the social sciences and psychology] is mixed. While the correct proportion of young faculty (45% in 1977)is higher than in most sciences and engineering disciplines, and the retirement picture is less unfavorable than in some other fields, projected enrollment trends are relatively unfavorable.... While these fields are not likely to experience a severe shortage of openings for new faculty in the immediate future, they may prove quite vulnerable later in the decade, as the effects of demographic trends come to be felt more strongly.

The Committee does anticipate, however, that the demand for skilled behavioral investigators in nontraditional settings--such as hospitals/clinics, government agencies, health care institutions, and the like--will continue to rise (NRC, 1975-1978: 1978 Report, p. 59). It is this phenomenon that has captured the Committee's attention in recent years.

In 1978, for example, the Committee reported the results of its analysis by sector of employment of the work activities of behavioral scientists who had received their doctorates between 1971 and 1975. The data indicated that employment in nonacademic settings does not lessen the opportunity for behavioral scientists to conduct health-related research. This finding led the Committee to suggest that employment in nonacademic settings may constitute an appropriate means for behavioral scientists to fulfill the payback obligation required under the provisions of the NRSA authority (NRC, 1975-1978: 1978 Report, p. 72).

Expansion of the nonacademic market is a recent phenomenon and, as such, suggests a number of important questions to be addressed by the Committee in the coming years:[3]

1. What factors affect the opportunities for behavioral scientists to conduct health-related research in nonacademic settings?
2. Do these settings permit the effective use of the research training acquired by behavioral scientists holding doctorates?
3. What is the potential for continued expansion of the nonacademic sector? What factors will influence such an expansion?
4. Are different research training goals and emphases desirable in the face of a shift toward employment in nonacademic settings?
5. How will the growth in nonacademic employment affect the behavioral science research enterprise and the corpus of behavioral science knowledge?

The Committee, through its Panel on Behavioral Sciences, is involved currently in an examination of existing sources of data, such as the NRC Comprehensive Roster of Doctorate Recipients, to determine the extent to which these research questions may be addressed using available information. However, should existing sources prove inadequate, the Committee will also consider the need for further surveys.

In addition to exploring the nonacademic market for behavioral scientists, the Committee plans to convene a series of workshops and symposia in the coming years to investigate more fully those issues that relate to the implementation of its recommendations for research training in this area. In January 1980, for example, the Committee and its Panel on Behavioral Sciences convened a 1-day work-

shop on the topic of "Establishing Research Training Programs in Behavior and Health" (see Appendix D). Workshop participants explored such issues as:

- the impact of changing patterns in graduate enrollment on the quality of predoctoral education in the behavioral sciences;

- the experiences of academic behavioral science departments in placing greater emphasis on postdoctoral training; and

- the potential for the NRSA authority to stimulate new directions for research training in the behavioral sciences.

The Committee plans to review and report the findings of this workshop in the coming months and to present specific recommendations in its next report.

The Committee and its Panel also plan to hold hearings in 1980 on the recruitment of clinicians to conduct mental health research. The purpose of the hearings is twofold: (1) to provide a forum for a number of professional organizations to share the results of their studies; and (2) to solicit from as broad an audience as possible suggestions for the further refinement of research training that could enhance the clinical research endeavor in this area.

HEALTH SERVICES RESEARCH

As early as 1976, the Committee pointed out that for federal research training policy to be responsive to the need for health services research (HSR) personnel, an appropriate data base would have to be established. Hence, for 2 years the Committee and its Panel on Health Services Research have attempted to develop the necessary statistics. The first step in achieving this goal now has been realized.

In 1978 the Committee launched the first national survey of health services research personnel to collect information on the training experiences and present employment of a segment of this labor force. Nearly 1,400 individuals were included in the survey. Of these, over 600 had received support as principal investigators on research grants/contracts awarded by the National Center for Health Services Research (NCHSR)[4] between 1960 and 1976. An additional 770 individuals were included as recipients of federal research training support in this area from NCHSR or ADAMHA between 1970 and 1978.

Over 80 percent of those surveyed responded. While the Committee plans to release the findings of the survey as a separate report, a few of the survey's more descriptive

findings that reveal a striking similarity between the characteristics of this group and those of the biosciences in general are given below (cf. NRC, 1975-78: 1977 Report):

- Fewer than 2 percent of the respondents were unemployed and seeking employment at the time of the survey.

- The majority of those employed full or part-time were employed in educational institutions.

- More than three-fourths of those individuals responding to the survey spent some portion of their total work time engaged in health services research.

With this preliminary employment and training picture in hand, the Committee has set as a major goal in the coming years the description of the market for HSR personnel. For example, employment opportunities in such locations as Health Systems Agencies and Community Mental Health Centers suggest that an examination of the nonacademic employment sector seems warranted. Questions that usefully might be addressed include:

- Do HSR personnel employed in nonacademic settings address different research questions than those addressed by academic HSR investigators?

- Is there an adequate supply of doctorally-prepared HSR investigators to meet today's research needs in these nonacademic settings?

- Is there an adequate supply of doctorally-trained HSR investigators to meet the expected personnel needs through the 1980's?

In addition to these questions, the Committee hopes to explore the factors that influence the demand for HSR personnel in such nonacademic settings as health insurance organizations and state and county governments. Findings from these studies and others should contribute eventually to the development of market models in this area.

SUGGESTIONS FROM THE PUBLIC

On March 8, 1979, the Committee held its third public hearing to solicit views from individuals and organizations about the Committee's work (see Appendix D for the program). These hearings, which have been held following the issuance of the annual reports, have established a continuing dialogue between the Committee and interested parties. The Committee was particularly impressed by the thoughtfulness of the comments, which reflected an awareness of the complexity of the issues surrounding federal research training support.

At this year's public hearing, 18 persons made formal presentations. In addition, eight other written statements were received and seven other individuals made oral remarks from the floor. Topics discussed included strengthening research training programs for nurses; enlarging opportunities for participation in research by women and minorities; preserving the quality of training programs in light of declining federal support; and special training needs. Considerable attention was given to the growing difficulty in attracting medical, dental, and veterinary degree students to clinical research. The American Heart Association outlined a small fellowship program that it was initiating to attract physician investigators.

One of the witnesses at the public hearing called attention to the Congressional practice of earmarking research and development funds to accompany expenditures for new programs of health, welfare, and similar services. Such set-asides could have a substantial effect upon research personnel. For example, a 5 percent set-aside from 1979 funds for research and development related to Title I of the Elementary and Secondary Education Act would require more than 3,000 behavioral science investigators. While such numbers may not seem large against the total number of behavioral scientists, the requirements would undoubtedly have a profound effect on supply of and demand for research personnel.

To generalize the point, the provision of set-asides for R&D in newly legislated programs almost surely brings pressure on a labor market that is small and delicately balanced between near full employment on the one hand and underutilization on the other, and on a personnel pool that is very expensive to generate and requires a long time to expand or to contract. That is not to say that such set-asides are unwise public policy.[5] It is relevant to note, however, that national needs for research personnel can be created by legislation, and some legislation can have a sudden and severe impact on the scientific research labor force.

The case of toxicology is relevant here. The passage of the Toxic Substances Control Act, which mandated the toxicological screening of compounds, and of the Occupational Safety and Health Act, which required the inspection and testing of workplace environments for the same purpose, abruptly and sizably increased the number of jobs for toxicologists. In the view of this Committee, as well as other bodies who studied the question, the increased demand required the establishment of new and rather special training programs, for the existing current sources of supply could not produce the needed numbers of specialists.

National needs for research personnel, then, fluctuate with changes in national priorities as well as with changes in science itself. While the latter changes are usually gradual, the demands that legislative changes produce are

more likely to be abrupt and difficult for the training institutions to meet in what the Congress might consider a timely fashion. Shifting the emphasis or the focus in training biomedical and behavioral scientists is not easy, for reasons that have to do with the very nature of the training enterprise. These circumstances--the possibility of sudden "legislated" changes in demand coupled with inherently slow response in supply changes--suggest both greater alertness on the part of the Committee to the consequences of legislation that bears on science, and, at the same time, a realistic recognition in the Congress that a body of trained personnel cannot be had by fiat, but must be pursued with constancy.

NOTES

1. In his capacity as Chairman of the U.S. House of Representatives' Subcommittee on Health and the Environment, then-Representative Paul Rogers (D-Fla.) clarified the intent of the NRSA authority in his statement introducing the Biomedical Research and Training Amendments of 1978:

> ...The committee has heard reports that the agencies administering the National Research Service Awards program have interpreted the provisions of law establishing separate clinical training and research training authorities in a manner to require totally separate training programs. The committee does not intend that the activities engaged in under research training programs and clinical educational programs need to be entirely separate in order to be supported under either type of training authority. The best research training programs should obviously focus on all of the needs of the trainees, not exclusively on whether they provide purely research or purely clinical aspects of biomedical or behavioral science. Therefore, these training authorities should be interpreted to permit some clinical training in the curriculums of individuals preparing for research careers in certain areas of biomedical research where such clinical experience would be appropriate. Some research training in clinical-clinical-directed curriculums should also be permissible where training in certain methods and techniques is appropriate for the education of a clinical professional. (Congressional Record, H11968, October 10, 1978)

2. The Committee's efforts in this regard have been concentrated in the basic biomedical sciences because the overall magnitude of the training grants program in these fields makes its role easier to discern here than in the behavioral sciences. This section is therefore directed to the basic biomedical area; however, it does not preclude an analysis of the behavioral sciences at a later time.

3. These questions were raised by Dr. C. Alan Boneau, consultant to the Panel on Behavioral Sciences, May 31, 1979.

4. The NCHSR is located in the Office of the Assistant Secretary for Health, DHEW.

5. Whether they are or not and what all their ramified consequences might be are questions that far exceed our capabilities.

3. ADMINISTRATIVE ISSUES AND POLICY CHANGES

SHORT-TERM TRAINING

The Committee has followed with interest the steps NIH has taken in planning and implementing the provision of the NRSA legislation permitting the use of up to 4 percent of appropriated funds for short-term training programs. Although a few short-term training programs for pre-Ph.D.'s and post-Ph.D.'s have been supported prior to this new provision, it is noteworthy that now recipients will be able to take up to three 3-month training sessions without being subject to the payback requirement. NIH currently plans to use most of these funds to provide health professions students with an exposure to research problems and techniques (Appendix C) in the hope of attracting some of these students into careers in clinical research. The Committee endorses such a program for health professions students, but believes that short-term training programs in other areas should not be expanded significantly until additional funds are made available.

The Committee believes that establishing a short-term training program for health professions students can be an important step in helping to revitalize the interest of these students in pursuing clinical research careers. In its 1978 Report (NRC, 1975-1978; pp. 101-103), the Committee noted that recent difficulty in attracting health professions students into research careers is the result not only of financial disincentives but also of a lack of first-hand experience in a research activity during the period of predoctoral training and residency. Making such experiences available through short-term training programs should enable students to test their interest and ability in research. Students who confirm their interest can then pursue with confidence a research training pathway. Those who discover little interest or ability in research can resume their training as practitioners without incurring the obligations of payback. Such sorting will also allow the valuable training resources of training grants and fellowships to be directed to those health professions students with confirmed interest and ability.

The 3-month program for predoctoral students will not augment the diminishing supply of physician investigators. For this purpose it may be highly desirable, even necessary, to provide a more substantial exposure to research during the physician's residency period by offering 1 or more full years of research training to medical doctors who are so inclined. Those who have a positive experience would be in a better position to decide about further research training following completion of the residency. It is worth noting that opportunities to interrupt a residency with research experience would serve to reduce the long hiatus in research training for M.D./ Ph.D. program graduates who otherwise enter standard residency programs.

The utilization of this short-term training mechanism to introduce health professions students to research suggests that other objectives, research areas, and types of students may also benefit from this kind of program. In the basic biomedical sciences, where the supply of researchers is not a problem, there already exists a few examples of short-term programs that have been designed to provide opportunities to acquire current research techniques (for example, at the Marine Biological Laboratory at Woods Hole, Massachusetts and the Cold Spring Harbor Laboratory, New York).

The short-term training mechanism could also play a role with respect to nursing research. The Committee has learned that the Health Resources Administration's Division of Nursing hopes to develop a short-term training program in addition to the existing institutional research training grant program. The purpose of this program would be to encourage nursing faculty to become more active in research. The Committee endorses this proposal and offers two suggestions: first, that the program permit individuals to participate for two or three consecutive summers; and, second, that program policy permit the use of short-term training support in a broad range of institutions with ongoing research activities rather than be restricted to only those institutions that currently have research training grants.

STIPEND LEVELS

In its 1977 Report (NRC, 1975-1978; pp. 180-181), the Committee noted that the absence of any increase in stipend levels since 1974 has seriously eroded the economic position of trainees and fellows. The Committee pointed out that a continuation of this situation could result in difficulties in recruiting individuals for research training and in enabling trainees and fellows to pursue their work on a full-time basis without diverting their attention from matters of training to those of subsistence. In recommending that stipend levels be raised, the Committee advised that increases should be effected through additional funding rather than by reducing the recommended number of trainees and fellows to be supported.

The Committee notes that Congress and DHEW have addressed this problem this year and have done much to correct the underlying inequity. DHEW has approved a plan for raising stipend levels, effective July 1, 1980 (Appendix C). Under the approved plan, predoctoral stipends will increase from $3,900 to $5,040 (a 29 percent increase) and beginning postdoctoral stipends will increase from $10,000 to $13,380 (a 33 percent increase). These increases are consistent with the Committee's 1977 recommendation for an

immediate cost-of-living increase, and the Committee notes that the plan will do much to compensate for the effects of inflation over the last 5 years.

The implementation of this plan of stipend increases faces certain difficulties that are traceable to the current provisions for NIH funding. In November 1979 Congress passed a continuing resolution, effective through September 1980, which allows the NRSA program $33 million more than FY 1979. The "additional" $33 million, however, was not a net increase in the total NIH budget, but rather an instruction to reprogram funds from other purposes to the support of training. Such a reprogramming scheme was clearly intended by the Congress to assist training but not to reduce research grant support. The reprogramming was to be effected on an institute by institute basis.

For most institutes with relatively large research contract programs, this reprogramming adjustment is being accomplished by shifting between these two categories. The Institute of General Medical Sciences, however, has found it impossible to make this adjustment. This Institute has the largest predoctoral training program in NIH. It makes two-thirds of all NIH predoctoral awards, and it has a comparatively small research contract program from whose resources it might draw to increase stipends.

The Committee understands that the NIGMS may have to reduce the number of predoctoral trainees to be supported in 1980 by as much as 20-25 percent in order to provide the newly increased levels. A few training programs may not be renewed; and most of the continuing programs will have fewer trainees than in 1979.

Thus, the outlook for support of predoctoral trainees in 1980 is for an NIH-wide reduction of approximately 13 percent in number of positions, with almost all of this reduction taking place through NIGMS programs. ADAMHA also was not provided with any additional funds to implement the planned increase in stipends, and this will result in a reduction of approximately 14 percent in the number of positions that can be supported in FY1980.

The Committee hopes that this significant reduction in predoctoral training in 1980 will be a transient, temporary phenomenon. The Committee is pleased that Congress and DHEW have recognized the problem of stipend levels and urges that Congress provide appropriate levels of funding for research training while avoiding unintended, but serious, inequities and disruptions such as those which appear to be occurring.

A particular problem with regard to stipend levels has been the case of the potential physician investigator. In addition to the considerable gap in lifetime earnings, there is a growing gap between the incomes of house staff and research trainees. The situation raises the possibility of establishing a differential stipend policy that would take into account those areas where market disincentives are

particularly acute. The Committee recognizes that differentials might have other disadvantages and will devote further attention to this issue when additional data on financial and other disincentives, currently being sought, become available.

INSTITUTIONAL SUPPORT COMPONENT OF THE TRAINING GRANT

DHEW has recently announced a modification of the procedure for determining the maximum level of award for the institutional support component of the training grant. The previous administrative procedure, instituted with the beginning of the NRSA program, used a formula which allotted a maximum of approximately 25 percent of the total of each training grant award for institutional support. Under that procedure private universities received larger sums for their institutional support than did public institutions because the tuition costs, which are significantly higher in private schools, were included in the base amount of the training award to which the 25 percent formula was applied. The new procedure, to commence on July 1, 1980, will be based on a maximum allotment per trainee--$3,000 per predoctoral and $5,000 per postdoctoral trainee. The overall amount of support budgeted for institutional purposes is not expected to change markedly. The result of this adjustment, however, will be to redress the imbalance that has existed between public and private universities in the amount awarded for institutional support.

The Committee is pleased that the present inequitable condition has been corrected, but believes that in the new procedure greater flexibility should be available to meet the training needs of individual programs. It is proper that agencies require each applicant to justify the amount of institutional support needed. In this regard, there is no more reason in the case of any individual program to impose an absolute ceiling than there is to impose an absolute floor on the institutional support component. While the agencies, of course, must place some overall ceiling on the amount of funds available for this purpose, the distribution of these funds to individual programs should be based on program-justified needs and not on a universal ceiling. This position is consonant with that expressed by the U.S. House of Representatives (1978, p. 33), which urged greater flexibility in the distribution of such funds.

The Committee recommends that greater flexibility be incorporated in the procedure for distributing the institutional support component of training grant funds. Agencies should permit waiving the rigid ceiling of $3,000 per pre-

doctoral and $5,000 per postdoctoral trainee in cases where adequate justification is given.

COORDINATION OF NIH PREDOCTORAL SUPPORT

In its 1978 Report (NRC, 1975-1978; pp. 55-57), the Committee strongly urged that NIH establish an intraagency mechanism for coordinating predoctoral support. The purpose was to assure that support for broad basic-science training was provided and that small multidisciplinary fields of special importance, such as epidemiology and biomathematics/biostatistics, did not receive inadequate support due to an absence of clearly focused responsibility within the agency. The Committee is pleased that an interinstitute review committee has been established this year to fulfill these objectives.

TRAINING POLICIES OF ADAMHA

ADAMHA's administrative regulation that restricts NRSA predoctoral support to students who have completed 2 years of graduate training has been the subject of a Committee recommendation each of the last 2 years.

Findings from the Committee's analysis of national human resource data suggest that additional efforts are needed to provide opportunities for minorities to enter doctoral training programs. Therefore, the Committee, in its 1977 report, urged ADAMHA to waive its restriction as one means of accomplishing this purpose (NRC, 1975-1978: 1977 Report, pp. 172-173).

In 1978, the Committee reported that ADAMHA, rather than waiving the restriction, was trying to develop special targeted training programs that would limit eligibility to members of minority groups and not prohibit support in the first 2 years of graduate study. The Committee endorsed this action but noted that directors of existing, nontargeted training programs continued to report difficulty in recruiting qualified minority students, owing in part, presumably, to ADAMHA's 2-year restriction (NRC, 1975-1978: 1978 Report, p. 79).

The Committee is gratified to note that in a recent memorandum to NRSA research training directors and applicants, Dr. Gerald Klerman, ADAMHA Administrator, announced a change in eligibility requirements for predoctoral trainee support, in effect waiving the administrative regulation[1]:

> Effective January 1, 1980, ADAMHA will no longer require two or more years of graduate work as an eligibility requirement for appointment

> of predoctoral trainees under NRSA institutional grants. (This change in policy does not apply to individual Fellowship awards.) Accordingly, as of this date, predoctoral individuals may be appointed during any year(s) of their graduate training, as long as such appointments are consistent with the statutory maximum of five years of predoctoral support under the National Research Service Award Act. This change is applicable to currently supported programs, as well as those funded in the future.
>
> Program Directors are strongly encouraged to provide stipends in the first and second years of graduate work only in cases where promising students (especially women and minorities) would not have sufficient resources to enable them to pursue their training on a full-time basis, and such students have expressed their commitment to pursue research careers in areas related to alcoholism, drug abuse, or mental health.

The Committee is hopeful that abolition of the 2-year restriction will enhance the recruitment and retention of well-qualified first- and second-year students in research careers relevant to the goals of ADAMHA.

With respect to their efforts to develop targeted research-training programs that would recruit members of minority groups into research careers, ADAMHA has also announced a new program of support[2]:

> ADAMHA has initiated a Minority Access to Research Careers (MARC) program modeled on the MARC program of the National Institute of General Medical Sciences at NIH.... We have high hopes that these mechanisms will help to assist institutions with substantial minority enrollment in the training of greater numbers of scientists and teachers in fields relating to alcoholism, drug abuse, and mental health.

The Committee commends ADAMHA on the significant stridestaken these past months to enhance the availability of NRSA support to minority-group members, women, and students from disadvantaged backgrounds. The Committee shares the hope expressed by Dr. Klerman that these actions will enhance the representation of these individuals in the scientific labor force and in the national alcohol, drug abuse, and mental health research effort.

CLINICIANS IN MENTAL HEALTH RESEARCH

In its 1978 Report (NRC, 1975-1978: p. 79), the Committee explored for the first time some of the barriers to the recruitment of clinicians into mental health research. Among the factors identified by the Committee was the separation of federal support for research training and clinical training as a result of the enactment of the NRSA authority. Specifically, the Committee observed:

> When the NRSA Act required that a distinction be made between clinical training and research training, ADAMHA, which had long provided support for both types of training through NIMH, established guidelines by which existing awards could be assigned to either the clinical or the research training category "as the preponderance of evidence" from the grant applications suggested.

Since the release of its 1978 Report, the Committee notes that former Representative Paul Rogers (D-Fla.) clarified the intent of the NRSA authority relative to providing research training opportunities to clinicians when he introduced the Biomedical Research and Training Amendments of 1978 (see note 1 to Chapter 2 of this Report). The Committee welcomes this clarification of intent. It recognizes the reality of introducing clinicians, including clinical psychologists and psychiatrists, to research during the course of their clinical professional training and gives the agencies flexibility to provide appropriate support under either training authority.[3]

HEALTH SERVICES RESEARCH UNDER THE NRSA AUTHORITY

The Committee is pleased that its earlier recommendations in this area have had a far-reaching impact. The Committee notes specifically that its recommendation to expand the NRSA authority to include the NCHSR has been realized. The Health Services Research, Health Statistics and Medical Technology Act of 1978 (PL 95-623, Section 3(a)(3)) amended the previous authority to permit the use of NRSA support for training in health services research[4]:

> The Secretary shall, through the National Center for Health Services Research, the National Center for Health Statistics, and the National Center for Health Care Technology and using National Research Service Awards and other appropriate authorities, undertake and support

> training programs to provide for an expanded and continuing supply of individuals qualified to perform the research, evaluation, and demonstration projects set forth in sections 305, 306, and 309.

The Committee is hopeful that this explicit extension of the NRSA authority to include the NCHSR will result in a more stable "federal commitment to the total health services research effort" (NRC, 1975-1978: 1977 Report, p. 129).

NOTES

1. Memorandum from Administrator, ADAMHA, to ADAMHA NRSA Research Training Program Directors and Potential Research Training Grant and Fellowship Applicants, December 19, 1979.

2. Dr. Gerald Klerman, ADAMHA Administrator, personal communication to Dr. Henry Riecken, January 3, 1980.

3. The Committee notes that the NRSA guidelines issued jointly by NIH and ADAMHA in 1976 and now the clinical training guidelines issued by NIMH in 1979 both contain language that permits under either authority support of clinical and research activities to the extent required to fulfill the principal purpose of the training program.

4. This amendment makes research training support mandatory rather than permissive, and extends the NRSA authority to include the National Center for Health Statistics and the new Office of Health Technology in addition to the NCHSR.

4. NUMERICAL RECOMMENDATIONS

TRAINING DATA FOR 1978

In fiscal year 1978, Congressional appropriations for the training programs of the NIH and ADAMHA were $169 million, up 15 percent from the $146 million appropriated in FY1977, which was somewhat below the normal level of recent years (NRC, 1975-1978: 1978 Report, p. 19). The augmented appropriation led to a 7.6 percent increase in the number of traineeships and fellowships awarded by these agencies from 12,261 in FY1977 to 13,204 in FY1978. Thus, in percentage terms, only about half of the increase in appropriations was used for increasing the number of trainees, while the rest was absorbed by increases in the costs of training such as tuition, salaries, and equipment.

The increases in training appropriations, however, were not shared equally between NIH and ADAMHA. The NIH appropriation for training in FY1978 increased by almost 18 percent, while that for ADAMHA decreased by 1 percent. Correspondingly, the number of NIH-supported trainees increased almost 10 percent, while ADAMHA's declined by almost 5 percent.

There were also differences among the various broad fields of training. Awards in the field of nursing research showed the largest percentage increase, up almost 34 percent (131 awards in FY1978 versus 98 in FY1977). The clinical sciences also had a large increase (16 percent) over FY1977 levels. Awards in the basic biomedical sciences showed a moderate increase (9 percent), while those in the behavioral sciences declined by 12 percent. In the latter case, most of the decline occurred in NIH training awards and was primarily due to a phasing out of behavioral science predoctoral training programs formerly authorized under the PHS Act. The complex situation with regard to training in the behavioral sciences is discussed more fully on p. 58. Health Services Research awards also showed a slight decrease from 1977 to 1978.

Table 4.1 shows the number of training positions (traineeships and fellowships) made available by the agencies from FY1978 funds.[1] The overall level of 13,204 awards is just slightly under the 13,775 recommended by the Committee. Table 4.2 presents the Committee's numerical recommendations for NIH/ADAMHA and the Health Resources Administration (HRA) training programs in FY1980-1982. These recommendations appeared in the 1978 Report and are reaffirmed here.

Since 1974, the training stipends paid under the NRSA Act have been fixed at the base levels of $3,900 for predoctoral trainees, and $10,000 for postdoctoral trainees. But from 1974 to 1978, the Consumer Price Index has risen by 34 percent, resulting in a decline of more than 8 percent

TABLE 4.1 NIH/ADAMHA/HRA Traineeship and Fellowship Awards for FY1978

			TOTAL ALL FIELDS	BIOMEDICAL SCIENCES						BEHAVIORAL SCIENCES	CLINICAL SCIENCES [a]	HEALTH SERVICES RESEARCH	NURSING RESEARCH
				Total	Basic	Med. Scientist Prog.	Epid./ Biostat. [a]	Community [a] and Envir. Hlth.	Other [a]				
GRAND TOTAL NIH/ADAMHA/ HRA	TOTAL	Total	13,203	8,064	6,294	616	232	146	776	1,514	3,358	136	131
		Predoc.	6,964	4,936	3,680	616	145	81	414	1,160	667	80	121
		Postdoc.	6,239	3,128	2,614	0	87	65	362	354	2,691	56	10
	Trainees	Total	11,031	6,517	4,834	616	220	139	708	1,331	3,042	132	9
		Predoc.	6,706	4,867	3,613	616	144	81	413	1,091	667	70	3
		Postdoc.	4,325	1,650	1,221	0	76	58	295	240	2,375	54	6
	Fellows	Total	2,172	1,547	1,460	0	12	7	68	183	316	4	122
		Predoc.	258	69	67	0	1	0	1	69	0	2	118
		Postdoc.	1,914	1,478	1,393	0	11	7	67	114	316	2	4
NIH [b]	TOTAL	Total	11,363	7,686	5,916	616	232	146	776	319	3,358	0	0
		Predoc.	5,665	4,756	3,500	616	145	81	414	242	667	0	0
		Postdoc.	5,698	2,930	2,416	0	87	65	362	77	2,691	0	0
	Trainees	Total	9,544	6,238	4,555	616	220	139	708	364	3,042	0	0
		Predoc.	5,649	4,740	3,486	616	144	81	413	242	667	0	0
		Postdoc.	3,895	1,498	1,069	0	76	58	295	22	2,375	0	0
	Fellows	Total	1,819	1,448	1,361	0	12	7	68	55	316	0	0
		Predoc.	16	16	14	0	1	0	1	0	0	0	0
		Postdoc.	1,803	1,432	1,347	0	11	7	67	55	316	0	0
ADAMHA	TOTAL	Total	1,709	378	378	0	0	0	0	1,195	0	136	0
		Predoc.	1,178	180	180	0	0	0	0	918	0	80	0
		Postdoc.	531	198	198	0	0	0	0	277	0	56	0
	Trainees	Total	1,478	279	279	0	0	0	0	1,067	0	132	0
		Predoc.	1,054	127	127	0	0	0	0	849	0	78	0
		Postdoc.	424	152	152	0	0	0	0	218	0	54	0
	Fellows	Total	231	99	99	0	0	0	0	128	0	4	0
		Predoc.	124	53	53	0	0	0	0	69	0	2	0
		Postdoc.	107	46	46	0	0	0	0	59	0	2	0
HRA Division of Nursing	TOTAL	Total	131	0	0	0	0	0	0	0	0	0	131
		Predoc.	121	0	0	0	0	0	0	0	0	0	121
		Postdoc.	10	0	0	0	0	0	0	0	0	0	10
	Trainees	Total	9	0	0	0	0	0	0	0	0	0	9
		Predoc.	3	0	0	0	0	0	0	0	0	0	3
		Postdoc.	6	0	0	0	0	0	0	0	0	0	6
	Fellows	Total	122	0	0	0	0	0	0	0	0	0	122
		Predoc.	118	0	0	0	0	0	0	0	0	0	118
		Postdoc.	4	0	0	0	0	0	0	0	0	0	4

[a] See note 1 to this chapter

[b] Excludes 205 postdoctoral fellowship awards from the Fogarty International Center.

SOURCE: NIH data were derived from records of 1978 training grant and fellowship awards from the IMPAC system, July 2, 1979. ADAMHA data were supplied by the Extramural Program Officer, April 27, 1979. HRA data were supplied by Division of Nursing April 2, 1979.

TABLE 4.2 Committee Recommendations for NIH/ADAMHA/HRA Traineeship and Fellowship Awards for FY1980-1982

				Biomedical Sciences					
			TOTAL	Basic[c]	Medical Scientist Program	Behavioral Sciences[a]	Clinical Sciences[b]	Health Services Research	Nursing Research
1980	TOTAL	Total	12,880	7,450	725	1,390	2,800	275	240
		Predoc.	5,915	4,250	725	575	0	160	205
		Postdoc.	6,965	3,200	0	815	2,800	115	35
	Trainees	Total	8,785	4,250	725	1,140	2,400	205	65
		Predoc.	5,620	4,250	725	470	0	120	55
		Postdoc.	3,165	0	0	670	2,400	85	10
	Fellows	Total	4,095	3,200	0	250	400	70	175
		Predoc.	295	0	0	105	0	40	150
		Postdoc.	3,800	3,200	0	145	400	30	25
1981	TOTAL	Total	12,845	7,450	725	1,300	2,800	300	270
		Predoc.	5,770	4,250	725	390	0	175	230
		Postdoc.	7,075	3,200	0	910	2,800	125	40
	Trainees	Total	8,760	4,250	725	1,065	2,400	225	95
		Predoc.	5,505	4,250	725	320	0	130	80
		Postdoc.	3,255	0	0	745	2,400	95	15
	Fellows	Total	4,085	3,200	0	235	400	75	175
		Predoc.	265	0	0	70	0	45	150
		Postdoc.	3,820	3,200	0	165	400	30	25
1982	TOTAL	Total	12,905	7,450	725	1,300	2,800	330	300
		Predoc.	5,810	4,250	725	390	0	190	255
		Postdoc.	7,095	3,200	0	910	2,800	140	45
	Trainees	Total	8,815	4,250	725	1,065	2,400	250	125
		Predoc.	5,540	4,250	725	320	0	140	105
		Postdoc.	3,275	0	0	745	2,400	110	20
	Fellows	Total	4,090	3,200	0	235	400	80	175
		Predoc.	270	0	0	70	0	50	150
		Postdoc.	3,820	3,200	0	165	400	30	25

[a]The allocation of awards in the behavioral science awards between traineeships and fellowships is based on the distribution that prevailed in FY 1976, i.e., 82 percent traineeships, 18 percent fellowships.

[b]In previous reports, the Committee's recommendations for the Medical Scientist Training Program were included under the clinical sciences area.

[c]Recommendations for biostatistics, epidemiology, community and environmental health, and other training fields not specifically shown in this table are included here.

SOURCE: National Research Council. Personnel Needs and Training for Biomedical and Behavioral Research Personnel. National Academy of Sciences, Washington, D.C., 1978.

per year in the real stipend level. The agencies have announced that a one-time increase in stipends will be made in FY1980, equivalent to a 5 percent increase per year since 1974. An additional 5 percent increase has been included in the budget requested for FY1981. The Committee, having recommended such stipend increases in its 1977 and 1978 Reports, readily agrees with this action.

The stipend schedules starting on July 1, 1980, and planned for 1981 are as follows (Appendix C):

	Starting July 1, 1980	FY1981
Predoctorals	$ 5,040	$ 5,202
Postdoctorals		
Years of prior experience		
0	13,380	14,040
1	14,040	14,736
2	14,736	15,468
3	15,468	16,236
4	16,236	17,040
5	17,040	17,892
6	17,892	18,780
7 and over	18,780	19,716

The institutional allowances have also been changed under the new plan. For training grants, the 25 percent limit for institutional allowances on NRSA grants has been replaced by a plan that allows a maximum of $3,000 for each predoctoral trainee and $5,000 for each postdoctoral trainee. Indirect costs of 8 percent and trainee tuition may also continue to be requested. For postdoctoral fellowships, the maximum institutional allowance will be $5,000 per 12-month period at nonfederal institutions and $2,000 at federal institutions. These new allowances will apply to awards made after July 1, 1980.

Table 4.3 shows the estimated cost of the Committee's recommended training levels using the new stipend levels and assuming a 5 percent annual increase in other training costs.

BASIC BIOMEDICAL SCIENCES

Training Levels

In its 1976 and 1977 Reports (NRC, 1975-1978), the Committee recommended cutbacks amounting to 30 percent in the number of predoctorals supported annually between FY1975 and FY1979 from 6,000 to 4,250 and a level support of 3,200 postdoctorals. These recommendations were made in view of evidence of a reduction in the growth in the overall demand for biomedical scientists, while affirming the vital role played by the

TABLE 4.3 Estimated Cost of Recommended NIH/ADAMHA/HRA Training Programs for FY1980–1982 Under Announced Stipend Increase[a] (millions of dollars)

	Type of Program	Academic Level	All Fields TOTAL	Biomedical Sciences	Behavioral Sciences	Clinical Sciences	Health Service Research	Nursing Research
1980	TOTAL	Total	207.4	111.6	27.7	61.0	4.2	3.0
		Predoc.	65.9	55.1	6.7	0.0	1.8	2.3
		Postdoc.	141.5	56.5	21.0	61.0	2.4	0.7
	Trainees	Total	136.8	55.1	23.9	53.9	3.1	0.8
		Predoc.	62.6	55.1	5.5	0.0	1.3	0.6
		Postdoc.	74.2	0.0	18.4	53.9	1.8	0.2
	Fellows	Total	70.5	56.5	3.8	7.2	0.9	2.1
		Predoc.	3.3	0.0	1.2	0.0	0.4	1.7
		Postdoc.	67.2	56.5	2.6	7.2	0.5	0.4
1981	TOTAL	Total	218.8	117.2	29.4	64.1	4.7	3.5
		Predoc.	67.4	57.9	4.8	0.0	2.0	2.7
		Postdoc.	151.4	59.3	24.6	64.1	2.7	0.8
	Trainees	Total	144.7	57.9	25.3	56.5	3.6	1.2
		Predoc.	64.3	57.9	3.9	0.0	1.5	0.9
		Postdoc.	80.4	0.0	21.4	56.5	2.1	0.3
	Fellows	Total	74.1	59.3	4.0	7.6	1.1	2.3
		Predoc.	3.1	0.0	0.9	0.0	0.5	1.8
		Postdoc.	71.0	59.3	3.1	7.6	0.6	0.5
1982	TOTAL	Total	230.7	123.0	30.9	67.3	5.5	4.1
		Predoc.	71.3	60.8	5.0	0.0	2.3	3.1
		Postdoc.	159.4	62.2	25.9	67.3	3.2	1.0
	Trainees	Total	152.8	60.8	26.6	59.3	4.3	1.8
		Predoc.	67.9	60.8	4.1	0.0	1.7	1.3
		Postdoc.	84.9	0.0	22.5	59.3	2.6	0.5
	Fellows	Total	77.9	62.2	4.2	7.9	1.2	2.3
		Predoc.	3.4	0.0	0.9	0.0	0.6	1.8
		Postdoc.	74.5	62.2	3.3	7.9	0.6	0.5

[a] Calculations were based on 1978 average cost figures derived from NIH data and modified to reflect the announced stipend increases plus a 5% per year increment in nonstipend training costs.

Estimated Training Costs Per Award in FY1980 Under the Announced Stipend Increases
(based on average costs in FY 1978 and assuming a 5% per year increase in nonstipend training costs)

	Predoctoral					Postdoctoral				
FY 1980	Biomed. Sci.	Behavioral Sci.	Clinical Sci.	Health Services Research	Nursing Research	Biomed. Sci.	Behavioral Sci.	Clinical Sci.	Health Services Research	Nursing Research
Trainees	11,082	11,704	9,941	11,082	11,082	21,399	27,412	22,419	21,399	21,399
Fellows	11,082	11,705	9,941	11,082	11,082	17,640	18,151	17,977	17,640	17,640

training grant and fellowship programs in training high-quality researchers. The 1978 Report reiterated these recommended levels and suggested that time was needed to evaluate the effects of these cutbacks and further developments in the labor market before new recommendations could be made.

The Committee now feels that, by the time of filing its next Report, sufficient time will have elasped since its 1976 employment survey to permit such a new evaluation of the labor market. A survey of recent Ph.D.'s is currently being completed and will yield up-to-date information on employment patterns. In addition, the Committee plans during the months immediately ahead to conduct a series of site visits, based upon its 1977 survey of basic biomedical science departments, in order to evaluate the impact of cutbacks in training support on enrollments and program quality. Therefore, while the Committee affirms its previously recommended levels of 4,250 predoctorals and 3,200 postdoctorals, it does anticipate having sufficient information this coming year to reevaluate the conditions on which these earlier recommendations were based.

BEHAVIORAL SCIENCES

Predoctoral/Postdoctoral Support

In its 1976 Report, the Committee recommended a gradual shift in training emphasis in the behavioral sciences from a program of predominantly predoctoral support to one of predominantly postdoctoral support with a ratio ultimately of 30 percent predoctoral/70 percent postdoctoral awards (NRC, 1975-1978: 1976 Report, p. 10). The proposed shift in training emphasis seeks to promote the emergence of specialized investigators in innovative areas of behavioral research, such as research in health and behavior (NRC, 1975-1978: 1977 Report, p. 106).

The Committee recommended that this change in training emphasis be carried out gradually over a 6-year period (see, for example, Table 4.4), while maintaining total program costs at FY1975 levels, adjusted periodically for cost-of-living increases (cf., Table 4.3). Thus, the Committee calculated the total number of awards available each year by costing out the number of predoctoral and postdoctoral awards that could be supported given a constant level of funding and an average stipend cost for these awards (NRC, 1975-1978: 1976 Report, p. 10). The Committee recognized, of course, that the total number of NRSA awards in the behavioral sciences would decrease owing to the greater cost involved in training postdoctorals.

On the basis of those calculations, then, the Committee recommended that no fewer than 1,300 awards be made in the behavioral sciences at any time, with approximately 390 predoctoral awards and 910 postdoctorals when the 30/70 ratio was in place.

Information provided by NIH and ADAMHA reveals, however, that the proposed shift to predominantly postdoctoral support has been occurring more slowly than recommended by the Committee. In FY1978, the ratio of awards was 77 percent predoctoral/23 percent postdoctoral, essentially unchanged from the ratio of 78 percent predoctoral/22 percent postdoctoral reported by the agencies in FY1977. (A ratio of 55 percent predoctoral/45 percent postdoctoral was recommended by the Committee for FY1978.)

The failure to move more quickly to predominantly postdoctoral support may also be partly a function of the slow expansion in the number of postdoctoral applications in this area. Table 4.4 below reveals that the actual number of postdoctoral awards made in FY1978 is less than half the recommended number.

Table 4.4 Committee Recommendations and Actual Awards by NIH and ADAMHA in the Behavioral Sciences

Agency Awards and Committee Recommendations	Fiscal Year							
	1975	1976	1977	1978	1979	1980	1981	1982
Actual awards								
Total	1966	1801	1738	1514				
Predoc.	1754	1401	1352	1160				
Postdoc.	212	400	386	354				
Committee recommendations								
Total		1860	1740	1590	1490	1390	1300	1300
Predoc.		1500	1200	850	745	575	390	390
Postdoc.		360	540	740	745	815	910	910

In a recent memorandum to the Institute Directors of ADAMHA, Dr. Gerald Klerman, Administrator, acknowledged that little shift had occurred toward the goal of 30 percent predoctoral/70 percent postdoctoral support in the behavioral sciences. Dr. Klerman proposed the establishment of a schedule for ADAMHA to reach the ratio of awards recommended by the Committee by FY1983[2]:

> Because of the evidence of only limited achievement in shifting the emphasis in behavioral science research training to postdoctoral support, I feel that a strong commitment from you and your staff is necessary in order for us to meet this goal. While it is not possible for us to reach the NAS-recommended goal by 1981 (based on current program distribution), I am establishing a schedule of goals for achieving the NAS recommended distribution in fiscal year 1983....

The Committee reiterates its view that if the goal of reaching a 30/70 ratio is to be achieved, and the desired specialized training in health and behavior at the postdoctoral level provided, it must be done by markedly increasing the number of postdoctoral awards and an orderly decrease in the number of predoctorals, rather than by merely reducing predoctoral support. Recognition of this point appears in a more recent memorandum from Dr. Klerman to ADAMHA research training program directors [3]:

> ADAMHA is giving special attention to increasing the number of postdoctoral trainees and fellows supported under the National Research Service Award (NRSA) program. Accordingly the number of awards for predoctoral training in the behavioral sciences will decline progressively to achieve, by 1983, a distribution of 70% postdoctoral trainees and 30% predoctoral trainees. In order to achieve this goal, only a limited number of new and competing extension (renewal) awards will be made each year for predoctoral training grant programs and predoctoral fellowships.

Because patterns of postdoctoral research training have not been as common in the behavioral sciences as in other areas, rapid expansion of the number of postdoctoral programs may be difficult. However, data from the NRC Committee on a Study of Postdoctoral Research Staff in Science and Engineering suggest that the number of behavioral scientists on postdoctoral appointments of all kinds almost doubled between 1973 and 1977--from 365 to 684 (NRC, 1978). Furthermore, a recent follow-up of graduates of NIMH research training programs in psychology reveals a sharp increase in the proportion of research postdoctorals--from 4 percent of those completing their training between 1968 and 1972 to over 11 percent of the 1973-1976 cohort.[4]

Together these data suggest that a trend toward postdoctoral training was underway even as the Committee formulated its recommendations in this area, and that there may be a larger opportunity for postdoctoral programs than ADAMHA is now supporting.

Institutions and training directors interested in providing postdoctoral research training support will be challenged to adapt existing patterns of education and to create new training experiences. However, the Committee believes this can be accomplished, and welcomes the commitment of ADAMHA and other agencies to this goal.

Traineeships/Fellowships

Each year the Committee has endorsed the existing ratio of approximately 80 percent traineeships/20 percent fellowships as a suitable mixture for research training in the behavioral sciences. Data reveal that this ratio shifted to almost 90 percent traineeships/10 percent fellowships in FY1978. This change appears to be linked to a decline in FY1978 appropriations for ADAMHA (see p. 50). While this may be a temporary perturbation in the system, the situation merits monitoring during the coming year.

The institutional training grant has become the primary mechanism of support over the years in the behavioral sciences. However, in fields such as anthropology and ethology, the research training fellowship provides opportunities for important predoctoral field work. It also assures opportunity for postdoctoral training for some investigators in new or emerging areas for which institutional training programs do not yet exist. Hence, it is important that the opportunity for training through NRSA fellowship awards not be substantially curtailed. The Committee, therefore, continues to recommend support for research training in the behavioral sciences through fellowships as well as institutional traineeships, and affirms its recommendation that the ratio of traineeships to fellowships be maintained at approximately 80 percent/20 percent through FY1983.

Reduction in Behavioral Science Awards

As noted earlier in this chapter, the number of awards made by NIH in the behavioral sciences declined substantially between 1977 and 1978. Whereas the number of behavioral science awards made by ADAMHA declined by about 5 percent between 1977 and 1978, the total number of predoctoral and postdoctoral awards made by NIH in the behavioral sciences declined by almost 30 percent during that time. The reasons for this sharp drop are not completely clear. Most of the

reductions occurred in the predoctoral training grants sponsored by NIGMS under the former (pre-NRSA) PHS authority. Some of the decline may be attributable to changes in classification. However, the extent to which such behavioral sciences training is counted in other areas remains to be clarified by the Committee in the coming year.

CLINICAL SCIENCES

In its 1978 Report (NRC, 1975-1978, p. 103), the Committee forecast a need for an annual increment of approximately 1,800 persons to meet requirements created by expansion and attrition of clinical faculties in medical schools over the next few years. Postulating a 3-year length of research training experience in the clinical disciplines, the nationwide pool of postdoctoral research trainees would have to be approximately 5,400 to achieve the described annual increment. For purposes of its funding recommendation, the Committee selected 50 percent of the total pool as the appropriate number of persons to be supported under the NRSA Act. The resulting calculations were subsequently adjusted to reflect two additional factors. First, the pool includes doctorate holders other than M.D.'s, such as individuals with the D.V.M., D.D.S., and Ph.D. degrees. Second, demand emanates from employment sites other than medical schools.

On the basis of the foregoing, federal support was recommended for 2,800 postdoctoral trainees and fellows. Since publication of its last report, no new data have become available that would lead the Committee to change its previous recommendation.

HEALTH SERVICES RESEARCH

For over 3 years the Committee has identified health services research as an emerging area of national need and has described the importance of federal support for research training in this area (NRC, 1975-1978: 1977-1978 Reports). The Committee notes that in his FY1980 budget proposal to Congress, President Carter emphasized two priorities in the health area, which probably require more emphasis on health services research and perhaps additional trained HSR personnel (Office of Management and Budget, 1979, pp. 231-232):

- Expanded assistance to improve access to health services for those most in need.

- Increased efforts to control inflationary growth in health care costs and to eliminate waste, fraud, and abuse in federally supported programs.

The FY1980 budget specifies that $62 million of the proposed $3.4 billion for health research is to be available for services research through the Health Care Financing Administration and NCHSR. It is expected that these funds will be used for research "in the area of technology assessment, cost containment and health planning, regulation and health [and for] survey work essential for some of the decisions to be made for the national health insurance plan" (Office of Management and Budget, 1979). These figures do not include, however, that portion of the ADAMHA research budget that will support an expanded mental health services research effort in keeping with the recommendations of the Report of the President's Commission on Mental Health (1978).

While there is, then, a clearly expressed national commitment to improve health care and health services research, a comparable commitment to the training of needed health services research personnel is generally lacking.

The only explicitly identifiable health services research training currently under the NRSA authority is that supported by ADAMHA for training in research on mental health, drug abuse, and alcoholism services. In 1978, 136 awards were made for such training (see Table 4.1).

NIH sponsors training under the NRSA authority in basic fields related to health services research (such as biostatistics, epidemiology, and public health). However, the present system of recording specialty fields of training has not allowed the Committee to determine the extent to which health services research training actually is being provided through these awards (NRC, 1975-1978: 1978 Report, pp. 116-117).[5]

Finally, as mentioned earlier, the recent extension of the NRSA authority to permit the use of these awards by the NCHSR makes possible a greater commitment of research training funds to the production of investigators in this area. It is the Committee's hope that a program of general health services research training will now be established in keeping with this legislative action.

In the past 2 years the Committee called for a 10 percent per annum increment in the number of NRSA awards made by ADAMHA in the area of health services research training (NRC, 1975-1978: 1977 Report, p. 144). The Committee notes that this recommendation has not been followed and that, in fact, the number of awards has declined from 164 in FY1976 to 136 in FY1978. This makes the Committee's former recommendations outmoded.

Yet the Committee does not consider its earlier goals undesirable. The Committee affirms its recommendation that ADAMHA expand its training in health services research at a rate of 10 percent per annum from present levels, thus achieving the recommended program levels (Table 4.2) by the mid-1980's.

NURSING RESEARCH

The research capabilities of many of the schools of nursing must be improved before strong doctoral training programs can be established. Hence, the Committee has recommended that NRSA institutional training grants be awarded to schools of nursing primarily to assist in the establishment of interdisciplinary programs that involve the close cooperation of university departments in the biological, physical, or behavioral sciences. However, where a strong research environment already exists in "well-qualified" schools of nursing, the Committee has also recommended that a limited number of these institutional grants be provided for doctoral research training.

The Committee notes that this recommendation has generated a great deal of controversy within the nursing profession. This appears to stem in part from a belief that interdisciplinary approaches to training often lack strong institutional support (Hansen and Williams, 1979), or will produce investigators without clear professional affiliations (Barritt, 1979).

The Committee believes a serious need now exists to provide ample opportunity for nurses to obtain scientific training in relevant basic science disciplines. This need will continue to exist even as schools of nursing bolster their programs of research and develop sound nursing education programs at the doctorate level. Hence, the Committee affirms its conclusion that opportunities for scientific training must be fostered through institutional arrangements that contribute to the advancement of nursing research.

The Committee is aware that its recommendation to limit training grants to "well-qualified" schools of nursing is perceived by the nursing profession as a doubled-edged sword. A majority of nurses endorse the criterion of "excellence" as a prerequisite to NRSA support (Gortner, 1979; Murphy, 1979). Others, however, find that many schools are unable to enhance their research capabilities owing to capricious federal budget policies (NRC, 1975-1978: 1978 Report, p. 137).

The primary concern of the Committee, of course, is that the quality of research training in nursing be high. For this reason, the primary need is, and will continue to be, to train nursing researchers in the basic sciences even as the research capabilities of schools of nursing improve.

Predoctoral/Postdoctoral Awards

In its 1977 and 1978 Reports (NRC, 1975-1978), the Committee recommended an expansion of the NRSA program from a total of

240 awards in FY1980 to 300 awards in FY1982. The HRA Division of Nursing has made substantial strides in expanding the NRSA awards in FY1978. The current rate of program growth would suggest that the Division will meet the Committee's recommended level of NRSA support by the early 1980's if funds are made available. The Committee notes that the bulk of awards have been made for predoctoral support in accordance with the recommendations of the Committee. In light of these developments, the Committee has concluded that the size of the program and rate of growth recommended in earlier reports continue to be appropriate.

Fellowships

The Committee has suggested in earlier reports that a major reorientation in fellowship support provided by the HRA Division of Nursing should occur so that there would be a substantial reduction in training support for study in nonscience departments (NRC, 1975-1978: 1977 Report, p. 164). Recent data from the Division of Nursing reveal that the proportion of individuals receiving fellowship support in nonscience areas has indeed been reduced.[6] The Committee applauds these efforts and will continue to monitor the development of this program by the Division. In the meantime, the Committee affirms its recommendations of previous years.

Senior Investigators

In its 1978 Report (NRC, 1975-1978, p. 142), the Committee acknowledged the need to give serious consideration to the recruitment of midcareer investigators whose research skills may need to be upgraded in view of the recent advances in nursing research. The Committee has learned that the HRA Division of Nursing is exploring a program of Senior Investigator Awards that would provide such midcareer opportunities under the auspices of the NRSA authority.

The Committee regards its recommendation for fellowship support as adequate to implement such a program on an experimental basis at the postdoctoral level. The Committee urges the Division to consider implementing a model program of senior investigator awards within the scope of fellowship support described by the Committee, and to keep the Committee informed of progress in this area.

NOTES

1. The Committee has examined closely the training grants awarded by NIH in epidemiology and biostatistics and has concluded that these grants do not fall within the Panel's definition of HSR (see NRC, 1975-1978: 1978 Report, p. 113). These awards, therefore, are shown in Table 4.1 under the biomedical sciences. Similarly, awards made by the NIH in the fields of community and environmental health are also shown under the biomedical sciences, although NIH would define these as HSR. The Panel on HSR is in the process of examining these latter awards, and will report the results of their analysis to the Committee in future reports.

ADAMHA provides training in these areas but was not asked to supply data in this format. ADAMHA also provides support for research training of clinicians, but these persons are not considered to be training in the clinical sciences and are reported in other areas depending on the disciplinary focus of their training.

2. Dr. Gerald Klerman, Administrator, ADAMHA, memorandum to Institute Directors, June 29, 1979.

3. Administrator, ADAMHA, memorandum to ADAMHA NRSA Research Training Program Directors and Potential Research Training Grant and Fellowship Applicants, December 19, 1979.

4. Dr. Stanley Schneider, Chief, Psychology Education Branch, NIMH, in an unpublished report transmitted to Dr. Pamela Ebert-Flattau, July 24, 1979.

5. The manner in which NIH reports its NRSA awards for the area of health services research training has been discussed extensively between NIH and Committee staff. The Committee has concluded that a two-dimensional matrix, similar to the one developed by ADAMHA, is the best means for the Committee to determine the extent to which these NIH awards are oriented toward the research problems that characterize health services research and set it apart from the other biosciences (see NRC, 1975-1978: 1978 Report, pp. 113-117).

6. In FY1978, 26 fellowships were awarded in the behavioral sciences: 27 in nursing, 10 in education, 4 in health services administration, 2 in the biomedical sciences, and 3 in other fields. Dr. Marie Bourgeois, HRA, Division of Nursing, personal communication to Dr. Pamela Ebert-Flattau, April 12, 1979.

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APPENDIXES

APPENDIX A

NATIONAL RESEARCH SERVICE AWARD AUTHORITY

A.1: Public Law 93-348, as Amended

A.2: Public Law 95-622

A.3: Legislative History

NATIONAL RESEARCH SERVICE AWARD AUTHORITY

Public Law 93-348, as Amended

NATIONAL RESEARCH SERVICE AWARDS

SEC. 472. (a)(1) The Secretary shall— 42 U.S.C. 289l-1

(A) provide National Research Service Awards for—

(i) biomedical and behavioral research at the National Institutes of Health and the Alcohol, Drug Abuse, and Mental Health Administration or under programs administered by the Division of Nursing of the Health Resources Administration, in matters relating to the cause, diagnosis, prevention, and treatment of the diseases or other health problems or Division of Nursing.

(ii) training at the Institutes and Administration of individuals to undertake such research,

(iii) biomedical and behavioral research at public institutions and at nonprofit private institutions, and

(iv) pre- and post doctoral training at such public and private institutions of individuals to undertake such research; and

(B) make grants to public institutions and to nonprofit private institutions to enable such institutions to make to individuals selected by them National Research Service Awards for research (and training to undertake such research) in the matters described in subparagraph (A)(i).

A reference in this subsection to the National Institutes of Health or the Alcohol, Drug Abuse, and Mental Health Administration shall be considered to include the institutes, divisions, and bureaus included in the Institutes or under the Administration, as the case may be.

(2) National Research Service Awards may not be used to support residencies.

(3) Effective July 1, 1975, National Research Service Awards may be made for research or research training in only those subject areas for which, as determined under section 473, there is a need for personnel.

(b)(1) No National Research Service Award may be made by the Secretary to any individual unless—

(A) the individual has submitted to the Secretary an application therefor and the Secretary has approved the application;

(B) the individual provides, in such form and manner as the Secretary shall by regulation prescribe, assurances satisfactory to the Secretary that the individual will meet the service requirement of subsection (c)(1); and

(C) in the case of a National Research Service Award for a purpose described in subsection (a)(1)(A)(iii) or (a)(1)(A)(iv), the individual has been sponsored (in such manner as the Secretary may by

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(ii) if authorized under subparagraph (B), serve as a member of the National Health Service Corps or serve in his specialty, or

(iii) if authorized under subparagraph (C), serve in a health related activity approved under that subparagraph,

for a period computed in accordance with paragraph (2).

(B) Any individual who received a National Research Service Award and who is a physician, dentist, nurse, or other individual trained to provide health care directly to individual patients may, upon application to the Secretary, be authorized by the Secretary to—

(i) serve as a member of the National Health Service Corps,

(ii) serve in his specialty in private practice in a geographic area designated by the Secretary as requiring that specialty, or

(iii) provides services in his specialty for a health maintenance organization to which payments may be made under section 1876 of title XVIII of the Social Security Act and which serves a medically underserved population (as defined in section 1302 (7) of this Act),

in lieu of engaging in health research or teaching if the Secretary determines that there are no suitable health research or teaching positions available to such individual.

(C) Where appropriate the Secretary may, upon application, authorize a recipient of a National Research Service Award. who is not trained to provide health care directly to individual patients. to engage in a health-related activity in lieu of engaging in health research or teaching if the Secretary determines that there are no suitable health research or teaching positions available to such individual.

(2) For each year for which an individual receives a National Research Service Award he shall—

(A) for twelve months engage in health research or teaching or any combination thereof which is in accordance with the usual patterns of academic employment. or, if so authorized. serve as a member of the National Health Service Corps. or

(B) if authorized under paragraph (1)(B) or (1)(C), for twenty months serve in his specialty or engage in a health-related activity.

(3) The requirement of paragraph (1) shall be complied with by any individual to whom it applies within such reasonable period of time, after the completion of such individual's Award, as the Secretary shall by regulation prescribe. The Secretary shall (A) by regulation prescribe (i) the type of research and teaching which an

regulation require) by the institution at which the research or training under the Award will be conducted.

An application for an Award shall be in such form, submitted in such manner, and contain such information, as the Secretary may by regulation prescribe.

(2) The award of National Research Service Awards by the Secretary under subsection (a) and the making of grants for such Awards shall be subject to review and approval by the appropriate advisory councils within the Department of Health, Education, and Welfare (A) whose activities relate to the research or training under the Awards, or (B) at which such research or training will be conducted.

(3) No grant may be made under subsection (a)(1)(B) unless an application therefor has been submitted to and approved by the Secretary. Such application shall be in such form, submitted in such manner, and contain such information, as the Secretary may by regulation prescribe. Subject to the provisions of this section other than paragraph (1) of this subsection, National Research Service Awards made under a grant under subsection (a)(1)(B) shall be made in accordance with such regulations as the Secretary shall prescribe.

(4) The period of any National Research Service Award made to any individual under subsection (a) may not exceed three years in the aggregate unless the Secretary for good cause shown waives the application of the three-year limit to such individual.

(5) National Research Service Awards shall provide for such stipends and allowances (including travel and subsistence expenses and dependency allowances) for the recipients of the Awards as the Secretary may deem necessary. A National Research Service Award made to an individual for research or research training at a non-Federal public or nonprofit private institution shall also provide for payments to be made to the institution for the cost of support services (including the cost of faculty salaries, supplies, equipment, general research support, and related items) provided such individual by such institution. The amount of any such payments to any institution shall be determined by the Secretary and shall bear a direct relationship to the reasonable costs of the institution for establishing and maintaining the quality of its biomedical and behavioral research and training programs.

(c)(1)(A) Each individual who receives a National Research Service Award shall, in accordance with paragraph (3), engage in—

(i) health research or teaching or any combination thereof which is in accordance with usual patterns of academic employment,

individual may engage in to comply with such requirement, and (ii) such other requirements respecting such research and teaching and alternative service authorized under paragraphs (1)(B) and (1)(C) as he deems necessary; and (B) to the extent feasible, provide that the members of the National Health Service Corps who are serving in the Corps to meet the requirement of paragraph (1) shall be assigned to patient care and to positions which utilize the clinical training and experience of the members.

(4)(A) If any individual to whom the requirement of paragraph (1) is applicable fails, within the period prescribed by paragraph (3), to comply with such requirement, the United States shall be entitled to recover from such individual an amount determined in accordance with the formula—

$$A = \phi\left(\frac{t - \frac{1}{2}s}{t}\right)$$

in which "A" is the amount the United States is entitled to recover; "ø" is the sum of the total amount paid under one or more National Research Service Awards to such individual; "t" is the total number of months in such individual's service obligation; and "s" is the number of months of such obligation served by him in accordance with paragraphs (1) and (2) of this subsection.

(B) Any amount which the United States is entitled to recover under subparagraph (A) shall, within the three-year period beginning on the date the United States becomes entitled to recover such amount, be paid to the United States. Until any amount due the United States under subparagraph (A) on account of any National Research Service Award is paid, there shall accrue to the United States interest on such amount at a rate fixed by the Secretary of the Treasury after taking into consideration private consumer rates of interest prevailing on the date the United States becomes entitled to such amount.

(5)(A) Any obligation of any individual under paragraph (3) shall be canceled upon the death of such individual.

(B) The Secretary shall by regulation provide for the waiver or suspension of any such obligation applicable to any individual whenever compliance by such individual is impossible or would involve extreme hardship to such individual and if enforcement of such obligation with respect to any individual would be against equity and good conscience.

(d) There are authorized to be appropriated to make payments under National Research Service Awards and under grants for such Awards $207,947,000 for the fiscal year ending June 30, 1975, $165,000,000 for fiscal year 1976, and $185,000,000 for fiscal year 1977. Of the sums appropriated under this subsection, not less than 25 per

centum shall be made available for payments under National Research Service Awards provided by the Secretary under subsection (a)(1)(A).

STUDIES RESPECTING BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

SEC. 473. (a) The Secretary shall, in accordance with subsection (b), arrange for the conduct of a continuing study to— 42 U.S.C. 289l-3

(1) establish (A) the Nation's overall need for biomedical and behavioral research personnel, (B) the subject areas in which such personnel are needed and the number of such personnel needed in each such area, and (C) the kinds and extent of training which should be provided such personnel;

(2) assess (A) current training programs available for the training of biomedical and behavioral research personnel which are conducted under this Act at or through institutes under the National Institutes of Health and the Alcohol, Drug Abuse, and Mental Health Administration, and (B) other current training programs available for the training of such personnel;

(3) identify the kinds of research positions available to and held by individuals completing such programs;

(4) determine, to the extent feasible, whether the programs referred to in clause (B) of paragraph (2) would be adequate to meet the needs established under paragraph (1) if the programs referred to in clause (A) of paragraph (2) were terminated; and

(5) determine what modifications in the programs referred to in paragraph (2) are required to meet the needs established under paragraph (1).

(b)(1) The Secretary shall request the National Academy of Sciences to conduct the study required by subsection (a) under an arrangement under which the actual expenses incurred by such Academy in conducting such study will be paid by the Secretary. If the National Academy of Sciences is willing to do so, the Secretary shall enter into such an arrangement with such Academy for the conduct of such study.

(2) If the National Academy of Sciences is unwilling to conduct such study under such an arrangement, then the Secretary shall enter into a similar arrangement with other appropriate nonprofit private groups or associations under which such groups or associations will conduct such study and prepare and submit the reports thereon as provided in subsection (c).

(3) The National Academy of Sciences or other group or association conducting the study required by subsection (a) shall conduct such study in consultation with the Director of the National Institute of Health.

(c) A report on the results of such study shall be submitted by the Secretary to the Committee on Interstate and Foreign Commerce of the House of Representatives and the Committee on Labor and Public Welfare of the Senate not later than September 30 of each year.

NATIONAL RESEARCH SERVICE AWARD AUTHORITY

Public Law 95-622

PART D—NATIONAL RESEARCH SERVICE AWARDS

EXTENSION OF AUTHORIZATIONS

SEC. 251. (a) Subsection (d) of section 472 is amended by striking out "and" after "1977," and by inserting before the period at the end of the first sentence the following: ", $197,500,000 for the fiscal year ending September 30, 1979, $210,000,000 for the fiscal year ending September 30, 1980, and $222,500,000 for the fiscal year ending September 30, 1981".

(b) Subsection (d) of such section is amended (1) by striking out "25 per centum" in the second sentence and inserting in lieu thereof "15 per centum", and (2) by inserting before the period "and not less than 50 per centum shall be made available for grants under subsection (a)(1)(B) for National Research Service Awards".

(c) Subsection (d) of such section is amended by adding at the end thereof the following new sentence: "In any fiscal year not more than 4 per centum of the amount obligated to be expended under this section may be obligated for National Research Service Awards for periods of three months or less.".

APPROVAL OF AWARDS

SEC. 252. Paragraph (2) of subsection (b) of such section is amended by striking out "The award of National Research Service Awards by the Secretary under subsection (a) and the making of grants for such Awards" and inserting in lieu thereof "The making of grants under subsection (a)(1)(B) for National Research Service Awards".

PERIOD OF AWARDS

SEC. 253. Paragraph (4) of subsection (b) of such section is amended to read as follows:

"(4) The period of any National Research Service Award made to any individual under subsection (a) may not exceed—

"(A) five years in the aggregate for predoctoral training, and

"(B) three years in the aggregate for postdoctoral training,

unless the Secretary for good cause shown waives the application of such limit to such individual."

ADJUSTMENTS IN ALLOWANCES

SEC. 254. The first sentence of subsection (b)(5) of such section is amended by inserting after "dependency allowances)" the following: ", adjusted periodically to reflect increases in the cost of living".

SERVICE OBLIGATION

SEC. 255. (a) Subparagraph (B) of subsection (c)(1) of such section is amended (1) by inserting "or" in clause (i) after "Corps,", (2) by striking out clause (ii), and (3) by redesignating clause (iii) as clause (ii).

(b)(1) Paragraph (2) of subsection (c) of such section is amended to read as follows:

"(2) For each month for which an individual receives a National Research Service Award which is made for a period in excess of three months, such individual shall—

"(A) for one month engage in health research or teaching or any combination thereof which is in accordance with the usual patterns of academic employment, or, if so authorized, serve as a member of the National Health Service Corps, or

"(B) if authorized under paragraph (1)(B) or (1)(C), for one month serve in the individual's specialty or engage in a health-related activity."

(2) Paragraph (4)(A) of such subsection is amended by striking out

$$\text{"}A=\phi\left(\frac{t-\frac{1}{2}s}{t}\right)\text{"}$$

and inserting in lieu thereof

$$\text{"}A=\phi\left(\frac{t-s}{t}\right)\text{"}.$$

(3) Paragraph (5)(B) of such subsection amended by striking out "extreme hardship" and inserting in lieu thereof "substantial hardship".

(b) The amendments made by subsection (a) shall apply only with respect to National Research Service Awards made under section 472 of the Public Health Service Act after the date of the enactment of this Act.

REPORTS ON STUDIES

SEC. 256. Section 473(c) is amended by striking out "not later than September 30 of each year" and inserting in lieu thereof "at least once every two years".

Legislative History

Background. The Public Health Service (PHS) was first given the authority to train researchers through the Ransdell Act of 1930 (PL 71-251). This Act established the first of the National Institutes of Health (NIH) and created a system of research fellowships for duty at NIH and at other medical and research institutions. Since that time the PHS authority has been broadened on at least 11 occasions, providing opportunities for training as each NIH institute was created. Table 1 presents a summary of the legislative history through 1972.

TABLE 1: Legislative History of Research Training in the Biosciences (1930-1972)

ACT	PL NUMBER	DESCRIPTION
Ransdell Act of 1930	71-251	Authorized biomedical research fellowships.
National Cancer Institute Act of 1937	75-244	Fellowships and training facilities related to cancer.
Public Health Service Act of 1944	78-410	General research fellowship and research project grant authority, sec. 301(c) and (d) of the act.
National Mental Health Act of 1946	79-487	Authority for training in mental health, sec. 303.
National Heart Act of 1948	80-655	Training and fellowships in diseases of the heart and circulation, sec. 412(7)
National Dental Research Act of 1948	80-755	Training and fellowships in dental diseases and conditions, sec. 422(c) and (f).
(No title; authorized establishment of research institutes; 1950).	81-692	General training and fellowship authority, sec. 433.
International Health Research Act of 1960	86-610	Authority for training and fellowships abroad, sec. 308.
(No title; authorized research training, NIGMS and NICHD; 1962).	87-838	General research training authority, sec. 301(d); NIGMS and NICHD secs. 442 and 444.
(No title; establishes the National Eye Institute; 1968).	90-489	NEI authority, sec. 453.
National Cancer Act of 1971	92-218	Training and fellowships for cancer, sec. 407(b)(7).
National Heart, Blood Vessel, Lung, and Blood Act of 1972.	92-423	Training and fellowships for heart and related diseases, sec. 413(a)(1).

SOURCE: House of Representatives, Report No. 93-224 "National Biomedical Research Fellowship, Traineeship and Training Act of 1973", Washington, D.C. 1973.

In presenting its budget recommendations for FY 1974, the Administration proposed phasing out this research training and fellowship program over a five year period by making no new awards, honoring only existing program

commitments. The reasons cited as the basis for this recommendation included: (1) the need for such programs and the manpower trained by them had never been adequately justified; (2) people trained in these programs later in life earned incomes which made it reasonable to ask them to bear the cost of their own training; (3) large numbers of those trained did not enter either biomedical research or academic training; (4) alternative federal programs of support for this training were available; and (5) the programs were not equitable because support was not available equally to all students.[1]

The Administration's position met with almost universal opposition by the nation's biomedical research community.[2] As a result, in July, 1973 the Administration reversed its position, and announced instead that a new, but much smaller, fellowship program would be developed which, in effect, would eliminate all training grant awards and would provide fellowships only at the postdoctoral level.[3]

The 1974 Legislation. Concerned that the Administration's proposals might significantly damage the national biomedical research effort,[4] Congress in 1974 enacted the National Research Act (PL 93-348) which stated:

> [T]he success and continued viability of the Federal biomedical and behavioral research effort depends on the availability of excellent scientists and a network of institutions of excellence capable of producing superior research personnel (Sec. 102).

Title I of that Act, the National Research Service Award (NRSA) Act of 1974, consolidated existing research training and fellowship authorities into a single, new authority. In addition to providing training authority to the NIH and ADAMHA, this new program of support contained several innovative features. While support for both individual fellowships and institutional training grants was retained for pre- and postdoctoral training, it was stipulated that an individual may receive support for no more than three years in the aggregate unless the Secretary, DHEW, waives the limitation on a case by case basis. This limitation was subsequently clarified in the 1978 amendments (see below).

Another feature of the Act is that each recipient of the award is required to reciprocate the support by engaging in health research or teaching for a period of 12 months for each year federal support is received. In the case of health professionals this payback provision may be fulfilled by serving in the National Health Service Corps.

In writing this legislation Congress admitted that an entirely different approach to training investigators might well be preferred to modifying the older program.[5] For this reason, Congress added a provision to the legislation which calls for a continuing study of training needs

with periodic reports and recommendations to the Congress. The National Academy of Sciences was asked to undertake this study and to examine the training programs "in more detail and more carefully than has been yet possible" with the intention that the results of the study will be given "serious legislative consideration".[6]

Amendments of 1976. In 1976, the NRSA authority was extended and revised through the Health Research and Health Amendments (PL 94-278). Training authority was extended to include the programs of the Health Resources Administration's (HRA) Division of Nursing, a unit which formerly had been a part of the NIH.

The so-called "payback provision" was broadened through these amendments to permit engagement in "health research or teaching or any combination thereof which is in accordance with usual patterns of academic employment", thus permitting service in appropriate nonacademic settings.

Finally, the 1976 amendments specified that the NAS conduct its study of personnel needs in consultation with NIH.

Amendments of 1978. The NRSA authority was extended most recently through the Community Mental Health Centers Extension and the Biomedical Research Extension Acts of 1978 (PL 95-622). Reauthorizing training support through September 30, 1981, the Act made several changes in the earlier legislative provisions: (1) not less than 50 percent of the program funds shall be made for institutional training grants; (2) the period of award for any individual

may not exceed 5 years in the aggregate at the predoctoral level and 3 years in the aggregate for postdoctoral training; and (3) allowances may now be adjusted annually to reflect cost of living increases.

Opportunities for short-term training represent another new feature of the NRSA program introduced with the 1978 amendments. Individuals may now receive up to three months of support for research training without incurring any obligation to pay back such support.

Finally, the 1978 NRSA amendments require the NAS to submit its reports at least once every two years, thereby modifying the previous requirement for annual reports.

FOOTNOTES

1. U.S. Senate, Report No. 93-381, "National Research Service Award Act", Washington, D.C., 1973.

2. Ibid.

3. Dr. Henry Simmons, DHEW, testimony before the U.S. Senate Committee on Labor and Public Welfare, July 10, 1973.

4. U.S. Senate, op. cit.

5. U.S. House of Representatives, Report No. 93-224, "National Biomedical Research Fellowship, Traineeship and Training Act of 1973," Washington, D.C., 1973.

6. Ibid.

APPENDIX B

SUMMARY OF RECOMMENDATIONS FROM THE 1978 COMMITTEE REPORT

NATIONAL RESEARCH COUNCIL
COMMISSION ON HUMAN RESOURCES

2101 Constitution Avenue Washington, D. C. 20418

COMMITTEE ON A STUDY OF NATIONAL NEEDS FOR
BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

RECOMMENDATIONS FROM THE 1978 REPORT: PERSONNEL NEEDS AND TRAINING FOR BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

CHAPTER 1. INTRODUCTION AND SUMMARY OF NUMERICAL RECOMMENDATIONS, FISCAL YEARS 1980-82

Mechanisms of Support. As in last year's report the Committee recommends that the federal government continue to support and maintain both training grant and fellowship programs in the biomedical and behavioral sciences. Specific recommendations for each of the broad areas are reported in the following chapters. (Page 11)

CHAPTER 2. BASIC BIOMEDICAL SCIENCES

Predoctoral Training Levels. The number of predoctorals supported in the basic biomedical sciences should be maintained at a level of 4,250 for FY 1980 and until such time as new information indicates to the Committee that a change should be made. (Page 51)

Postdoctoral Training Levels. The Committee recommends that for FY 1980-82, 3,200 postdoctorals continue to be supported annually. The Committee further recommends that of this number approximately 200 postdoctoral awards each year be in the field of toxicology or research training related to toxicology. (Page 51)

Training Grants and Fellowships. The Committee recommends that institutional training grants be the primary mechanism for NRSA support of predoctoral students in the basic biomedical sciences. Support of postdoctoral training, on the other hand, should utilize primarily the mechanism of individual fellowships. (Page 53)

Priority Fields and Announcement Areas.

Predoctoral Training. The Committee recommends that 1) predoctoral training fields not be specified in agency announcements for reasons other than for review and administrative purposes except for epidemiology, biomathematics/biostatistics, and toxicology which are viewed by the Committee as priority areas for predoctoral training; 2) NIH provide support for the establishment of prototype, multidisciplinary, predoctoral training grant programs in toxicology and related research areas in order to meet the long-term needs in this field for broadly trained researchers. (Page 55)

Postdoctoral Training. The Committee recommends that 1) in the field of biomathematics/biostatistics, encouragement be given to establishing programs to provide mathematical training for doctorates from other biomedical sciences; 2) in the field of epidemiology, encouragement and emphasis be given to attracting and providing postdoctoral training for M.D.'s; and 3) increased postdoctoral support be provided to the field of toxicology. (Page 55)

Coordination of NIH Support for Predoctoral Training. The Committee recommends that NIH establish a procedure for coordinating all of its support for predoctoral training in the basic biomedical sciences. It is suggested that this might be accomplished either through the Office of the Director or by placing this administrative responsibility within NIGMS. The purpose of such coordination is to ensure that no aspect of predoctoral training in the basic biomedical sciences, including the fields of biomathematics/biostatistics and epidemiology, is either undersupported or overemphasized.

Regardless of the administrative means selected, the funding institutes should participate fully both in providing appropriate support for the final program adopted by the agency, as well as in the decision-making process whereby this plan is established. (Page 56)

Multidisciplinary Training Grants. The Committee recommends that NIH not discourage applications for predoctoral training grants from single departments, and that NIH leave to the peer review system, as part of the application review process, decisions about what departmental arrangements in each case are best. (Page 57)

Fellowship Applications. The Committee recommends that the time for reviewing postdoctoral fellowship applications be reduced by omitting the currently required review and approval by advisory councils and by whatever other means may be possible. (Page 57)

CHAPTER 3. BEHAVIORAL SCIENCES

Predoctoral/Postdoctoral Support. The Committee recommends that a joint policy be developed by NIH and ADAMHA for implementing the Committee's recommendations so as to permit suitable departures from the recommended overall ratio of 30 percent predoctoral/70 percent postdoctoral support by those institutes that can demonstrate a need for expanding their support of predoctoral research training. (Page 76)

The Committee reaffirms its recommendation that a ratio of 30 percent predoctoral/70 percent postdoctoral be achieved by FY 1981. The Committee recommends further that this ratio be maintained through FY 1982. (Page 77)

Traineeships/Fellowships. The Committee reaffirms its recommendation that the proportion of traineeship to fellowship awards be maintained at a ratio of about 80 percent to 20 percent through FY 1982. (Page 77)

Minority Research Training Support. The Committee recommends that ADAMHA waive its two-year restriction to permit recruitment of minority scientists through current NRSA programs. Such a recommendation becomes increasingly feasible in the face of the congressional proposal to extend NRSA predoctoral research training support to a total of 5 years.

The Committee commends ADAMHA for its efforts to develop special programs for minorities. At the same time, however, the need continues to recruit such personnel through current programs. (Page 79)

CHAPTER 4. CLINICAL SCIENCES

Recommendation. The Committee recommends that 2,800 postdoctoral training positions be made available in the clinical sciences for FY 1980 and should be maintained at this level until new information indicates the need for a change. (Page 105)

Medical Scientist Training Program. The Committee recommends an increase in medical scientist trainees from 700 in 1979 to 725 in 1980, and that the program remain at that level through 1982. (Page 106)

CHAPTER 5. HEALTH SERVICES RESEARCH PERSONNEL

Predoctoral/Postdoctoral Training. The Committee reaffirms its recommendation that ADAMHA expand its program of HSR training at a rate of 10 percent per year based on FY 1976 levels of support through FY 1982. (Page 123)

Recommendation. The Committee recommends that a program of general health services research training be established under the NRSA authority. (Page 125)

Traineeships/Fellowships. The Committee recommends that traineeships represent no less than 75 percent of the total number of awards for health services research training. The majority of traineeships should be used to support predoctoral research training.

The majority of fellowships should be awarded for postdoctoral training. (Page 125)

CHAPTER 6. NURSING RESEARCH PERSONNEL

Predoctoral/Postdoctoral Training. The Committee recommends that up to 15 percent of the total number of research training awards made available by the Division of Nursing be made at the postdoctoral level as qualified candidates present themselves. (Page 140)

Traineeships. The Committee recommends that the program of institutional training grant support in nursing research continue to be expanded at the rate specified in Table 1.2. The Committee recommends that institutional awards be made primarily for training nurses in basic science departments that have established relationships with schools of nursing, in the pattern of the former Nurse Scientist Training Program, and that only a limited number of training grants be provided for research training in graduate departments in well-qualified schools of nursing. (Page 141)

Fellowships. The Committee recommends that the annual number of fellowship awards by the Division of Nursing remain at 175 through FY 1982, while the shift to training in nursing research is completed. (Page 141)

APPENDIX C

AGENCY ANNOUNCEMENTS FOR NATIONAL RESEARCH SERVICE AWARD PROGRAMS

NIH National Research Service Awards

ADAMHA National Research Service Awards

HRA National Research Service Awards

December 8, 1978

NATIONAL INSTITUTES OF HEALTH

NATIONAL RESEARCH SERVICE AWARDS

FOR

INSTITUTIONAL GRANTS

A N N O U N C E M E N T

The annual receipt dates for NRSA institutional grants are February 1, June 1, and October 1. Results of review will be announced after the appropriate Advisory Council meetings which occur the following October, February and May respectively. The usual start date for institutional grants is July 1.

Awards are subject to legislative authority and the availability of funds.

Under authority of Section 472 of the Public Health Service Act as amended (42 USC 289ℓ-1), the National Institutes of Health (NIH) awards grants to eligible institutions to develop or enhance research training opportunities for individuals selected by them who are interested in careers in biomedical and behavioral research. Title 42 of the Code of Federal Regulations, Part 66, is applicable to these awards.

Domestic nonprofit private or public institutions may apply for grants to support research training programs. Predoctoral and postdoctoral trainees may be supported if either or both level(s) of training are justified in the application and approved. The applicant institution must have, or be able to develop, the staff and facilities required for the proposed programs. The training program director at the institution will be responsible for the selection and appointment of trainees to receive National Research Service Awards and for the overall direction of the program.

The proposed program must encompass supervised biomedical or behavioral research and offer opportunity for research training leading to the research degree, or, for those who have already attained the research degree, opportunity to broaden their scientific background. For those who have attained the health professional degree the supervised research should be accompanied by training in scientific methodology; this may be a part of a research degree program. National Research Service Awards (NRSA) will not support study leading to the M.D., D.O., D.D.S., or other similar professional degrees, nor will they support residency training.

Application material. Application material may be obtained from the Grants Inquiries Office, Division of Research Grants, National Institutes of Health, Bethesda, Maryland 20014. A self-addressed gummed mailing label enclosed in the request for kits will expedite handling.

Applicants are advised to contact the person designated in the attachment to discuss any questions, and especially if

(1) an application including predoctoral training is planned, or

(2) compatibility between institutional and agency training aims is in doubt.

Review and selection. NRSA grant applications will be evaluated by initial review groups at the NIH; they are also subject to review and approval by the appropriate advisory council of the NIH. The application will be evaluated on the basis of records and qualifications of participating faculty, the proposed research training objectives and program design, previous training record of the program and its ability to attract high caliber students, institutional commitment, facilities and environment, and relationship of the proposed program goals to need for research personnel.

GENERAL PROVISIONS

Eligibility requirements. Individuals appointed as trainees on the grant must be citizens or non-citizen nationals of the United States, or must have been lawfully admitted to the United States for permanent residence and have in their possession an Alien Registration Receipt Card (I-151 or I-551) at time of appointment. A non-citizen national is a person who, although not a citizen of the United States, owes permanent allegiance to the United States. They are generally persons born in lands which are not States, but which are under United States sovereignty, jurisdiction, or administration (e.g. American Samoa). Individuals on temporary or student visas are not eligible.

Predoctoral trainees must have received an appropriate baccalaureate degree as of the date of appointment to the approved training program. An individual at the postdoctoral level must have received as of the date of appointment to the approved training program, a Ph.D., M.D., D.D.S., D.O., D.V.M., O.D., Sc.D., D.Eng., D.N.S., or equivalent domestic or foreign degree. Certification by an authorized official of the degree granting institution that all degree requirements have been met is also acceptable.

Stipends and other training costs. Stipends and allowances requested will be as follows: At the predoctoral level the annual stipend is $3,900.

For postdoctorals, the stipend for the first year of support is determined by the number of years of prior relevant postdoctoral experience at time of appointment in accordance with the accompanying table. Relevant experience may include research experience (including industrial), teaching, internship, residency, or other time spent in full-time pursuit of additional degrees or full-time studies in a health-related field at a level beyond that of the qualifying doctoral degree. The stipend for each additional year of support is based on the level of the first year plus $400 for each additional year under the National Research Service Award. There is no allowance for dependents.

Postdoctoral Stipends

Years of Relevant Experience at Time of Initial Appointment	Year of Award		
	1st Year	2nd Year	3rd Year
0	$10,000	$10,400	$10,800
1	10,800	11,200	11,600
2	11,500	11,900	12,300
3	12,200	12,600	13,000
4	12,800	13,200	13,600
5 or more	13,200	13,600	14,000

The stipend is a pre-established level of support to provide for the trainee's living expenses during the period of training; it is not a payment for services performed. Trainees supported under institutional grants are not considered to be employees either of the PHS or of the grantee institution.

Tuition and travel for trainees may be requested. Tuition at the postdoctoral level is limited to that required for specified courses. The institution may request tuition and fees (including appropriate health insurance) only to the extent that the same resident or nonresident tuition and fees are charged to regular non-Federally supported students. The institution may also request actual indirect costs or 8% of allowable direct costs (whichever is less) and up to 25% of the total award for costs deemed essential to carry out the NRSA training program such as salaries, equipment, research supplies, staff travel, etc.

Period of support. Awards for institutional grants may be made for project periods of up to 5 years. No trainee may receive more than 5 years of aggregate NRSA support at the predoctoral level and 3 years of aggregate NRSA support at the postdoctoral level. Any exception to this requires a waiver from the Agency head based on review of justification from the trainee and the grantee institution.

Conditions of award. Trainees, before they can receive a National Research Service Award under an NRSA Institutional Grant, must sign an agreement that they will fulfill the payback requirements described below. Institutions shall notify prospective trainees of the payback requirements no later than the time an appointment at the institution is offered.

The institution must submit a *Statement of Appointment* form along with the signed *Payback Agreement* each time a trainee is appointed or reappointed to the grant (usually every 12 months). At the end of the total support period for an individual trainee, the institution must submit a *Termination Notice* form to NIH. Failure to submit the required forms in a timely fashion may result in an expenditure disallowance.

Trainee appointments are made for full-time research and research training. Health professional postdoctorals may utilize some of their time in clinical duties only if such work is part of the research training.

A NRSA award may not be held concurrently with another Federally sponsored fellowship or similar Federal award which provides a stipend or otherwise duplicates provisions of the NRS award. NRSA recipients may, however, accept concurrent educational remuneration from the Veterans Administration (e.g. G.I. Bill) and loans from Federal funds.

Supplementation of the NRSA stipend from non-Federal funds is permitted. Other Federal funds may be used for supplementation only if explicitly authorized by the program from which such funds are derived. No NIH, ADAMHA, or HRA grant funds may be used for supplementation. This is not intended to discourage in any way the use of Federal loan funds. This additional support may be provided without obligation by the trainee or may be conditioned on his or her performance of certain services such as teaching or serving as a laboratory assistant. Under no circumstances, however, may the service requirements detract from or prolong the training.

Trainees are not entitled to vacations, as such, although those at academic institutions may take the holidays at Christmas, in the Spring, etc., and the short period between semesters or quarters. The time between a summer session and a fall semester is considered an active part of the training period. Those at non-academic institutions are entitled to the normal holiday and vacation periods of the institution.

Payback requirement. Within two years after completion of NRSA support, recipients of NRS Awards are to engage in continuous health-related biomedical or behavioral research or teaching or when in academic employment, any combination thereof which is in accordance with usual patterns of such employment. Alternatively, if the Secretary, DHEW, determines there are no suitable health research or teaching positions available to the individual, the following may be authorized: (1) If the individual is a

physician, dentist, nurse, or other individual trained to provide health care directly to patients, the Secretary may authorize (a) service in the National Health Service Corps, or (b) service in his or her specialty in a health maintenance organization serving a medically underserved population; (2) If the individual who received the NRS Award is not trained to provide health care to patients, the Secretary may authorize the individual to engage in some other health-related activity. The period of service shall equal the period of support under both regular and alternative payback service.

For individuals who fail to fulfill their obligation through service, the United States is entitled to recover an amount equal to the total amount of stipends paid to the individual plus interest. The amount is computed in accordance with a formula which gives full credit to each month of service performed. Interest on the amount begins on the date the United States becomes entitled to such amount; it is computed at a rate fixed by the Secretary of the Treasury considering private consumer rates prevailing on that date. Payment must be completed within three years.

By Federal Regulation, there are certain conditions under which the Secretary, HEW, may extend the period for undertaking service or for repayment, permit breaks in service, or otherwise waive or suspend the payback obligation of an individual where enforcement of the obligation would involve substantial hardship and be against equity and good conscience.

[This statement of payback requirements reflects legislative changes enacted November 9, 1978.]

Taxability of stipends. Section 161(b) of the Revenue Act of 1978, states that (1) any amount paid to, or on behalf of, an individual from appropriated funds as a National Research Service Award under section 472 of the Public Health Service Act shall be treated as a scholarship or fellowship grant under section 117 of the Internal Revenue Code of 1954 and (2) the provisions of subsection (b) shall apply to awards made during calendar years 1974 through 1979.

Section 117 is that part of the Internal Revenue Code which applies to the tax treatment of all scholarships and fellowships. In general, it provides that, subject to certain limitations, degree candidates may exclude the full amount of their scholarships or fellowships from their gross income for purposes of taxation, and non-degree candidates may exclude up to $300 a month of such awards for up to 36 months.

It must be emphasized that the interpretation and implementation of the tax laws are the domain of the Internal Revenue Service and the courts.

PHS takes no position on what this provision may mean for a particular taxpayer, and it does not have the authority to dispense tax advice. Individuals should consult their local IRS office about the applicability of the new law to their situations and for information on the proper steps to be taken regarding their tax obligations.

Notification of final action. The applicant will be notified by the awarding unit of the final action on the application by either an award notice or by a letter.

For additional information on the above program write: Office of Research Manpower, Division of Research Grants, National Institutes of Health, Bethesda, Maryland 20014.

The Alcohol, Drug Abuse, and Mental Health Administration and the Division of Nursing, Health Resources Administration, also provide support through National Research Service Awards. For information and application forms, contact the appropriate agency.

National Institutes of Health
Announcement Area List for Institutional
National Research Service Awards

For purposes of assignment to the appropriate Institute and initial review group, an application must be identified as responding to one or more of the announcement areas listed below.

NATIONAL INSTITUTE ON AGING

Awards may be for predoctoral and postdoctoral trainees or a combination of the two. Training may be for laboratory, clinical, or field research, and may be multidisciplinary. It may relate to:

1. The biology of aging, e.g. biophysical, biochemical, cellular, organ or organismic aging, the pathologic changes in aging experimental animals.
2. The special medical problems of aging and the aged, e.g. preventive medicine and aging, the aging nervous system, senile dementia, aging of the endocrine system, aging of connective tissue structures, pharmokinetics and pharmodynamics in the aged.
3. Psychological aspects of aging and the aged, e.g. cognitive, personality, and attitudinal changes with age.
4. Societal aspects of aging, e.g. population age-structure and its impact on economic, societal, and individual function, retirement, social aspects of aging in different cultures.

Dr. Walter Spieth (301) 496-9666

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

1. Allergic and Immunologic Diseases and Basic Immune Mechanisms

   Allergy
   Immunochemistry
   Immunology
   Immunopathology
   Immunogenetics
   Clinical Immunology
   Autoimmunity
   Transplantation Biology

2. Infectious Diseases and Basic Microbiological Mechanisms

   Bacteriology
   Virology
   Parasitology
   Mycology
   Pathogenesis of Infectious Diseases

3. Epidemiology of Allergic, Immunologic, and Infectious Diseases

Proposed institutional training programs may be multidisciplinary.

Dr. Louis D. Bourgeois (301) 496-7679

NATIONAL INSTITUTE OF ARTHRITIS, METABOLISM, AND DIGESTIVE DISEASES

Proposals should demonstrate capability to provide opportunity for (1) the clinically-trained to acquire expertise in scientific research (e.g. biochemistry, biophysics, cell biology, epidemiology, genetics, physiology, or psychology), and (2) the scientifically-trained to obtain further training in biomedical research or clinical investigation relating to:

- Arthritis, Bone, or Skin Diseases
- Diabetes, Endocrine, or Metabolic Diseases
- Digestive Diseases, Liver Diseases, or Nutrition
- Kidney, Urologic, or Blood Diseases

Office of Associate Director
(301) 496-7277

NATIONAL CANCER INSTITUTE

The goal of the Cancer Research Manpower Development Program is to insure that an adequate number of highly competent basic and clinical cancer research specialists will be trained to meet needs in the following areas of research:

- Cancer Etiology and Prevention
- Cancer Detection and Diagnosis
- Cancer Treatment and Restorative Care

Proposed institutional training programs may be multidisciplinary.

Dr. Barney Lepovetsky
(301) 496-7803

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT

Awards provide opportunities for research training in the biological and/or behavioral science aspects of the areas listed below. Primary concern in awarding institutional awards will be given to multidisciplinary or interdisciplinary programs which cannot be provided through individual fellowships. Although major concern is for postdoctoral training, predoctoral training will be considered where a special case for support can be justified.

Center for Research for Mothers and Children:

1. Pregnancy and Infancy
2. Developmental Biology & Nutrition
3. Learning and Behavior
4. Mental Retardation

Center for Population Research:

1. Fertility - Infertility
2. Fertility Regulation
3. Nutrition and Reproduction
4. Social and Behavioral Aspects of Reproduction
5. Population Change

Dr. Betty Pickett (301) 496-1848

For Institutional Awards

NATIONAL INSTITUTE OF DENTAL RESEARCH

*1. Behavioral Studies
*2. Cariology
3 Craniofacial Anomalies
4. Nutrition
5. Pain Control
6. Periodontal Diseases
7. Restorative Materials
8. Salivary Secretions
9. Soft Tissue Diseases

*To insure that proposals will be responsive to defined program needs, applicants are strongly urged to consult with NIDR staff prior to preparation of proposals.

Dr. Robert J. Schullein (301) 496-7748

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

1. Environmental Toxicology (including Teratogenesis, Carcinogenesis and Behavioral Toxicology)
2. Environmental Mutagenesis
3. Environmental Pathology - Pathophysiology
4. Environmental Epidemiology and Biostatistics

Dr. Christopher Schonwalder
(919) 755-4022

NATIONAL EYE INSTITUTE

Laboratory and clinical research training related to vision and disorders of the visual system:

1. Retinal and Choroidal Diseases
2. Corneal Diseases
3. Cataract
4. Glaucoma
5. Sensory and Motor Disorders and Rehabilitation

NEI (Continued)

Preference will be given to two-year research training programs in the following areas as they relate to the above:

1. Immunology
2. Genetics
3. Pharmacology
4. Epidemiology
5. Biostatistics
6. Physiology
7. Biochemistry
8. Developmental Biology
9. Psychophysics
10. Physiological Optics
11. Experimental & Clinical Pathology

Chief, Scientific Programs Branch
(301) 496-5303

NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES

Awards will be made to applicants presenting the most meritorious, broadly-based programs in the following areas, which match the NIGMS research programs:

For Predoctoral Training Grants:

1. Cellular and Molecular Biology
2. Genetics
3. Pharmacological Sciences
4. Systems and Integrative Biology
5. Medical Scientist Program

For Postdoctoral Training Grants:

1. Basic Pathobiology
2. Clinical Pharmacology
3. Genetics (with emphasis on Medical Genetics)
4. Trauma and Burn Research
5. Anesthesiology

Dr. Charles A. Miller (301) 496-7464
or 496-7021

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE

1. *Division of Heart and Vascular Diseases*

The research training may be in fundamental studies of basic processes and functions, behavioral studies, including risk factor modification (e.g. diet, smoking), genetics (including studies of populations) and primary or secondary prevention or clinical investigations directed toward long-term involvement in research toward increasing our knowledge and understanding in cardiovascular areas related to our programs in:

- Hypertension
- Arteriosclerosis
- Coronary Heart Disease
- Cardiovascular Aspects of Diabetes
- Arrhythmias
- Heart Failure and Shock
- Cerebrovascular Disease
- Peripheral Vascular Disease
- Congenital and Rheumatic Heart Diseases
- Cardiomyopathies and Infections of the Heart
- Circulatory Assistance
- Cardiovascular Devices and Technology

Dr. D. M. MacCanon (301) 496-1724

2. *Division of Lung Diseases*

The Division supports multidisciplinary research training in fundamental and clinical disciplines.

Training programs should be addressed to one or more of the following categories:

- Structure and Function of the Lung
- Pediatric Pulmonary Diseases
- Emphysema and Chronic Bronchitis
- Fibrotic and Immunologic Lung Diseases

NHLBI (Continued)

- Respiratory Failure
- Pulmonary Vascular Diseases
- Epidemiology of Respiratory Diseases

Ms. Barbara Marzetta (301) 496-7668

3. *Division of Blood Diseases and Resources*

The Division seeks to support research training awards in the areas of:

- Thrombosis
- Hemostasis
- Red Blood Cell Diseases
- Sickle Cell Disease
- Blood Resources
- Blood Banking Sciences

Dr. Fann Harding (301) 496-1817

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE

Applications are accepted in the following four areas. Listed are examples of training disciplines in which applications would be appropriate.

1. Basic Neurosciences

- Developmental Neurology
- Neuroanatomy
- Neurobiology
- Nuerochemistry
- Neuroimmunology
- Neuropharmacology
- Neurophysiology
- Neuroradiobiology
- Neurovirology
- Sensory Physiology and Biophysics

2. Clinical Neurosciences

- Clinical Investigation
- Neuroepidemiology
- Neuropathology

(Continued)

NINCDS (Continued)

3. Basic Communicative Sciences

Audiology
Sensory Physiology and Biophysics
Speech Pathology

4. Clinical Communicative Sciences

Audiology
Clinical Investigation
Otopathology
Speech Pathology

Dr. Raymond Summers (301) 496-9236

DIVISION OF RESEARCH RESOURCES

Laboratory Animal Science and Medicine

Dr. John Holman (301) 496-5175

Special Programs for Minority Institutions: In addition to the programs described above, NIH offers institutions with predominantly minority enrollments programs with eligibility requirements and terms of support that differ from those described herein. Inquiries should be addressed to

Mr. Elward Bynum, Director
Minority Access to Research Careers (MARC), National Institute of General Medical Sciences
(301) 496-7941

Dr. Ciriaco Gonzales, Director
Minority Biomedical Support Program (MBS), Division of Research Resources
(301) 496-6743

January 29, 1979

NATIONAL INSTITUTES OF HEALTH

NATIONAL RESEARCH SERVICE AWARDS FOR INDIVIDUAL POSTDOCTORAL FELLOWS

February 1, June 1 and October 1 are the annual receipt dates for individual National Research Service Award applications. Results of review will be announced approximately eight months after the receipt date.

Awards are subject to legislative authority and the availability of funds.

Under authority of Section 472 of the Public Health Service Act as amended (42 USC 289*l*-1), the National Institutes of Health (NIH) provides National Research Service Awards to postdoctoral individuals for training experiences in biomedical and behavioral research. (See Attachment for research areas.)

Awards are made to individual applicants, for specified training proposals, selected as a result of a national competition. Title 42 of the Code of Federal Regulations, Part 66, is applicable to these awards.

Eligibility requirements. Applicants must be citizens or non-citizen nationals of the United States, or have been lawfully admitted to the United States for permanent residence and have in their possession an Alien Registration Receipt Card (I-151 or I-551) at time of application. Non-citizen nationals are persons who, although not citizens of the United States, owe permanent allegiance to the United States. They are generally persons born in lands which are not States, but which are under United States sovereignty, jurisdiction, or administration (e.g. American Samoa). Individuals on temporary or student visas are not eligible.

As of the beginning date of the proposed fellowship, an applicant must have received a Ph.D., M.D., D.D.S., D.O., D.V.M., O.D., Sc.D., D.Eng., D.N.S., or equivalent domestic or foreign degree. Certification by an authorized official of the degree granting institution that all degree requirements have been met is also acceptable. Proposed training must encompass biomedical or behavioral research training with an opportunity to carry out supervised research and offer opportunity to research health scientists, research clinicians, etc., to broaden their scientific background, or to extend their potential for research in health-related areas. For those who have attained the health professional degree the proposed training may be a part of a research degree program. National Research Service Awards (NRSA) are not made for study leading to the M.D., D.O., D.D.S., or other similar professional degrees. Neither will these awards support residency training.

Prior to formal submission, an applicant must arrange for appointment to an appropriate institution and acceptance by a sponsor who will supervise his or her training and research experience. The institutional setting may be a domestic non-profit private or public institution including the NIH and ADAMHA. The application must document the availability of staff and facilities to provide a suitable environment for performing high-quality work. The major emphasis of the application should be the research training experience and broadening of scientific competence.

Under exceptional circumstances when such study and opportunity are not available at any domestic institution, an individual may request support for study abroad. Such applicant will be required to provide detailed justification based on the unique facilities and/or training opportunity that are of the nature and caliber that they cannot be found in the U.S. and the particular suitability of the foreign situation, rather than the domestic, to the proposed research.

Documents to be submitted. The applicant must submit (1) an application (PHS 416-1), (2) a signed assurance that the service or payback requirement will be complied with, if an award is made, and (3) if a non-citizen, a notarized statement of permanent residence. Since a complete application includes the sponsor's Facilities and Commitment Statement, that Statement must be with the application when submitted. In addition, an applicant will arrange for the submission of reference reports (PHS 416-3) on his or her behalf.

An individual may not have two competing applications pending review concurrently in the National Research Service Award program.

Application material. Individuals are encouraged to review the eligibility criteria before requesting application kits from Grants Inquiries, Division of Research Grants, National Institutes of Health, Bethesda, Maryland 20014. If a self-addressed gummed mailing label is enclosed in the request for kits, it will expedite handling.

Review cycle.

Application Receipt Date	Initial Review Meetings	Results Announced Approximately	Earliest Approximate Start Date
February 1	June	August	Sept 1
June 1	Oct/Nov	January	Feb 1
October 1	Feb/Mar	May	June 1

Annual stipends and allowances. The stipend level for the first year is determined by the number of years of prior relevant postdoctoral experience at the time of award. Relevant experience may include research experience

(including industrial), teaching, internship, residency, or other time spent in full-time pursuit of additional degrees or full-time studies in a health-related field at a level beyond that of the qualifying doctoral degree. The stipend for each additional year of support is based on the level of the first year plus $400 for each additional year under the NRSA.

Postdoctoral Stipends

Years of Relevant Experience at Time of Initial Award	Year of Award		
	1st Year	2nd Year	3rd Year
0	$10,000	$10,400	$10,800
1	10,800	11,200	11,600
2	11,500	11,900	12,300
3	12,200	12,600	13,000
4	12,800	13,200	13,600
5 or more	13,200	13,600	14,000

The stipend is a pre-established level of support to provide for the awardee's living expenses during the period of training. The stipend is not a payment for services performed. Individuals supported under NRSA awards are not considered to be employees either of PHS or of their sponsoring institution. The payment of the stipend for awardees sponsored by domestic non-Federal institutions, will be made through the sponsoring institution. The stipend payment for awardees sponsored by Federal or foreign institutions will be made directly to the individual by U.S. Treasury check.

No allowance will be provided for dependents or travel to a domestic training site. Awardees affiliating with foreign sponsoring institutions will receive a single economy or coach round-trip travel fare to the training site.

Upon request, the NIH will provide funds of up to $3,000 per 12-month period to the non-Federal sponsoring institution to help defray such awardee expenses as tuition and fees, appropriate health insurance, research supplies, equipment, travel to scientific meetings, and related items. The allowance is under control of the sponsoring institution. An allowance of up to $1,000 is available for the individual sponsored by a Federal laboratory for scientific meeting travel expenses, appropriate health insurance and tuition and fees.

Period of support. No individual may receive more than three years of total National Research Service Award support at the postdoctoral level. Any exception to this requires a waiver from PHS based on review of justification from the applicant and sponsor. Although fellowships are awarded for 12-month periods, assurances may be given by the awarding unit for continued support beyond the first year provided progress is satisfactory and funds are available.

Selection of awardees. Applications will be evaluated by initial review groups at the NIH. This evaluation will be based on past academic and research records, the research training proposal, the sponsor and training environment, the applicant's research goals, publications, reference reports, and other relevant information. Final selection will be made by the appropriate NIH awarding unit based on the initial review group's recommendation, program interests, and the availability of funds.

Notification of final action. An applicant is notified by the awarding unit of the final action on the application by an award notice or by a letter.

Activation date. An awardee has until the end of 12 months from the issue date on the award notice to activate a new award.

Conditions of award. No award will be made to an individual unless that individual has signed and submitted to PHS a Payback Assurance indicating his or her intent to meet the payback requirements (see below). No funds may be disbursed until the individual has started under the award and an Activation Notice and Payback Agreement have been submitted to PHS.

Individual awards are made for full-time research and research training. Health professional postdoctorals may utilize some of their time in clinical duties only if such work is part of the research training.

A NRSA award may not be held concurrently with another Federally sponsored fellowship or similar Federal award which provides a stipend or otherwise duplicates provisions of the award. NRSA recipients may, however, accept concurrent educational remuneration from the Veterans Administration (e.g. G.I. Bill) and loans from Federal funds.

Supplementation of the NRSA stipend from non-Federal funds is permitted. Other Federal funds may be used for supplementation only if explicitly authorized by the program from which such funds are derived. No NIH, ADAMHA, or HRA grant funds may be used for supplementation. This is not intended to discourage in any way the use of Federal loan funds. This additional support may be provided without obligation by the awardee or may be conditioned on his or her performance of certain services such as teaching or serving as a laboratory assistant. Under no circumstances, however, may the service requirements detract from or prolong the training.

Awardees are not entitled to vacations, as such, although those at academic institutions may take the holidays at Christmas, in the Spring, etc., and the short period between semesters or quarters. The time between a summer session and a fall semester is considered an active part of the training period. Those at non-academic institutions are entitled to the normal holiday and vacation periods of the institution.

Payback requirement. Within two years after completion of NRSA support, recipients of NRS Awards are to engage in continuous biomedical or behavioral research or teaching or when in academic employment any combination thereof which is in accordance with usual patterns of such employment for a period equal to the period of support. Alternatively, if the Secretary, DHEW, determines there are no suitable health research or teaching positions available to the individual, the following may be authorized: (1) If the individual is a physician, dentist, nurse, or other individual trained to provide health care directly to patients, the Secretary may authorize (a) service in the National Health Service Corps, or (b) service in his or her specialty in a health maintenance organization serving a medically underserved population; (2) If the individual who received the NRS Award is not trained to provide health care to patients, the Secretary may authorize the individual to engage in some other health-related activity. The period of service shall equal the period of support under both regular and alternative payback service.

For individuals who fail to fulfill their obligation through service, the United States is entitled to recover an amount equal to the sum of the total amount paid to the individual plus interest. The amount is computed in accordance with a formula which gives full credit to each month of service performed. Interest on the amount begins and is at the rate fixed by the Secretary of the Treasury considering private consumer rates which prevail on the date the United States becomes entitled to such amount. Payment must be completed within three years from that date.

By Federal Regulation, there are certain conditions under which the Secretary, HEW, may extend the period for undertaking service or for repayment, permit breaks in service, or to otherwise waive or suspend the payback obligation of an individual where enforcement of the obligation would involve substantial hardship and be against equity and good conscience.

(This statement of payback requirements reflects legislative changes enacted November 9, 1979.)

Taxability of stipends. Section 161(b) of the Revenue Act of 1978, states that (1) any amount paid to, or on behalf of, an individual from appropriated funds as a National Research Service Award under section 472 of the Public Health Service Act shall be treated as a scholarship or fellowship grant under section 117 of the Internal Revenue Code of 1954 and (2) the provisions of subsection (b) shall apply to awards made during calendar years 1974 through 1979.

Section 117 is that part of the Internal Revenue Code which applies to the tax treatment of all scholarships and fellowships. In general, it provides that, subject to certain limitations, degree candidates may

exclude the full amount of their scholarships or fellowships from their gross income for purposes of taxation, and non-degree candidates may exclude up to $300 a month of such awards for up to 36 months.

It must be emphasized that the interpretation and implementation of the tax laws are the domain of the Internal Revenue Service and the courts. PHS takes no position on what this provision may mean for a particular taxpayer, and it does not have the authority to dispense tax advice. Individuals should consult their local IRS office about the applicability of the new law to their situations and for information on the proper steps to be taken regarding their tax obligations.

For additional information on the above program write: Office of Research Manpower, Division of Research Grants, National Institutes of Health, Bethesda, Maryland 20014.

The Alcohol, Drug Abuse, and Mental Health Administration and the Division of Nursing, Health Resources Administration, also provide support through National Research Service Awards. For information and application forms, contact the appropriate agency.

National Institutes of Health
Research Area List for Individual Postdoctoral
National Research Service Awards

The research areas, in which applications are accepted for individual postdoctoral awards are listed below by NIH awarding unit. Applicants should contact the individuals designated below for additional information concerning the areas of research.

NATIONAL INSTITUTE ON AGING

1. The biology of aging, e.g. biophysical, biochemical, cellular, organ or organismic aging, the pathologic changes in aging experimental animals.
2. The special medical problems of aging and the aged, e.g. preventive medicine and aging, the aging nervous system, senile dementia, aging of the endocrine system, aging of connective tissue structures, pharmokinetics and pharmodynamics in the aged.
3. Psychological aspects of aging and the aged, e.g. cognitive, personality, and attitudinal changes with age.
4. Societal aspects of aging, e.g. population age-structure and its impact on economic, societal, and individual function, retirement, social aspects of aging in different cultures.

Dr. Walter Spieth (301) 496-9666

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

1. Allergic and Immunologic Diseases and Basic Immune Mechanisms

   Allergy
   Immunochemistry
   Immunology
   Immunopathology
   Immunogenetics
   Clinical Immunology
   Autoimmunity
   Transplantation Biology

2. Infectious Diseases and Basic Microbiological Mechanisms

   Bacteriology
   Virology
   Parasitology
   Mycology
   Pathogenesis of Infectious Diseases

3. Epidemiology of Allergic, Immunologic, and Infectious Diseases

Dr. Louis D. Bourgeois (301) 496-7679

NATIONAL INSTITUTE OF ARTHRITIS, METABOLISM, AND DIGESTIVE DISEASES

Proposals should demonstrate capability to provide opportunity for (1) the clinically-trained to acquire expertise in scientific research (e.g. biochemistry, biophysics, cell biology, epidemiology, genetics, physiology, or psychology), and (2) the scientifically-trained to obtain further training in biomedical research or clinical investigation relating to:

Arthritis, Bone, or Skin Diseases
Diabetes, Endocrine, or Metabolic Diseases
(Continued)

NIAMDD (Continued)

Digestive Diseases, Liver Diseases, or Nutrition
Kidney, Urologic, or Blood Diseases

Office of Associate Director
(301) 496-7277

NATIONAL CANCER INSTITUTE

The goal of the Cancer Research Manpower Development Program is to insure that an adequate number of highly competent basic and clinical cancer research specialists will be trained to meet needs in the following areas of research:

Cancer Etiology and Prevention
Cancer Detection and Diagnosis
Cancer Treatment and Restorative Care

Dr. Barney Lepovetsky (301) 496-7803

NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT

Awards provide opportunities for research training in the biological and/or behavioral science aspects of the areas listed below.

Center for Research for Mothers and Children:

1. Pregnancy and Infancy
2. Developmental Biology & Nutrition
3. Learning and Behavior
4. Mental Retardation

Center for Population Research:

1. Fertility - Infertility
2. Fertility Regulation
3. Nutrition and Reproduction
4. Social and Behavioral Aspects of Reproduction
5. Population Change

Dr. Betty Pickett (301) 496-1848

NATIONAL INSTITUTE OF DENTAL RESEARCH

1. Behavioral Studies
2. Cariology
3. Craniofacial Anomalies (including Malocclusion, Acquired Disfigurement, Congenital Craniofacial Defects, Developmental Biology)
4. Mineralization
5. Nutrition
6. Pain Control
7. Periodontal Diseases
8. Restorative Materials and Implants
9. Salivary Secretions
10. Soft Tissue Diseases

Dr. Robert J. Schullein (301) 496-7748

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

1. Environmental Toxicology (including Teratogenesis, Carcinogenesis and Behavioral Toxicology)
2. Environmental Mutagenesis
3. Environmental Pathology - Pathophysiology
4. Environmental Epidemiology and Biostatistics

Dr. Christopher Schonwalder
(919) 755-4022

NATIONAL EYE INSTITUTE

Laboratory and clinical research training related to vision and disorders of the visual system:

1. Retinal and Choroidal Diseases
2. Corneal Diseases
3. Cataract
4. Glaucoma
5. Sensory and Motor Disorders and Rehabilitation

(Continued)

NEI (Continued)

Preference will be given to two-year research training programs in the following areas as they relate to the above:

1. Immunology
2. Genetics
3. Pharmacology
4. Epidemiology
5. Biostatistics
6. Physiology
7. Biochemistry
8. Developmental Biology
9. Psychophysics
10. Physiological Optics
11. Experimental & Clinical Pathology

Chief, Scientific Programs Branch
(301) 496-5303

NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES

1. Anesthesiology
2. Basic Pathobiology
3. Behavioral Sciences related to Medicine
4. Cellular and Molecular Biology
5. Clinical Laboratory Sciences
6. Clinical Pharmacology
7. Epidemiology
8. Genetics
9. Pharmacological Sciences
10. Systems and Integrative Biology
11. Trauma and Burn Research

(Support is also provided through the Minority Access to Research Careers program.)

Dr. Roger Fuson (301) 496-7368

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE

1. *Division of Heart and Vascular Diseases*

The research training may be in fundamental studies of basic processes and functions, behavioral studies, including risk factor modification (e.g. diet, smoking), genetics (including studies of populations) and primary or secondary prevention or clinical investigations directed toward long-term involvement in research toward increasing our knowledge and understanding in cardiovascular areas related to our programs in:

Hypertension
Arteriosclerosis
Coronary Heart Disease
Cardiovascular Aspects of Diabetes
Arrhythmias
Heart Failure and Shock
Cerebrovascular Disease
Peripheral Vascular Disease
Congenital and Rheumatic Heart Diseases
Cardiomyopathies and Infections of the Heart
Circulatory Assistance
Cardiovascular Devices and Technology

Dr. D. M. MacCanon (301) 496-1724

2. *Division of Lung Diseases*

The Division supports research training in fundamental and clinical disciplines.

Training programs should be addressed to one or more of the following categories:

Structure and Function of the Lung
Pediatric Pulmonary Diseases
Emphysema and Chronic Bronchitis
Fibrotic and Immunologic Lung Diseases
Respiratory Failure
Pulmonary Vascular Diseases
Epidemiology of Respiratory Diseases

Ms. Barbara Marzetta (301) 496-7668

(Continued)

NHLBI (Continued)

3. *Division of Blood Diseases and Resources*

The Division seeks to support research training awards in the areas of:

Thrombosis
Hemostasis
Red Blood Cell Diseases
Sickle Cell Disease
Blood Resources
Blood Banking Sciences

Dr. Fann Harding (301) 496-1817

NATIONAL INSTITUTE OF NEUROLOGICAL AND COMMUNICATIVE DISORDERS AND STROKE

Applications are accepted in the following four areas. Listed are examples of training disciplines in which applications would be appropriate.

1. Basic Neurosciences

Developmental Neurology
Neuroanatomy
Neurobiology
Nuerochemistry
Neuroimmunology
Neuropharmacology
Neurophysiology
Neuroradiobiology
Neurovirology
Sensory Physiology and Biophysics

2. Clinical Neurosciences

Clinical Investigation
Neuroepidemiology
Neuropathology

3. Basic Communicative Sciences

Audiology
Sensory Physiology and Biophysics
Speech Pathology

NINCDS (Continued)

4. Clinical Communicative Sciences

Audiology
Clinical Investigation
Otopathology
Speech Pathology

Dr. Raymond Summers (301) 496-9236

DIVISION OF RESEARCH RESOURCES

Laboratory Animal Science and Medicine

Dr. John Holman (301) 496-5175

NIH Guide for Grants and Contracts
Vol. 8, No. 13, October 26, 1979

NATIONAL RESEARCH SERVICE AWARDS FOR SHORT-TERM TRAINING: STUDENTS IN HEALTH PROFESSIONAL SCHOOLS

ANNOUNCEMENT

There has been recent evidence of a disturbing decline in the number of students in health professional schools who are interested in research careers. To help arrest or reverse this trend, the National Institutes of Health would like to take advantage of the November 1978 amendments to the National Research Service Award (NRSA) Act, P.L. 95-622, which encourage short-term research training. Individuals receiving research training awards of up to three months duration are not subject to a pay-back provision under this program. Title 42 of the Code of Federal Regulations, Part 66, is applicable to these awards.

I. PURPOSE

The National Institutes of Health announces a new program to expose talented students in health professional schools to the opportunities inherent in a research career. The program is designed to ameliorate the future shortage of clinical investigators by attracting highly qualified professional students into biomedical and behavioral research careers.

II. ELIGIBILITY REQUIREMENTS

A. Applicant Institutions

Domestic nonprofit private or public schools of medicine, osteopathy, dentistry, veterinary medicine, optometry, pharmacy and podiatry may apply for grants to support short-term research training for students in health professional schools for discrete periods of up to three months. The applicant institution must have the staff and facilities required for the proposed program. Only one application per health professional school will be accepted.

B. Trainees

The training institution will be responsible for the selection and appointment of trainees. Trainees must have successfully completed at least one semester at an accredited school of medicine, osteopathy, dentistry, veterinary medicine, optometry, pharmacy or podiatry prior to participating in the program. NRSA awards cannot be used to support courses which are required for the M.D., D.O., D.D.S., D.V.M. or other similar professional degrees.

Individuals appointed as trainees on the grant must be citizens or noncitizen nationals of the United States, or must have in their possession an Alien Registration Receipt Card (I-151 or I-551) at time of appointment. Noncitizen nationals are individuals who, although not citizens of the United States, owe permanent allegiance to the United States. They are generally persons born in lands which are not states but which are under United States sovereignty, jurisdiction, or administration (e.g. American Samoa). Individuals on temporary or student visas are not eligible.

III. PROGRAM ELEMENTS

Each institution is invited to develop a proposal in response to this announcement that is best suited to its own strengths and characteristics. The goal is to identify a cadre of exceptional students with the potential to pursue careers in biomedical and behavioral research.

The training program director should have a demonstrated record of success in conducting research and in working with research trainees. Each proposal should describe a plan for widely advertising the program throughout the school to insure active competition for places in the participating laboratories as well as a reasonable means of selecting only students with a genuine interest in exploring a research career. Special attention should be given to the recruitment of minority students and women.

No grants will be made for fewer than four, nor more than thirty-two, students per year.

The overall training is not necessarily restricted to activities in a single discipline or department. The choice of participating training sites and mentors should be carefully described to show that the institution's best environments and role models have been selected. It is expected that students will be assigned to the institution's strongest research and research training programs.

Each institution will be expected to encourage among the trainees a sense of belonging to a community of scientists. Among the methods that may be used is providing a special seminar series addressing such topics as research methodology, instrumentation, experimental design, etc. A plan for assessing the impact of the program on both the institution and the trainee is highly desirable.

IV. APPLICATION PROCESS

A. Application Form

The application form for Institutional Training Grants (PHS 6025) should be used. Block 1, Title of Proposal, should read Short-Term Training: Students in Health Professional Schools. Short-Term Training applications may not be submitted as supplements to an ongoing NIH award.

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B. Period of Support

Institutions applying for short-term training institutional grants may request support for up to five years.

C. Institutional Training Costs

Institutional costs of up to $250 per month for each participating student may be requested for applicable institutional expenses.

D. Stipends

The stipend support for trainees will be that approved for pre-doctoral NRSA trainees, as of July 1, 1980, $420 per month. NRSA trainees in this program will not be required to sign payback agreements. Supplementation of the NRSA stipend from non-Federal funds is permitted.

E. Indirect Costs

Indirect costs may be requested at 8% of total allowable direct costs or actual rate, whichever is less.

V. REVIEW CRITERIA

All applications will be subject to the NIH peer review procedures. Particular attention will be paid to:

- The proposed training experience and the qualifications of the mentors.
- The training environment.
- The institution's commitment to the training of clinical investigators.
- The method of selection and assignment of students.
- The plan for measuring the effectiveness of the program.

VI. APPLICATION DATES AND NOTIFICATION OF AWARDS

November 19, 1979 is the only receipt date for applications to be funded in fiscal year 1980. The applications will be considered by the January-February 1980 National Advisory Councils; awards will be made in the spring of 1980. Thereafter, there will be one annual receipt date of May 1 for awards to be made early in the following year after consideration by the appropriate National Advisory Councils.

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NATIONAL RESEARCH SERVICE AWARD (NRSA)

STIPEND INCREASE

ANNOUNCEMENT

As of July 1, 1980, all individuals receiving support through awards made under the National Research Service Award (NRSA) Act, P.L. 93-348 as amended under P.L. 95-622 dated November 1978, will receive an adjustment in their annual stipend level as follows:

Predoctoral Stipend

All Years	Current	As of July 1, 1980
-----	$3,900	$ 5,040

Postdoctoral Stipend

Years of Relevant Experience	Present Stipend	As of July 1, 1980
0	$10,000	$13,380
1	10,800	14,040
2	11,500	14,736
3	12,200	15,468
4	12,800	16,236
5 or more *	13,200	17,040

Training program directors and individual NRSA awardees will be contacted by the awarding Institute as soon as implementation procedures have been completed. Every trainee and fellow supported under the NRSA Act will receive the adjustment on July 1, 1980 regardless of the date of the original award. No retroactive adjustments will be made.

The new stipend levels are to be used in the preparation of future NRSA institutional (training) and individual fellowship applications. They will be administratively applied to all applications now in the review process.

* Subsequent to publication of this guide PHS approved stipends of $17,892 and $18,780 for 6 and "7 and over" years of relevant experience, respectively.

--Communication to the Committee from the Office of the Director, NIH

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NATIONAL RESEARCH SERVICE AWARD (NRSA)

NON-TRAINEE EXPENSES - INSTITUTIONAL ALLOWANCES:

ADJUSTMENT FOR NEW AND COMPETING AWARDS MADE AFTER JULY 1, 1980

A. Institutional NRSA Training Grants

The policy which limits support of non-trainee expenses to 25% of the total anticipated award has been modified. The maximum amount which can be requested is now based on a calculation which may provide up to $3,000 per year for each predoctoral trainee and $5,000 per year for each postdoctoral trainee. This is not an automatic allowance. It represents the maximum allowable direct cost for essential support costs to the training program. Indirect cost may also be requested at 8% of total allowable direct cost or actual rate, whichever is less.

B. Individual Postdoctoral NRSA Fellowships

1. Postdoctoral Awards - Non-Federal Institutions

An institution may request funds of up to $5,000 per 12-month period to the non-Federal sponsoring institution to help defray such awardee expenses as tuition and fees, appropriate health insurance, research supplies, equipment, travel to scientific meetings and related items. The allowance is under control of the sponsoring institution.

2. Postdoctoral Awards - Federal Institutions

An allowance of up to $2,000 is available for the individual sponsored by a Federal laboratory for scientific meetings, travel expenses, appropriate health insurance, tuition and fees.

The new allowances are to be used in the preparation of all future NRSA applications. No retroactive adjustments will be made. Training program directors and individual NRSA awardees will be contacted by the awarding Institute as soon as implementation procedures have been completed.

Application forms and detailed instructions specific to this program should be requested from:

Office of Grants Inquiries
Division of Research Grants
National Institutes of Health
Bethesda, Maryland 20205

(301) 496-7441

C.6

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION
ROCKVILLE, MARYLAND 20852

OFFICE OF THE ADMINISTRATOR

A N N O U N C E M E N T

ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION

National Research Service Awards for
Institutional Grants

(Federal Domestic Assistance Catalog Numbers 13.272, 13.278 and 13.282)

May 1979

Subject to availability of funds and to periodic modification of research areas, applications for institutional research training grants will be accepted by ADAMHA under receipt dates of February 1, June 1, and October 1.

AUTHORITY AND PURPOSE: Under authority of Section 472 of the Public Health Service Act as amended (42 USC 2891-1), the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) will award grants to eligible institutions to develop or enhance research training opportunities for individuals selected by them who are training for careers in specified areas of biomedical and behavioral research. (See Attachment for description of these areas.) Title 42 of the Code of Federal Regulations, Part 66, is applicable to these awards. This announcement supersedes all previous program announcements, guidelines, or other communications regarding the ADAMHA National Research Service Awards program, except for the "Guidelines for National Research Service Awards" issued jointly by the National Institutes of Health, ADAMHA, and the Health Resources Administration. Should supplementary guidelines be necessary in the future, they will be issued only by the Office of the Administrator, ADAMHA or by the Director of an Institute. This announcement contains only minor changes from the July, 1978 announcement, and these are principally to reflect modifications in legislative and administrative requirements.

AVAILABILITY OF FUNDS: In Fiscal Year 1978, 226 institutional grants were funded by ADAMHA Institutes for a total of $14.6 million. Of these awards, 42 were for new and competing extension (renewal) applications, for a total of $2.1 million. Availability and amount of funds for future years is contingent upon annual appropriations.

LEVELS OF TRAINING: Applications will be accepted for predoctoral and/or postdoctoral research training. However, based on findings and recommendations from national manpower studies, ADAMHA is redirecting the emphasis in its research training programs from predoctoral to post-doctoral support. Accordingly, applications for predoctoral training must include information on the need for training at that level in the particular research area(s) to be encompassed by the proposed training program.

ELIGIBILITY REQUIREMENTS: Domestic public or non-profit private institutions may apply for institutional grants to support research training programs in areas of research specified in this announcement (see Attachment). The applicant institution must have, or be able to develop, the staff and facilities to provide the proposed research training in a suitable environment for performing high-quality work.

The training program director at the institution will be responsible for selection and appointment of individuals to receive National Research Service (NRS) Awards and for the overall direction of the research training program. The training program must provide opportunities for individual awardees selected by the institution to carry out supervised research in the specified areas with the primary objective of extending their skills and knowledge.

Individuals selected by the program director to be recipients of NRS Awards must be citizens or non-citizen nationals of the United States, or have been lawfully admitted to the United States for permanent residence and have in their possession an Alien Registration Receipt Card (I-151 or I-551) at the time of appointment to the training program. Non-citizen nationals are persons born in lands which are not States, but which are under U.S. sovereignty, jurisdiction, or administration (e.g., American Samoa). Individuals on temporary or student visas are not eligible.

Predoctoral individuals selected to receive NRS Awards must have completed two or more years of graduate work at the time of appointment to the NRSA training program. Postdoctoral individuals selected to receive NRS Awards must have received a Ph.D., M.D., D.D.S., D.O., D.V.M., O.D., Sc.D., D.Eng., D.N.S., or equivalent domestic or foreign degree as of the date of appointment to the NRSA training program. Certification by an authorized official of the degree granting institution that all degree

requirements have been met is also acceptable. National Research Service Awards are not made for study leading to the M.D., D.O., D.D.S., or other similar professional degrees, or for study which is part of residency training leading to a medical specialty. However, an NRS Award may support a specified period of full-time research training for a health professional who intends to pursue a research career, even if that period of training may be creditable toward specialty board certification.

STIPENDS AND OTHER TRAINING COSTS: The annual stipend for predoctoral individuals at all levels is $3,900.

For postdoctoral individuals the stipend for the first year is determined by the number of years of prior relevant postdoctoral experience at the time of appointment. Relevant experience may include research experience (including industrial), teaching, internship, residency, or other time spent in full-time pursuit of additional degrees or full-time studies in a health-related field at a level beyond that of the qualifying doctoral degree. The stipend for each subsequent year of support is based on the level of the first year plus $400 for each additional year under a National Research Service Award.

Postdoctoral Stipends

Years of Relevant Postdoctoral Experience at Time of Initial Appointment	YEAR OF AWARD		
	1st Year	2nd Year	3rd Year
0	$10,000	$10,400	$10,800
1	10,800	11,200	11,600
2	11,500	11,900	12,300
3	12,200	12,600	13,000
4	12,800	13,200	13,600
5 or more	13,200	13,600	14,000

The stipend is a pre-established level of support to help provide for the trainee's living expenses during the period of training. The stipend is not a payment for services performed. Trainees are not considered to be employees either of PHS or their sponsoring institution.

Supplementation of the NRSA stipend from non-Federal funds is permitted. Other Federal funds may be used for supplementation only if explicitly authorized by the program from which such funds are derived. No ADAMHA, NIH, or HRA grant funds may be used for supplementation. This is not intended to discourage in any way the use of Federal loan funds. This additional support may be provided without obligation by the trainee or may be conditioned on his or her performance of certain services such as teaching or serving as a laboratory assistant. Under no circumstances, however, may the service requirements detract from or prolong the training.

In addition to stipends, the institution may request funds for tuition, fees and certain types of travel for trainees; actual indirect costs or 8% of allowable direct costs (whichever is less) to cover related institutional overhead; and up to 25% of the total award for other related costs (salaries, equipment, research supplies, etc.) which are deemed essential to carry out the program of training for the National Research Service Awardees appointed under the grant. Funds for such "other related costs" are intended to provide the institution with only partial support for the costs of developing or maintaining a high quality environment for the proposed research training and for meeting the costs of trainee research. Tuition at the postdoctoral level is limited to that required for specified courses.

PERIOD OF SUPPORT: Awards for institutional grants may be made for project periods of up to five years.

By law, an individual may receive no more than 5 years of support in the aggregate at the predoctoral level and 3 years of support in the aggregate at the postdoctoral level under the NRSA program (through an individual and/or institutional award). Any exception to these limitations requires a waiver from the Director of the awarding Institute based on review of justification from the awardee and the program director for the institutional grant. Length of predoctoral support is also affected by eligibility requirements stated elsewhere in this announcement (i.e., the requirement for 2 years graduate work).

CONDITIONS OF AWARD: Before a trainee can be appointed to an NRSA institutional grant and receive an NRS Award under the grant, he or she must meet NRSA eligibility requirements, and sign a Payback Agreement indicating his or her intent to meet the payback provisions required under the law (see below). Institutions shall notify prospective trainees of this provision prior to or at the time an appointment is offered.

The institution must submit to ADAMHA a Statement of Appointment form (PHS 2271) along with the signed Payback Agreement each time a trainee is appointed or reappointed to the grant (usually every 12 months). At the end of the total support period for an individual trainee, the institution must submit a Termination Notice form to ADAMHA. Failure

to submit the required forms in a timely fashion may result in an expenditure disallowance. No funds for tuition, fees, or trainee travel costs may be provided from an institutional NRSA grant to, or on behalf of, any individual unless that individual is receiving a stipend under the NRSA grant.

National Research Service Awards provided to individuals under institutional grants are made for full-time research training. Awardees may utilize some of their time in course studies and clinical duties if such work is closely related to and necessary for the research training experience. No appointment for less than nine months may be made without the prior approval of the ADAMHA awarding unit.

An NRS award recipient may not be held concurrently with another Federally-sponsored fellowship or similar Federal award which provides a stipend or otherwise duplicates provisions of the NRS award. An awardee may, however, accept concurrent educational remuneration from the Veterans Administration (e.g., G.I. Bill) and loans from Federal funds.

Awardees in academic institutions are not entitled to vacations as such. They are, however, entitled to the normal short student holidays observed by their training institution. The time between a summer session and the fall semester is to be utilized as an active part of the training period. Awardees in non-academic institutions are entitled to the holiday and vacation schedule applicable to all trainees at the institution.

PAYBACK REQUIREMENT: Within two years after completion of NRSA support, individual recipients of NRS Awards are to engage, for a period equal to the period of support, in continuous, health-related, biomedical or behavioral research or teaching, or any combination thereof. When in academic employment, such research or teaching may be in any combination in accordance with the usual patterns of academic employment. Alternatively, if the Secretary, HEW, determines there are no suitable health research or teaching positions available to the individual, the following may be authorized: (1) If the individual is a physician, dentist, nurse, or other individual trained to provide health care directly to patients, the Secretary may authorize (a) service in the National Health Service Corps, or (b) service in his or her specialty in a health maintenance organization serving a medically underserved population; or (2) If the individual who received the NRS Award is not trained to provide health care to patients, the Secretary may authorize the individual to engage in some other health-related activity. The period of service shall equal the period of support under both regular and alternative payback service.

For individuals who fail to fulfill their full service obligation, the United States is entitled to recover an amount equal to the total amount paid to the individual from the institutional grant, plus interest. The amount is computed in accordance with a formula which gives full credit

to total months actually served. Interest on the amount begins and is at the rate fixed by the Secretary of the Treasury considering private consumer rates which prevail on the date the United States becomes entitled to such amount. Financial payback must be completed within three years from that date.

By Federal Regulation, there are certain conditions under which the Secretary, HEW, may extend the period for undertaking service or for financial payback, permit breaks in service, or otherwise waive or suspend the payback obligation to an individual where enforcement of the obligation would involve substantial hardship and be against equity and good conscience.

TAXABILITY OF STIPENDS: Section 161(b) of the Revenue Act of 1978, states that (1) any amount paid to, or on behalf of, an individual from appropriated funds as a National Research Service Award under section 472 of the Public Health Service Act shall be treated as a scholarship or fellowship grant under section 117 of the Internal Revenue Code of 1954 and (2) the provisions of subsection (b) shall apply to awards made during calender years 1974 through 1979.

Section 117 is that part of the Internal Revenue Code which applies to the tax treatment of all scholarships and fellowships. In general, it provides that, subject to certain limitations, degree candidates may exclude the full amount of their scholarships or fellowships from their gross income for purposes of taxation, and non-degree candidates may exclude up to $300 a month of such awards for up to 36 months.

It must be emphasized that the interpretation and implementation of the tax laws are the domain of the Internal Revenue Service and the courts.

PHS takes no position on what this provision may mean for a particular taxpayer, and it does not have the authority to dispense tax advice. Individuals should consult their local IRS office about the applicability of the new law to their situations and for information on the proper steps to be taken regarding their tax obligations.

REVIEW PROCESS AND REVIEW CRITERIA: Applications for institutional grants are evaluated for scientific/technical merit by ADAMHA initial review groups and also are subject to the review and recommendations of the appropriate ADAMHA Advisory Council. Applications will be evaluated on the basis of records and qualifications of participating faculty, the proposed research objectives and program design, the criteria to be employed in selecting individuals to receive NRS Awards, previous training record of the program and its ability to attract high caliber students, institutional commitments, facilities and environment, and relationship of the proposed program goals to need for research training in ADAMHA program areas.

FUNDING CRITERIA: Awarding components select applications for funding primarily on the basis of merit review results, but other factors which may be considered include availability of funds, priority on postdoctoral support, program priorities as indicated in the research areas specified in this announcement, and grants policy requirements.

APPLICATION RECEIPT AND REVIEW SCHEDULE:

Receipt Date	Initial Review Group Meeting	Council Meeting	Earliest Possible Start Date
February 1	June	October	December 1
June 1	November	February	April 1
October 1	March	May	July 1

APPLICATION: Eligible institutions desiring to request support under this program are encouraged to review the specified research areas (see Attachment). Application must be made on Form PHS 6025. Application forms are to be submitted to the Division of Research Grants, 5333 Westbard Avenue, Bethesda, Maryland 20205. Requests for application forms and other inquiries regarding the ADAMHA National Research Service Awards program should be addressed as follows:

General Mental Health:	Grants Management Officer National Institute of Mental Health 5600 Fishers Lane Rockville, Maryland 20857
Alcohol Abuse and Alcoholism:	Chief, Training Branch Division of Resource Development National Institute on Alcohol Abuse and Alcoholism 5600 Fishers Lane Rockville, Maryland 20857
Drug Abuse:	Grants Management Officer National Institute on Drug Abuse 5600 Fishers Lane Rockville, Maryland 20857

NOTIFICATION OF FINAL ACTION: Applicants are notified by the awarding unit of the final action on the application by an award notice and/or by a letter.

The National Institutes of Health and the Division of Nursing/Health Resources Administration also provide support through National Research Service Awards. For information and application forms, contact the appropriate agency.

May 1979

ATTACHMENT

ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION

National Research Service Awards Program
Research Areas for Individual and Institutional Awards

Research areas are described below in which the three Institutes of the Alcohol, Drug Abuse, and Mental Health Administration will offer awards. These areas are defined in terms of substantive and problem areas for which research manpower is needed, and examples are included of professions, disciplines, and approaches to be emphasized. Presentation of research areas is not in order of priority.

National Institute on Alcohol Abuse and Alcoholism

The research training efforts of the National Institute on Alcohol Abuse and Alcoholism are derived from the research program of the Institute which focuses on the multiple determinants of alcoholism and on the treatment and rehabilitation of alcoholics and alcohol abusers. The research program has as its main goals the reduction of the incidence and prevalence of alcohol abuse and alcoholism, and the reduction of the morbidity and mortality associated with alcohol use, abuse and alcoholism. Research training support may be obtained for the totality of research and disciplinary areas ranging from basic biochemical and biomedical research to psychosocial and anthropological research. At present, however, the highest priority for funding under the NRSA program is in social, behavioral, clinical, and treatment research training involving such disciplines as sociology, psychology, anthropology, epidemiology, and health economics. The specific foci of the program are indicated below.

1. Development of Behavior

Research training is provided for the study of processes relating to the development of alcoholism and alcohol abuse. These studies may include examination of basic biological processes. Of particular interest at the present time are studies of genetic factors in the development of alcoholism. However, priority will be given to applications in the psycho-social disciplines; e.g., social factors which may influence use of alcohol, particularly in youths; and in the development of alcohol problems.

2. Disorders and Maladaptive Behavior

The NIAAA emphasizes research training related to the problems of alcoholism and excessive alcohol use, including related medical and

behavior disorders. Proposals are invited for research training in the etiology, diagnosis, treatment, epidemiology, and prevention of alcoholism and alcohol-related problems. Eligible training proposals may be concerned with such issues as early differential diagnosis of alcoholism, both from other related diseases as well as defining better the distinction between chronic heavy drinking and alcoholism itself; association between alcohol and other disorders such as heart disease, cancer or depression; efficacy of new and established treatments for various subpopulations; fetal alcohol syndrome; occupational alcoholism; and improved prevention strategies.

3. Social Issues Relating to Alcoholism and Alcohol Problems

The NIAAA places high priority on minorities, youth, and women, and seeks research training applications related to these populations. Areas of interest include, for example, cultural patterns in use and abuse of alcohol, special service needs and problems of these populations.

Research training proposals may address legal, political science, and economic aspects of various social issues related to alcoholism, in addition to psychological and sociological aspects. Examples of areas for which research training support might be provided include the effects of legislation (drinking-driving laws, alcoholic beverage control laws, drinking age, etc.) on patterns and trends in occurrence of alcoholism.

4. Services Research

There is need for highly qualified researchers to develop and apply scientific methodology to problems connected with developing and improving delivery systems for alcoholism treatment, rehabilitation, and prevention services. Encouraged are applications focused on research training in: the determination of the effectiveness of various services in meeting the needs of particular populations and communities (for example, minorities or occupational alcoholism programs); epidemiologic techniques as applied to alcoholism service delivery systems, to elucidate, for example, the effects of social and economic factors on the utilization of services; and methods for researching needs assessment and planning approaches, organization, staffing, management, and financing of alcoholism services as factors affecting, for example, the standards and quality of care, utilization, and cost effectiveness.

National Institute on Drug Abuse

1. Development of Behavior

Research training will emphasize the development of scientific expertise in behavioral pharmacology, molecular pharmacology, neuropharmacology, immunopharmacology, and endocrine pharmacology as these

disciplines relate to mechanisms underlying the development of substance abuse behaviors. There is also a need to train scientific personnel for basic and applied research in the following areas: analytical chemistry, chemical synthesis, pharmacokinetics, and quantitative structure activity relationships. Additional expertise is needed in the areas of behavioral genetics and pharmacogenetics as they relate to the addictive process. Specialists are also sought in human personality formation, psychological development, the socialization process, and their interrelationships with addictive life styles.

2. Disorders and Maladaptive Behavior

There is need to develop research expertise on complex behavioral and societal factors involved in the etiology and epidemiology of drug abuse and related maladaptive behavior. Emphasis will be placed on providing interdisciplinary training and training of behavioral and social scientists in experimental and field analysis of social behavior. Particular emphasis is placed on training of behavioral and social scientists who have an interest in research on substance abuse and its sequelae and analyzing life style factors in clinical and naturalistic settings. Experimental and methodological expertise is needed to develop new measures of incidence, prevalence, and usage patterns of abuse substances. Training also is needed to enable scientists to assess the safety and efficacy of new pharmacological and innovative behavioral treatment modalities and to develop and assess, within both clinical and naturalistic settings, new modalities for treating drug and substance abuse behavior among various population groups. Emphasis will be given to extending research methodological skills of clinicians in the fields of pharmacology, behavioral pharmacology, and treatment of substance abuse.

3. Social Issues Relating to Alcohol, Drug Abuse, and Mental Health

Applications for training are encouraged with respect to variations in drug abuse problems among special population groups at risk. Emphasis will be on interdisciplinary research training for social, psychological, and medical scientists. Trained personnel are also needed to conduct research employing anthropological methods for the study of drug use and abuse in different cultures and groups.

4. Services Research

Training is needed for social and behavioral scientists to design and execute evaluations of current programs of treatment or prevention.

National Institute of Mental Health

The research objective of NIMH is to better understand the determinants of human behavior particularly relevant to mental illness and mental health. Highly trained researchers are required to produce the new knowledge that is needed. Manpower needs in research related to mental health problems are in four general areas: (1) the processes underlying the development and variation of behavior; (2) mental disorders and maladaptive behavior; (3) social problems related to mental health; and (4) mental health services research. Support is available in these areas as they are relevant to the NIMH mission.

1. Development of Behavior

As behavior is determined by biological, psychological, and sociocultural factors, proposals will be accepted for research training in disciplinary or interdisciplinary settings concerned with these determinants. The development and maintenance of mental health throughout the entire lifespan of the individual is of concern, with special focus on childhood, adolescence, and old age.

Applications concerned with such areas as behavioral genetics, psychobiological aspects of maturation, sensory and motor processes, affective and cognitive processes, and biological bases of social behavior and social organization are eligible for support. The influence of psychotropic drugs on these processes and the mechanisms of action are of special concern to NIMH. Proposals will be considered also in such areas as development of the brain and the central nervous system, at all levels of organization, as they relate to behavior.

Proposals are also invited in the areas of social and cognitive development, perception, memory, and language, particularly as they relate to personality research. Other relevant topics include cultural norms of behavior, social structure, social interaction, socio-cultural factors of change and stress, human adaptation, socialization, family dynamics, and in general the effects of socio-cultural environment on the developmental processes of persons, families, and groups. Processes involving adaptive or "normal" behavior are as much of concern as those involving maladaptive or "abnormal" behavior.

2. Mental Disorders and Maladaptive Behavior

The mission of the NIMH includes concern for both mental health and mental illness. Proposals are invited for research training in the etiology, diagnosis, psychopathology, treatment, epidemiology, and the prevention of mental disorders and maladaptive behavior in homogeneous and heterogeneous cultural settings.

Eligible training proposals may be concerned with organic and functional disorders involving the nervous system and behavior in general. Areas of special importance are child mental health problems, mental disorders in later life, schizophrenia, depression and suicide, psychosomatic disorders, and psychoneuroses. Applications are invited for research training to identify life events associated with risk populations and the genetics of mental disorders. Of particular interest is training which combines basic biological, psychological, or socio-cultural research with clinical research training in mental disorders and maladaptive behavior. Research training concerned with measurement in the community of dimensions and distribution of mental disorders in terms of incidence, prevalence, and mortality, and an understanding of the factors associated with differential distribution is encouraged.

3. Social Problems Related to Mental Health

Applications are sought for research training in several social problem areas as they relate to mental health: (1) understanding crime and delinquency, individual violence, and law/mental health interactions, and evaluating community-based treatment programs for offenders; (2) understanding the relationship between the conditions of urban life, the functioning of communities and families, and the well-being and mental health of the individual; problem areas of special interest are the work situation, economic change, informal helping networks and alternative social forms; (3) understanding minority group concerns including their interest in mental health services, research on planning for the improvement of such services to minority groups, and understanding institutional racism and evaluating intervention programs to alleviate it; (4) social policy and social problems in mental health and aging; and (5) understanding the social and other conditions which encourage sexual attacks; the impact of rape on the victim and the family of the victim; evaluating the effectiveness of laws to prevent and control rape; evaluating the effectiveness of programs to assist the victim and the family of the victim, and programs to treat offenders.

Training in the area of social problems research is often multidisciplinary in nature. It covers a broad range of research problems, including basic studies of human behavior, intervention studies concerned with meeting special human needs, and studies on the overall improvement of mental health and social systems. Such problems can be addressed from the level of individual behavior and needs on the one hand, to the level of social institutions and their interactions on the other hand.

4. Mental Health Services Research

A major task for the research community is the development of a pool of highly qualified researchers trained to develop, apply, and refine appropriate scientific methodologies for the study of problems related to the delivery of mental health services.

Accordingly, applications are sought for research training proposals designed to strengthen and expand the capabilities of researchers for work on theoretical and methodological problems in this area, particularly as regards mental health services for children, the elderly, and minorities.

Encouraged are applications focused on training in: epidemiologic techniques as applied to mental health service systems, to elucidate, for example, the effects of social and economic factors on utilization of services; methods for researching needs assessment and planning approaches, organization, staffing management, and financing of mental health services as factors affecting, for example, the standards and quality of care, utilization and cost effectiveness; and methods for evaluating the effectiveness of various services in meeting the needs of particular populations or communities.

The general research areas described above (development of behavior, mental disorders and maladaptive behavior, social problems related to mental health and mental health services research) require the mobilization of both disciplinary and interdisciplinary approaches. Accordingly, the Institute provides support for research training which addresses the problems and priorities discussed above through such disciplines as the following:

Biological Sciences:

This area consists primarily of:

- Behavioral Genetics
- Biological Anthropology
- Neurobehavioral Sciences
  - Neuroanatomy
  - Neurophysiology
  - Neuropsychology
  - Neuroendocrinology
  - Neurochemistry
- Psycho-Neuropharmacology
- Ethology

Psychological Sciences:

This cluster consists primarily of:

- Child and Developmental (life span)
- Social, Environmental, and Ecological
- Sensory Processes, Perception, and Cognition
- Human Learning, Memory and Performance
- Comparative and Animal Behavior
- Physiological and Biopsychology
- Experimental Psychopathology and Personality
- Evaluation/Policy Research

Social Sciences:

This area consists primarily of:

Cultural Anthropology
Sociology
Social Psychology
Economics
Political Science
Epidemiology
Evaluation/Policy Research

Clinical Investigators

Research training support is also available to train people as clinical investigators. Clinical investigators are those individuals with a doctoral or equivalent professional degree in a clinical health profession (such as medicine, clinical psychology, nursing, or social work) who are trained to provide clinical services but who wish training in the conduct of clinical research. Research training may be in the theory, methods and techniques of any relevant discipline(s).

C.7

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION
ROCKVILLE, MARYLAND 20852

OFFICE OF THE ADMINISTRATOR

A N N O U N C E M E N T

ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION

National Research Service Awards for
Individual Fellows

(Federal Domestic Assistance Catalog Numbers 13.272, 13.278 and 13.282)

May 1979

Subject to availability of funds and to periodic modification of research areas, applications for individual fellowships will be accepted by ADAMHA under receipt dates of February 1, June 1, and October 1.

AUTHORITY AND PURPOSE: Under authority of Section 472 of the Public Health Service Act as amended (42 USC 2891-1), the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) provides National Research Service Awards to individuals for research training experiences in specified areas of biomedical and behavioral research. (See Attachment for description of these areas.) Title 42 of the Code of Federal Regulations, Part 66, is applicable to these awards. This announcement supersedes all previous program announcements, guidelines, or other communications regarding the ADAMHA National Research Service Awards program except for the "Guidelines for National Research Service Awards" issued jointly by the National Institutes of Health, ADAMHA, and the Health Resources Administration. Should supplementary guidelines be necessary in the future, they will be issued only by the Office of the Administrator, ADAMHA or by the Director of an Institute. This announcement contains only minor changes from the July, 1978 announcement, and these are principally to reflect modifications in legislative and administrative requirements.

AVAILABILITY OF FUNDS: In Fiscal Year 1978, 231 fellowships were funded for a total of $2.3 million. Of these, 98 were for new or competing extension (renewal) applications, for a total of $1.1 million. Availability and amount of funds for future years is contingent upon annual appropriations.

LEVELS OF TRAINING: Applications will be accepted for predoctoral or postdoctoral research training. However, based on findings and recommendations from national manpower studies, ADAMHA is redirecting the emphasis in its programs from predoctoral to postdoctoral support.

ELIGIBILITY REQUIREMENTS: Applicants must be citizens or non-citizen nationals of the United States, or have been lawfully admitted to the United States for permanent residence and have in their possession an Alien Registration Receipt Card (I-151 or I-551) at time of application. Non-citizen nationals are persons born in lands which are not States, but which are under U.S. sovereignty, jurisdiction, or administration (e.g., American Samoa). Individuals on temporary or student visas are not eligible.

A predoctoral applicant must have completed two or more years of graduate work as of the proposed activation date of the fellowship. A post-doctoral applicant must have received a Ph.D., M.D., D.D.S., D.O., D.V.M., O.D., Sc.D., D.Eng., D.N.S., or equivalent degree as of the proposed activation date of the fellowship. Certification by an authorized official of the degree granting institution that all requirements have been met is also acceptable.

Applicants must propose research training in specified research areas (see Attachment). The program offers an opportunity to scientists, research clinicians, etc., to carry out supervised research in these areas, with the primary purpose of extending their skills and knowledge. National Research Service (NRS) Awards are not made for study leading to the M.D., D.O., D.D.S., or similar professional degrees, or for study which is part of residency training leading to a medical specialty. However, an NRS Award may support a specified period of full-time research training for a health professional who intends to pursue a research career, even if that period of training may be creditable toward specialty board certification.

Prior to formal submission, an applicant must arrange for appointment to an appropriate institution and acceptance by a sponsor who will supervise the research training experience. The institutional setting may be a domestic or foreign non-profit private or public institution (including ADAMHA or NIH) that has the staff and facilities to provide the proposed research training in a suitable environment.

With adequate justification, an individual may request support for research training abroad. Such applicants are required to provide detailed information on the unique facilities and/or training opportunity at the proposed location.

ANNUAL STIPENDS AND ALLOWANCES: The annual stipend for predoctoral individuals at all levels is $3,900.

For postdoctoral individuals the stipend for the first year is determined by the number of years of prior relevant postdoctoral experience at the time of award. Relevant experience may include research experience (including industrial), teaching, internship, residency, or other time spent in full-time pursuit of additional degrees or full-time studies in a health-related field at a level beyond that of the qualifying doctoral degree. The stipend for each subsequent year is based on the level of the first year plus $400 for each additional year under a National Research Service Award.

Postdoctoral Stipends

Years of Relevant Postdoctoral Experience at Time of Award	YEAR OF AWARD		
	1st Year	2nd Year	3rd Year
0	$10,000	$10,400	$10,800
1	10,800	11,200	11,600
2	11,500	11,900	12,300
3	12,200	12,600	13,000
4	12,800	13,200	13,600
5 or more	13,200	13,600	14,000

The stipend is a pre-established level of support to help provide for the fellow's living expenses during the period of training. The stipend is not a payment for services performed. Fellows supported under individual awards are not considered to be employees either of PHS or of their sponsoring institution. For fellows sponsored by domestic non-Federal institutions, the payment of the stipend will be made through the sponsoring institution. For fellows sponsored by Federal or foreign institutions, the stipend payment will be made directly by U.S. Treasury check.

Supplementation of the NRSA stipend from non-Federal funds is permitted. Other Federal funds may be used for supplementation only if explicitly

authorized by the program from which such funds are derived. No ADAMHA, NIH, or HRA grant funds may be used for supplementation. This is not intended to discourage in any way the use of Federal loan funds. This additional support may be provided without obligation by the awardee or may be conditioned on his or her performance of certain services such as teaching or serving as a laboratory assistant. Under no circumstances, however, may the service requirements detract from or prolong the training.

Funds will not be provided to cover the cost of travel between the fellow's place of residence and the training institution, except (1) the institution may authorize from the institutional allowance a one-way travel allowance in a case of extreme need or hardship; or, (2) the ADAMHA awarding component may authorize the cost of a single roundtrip economy or coach ticket to the training site when the approved training is at a foreign site or institution.

Upon request, ADAMHA will provide funds of up to $3,000 per 12-month period to the non-Federal sponsoring institution to help defray such trainee expenses as tuition and fees, research supplies, equipment, travel to scientific meetings, and related items. An allowance of up to $1,000 per 12-month period is available for the fellow sponsored by a Federal laboratory for scientific meeting travel expenses and appropriate medical insurance. When an individual award is for approved training involving research at sites other than the sponsoring institution, an allowance may be requested to help support field costs of the research as well as travel.

The sponsoring institution shall be entitled to the approved institutional allowance only upon official activation of the award. However, if an individual fellow is not enrolled or engaged in training for more than half of the year of support for which the award was made, one-half of the allowance must be refunded to the Public Health Service.

PERIOD OF SUPPORT: There are legal limitations on the aggregate number of years of NRSA support which an individual may receive, through individual awards and/or institutional grants, i.e., no more than 5 years at the predoctoral level and 3 years at the postdoctoral level. Any exception to these legal limitations requires a waiver from the Director of the awarding Institute based on review of justification from the individual awardee and his or her sponsor.

ADAMHA policy limits an application for fellowship support, at either the pre- or postdoctoral level, to three years. In practice, recommendations of review committees are generally for one or two years. Support beyond the recommended period, and within the legal limits of 5 years predoctoral and 3 years of postdoctoral support, may be requested in an application that will be reviewed by an initial review group and will compete for available funds.

CONDITIONS OF AWARD: No award will be made available to an individual unless he or she has signed and submitted a Payback Assurance indicating

his or her intent to meet payback provisions required under the law. No funds may be disbursed until the individual has started under the award and an Activation Notice and Payback Agreement have been submitted to PHS. At the end of the total support period, the individual fellow must submit a Termination Notice form to ADAMHA. Failure to submit this required form in a timely fashion may result in collection action.

Awards are made for full-time research training. Fellows may utilize some of their time in course studies and clinical duties if such work is closely related to and necessary for their research training experience.

An NRS award may not be held concurrently with another Federally-sponsored fellowship or similar Federal award which provides a stipend or otherwise duplicates provisions of the NRS Award. An NRSA recipient may, however, accept concurrent educational remuneration from the Veterans Administration (e.g., G.I. Bill) and loans from Federal funds.

Awardees in academic institutions are not entitled to vacations as such. They are, however, entitled to the normal short student holidays observed by their training institution. The time between a summer session and the fall semester is to be utilized as an active part of the training period. Awardees in non-academic institutions are entitled to the holiday and vacation schedule applicable to all trainees at the institution.

PAYBACK REQUIREMENTS: Within two years after completion of NRSA support, individual recipients of NRS Awards are to engage, for a period equal to the period of support, in continuous, health-related, biomedical or behavioral research or teaching, or any combination thereof. When in academic employment, such research or teaching may be in any combination in accordance with the usual patterns of academic employment. Alternatively, if the Secretary, HEW, determines there are no suitable health research or teaching positions available to the individual, the following may be authorized: (1) If the individual is a physician, dentist, nurse, or other individual trained to provide health care directly to patients, the Secretary may authorize (a) service in the National Health Service Corps, or (b) service in his or her specialty in a health maintenance organization serving a medically underserved population; or, (2) If the individual who received the NRS Award is not trained to provide health care to patients, the Secretary may authorize the individual to engage in some other health-related activity. The period of service shall equal the period of support under both regular and alternative payback service.

For individuals who fail to fulfill their full service obligation, the United States is entitled to recover an amount equal to the total amount paid to the individual, plus interest. The amount is computed in accordance with a formula which gives full credit to total months actually served. Interest on the amount begins and is at the rate fixed by the Secretary of the Treasury considering private consumer rates

which prevail on the date the United States becomes entitled to such amount. Financial payback must be completed within three years from that date.

By Federal Regulation, there are certain conditions under which the Secretary, HEW, may extend the period for undertaking service or for financial payback, permit breaks in service, or otherwise waive or suspend the payback obligation to an individual where enforcement of the obligation would involve substantial hardship and be against equity and good conscience.

TAXABILITY OF STIPENDS: Section 161(b) of the Revenue Act of 1978, states that (1) any amount paid to, or on behalf of, an individual from appropriated funds as a National Research Service Award under section 472 of the Public Health Service Act shall be treated as a scholarship or fellowship grant under section 117 of the Internal Revenue Code of 1954 and (2) the provisions of subsection (b) shall apply to awards made during calendar years 1974 through 1979.

Section 117 is that part of the Internal Revenue Code which applies to the tax treatment of all scholarships and fellowships. In general, it provides that, subject to certain limitations, degree candidates may exclude the full amount of their scholarships or fellowships from their gross income for purposes of taxation, and non-degree candidates may exclude up to $300 a month of such awards for up to 36 months.

It must be emphasized that the interpretation and implementation of the tax laws are the domain of the Internal Revenue Service and the courts.

PHS takes no position on what this provision may mean for a particular taxpayer, and it does not have the authority to dispense tax advice. Individuals should consult their local IRS office about the applicability of the new law to their situations and for information on the proper steps to be taken regarding their tax obligations.

REVIEW PROCESS AND REVIEW CRITERIA: Applications will be evaluated for scientific/technical merit by ADAMHA initial review groups. The application will be evaluated on the basis of past academic and research records, the research training proposal, the sponsor's general qualifications, the training environment, the applicant's research goals in terms of specified priority areas, publications, reference reports and other relevant information.

FUNDING CRITERIA: Awarding components select applications for funding primarily on the basis of merit review results, but other factors which may be considered include availability of funds, priority on postdoctoral support, program priorities as indicated in the research areas specified in this announcement, and grants policy requirements.

APPLICATION RECEIPT AND REVIEW SCHEDULE:

Receipt Dates	Initial Review Group Meeting	Earliest Possible Start Date
February 1	June	September 1
June 1	November	February 1
October 1	March	June 1

APPLICATION INFORMATION: Individuals are encouraged to review the eligibility criteria and specified research areas in this announcement before requesting application kits. The applicant must submit (1) an application (PHS 416-1), according to instructions provided by ADAMHA; (2) a signed assurance indicating that the service or financial payback requirement will be complied with, if an award is made; and (3) if a non-citizen, a notarized statement of permanent residence. A complete application also includes the sponsor's Facilities and Commitment Statement which must be with the application at the time it is submitted. In addition, an applicant must arrange for the submission of reference reports on his or her behalf. Application forms are to be submitted to the Division of Research Grants, 5333 Westbard Avenue, Bethesda, Maryland 20205.

An individual may not have more than one competing application pending review concurrently in the National Research Service Award program.

Requests for application forms and other inquiries regarding the ADAMHA National Research Service Awards for individual fellows should be addressed as follows:

General Mental Health:
Grants Management Officer
National Institute of Mental Health
5600 Fishers Lane
Rockville, Maryland 20857

Alcohol Abuse and Alcoholism:
Chief, Training Branch
Division of Resource Development
National Institute on Alcohol Abuse and Alcoholism
5600 Fishers Lane
Rockville, Maryland 20857

Drug Abuse:
Grants Management Officer
National Institute on Drug Abuse
5600 Fishers Lane
Rockville, Maryland 20857

NOTIFICATION OF FINAL ACTION: An applicant is notified by the awarding unit of the final action on the application by an award notice or by a letter.

The National Institutes of Health and the Division of Nursing/Health Resources Administration also provide support through National Research Service Awards. For information and application forms, contact the appropriate agency.

NOTE: For descriptions of eligible "Research Areas for Individual and Institutional Awards," see Attachment to the May 1979 Announcement by ADAMHA of National Research Service Awards for Institutional Grants. (See pages 134-140 of this report.)

C.8

NATIONAL RESEARCH SERVICE AWARDS

Institutional Grants

Public Health Service Act, Section 472

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE
HEALTH RESOURCES ADMINISTRATION BUREAU OF HEALTH MANPOWER DIVISION OF NURSING HYATTSVILLE, MD. 20782

National Research Service Awards (Institutional Grants) may be provided to eligible institutions to develop or enhance postdoctoral research training opportunities for individuals, selected by the institutions, who are interested in careers in nursing research and related behavioral and biomedical research. Awards are contingent upon favorable review and the availability of funds.

PURPOSE: To extend research training opportunities in nursing and health-related sciences through the support of institutions that offer exceptional training opportunities in selected areas of study.

CONDITIONS OF AWARD:

Full-time Study: Appointments are made for full-time training in research.

Payback Provisions: Trainees must sign a Payback Agreement indicating intent to meet the service or payback provisions required under the law.

PERIOD OF SUPPORT: Institutional grant awards may be made for project periods of up to 5 years.

No individual may receive more than 5 years of aggregate NRSA support at the predoctoral level and 3 years of aggregate NRSA support at the postdoctoral level.

PROVISIONS: Predoctoral stipends are $5,040 per year.

Postdoctoral stipends begin at $13,380 per year and are determined by the number of years of relevant postdoctoral experience at the time of the award.

The institution will receive upon request a training allowance of $3,000 per year for each predoctoral trainee and $5,000 per year for each postdoctoral trainee to include tuition and fees and certain other costs essential to carry out the training program.

ELIGIBILITY: Nonprofit private or non-Federal public institutions in the United States must have the staff and facilities required for the proposed programs.

Trainees must be (1) citizens of the U.S. or have been lawfully admitted for permanent residence (individuals on temporary or student visas are not eligible); (2) registered professional nurses with active license and a baccalaureate and/or a master's degree in nursing.

Postdoctoral trainees must have received a doctoral degree as of the date of appointment to the program, in an area relevant to the proposed research.

APPLICATION PROCEDURE: Applicants are urged to contact the Nursing Research Branch for consultation before completing applications (telephone 301-436-6204). Application kits may be obtained from:

Nursing Research Branch
Division of Nursing, BHM, HRA
Center Building, Room 3-50
3700 East-West Highway
Hyattsville, Maryland 20782

DEADLINE DATES FOR RECEIPT OF APPLICATIONS: February 1, June 1, and October 1.

SELECTION OF AWARDEES: Institutional Grant applications are subject to both peer review for scientific merit and programmatic merit and to final review by the National Advisory Council on Nurse Training.

Revised March 1980

C.9

NATIONAL RESEARCH SERVICE AWARDS

Predoctoral and Postdoctoral Nurse Fellowship Program

Public Health Service Act, Section 472

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE
HEALTH RESOURCES ADMINISTRATION BUREAU OF HEALTH MANPOWER DIVISION OF NURSING HYATTSVILLE, MD. 20782

National Research Service Awards (nurse fellowships) may be provided to individual nurses for predoctoral and postdoctoral research training in specified areas of nursing and in the biomedical and behavioral fields important to nursing for periods up to five years. Awards are contingent upon favorable review and the availability of funds.

PURPOSES: (1) To increase the opportunities for qualified nurses to engage in full-time graduate study and research training; (2) to prepare professional nurses to conduct independent research, collaborate in interdisciplinary research, and stimulate and guide others in nursing research; (3) to promote the availability and utilization of nurses with research training in nursing and/or the basic sciences to function as faculty in schools of nursing at undergraduate and graduate levels; and (4) to prepare nurses to conduct scientific inquiry in disciplines that have significance for nursing theory and practice.

CONDITIONS OF AWARD:

Full-time Study: Appointments are made for full-time training in research.

Payback Provisions: Trainees must sign a Payback Agreement indicating intent to meet the service or payback provisions required under the law.

PERIOD OF SUPPORT: No individual may receive more than 5 years of aggregate NRSA support at the predoctoral level and 3 years of aggregate NRSA support at the postdoctoral level.

Predoctoral stipends are $5,040 per year.

Postdoctoral stipends begin at $13,380 per year and are determined by the number of years of relevant postdoctoral experience at the time of the award.

The institution will receive upon request a training allowance of $3,000 per year for each predoctoral trainee and $5,000 per year for each postdoctoral trainee to include tuition and fees and certain other costs essential to carry out the training program.

ELIGIBILITY: Applicants must be registered professional nurses with active license and either a baccalaureate and/or a master's degree in nursing. Applicants for postdoctoral study must have received a Ph.D., D.N.S., Sc.D., or equivalent degree prior to the beginning date of the proposed fellowship.

Applicants must be citizens or have been lawfully admitted to the United States for permanent residence and have in their possession a permanent visa at the time of application. Individuals on temporary or student visas are not eligible.

APPLICATION PROCEDURE: Applicants should request further information and/or kits from:

Nursing Research Branch
Division of Nursing, BHM, HRA
Center Building, Room 3-50
3700 East-West Highway
Hyattsville, Maryland 20782

DEADLINE DATES FOR RECEIPT OF APPLICATIONS: February 1, June 1, and October 1.

SELECTION OF AWARDEES: Applications will be evaluated by initial scientific review groups and are also subject to review and action by the National Advisory Council on Nurse Training.

Revised March 1980

APPENDIX D

CONFERENCES

D.1: Program for Public Hearing, March 8, 1979, Washington, D.C.

D.2: Program for Invitational Conference on Issues in the Clinical Sciences, June 5, 1979, Chicago

D.3: Program and List of Participants for Workshop on Establishing Research Training Programs in Behavior and Health, January 18, 1980, Washington, D.C.

NATIONAL RESEARCH COUNCIL
COMMISSION ON HUMAN RESOURCES

2101 Constitution Avenue Washington, D. C. 20418

COMMITTEE ON A STUDY OF NATIONAL NEEDS FOR
BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

PROGRAM FOR PUBLIC HEARING

March 8, 1979 8:30 a.m. to 1:15 p.m.

Lecture Room, National Academy of Sciences

8:00 a.m. REGISTRATION

8:30 a.m. INTRODUCTORY REMARKS
Dr. Henry Riecken, Chairman

Speakers (in order of appearance)

Ida Martinson	University of Minn., School of Nursing
Mary Conway	Univ. of Wisconsin-Milwaukee, School of Nursing
Evelyn Barritt	Univ. of Iowa, College of Nursing
Marion Murphy	American Assoc. of Colleges of Nursing
Peyton Weary	Assoc. of Professors of Dermatology
Frank Young	American Society for Microbiology
Michael Pallak	American Psychological Association
James Gallagher	Society for Research on Child Development
Herbert Blalock	American Sociological Association
Cynthia Jenkins	Institute for African-American Health
Rachel Larson	Sigma Delta Epsilon--Graduate Women in Science
Melvin Fried	Univ. of Florida, College of Medicine
John Eckstein	American Heart Association
Walter Abelmann	American College of Cardiology
Richard Peterson	Society of Nuclear Medicine
William Jarzembski	Institute of Electrical & Electronic Engineering/Engineering in Medicine & Biology Society
Coralie Farlee	Environmental Protection Agency
Howard Brinkley	Society for the Study of Reproduction

12:45 p.m. OPEN DISCUSSION PERIOD

1:15 p.m. ADJOURNMENT

NATIONAL RESEARCH COUNCIL
COMMISSION ON HUMAN RESOURCES

2101 Constitution Avenue Washington, D. C. 20418

COMMITTEE ON A STUDY OF NATIONAL NEEDS FOR
BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

PANEL ON CLINICAL SCIENCES

Invitational Conference
O'Hare Hilton
June 5, 1979

AGENDA

I.	Purpose and Ground Rules	Dr. Challoner
II.	Introductory Remarks	Dr. Wyngaarden
III.	Outlook on NIH Support of Research Training	Dr. Merritt
IV.	Clinical Research Personnel in the Behavioral Sciences	Dr. Klerman
V.	Statements by Invited Participants	
VI.	General Discussion	Dr. Challoner
VII.	Executive Session	

NATIONAL RESEARCH COUNCIL
COMMISSION ON HUMAN RESOURCES

2101 Constitution Avenue Washington, D. C. 20418

COMMITTEE ON A STUDY OF NATIONAL NEEDS FOR
BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

PANEL ON CLINICAL SCIENCES

Invitational Conference
O'Hare Hilton

June 5, 1979

Invited Participants

	Organization
Dr. JoAnne Brasel Columbia University College of Physicians and Surgeons 630 West 168th Street New York, New York 10032	Society for Pediatric Research
Dr. Neal S. Bricker Department of Medicine UCLA School of Medicine 1000 Veteran Avenue West Medical Campus Los Angeles, California 90024	Committee on National Medical Policy, American Society for Clinical Investigation
Dr. Kenneth E. Clark, Dean College of Arts and Sciences University of Rochester Rochester, New York 14627	Co-chairperson, Panel on Behavioral Sciences, National Research Council
Dr. Jean Dodds Division of Laboratories and Research New York State Department of Health Albany, New York 12201	Committee on Veterinary Medical Sciences, National Research Council
Dr. John N. Forrest, Jr. Department of Medicine Yale University School of Medicine 333 Cedar Street New Haven, Connecticut 06510	American Federation for Clinical Research

Dr. Daniel B. Green, Executive Director
American Association for Dental Research
734 Fifteenth Street, N.W.
Washington, D. C. 20005

Dr. Gerald L. Klerman, Administrator
Alcohol, Drug Abuse, and Mental Health
Administration
Parklawn Building
5600 Fishers Lane
Rockville, Maryland 20857

Dr. Doris Merritt
Assistant to the Director
National Institutes of Health
Bethesda, Maryland 20205

Dr. Thomas E. Morgan, Director
Division of Biomedical Research
Association of American Medical Colleges
One Dupont Circle, N.W.
Washington, D. C. 20036

Dr. Donald O. Nutter
Robert Wood Johnson Health Policy Fellow
Office of Senator Richard S. Schweiker
253 Russell Senate Office Building
Washington, D. C. 20510

Dr. Arthur H. Rubenstein
Department of Medicine
Pritzker School of Medicine
University of Chicago
950 East 59th Street
Chicago, Illinois 60637

Dr. Richard M. Scheffler
Institute of Medicine
2600 Virginia Avenue, N.W.
Washington, D. C. 20006

PANEL ON CLINICAL SCIENCES
June 5 Invitational Conference
Invited Participants

Dr. Alvin R. Tarlov, Chairman
Department of Medicine
Pritzker School of Medicine
University of Chicago
950 East 59th Street
Chicago, Illinois 60637

Chairman, Task Force on Manpower Needs in Internal Medicine

Dr. James B. Wyngaarden, Chairman
Department of Medicine
Duke University Medical Center
Durham, North Carolina 27710

Vice Chairman, Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel

* * * *

Staff

Dr. Samuel S. Herman
Dr. Herbert B. Pahl
Dr. Allen M. Singer
Dr. Pamela Ebert-Flattau
Mrs. Kay C. Harris

NATIONAL RESEARCH COUNCIL
COMMISSION ON HUMAN RESOURCES

2101 Constitution Avenue Washington, D. C. 20418

COMMITTEE ON A STUDY OF NATIONAL NEEDS FOR
BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

WORKSHOP ON ESTABLISHING RESEARCH TRAINING PROGRAMS IN BEHAVIOR AND HEALTH

January 18, 1979

The Board Room
National Academy of Sciences

Thematic Sessions

Chairman: Kenneth E. Clark

8:30 a.m.	Introductory Remarks: Gardner Lindzey
8:45 - 10:00	Session I: ENHANCING THE QUALITY OF GRADUATE EDUCATION IN THE BEHAVIORAL SCIENCES o Changing patterns in graduate enrollments o New jobs, new demands
10:00 - 10:15	Open discussion
10:15 - 11:30	Session II: INNOVATIONS IN BEHAVIORAL RESEARCH -- DEVELOPING A SENSE OF IDENTITY
11:30 - 11:45	Open discussion
11:45	Luncheon
1:00 - 2:00 p.m.	Session III: EXPERIENCES IN PUTTING GREATER EMPHASIS ON POSTDOCTORAL TRAINING o The research environment o Faculty/curricula o Placement of graduates

2:00 - 2:15 **Open discussion**

2:15 - 3:15 **Session IV: THE NATIONAL RESEARCH SERVICE AWARDS AUTHORITY**

- **Length of training**
- **Institutional support**
- **Recruitment of women/minorities**
- **Short-term training**

3:15 - 3:30 **Open discussion**

3:30 - 4:00 **Conference overview**

4:00 **Adjournment**

NATIONAL RESEARCH COUNCIL
COMMISSION ON HUMAN RESOURCES

2101 Constitution Avenue Washington, D. C. 20418

COMMITTEE ON A STUDY OF NATIONAL NEEDS FOR
BIOMEDICAL AND BEHAVIORAL RESEARCH PERSONNEL

WORKSHOP ON ESTABLISHING RESEARCH TRAINING PROGRAMS IN BEHAVIOR AND HEALTH

January 18, 1980

The Board Room
National Academy of Sciences

Workshop Participants

PANEL ON BEHAVIORAL SCIENCES

Kenneth E. Clark, University of Rochester

Lucy M. Cohen, Catholic University of America

Ada Jacox, University of Maryland

Otto Larsen, University of Washington

P. Herbert Liederman, Stanford Medical School

Gardner Lindzey, Center for Advanced Studies in the Behavioral Sciences

Brendan Maher, Harvard University

Robert McGinnis, Cornell University

Lee Robins, Washington University, St. Louis

Jerome Singer, Uniformed Services University of the Health Sciences

NRSA COMMITTEE

Henry W. Riecken, University of Pennsylvania

INVITED PARTICIPANTS

Samuel Bloom, Mt. Sinai School of Medicine

M. Margaret Clark, University of California, San Francisco

Mildred Disbrow, University of Washington

Richard Evans, University of Houston

Gerald McClearn, University of Colorado

Joseph Matarazzo, University of Oregon School of Medicine

David Mechanic, Rutgers University

Evan Pattishall, Pennsylvania State University School of Medicine

Herbert Pick, University of Minnesota

Bertram Raven, University of California, Los Angeles

Donald Reis, Cornell Medical College

Mark Sobell, Vanderbilt University

INVITED OBSERVERS

National Institutes of Health (Office of the Director)

William Batchelor

Harvey Wichman

Solomon Schneyer

National Institute of Neurological and Communicative Diseases and Stroke

Larry Fisher

National Cancer Institute

Sandra Levy

National Institute of Dental Research

Patricia Bryant

National Institute of Arthritis, Metabolism and Digestive Diseases

Lois Lipsett

National Institute on Aging

Matilda White Riley

National Institute of Child Health and Human Development

Betty Pickett

National Heart, Lung and Blood Institute

Donald MacCannon

Stephen Weiss

NIH/Division of Research Grants

Susan Streufert

Alcohol, Drug Abuse and Mental Health Administration (Extramural Affairs)

Michele Harvey

National Institute of Mental Health

Stanley Schneider

Kenneth Lutterman

National Institute on Alcohol Abuse and Alcoholism

Leonard Mitnick

National Institute on Drug Abuse

Edward Morgan

Health Resources Administration/Division of Nursing

Marie Bourgeois

American Anthropological Association

Louis Cimino

American Association for the Advancement of Science

Arthur Livermore

American Psychological Association

Steve Nelson

American Sociological Association

Lawrence Rhoades

Council of Graduate Schools in the U.S.

Michael Pelczar

NAS/Institute of Medicine

Carleton Evans

Delores Parron

Fredrick Solomon

NRSA STAFF

Pamela Ebert-Flattau

Jesse Gary

Janie B. Marshall

APPENDIX E

QUESTIONNAIRE: SURVEY OF HEALTH SERVICES RESEARCH PERSONNEL CONDUCTED BY THE NATIONAL RESEARCH COUNCIL

OMB No. 68S-78005
Approval Expires March 1979

SURVEY OF HEALTH SERVICES RESEARCH PERSONNEL CONDUCTED BY THE NATIONAL RESEARCH COUNCIL

THE ACCOMPANYING LETTER requests your assistance in this survey of health services research personnel.
PLEASE READ THE INSTRUCTIONS carefully and answer by printing your reply or entering an "X" in the appropriate box.
PLEASE RETURN the completed form in the enclosed envelope to the Commission on Human Resources, JH638, National Research Council, 2101 Constitution Ave., NW, Washington, D.C. 20418.

NOTE: ALL INFORMATION YOU PROVIDE WILL BE TREATED AS CONFIDENTIAL AND USED FOR STATISTICAL PURPOSES ONLY.

[ ] [ ]

(1-7) ID
(8) CD

1 Date of Birth	2 State or Foreign Country of Birth	3 Citizenship	4 Sex
Mo. Day Year		USA Non-USA Specify	Male Female
____ ____ ____	____	1☐ 2☐ ____	1☐ 2☐
(9) (10-11) (12-13)	(14-15)	(16) (17-18)	(19)

5 What is your racial background?

0 ☐ American Indian or Alaskan Native
1 ☐ Asian or Pacific Islander
2 ☐ Black
3 ☐ White
(20)

5a Is your ethnic heritage Hispanic?

0 ☐ Yes
1 ☐ No
(21)

6 List in the table below all COLLEGIATE and GRADUATE DEGREES, excluding honorary degrees, that have been awarded to you. Use the enclosed SPECIALTIES LIST for each degree specified.

Type of Degree	Granted Mo. Yr.	Major Field (Use Specialties List) Name	No.	Institution Name	City	State
Bachelor's						
Master's						
Other Degree Specify_____						
Other Degree Specify_____						

EMPLOYMENT OR ACADEMIC AFFILIATION

Instructions: Please answer Questions 7 through 11 with respect to your PRINCIPAL employment or academic affiliation as of OCTOBER 15, 1977.

7 Which BEST describes your PRINCIPAL employment or academic status as of OCTOBER 15, 1977? *(Check only ONE)*

1 ☐ Full-time degree candidate
2 ☐ Holding postdoctoral appointment
3 ☐ Employed full-time (excluding postdoctoral appointment)
4 ☐ Employed part-time (excluding postdoctoral appointment)
5 ☐ Unemployed and seeking employment
6 ☐ Unemployed and NOT seeking employment
7 ☐ Retired
8 ☐ Other status, specify_____ (70)

8 What is the name and location of your PRINCIPAL employer/academic affiliation?

_____ _____ _____ (71-76)
Name of Institution/Organization | City | State

9 Which category below best describes the type of organization of your PRINCIPAL employer/academic affiliation? *(Check only ONE)*

UNIVERSITY
1 ☐ Medical school
2 ☐ University-owned or -affiliated teaching hospital
3 ☐ Other health professional school, specify_____
4 ☐ Faculty of arts and sciences
5 ☐ Other, specify_____

OTHER EDUCATIONAL INSTITUTION
6 ☐ 4-year college
7 ☐ 2-year college or technical school
8 ☐ Other, specify_____

GOVERNMENT
9 ☐ Federal government (including national laboratory and military)
10 ☐ State or local government, specify_____

BUSINESS
11 ☐ Self-employed
12 ☐ Pharmaceutical firm
13 ☐ Other business or industry (including insurance companies)

OTHER SECTORS
14 ☐ Hospital (other than those included above)
15 ☐ Clinic
16 ☐ Nonprofit organization (other than those included above)
17 ☐ Other type of employer, specify_____
_____ (77-78)

10 From the Degree and Employment Specialties List enclosed, enter both the number and title of the scientific specialty most closely related to your principal employment/postdoctoral appointment. Write in your specialty if it is not on the list.

_____ _____ (9-11)
Number | Title of Specialty

11 Approximately what percent of your time do you devote to each of the following activities?

Research/development	_____ % (12-13)
Teaching	_____ % (14-15)
Administration/management	_____ % (16-17)
Consulting	_____ % (18-19)
Professional services (other than consulting)	_____ % (20-21)
Other, specify_____	_____ % (22-23)
	100 %

HEALTH SERVICES RESEARCH: TRAINING

DEFINITION: Health services research examines the organization and performance of the health care system so that sound health care policy may be developed. Through the application of quantitative and systematic research methods, health services research seeks to increase the efficiency and effectiveness of the health care system to make the products of biomedical and behavioral research available promptly and equitably.

12 Have you ever been or are you currently engaged in health services research as described above?

1 ☐ YES (24) 2 ☐ NO *(If NO, you have completed this questionnaire. THANK YOU for your participation in this survey.)*

13 Have you had or are you currently engaged in any TRAINING in health services research (e.g., academic course work, dissertation studies, postdoctoral appointments, workshops)?

1 ☐ YES (25) 2 ☐ NO *(If NO, please proceed to Question 18)*

14 In what year did you BEGIN this training in health services research? 19_____ (26-27)

15 From the columns below, check ONE BOX in Column A which identifies your FIRST TRAINING experience in health services research, and ONE BOX in Column B which identifies the PRIMARY SOURCE OF SUPPORT for that training.

Column A
TYPE OF TRAINING
(Check only ONE)

THESIS/ACADEMIC COURSEWORK

1 ☐ MA/MS
2 ☐ Ph.D.
3 ☐ Other degree, specify_____

ACADEMIC EMPLOYMENT

4 ☐ Research assistant
5 ☐ Research associate
6 ☐ Instructor
7 ☐ Professor
8 ☐ Other, specify_____

OTHER ACADEMIC

9 ☐ Postdoctoral appointment
10 ☐ Other, specify_____

GOVERNMENT

11 ☐ Employment-training
12 ☐ On-the-job training
13 ☐ Other, specify_____

BUSINESS/INDUSTRY

14 ☐ Employment-training
15 ☐ On-the-job training
16 ☐ Other, specify_____

OTHER

17 ☐ Specify_____

(28-29)

Column B
PRIMARY SOURCE OF SUPPORT
(Check only ONE)

FEDERAL GOVERNMENT

1 ☐ Research grant
2 ☐ Research contract
3 ☐ Fellowship
4 ☐ Traineeship
5 ☐ Other, specify_____

INSTITUTION/STATE

6 ☐ Research grant/contract
7 ☐ Fellowship/traineeship
8 ☐ Teaching assistantship
9 ☐ Other, specify_____

PRIVATE FOUNDATION

10 ☐ Research grant/contract
11 ☐ Fellowship
12 ☐ Other, specify_____

OTHER

13 ☐ Specify_____

(30-31)

16 If federal support had NOT been available, which of the following would you have sought as a PRIMARY SOURCE OF SUPPORT to finance your health services research training? *(Check only ONE)*

1 ☐ Did not receive federal support
2 ☐ Other federal training grant/fellowship
3 ☐ Federal research grant/contract
4 ☐ University or state funds (including teaching assistantship)
5 ☐ Personal resources (savings, income, family assistance, etc.)
6 ☐ Commercial loans
7 ☐ Other sources, specify_____
8 ☐ Would not have pursued health services research training

(32)

17 Using the categories below, check ONE BOX in Column A which best characterizes the SPECIALTY AREA of your health services research training, and ONE BOX in Column B which represents the PRIMARY RESEARCH APPROACH learned.

Column A
SPECIALTY AREA
(Check only ONE)

1 ☐ Health Personnel
2 ☐ Mental Health Personnel
3 ☐ Ambulatory Care Centers
4 ☐ Child Health Services
5 ☐ Dental Health Services
6 ☐ Emergency Health Services
7 ☐ Health Services for the Disadvantaged
8 ☐ Indian Health Services
9 ☐ Long-term Care
10 ☐ Nursing Health Services
11 ☐ Pharmacy-related Health Services
12 ☐ Rural Health Care Services
13 ☐ Alcoholism Prevention Programs
14 ☐ Drug Abuse Prevention Programs
15 ☐ Mental Health Services
16 ☐ Inflation and Cost Containment
17 ☐ Health Insurance
18 ☐ Quality Assurance of Health Care Practice/Practitioners
19 ☐ Quality Assurance of Health Services
20 ☐ Health Facilities (including organization and utilization)
21 ☐ Legal Aspects of Health Care (including regulatory studies)
22 ☐ Health Politics
23 ☐ Community Studies related to Health
24 ☐ Health Education
25 ☐ Sociobehavioral Aspects of Health Care (including compliance)
26 ☐ Health Services Design and Development (including technology transfer)
27 ☐ Other, specify_____

(33-34)

Column B
PRIMARY RESEARCH APPROACH
(Check only ONE)

1 ☐ Health Statistics
2 ☐ Statistical Indicators (including health status indicators)
3 ☐ Computer Models
4 ☐ Case Studies
5 ☐ Clinical Studies
6 ☐ Social Experimentation
7 ☐ Survey Research
8 ☐ Evaluation Research (including program evaluation)
9 ☐ Technology Assessment
10 ☐ Decision Analysis
11 ☐ Policy Analysis
12 ☐ Other, specify_____

(35-36)

The remaining sections explore the EMPLOYMENT experiences of health services research personnel. If you are CURRENTLY a degree candidate or hold a postdoctoral appointment, please check the box below.

☐ Degree Candidate/Postdoctoral
(37)

(You have completed this questionnaire. THANK YOU for your participation in this survey.)

HEALTH SERVICES RESEARCH: CURRENT EMPLOYMENT (October 15, 1977)

Instructions: Please answer Questions 18 through 23 with respect to your principal employment as of October 15, 1977.

18 What percent of your TOTAL WORK TIME did you devote to health services research?_____%. *(If ZERO, please proceed to Question 24)* (38-39)

19 If you devoted ANY of your time to health services research, specify the PRIMARY and SECONDARY activities in which you were employed as a health services researcher as of October 15, 1977. *(Check only ONE in each column)*

	PRIMARY *(Check only ONE)*	SECONDARY *(Check only ONE)*
Health services R & D	1 ☐	1 ☐
Teaching of health services research	2 ☐	2 ☐
Administration/management of health services research	3 ☐	3 ☐
Consulting (health services research)	4 ☐	4 ☐
Other, specify_____	5 ☐ (40)	5 ☐ (41)

20 Which of the following federal agencies, if any, supported or sponsored your work in health services research? *(Check all that apply)*

1 ☐ No federal support
2 ☐ ADAMHA (National Institute of Mental Health, National Institute on Alcohol and Alcoholism, and National Institute on Drug Abuse)
3 ☐ OSH (National Center for Health Services Research, National Center for Health Statistics)
4 ☐ NIH (National Institutes of Health)
5 ☐ VA (Veterans Administration)
6 ☐ Other federal agency, please specify_____ (42-47)

21 Briefly describe the PRIMARY research problem on which you were working: _____

22 If you devoted ANY of your time to health services research, indicate the PRIMARY AREA below. *(Check only ONE)*

SPECIALTY AREA
(Check only ONE)

1 ☐ Health Personnel
2 ☐ Mental Health Personnel
3 ☐ Ambulatory Care Centers
4 ☐ Child Health Services
5 ☐ Dental Health Services
6 ☐ Emergency Health Services
7 ☐ Health Services for the Disadvantaged
8 ☐ Indian Health Services
9 ☐ Long-term Care
10 ☐ Nursing Health Services
11 ☐ Pharmacy-related Health Services
12 ☐ Rural Health Care Services
13 ☐ Alcoholism Prevention Programs
14 ☐ Drug Abuse Prevention Programs
15 ☐ Mental Health Services
16 ☐ Inflation and Cost Containment
17 ☐ Health Insurance
18 ☐ Quality Assurance of Health Care Practice/Practitioners
19 ☐ Quality Assurance of Health Services
20 ☐ Health Facilities (including organization and utilization)
21 ☐ Legal Aspects of Health Care (including regulatory studies)
22 ☐ Health Politics
23 ☐ Community Studies related to Health
24 ☐ Health Education
25 ☐ Sociobehavioral Aspects of Health Care (including compliance)
26 ☐ Health Services Design and Development (including technology transfer)
27 ☐ Other, specify_____ (48-49)

23a In your opinion, is formal, specialized training (beyond basic science training) necessary to conduct health services research?

1 ☐ YES 2 ☐ NO (50)

b If YES, what is the minimum level of training necessary to conduct health services research adequately in your opinion? *(Check only ONE)*

1 ☐ Postdoctoral training in health services research
2 ☐ Doctoral training in health services research
3 ☐ Master's level training in health services research
4 ☐ Nondegree training in health services research, specify _____
5 ☐ Other, specify _____
(51)

HEALTH SERVICES RESEARCH: UTILIZATION

24 In which YEAR did you FIRST ENGAGE in health services research? 19_____ (52-53)

25 Were you engaged in health services research in:

1960-64	1 ☐ Yes	2 ☐ No (54)		1970-74	1 ☐ Yes	2 ☐ No (56)	
1965-69	1 ☐ Yes	2 ☐ No (55)		1975-76	1 ☐ Yes	2 ☐ No (57)	

26 If you were not engaged in health services research in OCTOBER, 1977, BUT CONDUCTED such research at some time prior to that date:

☐ NOT applicable (58)

a. Specify the PRIMARY REASON for the fact that you were not engaged in health services research in October, 1977. *(Check only ONE)*

1 ☐ New research interests
2 ☐ Inappropriate job setting
3 ☐ Lack of proper training
4 ☐ Other, specify _____
(59)

b. If you were given the opportunity to re-enter health services research, what is the primary factor which would facilitate such an entrance?

1 ☐ Available research support
2 ☐ Opportunity for advanced research training
3 ☐ Appropriate job setting
4 ☐ Income potential
5 ☐ Other, specify _____
(60)

27 What is the BASIC SALARY* associated with your principal employment? (Round to the nearest thousand)

$_____ per year (61-63) $_____ per academic year (9-10 months) (64-66)

*Includes your salary before deductions for income tax, social security, retirement, etc., but DOES NOT include bonuses, overtime, summer teaching, consulting or other payment for professional work.

28 Please indicate the total number of books/articles you have had published for each category specified.

	AT ANY TIME		1975-77	
	Total No. of Publications	Total No. of Health Services Research Publications	Total No. of Publications	Total No. of Health Services Research Publications
Books	_____ (9-10)	_____ (11-12)	_____ (13-14)	_____ (15-16)
Articles	_____ (17-19)	_____ (20-22)	_____ (23-24)	_____ (25-26)

(You have completed this questionnaire. THANK YOU for your participation in this survey.)

DEGREE AND EMPLOYMENT SPECIALTIES LIST

MATHEMATICAL SCIENCES

000 - Algebra
010 - Analysis & Functional Analysis
020 - Geometry
030 - Logic
040 - Number Theory
052 - Probability
055 - Math. Statistics (see also 544, 670, 725, 729)
060 - Topology
082 - Operations Research (see also 478)
085 - Applied Mathematics
089 - Combinatorics & Finite Mathematics
091 - Physical Mathematics
098 - Mathematics, General
099 - Mathematics, Other*

COMPUTER SCIENCES

071 - Theory
072 - Software Systems
073 - Hardware Systems
074 - Intelligent Systems
079 - Computer Sciences, Other

PHYSICS & ASTRONOMY

101 - Astronomy
102 - Astrophysics
110 - Atomic & Molecular Physics
120 - Electromagnetism
130 - Mechanics
132 - Acoustics
134 - Fluids
135 - Plasma Physics
136 - Optics
138 - Thermal Physics
140 - Elementary Particles
150 - Nuclear Structure
160 - Solid State
198 - Physics, General
199 - Physics, Other*

CHEMISTRY

200 - Analytical
210 - Inorganic
215 - Synthetic Inorganic & Organometallic
220 - Organic
225 - Synthetic Organic & Natural Products
230 - Nuclear
240 - Physical
245 - Quantum
250 - Theoretical
255 - Structural
260 - Agricultural & Food
265 - Thermodynamics & Material Properties
270 - Pharmaceutical
275 - Polymers
280 - Biochemistry (see also 540)
285 - Chemical Dynamics
298 - Chemistry, General
299 - Chemistry, Other*

EARTH, ENVIRONMENTAL AND MARINE SCIENCES

301 - Mineralogy, Petrology
305 - Geochemistry
310 - Stratigraphy, Sedimentation
320 - Paleontology
330 - Structural Geology
341 - Geophysics (Solid Earth)
350 - Geomorph & Glacial Geology
381 - Applied Geol., Geol. Engr. & Econ. Geol.
395 - Fuel Tech. & Petrol. Engr. (see also 479)
360 - Hydrology & Water Resources
370 - Oceanography
397 - Marine Sciences, Other*
381 - Atmospheric Physics & Chemistry
382 - Atmospheric Dynamics
383 - Atmospheric Sciences, Other*
388 - Environmental Sciences, General (see also 480, 528)
389 - Environmental Sciences, Other*
398 - Earth Sciences, General
399 - Earth Sciences, Other*

ENGINEERING

400 - Aeronautical & Astronautical
410 - Agricultural
415 - Biomedical
420 - Civil
430 - Chemical
435 - Ceramic
440 - Electrical
445 - Electronics
450 - Industrial & Manufacturing
455 - Nuclear
460 - Engineering Mechanics
465 - Engineering Physics
470 - Mechanical
475 - Metallurgy & Phys. Met. Engr.
476 - Systems Design & Systems Science (see also 072, 073, 074)
478 - Operations Research (see also 082)
479 - Fuel Technology & Petrol. Engr.
480 - Sanitary & Environmental
486 - Mining
497 - Materials Science Engr.
498 - Engineering, General
499 - Engineering, Other*

AGRICULTURAL SCIENCES

500 - Agronomy
501 - Agricultural Economics
502 - Animal Husbandry
504 - Fish & Wildlife
505 - Forestry
506 - Horticulture
507 - Soils & Soil Science
510 - Animal Science & Animal Nutrition
511 - Phytopathology
517 - Food Science & Technology (see also 573)
518 - Agriculture, General
519 - Agriculture, Other*

MEDICAL SCIENCES

520 - Medicine & Surgery
522 - Public Health & Epidemiology
523 - Veterinary Medicine
524 - Hospital Administration
526 - Nursing
527 - Parasitology
528 - Environmental Health
534 - Pathology
536 - Pharmacology
537 - Pharmacy
538 - Medical Sciences, General
539 - Medical Sciences, Other*

BIOLOGICAL SCIENCES

540 - Biochemistry (see also 280)
542 - Biophysics
543 - Biomathematics
544 - Biometrics, Biostatistics (see also 055, 670, 725, 729)
545 - Anatomy
546 - Cytology
547 - Embryology
548 - Immunology
550 - Botany
560 - Ecology
562 - Hydrobiology
564 - Microbiology & Bacteriology
566 - Physiology, Animal
567 - Physiology, Plant
569 - Zoology
570 - Genetics
571 - Entomology
572 - Molecular Biology
573 - Food Science & Technology (see also 517)
574 - Behavior/Ethology
576 - Nutrition & Dietetics
578 - Biological Sciences, General
579 - Biological Sciences, Other*

PSYCHOLOGY

600 - Clinical
610 - Counseling & Guidance
620 - Developmental & Gerontological
630 - Education
635 - School Psychology
641 - Experimental
642 - Comparative
643 - Physiological
650 - Industrial & Personnel
660 - Personality
670 - Psychometrics (see also 055, 544, 725, 729)
680 - Social
698 - Psychology, General
699 - Psychology, Other*

SOCIAL SCIENCES

700 - Anthropology
703 - Archeology
708 - Communications*
709 - Linguistics
710 - Sociology
720 - Economics (see also 501)
725 - Econometrics (see also 055, 544, 670, 729)
729 - Social Statistics (see also 055, 544, 670, 725)
740 - Geography
745 - Area Studies*
751 - Political Science
752 - Public Administration
755 - International Relations
770 - Urban & Regional Planning
775 - History & Philosophy of Science
788 - Social Sciences, General
789 - Social Sciences, Other*

HUMANITIES

802 - History & Criticism of Art
804 - History, American
805 - History, European
806 - History, Other*
808 - American Studies
830 - Music
831 - Speech as a Dramatic Art (see also 885)
833 - Religion (see also 881)
834 - Philosophy
836 - Comparative Literature
878 - Humanities, General
879 - Humanities, Other*
891 - Library & Archival Sciences

LANGUAGES & LITERATURE

811 - American
812 - English
821 - German
822 - Russian
823 - French
824 - Spanish & Portuguese
826 - Italian
827 - Classical*
829 - Other Languages*

EDUCATION & OTHER PROFESSIONAL FIELDS

838 - Education
801 - Art, Applied
881 - Theology (see also 833)
882 - Business Administration
883 - Home Economics
884 - Journalism
885 - Speech & Hearing Sciences (see also 831)
886 - Law, Jurisprudence
887 - Social Work
887 - Professional Field, Other*

999 - OTHER FIELDS*

*Identify the specific field in the space on the questionnaire.

* U. S. GOVERNMENT PRINTING OFFICE : 1980 625-518/1933