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ABSTRACT

This report presents data concerning predoctoral students supported under training grants of the National Institutes of Health (NIH) and the National Institute of Mental Health (NIMH). The report offers a discussion of the training grant and a comparison of it to other forms of support, a discussion of the students and the fields of study supported under training grants (biological sciences, social sciences, and health professions), and a comparison of NIH and NIMH trainees to all federally supported students receiving fellowships and traineeships. Also discussed are some of the proposals made for extending federal financial aid to graduate as well as undergraduate students regardless of field. (HS)

OE-55060

Report on

Federal Predoctoral Student Support

Part II - Students Supported Under Training Grants of the National Institutes of Health and the National Institute of Mental Health

by the

FEDERAL INTERAGENCY COMMITTEE ON EDUCATION

Student Support Study Group

April 1971

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REPORT ON FEDERAL PREDOCTORAL STUDENT SUPPORT

Part II - Students Supported Under Training Grants of the National Institutes of Health and the National Institute of Mental Health

This report complements the Report on Federal Predoctoral Student Support, Part I - Fellowships and Traineeships, released by the Student Support Study Group of the Federal Interagency Committee on Education in April 1970. Each of these reports reviews a different type of student support grant to full-time predoctoral students enrolled in United States institutions of higher education during the last ten years.

The fellowships and traineeships report revealed a substantial decline in that type of aid in the last two years, a decline which budget estimates indicate will continue at least through the next two academic years. Data reported in Part II show that the number of predoctoral students (trainees) receiving support under the training grants awarded by the National Institutes of Health and the National Institute of Mental Health together has not declined, although NIMH shows an estimated drop of 100 trainees in 1969-70. Based on projections suggesting static or declining appropriations, program administrators expect an accentuated decline in coming years.

Discussion of the Training Grant and Comparison of It to Other Forms of Support

The data reported in Part II, except where otherwise noted, apply only to predoctoral students receiving support under the training

grants of the National Institutes of Health and the National Institute of Mental Health. The FICE Student Support Study Group has defined a training grant as "an award to an institution of higher education for institutional support and graduate student training." This is considered an indirect type of student support as opposed to the more direct forms, fellowships and traineeships, discussed in Part I.

Training grants are typically awarded for the purpose of supporting the training environment in addition to providing funds for student aid. Student aid (more commonly called trainee costs) provided from training grants may include stipends, dependency allowances, travel costs for the trainees, and tuition. Fellowships and traineeships, on the other hand, are awarded specifically for student support with only a fixed allowance accruing to the institution to cover tuition and fees.

The training grant is more completely oriented to producing mission related manpower than direct forms of support. NIMH and NIH support is provided in the many specialties, disciplines, and fields related to health research, service, and training. The definition of health relatedness as suggested by this support is much broader than the 'health field' designation utilized in this report. It follows then that much of the NIMH and NIH support falls into other related fields such as biological sciences and the social sciences.

For example, the FICE category, "social sciences," includes all the various subspecialties of social work and psychology, without differentiation, for students either enrolled or supported.

By far the largest portion of NIH predoctoral trainees are shown on the tables as being in two fields: for FY 1969, there are 49 percent of the total shown in the biological sciences and 33 percent in health. Such classification is variable and, as a result, comparability of data sets is often not possible. The field of biological sciences as used in this report includes anatomy, biochemistry, microbiology, entomology, genetics, cell biology, and related biologic disciplines. This is a major area for NIH training efforts.

The definition of health as a field in this report includes closely related sciences. Often to avoid confusion 'biologic science' and 'health' are combined into an overall descriptive term of 'biomedical sciences.' This broad term is descriptive of the major concentration by NIH--as shown above it includes 82 percent of the predoctoral trainees in FY 1969.

'Health' as a title in this publication consists of health related engineering, parasitology, immunology, nonclinical pathology, pharmacology and toxicology, physiology, nutrition, and public health as its major components. While the clinical sciences are also included in health, NIH does not provide predoctoral training support.

The inclusions under these two headings are such as to preclude comparisons with enrollment and degree data as published by the Office of Education. For example, OE uses the title 'health professions' which covers the professional and paraprofessional area of medicine, dentistry, optometry, nursing, and allied professions.

Fellowship programs were initiated to provide support to the best qualified students so that their graduate education could be completed without interruption. While the main objective for traineeships is identical to that of fellowships, due to the support of institutional costs, training grants have also had the ancillary effect of strengthening heretofore weak departments and activities in both large and small institutions. While fellowships are awarded on the basis of national competition, institutions select traineeship and training grant aid recipients from among the predoctoral students enrolled.

It is important to remember that predoctoral students supported under training grants represent a fraction of the total supported through this mechanism. The remainder are at the postdoctoral level or in special programs and are therefore not included in this report.

Specifications and Definitions of Data

The data for Part II were structured to be as comparable as possible to Part I. Therefore, a brief recapitulation of the specifications and definitions stated in Part I follows.

In both parts, FICE specified what was to be reported as follows: the number of full-time, academic year students by field of study receiving stipends, dependency and/or other allowances, plus cost of education or tuition payments from program funds, and the attributable costs. FICE assumes that all programs queried complied with these specifications in submitting data for this report, regardless of their own definitions.

It can be assumed that dollar increases shown over the years in both Parts I and II reflect changes in Congressional funding and agency priorities and that these increases are designed to permit support of more students as well as to cover the progressively higher costs of support resulting from inflation.

To establish the guidelines on academic fields for enrollment and students supported in both parts of the study, FICE relied upon the categories used in the Office of Education's annual survey, Students Enrolled for Advanced Degrees (including the master's degree), making adjustments in OE data as necessary to assure as much comparability as possible from year to year. This arrangement also permits relatively accurate comparison of students supported as to enrollment. Appendix B in Part I shows how FICE grouped the OE categories to form its nine broad ones for this study. For further

detail, the reader should consult the OE survey report for fall 1968.

The OE enrollment figures do not include postbaccalaureate students not pursuing advanced degrees. This was not a serious problem in Part I of this report because with few exceptions students had to be enrolled full-time for advanced degrees to be eligible for a fellowship or traineeship. Trainees supported by NIH and NIMH, however, do not necessarily have to be pursuing degrees, although program administrators estimate that most of them do so. In comparing trainees to enrollment by field, then, one must remember that the enrollment figures probably slightly understate the base against which supported students are compared, thereby yielding a somewhat higher ratio of support than is actually the case. This is more likely to be true of the health professions than the biological and social sciences.

As in Part I, no data are included here on M.D.'s, D.V.M.'s and D.D.S.'s receiving aid under training grants because generally such trainees are enrolled in postdoctoral programs.

NIH and NIMH reported their predoctoral trainee data to FICE according to the specifications listed above in the same format that they (and other participating agencies) reported the fellowship and traineeship information contained in Part I. For this trainee study, FICE agreed to accept NIH's suggestion to count as full-time all students receiving

"100 percent training" for eight months or longer out of a year. NIMH concurred in this definition.

It is essential to bear in mind the fact that for the years 1960-61 through 1964-65 and 1969-70, both NIH and NIMH submitted estimates based on computerized data for the years 1965-66 through 1968-69. The data collected in the early sixties are likely to vary from those for more recent years; for example, no tuition payments were included as part of the support before 1965-66, nor were there stipend schedules.

Students Supported Under Training Grants

The National Institutes of Health and the National Institute of Mental Health support large numbers of students primarily in three fields--biological sciences, social sciences, and health professions--NIH supports small numbers of students in all other fields in the FICE study except arts and humanities and education. Together these two agencies supported a total of 2,924 full-time predoctoral students in all fields under training grants in 1960-61 at a total cost of $8.8 million. By 1969-70, these support levels had grown to 11,215 students at a total cost of $46.1 million.

NIMH provided nearly all of the support for trainees in the social sciences during this period. NIH, on the other hand, supported virtually all trainees in biological sciences. Support for trainees in the health professions was divided between the two agencies in a

constant, slightly better than 2:1 NIH to NIMH ratio through the period of the study.

The field receiving the largest portion--nearly 50 percent--of total NIH support was biological sciences, with 680 out of a total of 1,396 trainees in 1960-61 and 3,140 out of 6,435 in 1969-70. Health professions is the second ranking NIH-supported field with 502 trainees in 1960-61 and 2,117 in 1969-70, or about one-third of the total. Most of the remaining NIH trainee support from 1960-61 through 1965-66 was distributed among mathematics (between 71 and 245 students received NIH training grant aid in this field each year), and social sciences (66 to 222), physical sciences, and engineering, in that order through 1965-66. In 1966-67, social sciences (330) passed mathematics (236) in number supported--a trend which continued through 1969-70. During the entire period, NIH supported between 49 and 270 trainees in the "other" category, between 14 and 47 in physical sciences, and between 14 and 68 in engineering.

NIMH concentrated its trainee support in the social sciences throughout the period covered by this report. In 1960-61, 1,212 or 79 percent of the total 1,528 NIMH trainees were in the social sciences. During the 10-year period of the study, this proportion remained between 75 and 80 percent. In 1969-70, the number NIMH supported in the social sciences was 3,657 out of a total of 4,780 slightly below the 1968-69 high point of 3,734 (out of

4,881). In 1960-61, NIMH supported 272 (or 17.8 percent) trainees in the health professions, a figure which peaked at 928 in 1968-69 and dropped slightly to 909 (but 19 percent of the total) in 1969-70. All other NIMH trainees during the period of this study were in the biological sciences; the number ranged from 44 in 1960-61 to 219 in 1968-69 and 214 in 1969-70.

NIMH has, throughout the period covered by this report, supported a larger number of trainees in its best-supported, mission-related specialties in social sciences than NIH has under its best-supported specialties in the biological sciences. Because of the size and scope of the full-time enrollment in the FICE social science category, however, it is difficult to gauge the impact of the NIMH support on particular areas with which the agency is primarily concerned. In 1960-61, NIMH-supported trainees comprised 4.6 percent of total full-time, social science enrollment (1,212 out of 26,219 enrolled). In 1964-65 (the peak year of its support in percentage terms), NIMH supported 6.6 percent of the total U.S. social science enrollment (2,790 out of 42,377). This percentage has been declining ever since because of the rapid growth of enrollment in social sciences. In absolute numbers, the peak year of NIMH support was 3,734 in 1968-69.

On the other hand, even though NIH supports smaller numbers in both biological science and health professions than NIMH does in social science, NIH supports larger percentages of enrollment in those fields. For example, in 1960-61, NIH support in the biological

sciences amounted to 5.4 percent of total U.S. enrollment (680 trainees out of 12,504 enrollment) and in the health professions, 11.6 percent (502 out of 4,312). By 1968-69, these figures had grown to 10.2 and 23.1 percent respectively (2,996 trainees out of 29,402 enrolled in biological sciences, and 2,018 out of 8,752 in health professions). The percentage supported in biological sciences remained the same in 1969-70, while that for health professions dropped to 21.3 (2,117 out of 9,961).

Comparison of NIH and NIMH Trainees to All Federally Supported Students Receiving Fellowships and Traineeships

For comparative purposes, FICE consolidated the numbers of full-time trainees and the amounts allocated for their support with similar data for fellowships and traineeships published in Part I of this report. The staff then recomputed the percentage of enrollment supported in each field as well as the percentage of the total students supported in each comprise. It must be noted, however, that trainee data for six of the years covered by this report are estimates and are also not entirely comparable to the data on fellowships and traineeships.

In actual numbers, NIH and NIMH trainees between 1960-61 and 1965-66 comprised between 25 and 29 percent of all predoctoral students receiving support from fellowships, traineeships, or training grants. In 1966-67, this percentage dropped to 19.5, reaching a low of 16.8 percent in the following year before climbing back up to approximately

21 percent in 1969-70. These percentages, however, do not reflect fluctuations in the total number of trainees. While the total numbers have increased, the fluctuations reflect the accelerated growth of NIMH and NIH fellowship and traineeship support in the mid-sixties and its sharp decline in 1968-69 and 1969-70.

In terms of the percentages of students supported in each field, the addition of trainees to the numbers reported in Part I makes substantial differences in three fields: biological sciences, social sciences, and health professions.

For biological sciences, the Part I report showed 5.2 percent of the full-time enrollment supported in 1960-61, rising to a high of 16.6 percent in 1968-69 before dropping slightly to 16.9 percent in 1969-70. With NIH and NIMH trainee figures added to the number supported, the overall percentages rose from 11.0 in 1960-61 to 27.5 in 1968-69, then dropped to 27.0 percent of the enrollment in biological sciences in 1969-70.

Social sciences show a similar growth pattern at a somewhat lower level. The proportion of enrollment in this field supported by fellowships and traineeships grew from 4.3 percent in 1960-61 to a peak of 14.4 in 1967-68 before dropping to 11.8 percent in 1969-70. By adding NIH and NIMH social science trainees, these percentage figures changed to 9.1 in 1960-61, grew to a high point of 20.7 in 1967-68, and fell to 17.5 in 1969-70.

The addition of trainees makes a greater difference in the support level of students in health professions than in any other field. This field, where enrollment was already well supported with fellowships and traineeships, showed 10 percent of its enrolled students receiving such aid in 1960-61 (see Part I). Fellowship and traineeship support peaked in 1967-68 at 23.3 percent of health professions enrollment. With the addition of trainees, the percentage of health professions students receiving all these types of aid grew from 28.0 in 1960-61 to 57.9 in 1967-68 before falling to 48.1 percent in 1969-70.

Again, it is important to remember, particularly for the health professions, that the number of students supported includes some who are not pursuing advanced degrees, while the enrollment figures include only those who are.

For all fields together, the addition of trainees to the data base increased the percentage of total enrollment supported by an average of 3.4 percent per year over that reported in Part I. In 1960-61, trainee support aided 2.3 percent of total enrollment. It peaked in 1963-64 at 3.9 percent and dropped down to 3.3 percent by 1969-70.

NIH and NIMH both submitted figures on the number of part-time predoctoral trainees they supported during the period covered by this report. Like the data on full-time trainees, part-time trainee figures are estimates for all years except 1965-66 through 1968-69. These figures show that the NIH part-time trainee population grew steadily from 1,008 in 1960-61 to 2,562 in 1965-66. In 1966-67,

the number fell to 2,087 but rose again to 2,259 in 1969-70. NIMH shows an uninterrupted increase in the number of part-time trainees supported, from zero in 1960-61 to 30 in 1961-62 then to 445 in 1968-69 before falling back to 353 in 1969-70.

No information is available on the field distribution of part-time trainees of either agency. Counting the part-time trainees of NIH and NIMH together, there was a total of 1,008 in 1960-61 (although only NIH provided part-time aid that year) which nearly tripled to 2,825 in 1965-66, the highest point of the 10-year period. The total fell to 2,367 in 1966-67 but climbed back up to 2,612 in 1969-70.

Review, Summary, and Conclusions

The data reported in Part II on predoctoral students supported under NIH and NIMH training grants show a steady growth of both program funds and the number of students they supported between 1960-61 and 1968-69, with a leveling off in 1970. Training grant programs appear not to have been as severely diminished by Congressional action and administrative decisions within their agencies as fellowship and traineeship programs.

Looking at training grant support combined with fellowship and traineeship support, one can still observe a sharp drop between 1968-69 and 1969-70 in total students aided. Because students

supported under NIH and NIMH training grants comprise only 17.6 and 20.9 percent, respectively, of the three mechanisms taken together in those two years, the sharp reduction in fellowship and traineeship support has caused an overall decline in the general training fund picture.

NIH and NIMH have traditionally concentrated, as has been said previously, their training grant support in three major fields--health professions, biological sciences, and social sciences. The fellowship and traineeship support reported in Part I placed health professions at or near the top of the list in almost every year in terms of percentage of enrollment supported. When combined with training grant aid, the resulting total support for students in this field rose from 28 percent of enrollment in 1960-61 to 57.9 percent in 1967-68 before dropping back to 48.1 percent in 1969-60.

Of course, health professions shows the lowest enrollment of any field (from 4,312 to 9,961) throughout the period covered by this report. With the addition of training grant aid to fellowship and traineeship support, therefore, biological sciences become the second ranking field in percentage of enrollment supported, rising from a combined total of 11.0 percent in 1960-61 to 27.5 percent in 1968-69 before falling back to 27.0 percent in 1969-70.

Although the field of social sciences is the best supported of those receiving training grant aid from NIH and NIMH, it ranks fourth

among all fields in percentage of enrollment supported from all three sources. It follows health professions, biological sciences, and education. Support for students enrolled in the social sciences by fellowships, traineeships, and training grants together rose from 9.1 percent in 1960-61 to 20.3 percent in 1968-69 before dropping to 17.5 percent in 1969-70. The reason for the low percentage of support in this field, as noted earlier, is that although the social sciences show the largest number of students supported by all three mechanisms together in every year of the study, they also have a considerably higher enrollment than any other field.

The training mechanisms discussed in both parts of this report are related to the missions of the agencies administering them. By offering them this financial assistance, the Government attempts to interest students in certain fields related to national priorities which need additional manpower.

An overview of all mechanisms discussed in both parts of this report shows a recent decline in Federal involvement in all types of graduate student support. Program administrators point out that Federal student support policies and practices in effect now--particularly the cutbacks--will have their real impact on manpower five years from now.

The "production" of students cannot be immediately responsive to annual appropriation increases or decreases for the following reasons.

The pipeline includes a time-lag involving both the appropriation and educational processes. While a minimum of one year is required to demonstrate a production decline from a significantly reduced appropriation, an appreciable increase in student production has a time-lag varying from four to seven years, depending on the field supported. In addition, those programs surviving budget retrenchment have real limitations on both the degree and rate of expansion that can be obtained even when funds are restored.

NIH and NIMH face a common problem in that society always needs people trained in health and related fields. While shortages of health personnel exist now in some scientific disciplines, a growing population will intensify the need for more trained professionals. NIH and NIMH training grant and fellowship programs, according to agency spokesmen, have not kept pace with current needs, much less future demands. Yet approximately half of all full-time students in the FICE/OE category of health professions receive Federal support, as do a large proportion of students in the related fields of biological and social sciences. A major problem, then, appears to be attracting more students into these areas.

The present Administration has put forth a proposal for an expanded loan program for graduate as well as undergraduate students regardless of field. If enacted by Congress in its present form, this loan plan would substitute sources of graduate student support discussed in Part I of this report.

Many Federal student aid administrators, particularly those at the graduate level, believe that a loan program would not fulfill society's manpower needs, in part because loans offer no inducement to students to enter a particular field.

A second disadvantage, they believe, is the cost to students, which, because of high interest rates and long repayment period, would be very high. This might discourage students from enrolling in graduate programs unless they have other sources of support. Whatever the anticipated problems, predictions of the effects of such a program on graduate enrollment or eventual manpower production can only be speculation at this time since such a system is without precedent.

Recommendations

In the light of the data reviewed and the concern of the two reporting agencies for developing and maintaining an adequate supply of professionals in their areas of concern, and taken in context with the proposals in Part I, FICE makes the following recommendations with respect to the training programs of the National Institutes of Health and the National Institute of Mental Health:

1. That the utmost caution be exercised and the most careful consideration be given to any alternative policies for the support of health manpower training. This recommendation reflects the agencies' concern over the national

need for personnel trained in the health professions and related fields and because of the approximate five-year time lag involved in increasing manpower.

2. That any contemplated changes in the support mechanisms for health manpower training await the completion and analysis of comprehensive studies now being undertaken by NIH and NIMH.

3. That the appropriations for these programs be maintained at the 1969-70 level in order to prevent the deterioration of the educational base necessary for the production of health manpower, until alternatives for the training of health manpower are sufficiently developed and supported.

4. That NIH and NIMH explore means to achieve the training of more individuals in health and mental health fields, including a "seed-grant program" encouraging more institutions to establish training programs in health fields.

APPENDICES

APPENDIX A

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment 1960-61 through 1969-70

Table A-1

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1960-61

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees*	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees*	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees*	Total trainees as percentage of full-time graduate enrollment
Mathematics	5,104	71	1.4	--	--	71	1.4
Physical Sciences	15,045	14	.09	--	--	14	.09
Engineering	15,124	14	.09	--	--	14	.09
Biological Sciences	12,504	680	5.4	44	.4	724	5.8
Social Sciences	26,219	66	.3	1,212	4.6	1,278	4.9
Arts and Humanities	20,471	--	--	--	--	--	--
Education	16,085	--	--	--	--	--	--
Health	4,312	502	11.6	272	6.3	774	17.9
Other	9,825	49	.5	--	--	49	.5
TOTAL	124,689	1,396	1.1	1,528	1.2	2,924	2.3

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table A-2

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1961-62

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees*	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees*	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees*	Total trainees as percentage of full-time graduate enrollment
Mathematics	5,817	109	1.9	--	--	109	1.9
Physical Sciences	15,783	21	.1	--	--	21	.1
Engineering	16,044	21	.1	--	--	21	.1
Biological Sciences	13,371	1,035	7.7	69	.5	1,104	8.3
Social Sciences	28,698	100	.3	1,409	4.9	1,509	5.2
Arts and Humanities	21,644	--	--	--	--	--	--
Education	16,756	--	--	--	--	--	--
Health	4,523	765	16.9	319	7.1	1,084	24.0
Other	10,039	74	.7	--	--	74	.7
TOTAL	132,675	2,125	1.6	1,797	1.4	3,922	3.0

Note: Detail of percentages may not add to total because of rounding
* Estimate

Table A-3

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1962-63

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees*	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees*	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees*	Total trainees as percentage of full-time graduate enrollment
Mathematics	6,496	125	1.9	--	--	125	1.9
Physical Sciences	17,666	24	.1	--	--	24	.1
Engineering	18,050	24	.1	--	--	24	.1
Biological Sciences	15,051	1,191	7.9	86	.6	1,277	8.5
Social Sciences	32,399	115	.4	1,824	5.6	1,939	6.0
Arts and Humanities	23,934	--	--	--	--	--	--
Education	19,050	--	--	--	--	--	--
Health	4,929	881	17.9	413	8.4	1,294	26.3
Other	10,851	86	.8	--	--	86	.8
TOTAL	148,426	2,446	1.6	2,323	1.6	4,769	3.2

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table A-4

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1963-64

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees*	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees*	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees*	Total trainees as percentage of full-time graduate enrollment
Mathematics	7,061	175	2.5	--	--	175	2.5
Physical Sciences	18,919	35	.2	--	--	35	.2
Engineering	19,964	34	.2	--	--	34	.2
Biological Sciences	17,021	1,673	9.8	90	.5	1,763	10.4
Social Sciences	35,313	162	.5	2,288	6.5	2,450	6.9
Arts and Humanities	26,566	--	--	--	--	--	--
Education	21,323	--	--	--	--	--	--
Health	5,549	1,237	22.3	514	9.3	1,751	31.6
Other	11,747	120	1.0	--	--	120	1.0
TOTAL	163,463	3,436	2.1	2,892	1.8	6,328	3.9

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table A-5

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1964-65

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees*	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees*	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees*	Total trainees as percentage of full-time graduate enrollment
Mathematics	8,860	202	2.3	--	--	202	2.3
Physical Sciences	21,223	40	.2	--	--	40	.2
Engineering	22,415	39	.2	--	--	39	.2
Biological Sciences	19,362	1,934	10.0	108	.6	2,042	10.5
Social Sciences	42,377	187	.4	2,790	6.6	2,977	7.0
Arts and Humanities	30,880	--	--	--	--	--	--
Education	26,631	--	--	--	--	--	--
Health	6,232	1,430	22.9	626	10.0	2,056	33.0
Other	18,840	139	.7	--	--	139	.7
TOTAL	196,820	3,971	2.0	3,524	1.8	7,495	3.8

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table A-6

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1965-66

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees	Total trainees as percentage of full-time graduate enrollment
Mathematics	10,148	245	2.4	--	--	245	2.4
Physical Sciences	23,614	47	.2	--	--	47	.2
Engineering	25,832	46	.2	--	--	46	.2
Biological Sciences	22,830	2,320	10.2	122	.5	2,442	10.7
Social Sciences	49,832	222	.5	3,151	6.3	3,373	6.8
Arts and Humanities	37,669	--	--	--	--	--	--
Education	31,716	--	--	--	--	--	--
Health	6,840	1,713	25.0	708	10.4	2,421	35.4
Other	22,426	167	.7	--	--	167	.7
TOTAL	230,907	4,760	2.1	3,981	1.7	8,741	3.8

Note: Detail of percentages may not add to total because of rounding.

Table A-7

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1966-67

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees	Total trainees as percentage of full-time graduate enrollment
Mathematics	11,899	236	2.0	--	--	236	2.0
Physical Sciences	25,492	46	.2	--	--	46	.2
Engineering	26,829	68	.3	--	--	68	.3
Biological Sciences	24,628	2,542	10.3	143	.6	2,685	10.9
Social Sciences	55,333	330	.6	3,390	6.1	3,720	6.7
Arts and Humanities	42,874	--	--	--	--	--	--
Education	37,541	--	--	--	--	--	--
Health	7,459	1,847	24.8	877	11.8	2,724	36.5
Other	26,110	189	.7	--	--	189	.7
TOTAL	258,165	5,258	2.0	4,410	1.7	9,668	3.7

Note: Detail of percentages may not add to total because of rounding.

Table A-8

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1967-68

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees	Total trainees as percentage of full-time graduate enrollment
Mathematics	12,910	244	1.9	--	--	244	1.9
Physical Sciences	28,551	46	.2	--	--	46	.2
Engineering	30,137	23	.08	--	--	23	.08
Biological Sciences	28,188	2,800	9.9	183	.6	2,983	10.6
Social Sciences	64,301	446	.7	3,623	5.6	4,069	6.3
Arts and Humanities	52,016	--	--	--	--	--	--
Education	46,560	--	--	--	--	--	--
Health	8,006	1,873	23.4	894	11.2	2,767	34.6
Other	30,471	224	.7	--	--	224	.7
TOTAL	301,140	5,656	1.9	4,700	1.6	10,356	3.4

Note: Detail of percentages may not add to total because of rounding.

Table A-9

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1968-69

Field	Full-time graduate enrollment	NIH full-time predoctoral trainees	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time predoctoral trainees	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees	Total trainees as percentage of full-time graduate enrollment
Mathematics	13,506	229	1.7	--	--	229	1.7
Physical Sciences	29,333	39	.1	--	--	39	.1
Engineering	30,994	17	.05	--	--	17	.05
Biological Sciences	29,402	2,996	10.2	219	.7	3,215	10.9
Social Sciences	68,875	582	.8	3,734	5.4	4,316	6.3
Arts and Humanities	56,317	--	--	--	--	--	--
Education	54,900	--	--	--	--	--	--
Health	8,752	2,018	23.1	928	10.6	2,946	33.7
Other	30,857	259	.8	--	--	259	.8
TOTAL	322,936	6,140	1.9	4,881	1.5	11,021	3.4

Note: Detail of percentages may not add to total because of rounding.

Table A-10

NIH and NIMH Full-Time Predoctoral Trainees Compared to Full-Time Advanced Degree Enrollment, 1969-70

Field	Full-time graduate enrollment	NIH full-time pre-doctoral trainees*	NIH trainees as percentage of full-time graduate enrollment	NIMH full-time pre-doctoral trainees*	NIMH trainees as percentage of full-time graduate enrollment	Combined total of NIH and NIMH trainees*	Total trainees as percentage of full-time graduate enrollment
Mathematics	14,123	238	1.7	--	--	238	1.7
Physical Sciences	27,737	40	.1	--	--	40	.1
Engineering	31,654	19	.06	--	--	19	.06
Biological Sciences	30,646	3,140	10.2	214	.7	3,354	10.9
Social Sciences	73,822	611	.8	3,657	5.0	4,268	5.8
Arts and Humanities	56,594	--	--	--	--	--	--
Education	60,702	--	--	--	--	--	--
Health	9,961	2,117	21.3	909	9.1	3,026	30.4
Other	35,821	270	.8	--	--	270	.8
TOTAL	340,960	6,435	1.9	4,780	1.4	11,215	3.3

Note: Detail of percentages may not add to total because of rounding.
* Estimate

APPENDIX B

Number of Part-Time Trainees Supported by NIH and NIMH
Regardless of Length of Appointment, 1960-61 through 1969-70*

Year	NIH Part-Time Trainees	NIMH Part-Time Trainees	Total Part-Time Trainees
1960-61	1,008	0	1,008
1961-62	1,535	30	1,565
1962-63	1,772	60	1,832
1963-64	2,331	115	2,446
1964-65	2,426	230	2,656
1965-66	2,562	263	2,825
1966-67	2,087	280	2,367
1967-68	2,101	400	2,501
1968-69	2,156	445	2,601
1969-70	2,259	353	2,612

* All figures for 1960-61 through 1964-65 and 1969-70 are estimates.

APPENDIX C

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1960-61 through 1969-70

Table C-1

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1960-61

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees*	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	5,104	71	1.4	629	12.3	700	13.7
Physical Sciences	15,045	14	.09	1,273	8.5	1,287	8.6
Engineering	15,124	14	.09	638	4.2	652	4.3
Biological Sciences	12,504	724	5.8	656	5.2	1,380	11.0
Social Sciences	26,219	1,278	4.9	1,123	4.3	2,401	9.1
Arts and Humanities	20,471	--	--	1,146	5.6	1,146	5.6
Education	16,085	--	--	2,099	13.0	2,099	13.0
Health	4,312	774	17.9	433	10.0	1,207	28.0
Other	9,825	49	.5	2	--	51	.5
TOTAL	124,689	2,924	2.3	7,999	6.4	10,923	8.8

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table C-2

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1961-62

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees*	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	5,817	109	1.9	852	14.6	961	16.5
Physical Sciences	15,783	21	.1	1,684	10.7	1,705	10.8
Engineering	16,044	21	.1	860	5.4	881	5.5
Biological Sciences	13,371	1,104	8.3	1,447	10.8	2,551	19.1
Social Sciences	28,698	1,509	5.2	1,938	6.8	3,447	12.0
Arts and Humanities	21,644	--	--	1,836	8.5	1,836	8.5
Education	16,756	--	--	2,331	13.9	2,331	13.9
Health	4,523	1,084	24.0	601	13.2	1,685	37.3
Other	10,039	74	.7	42	.4	116	1.2
TOTAL	132,675	3,922	3.0	11,591	8.7	15,513	11.7

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table C-3

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1962-63

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees*	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	6,496	125	1.9	899	13.8	1,024	15.8
Physical Sciences	17,666	24	.1	1,955	11.1	1,979	11.2
Engineering	18,050	24	.1	1,050	5.8	1,074	6.0
Biological Sciences	15,051	1,277	8.5	1,691	11.2	2,968	19.7
Social Sciences	32,399	1,939	6.0	2,380	7.3	4,319	13.3
Arts and Humanities	23,934	--	--	2,131	8.9	2,131	8.9
Education	19,050	--	--	2,747	14.4	2,747	14.4
Health	4,929	1,294	26.3	567	11.5	1,861	37.8
Other	10,851	86	.8	108	1.0	194	1.8
TOTAL	148,426	4,769	3.2	13,528	9.1	18,297	12.3

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table C-4

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1963-64

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees*	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	7,061	175	2.5	1,024	14.5	1,199	17.0
Physical Sciences	18,919	35	.2	2,461	13.0	2,496	13.2
Engineering	19,964	34	.2	1,402	7.0	1,436	7.2
Biological Sciences	17,021	1,763	10.4	1,942	11.4	3,705	21.8
Social Sciences	35,313	2,450	6.9	2,533	7.2	4,983	14.1
Arts and Humanities	26,566	--	--	1,934	7.3	1,934	7.3
Education	21,323	--	--	3,193	15.0	3,193	15.0
Health	5,549	1,751	31.6	906	16.3	2,657	47.9
Other	11,747	120	1.0	206	1.8	326	2.8
TOTAL	163,463	6,328	3.9	15,601	9.5	21,929	13.4

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table C-5

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1964-65

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees*	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	8,860	202	2.3	1,211	13.7	1,413	15.9
Physical Sciences	21,223	40	.2	2,974	14.0	3,014	14.2
Engineering	22,415	39	.2	3,092	13.8	3,131	14.0
Biological Sciences	19,362	2,042	10.5	2,051	10.6	4,093	21.1
Social Sciences	42,377	2,977	7.0	3,077	7.3	6,054	14.3
Arts and Humanities	30,880	--	--	1,866	6.0	1,866	6.0
Education	26,631	--	--	4,713	17.7	4,713	17.7
Health	6,232	2,056	33.0	1,140	18.3	3,196	51.3
Other	18,840	139	.7	318	1.7	457	2.4
TOTAL	196,820	7,495	3.8	20,442	10.4	27,937	14.2

Note: Detail of percentages may not add to total because of rounding.
* Estimate

Table C-6

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1965-66

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	10,148	245	2.4	1,824	18.0	2,069	20.4
Physical Sciences	23,614	47	.2	4,353	18.4	4,400	18.6
Engineering	25,832	46	.2	4,190	16.2	4,236	16.4
Biological Sciences	22,830	2,442	10.7	2,564	11.2	5,006	21.9
Social Sciences	49,832	3,373	6.8	4,026	8.1	7,399	14.8
Arts and Humanities	37,669	--	--	2,740	7.3	2,740	7.3
Education	31,716	--	--	5,298	16.7	5,298	16.7
Health	6,840	2,421	35.4	1,114	16.3	3,535	51.7
Other	22,426	167	.7	316	1.4	483	2.2
TOTAL	230,907	8,741	3.8	26,425	11.4	35,166	15.2

Note: Detail of percentages may not add to total because of rounding.

Table C-7

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Comapred to Full-Time Graduate Enrollment, 1966-67

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	11,899	236	2.0	2,598	21.8	2,834	23.8
Physical Sciences	25,492	46	.2	5,424	21.3	5,470	21.5
Engineering	26,829	68	.3	4,784	17.8	4,852	18.1
Biological Sciences	24,628	2,685	10.9	3,644	14.8	6,329	25.7
Social Sciences	55,333	3,720	6.7	6,839	12.4	10,559	19.1
Arts and Humanities	42,874	--	--	4,559	10.6	4,559	10.6
Education	37,541	--	--	10,002	26.7	10,002	26.7
Health	7,459	2,724	36.5	1,394	18.7	4,118	55.2
Other	26,110	189	.7	763	2.9	952	3.6
TOTAL	258,165	9,668	3.7	40,007	15.5	49,675	19.2

Note: Detail of percentages may not add to total because of rounding.

Table C-8

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1967-68

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	12,910	244	1.9	3,024	23.4	3,268	25.3
Physical Sciences	28,551	46	.2	5,960	20.9	6,006	21.0
Engineering	30,137	23	.08	5,507	18.3	5,530	18.3
Biological Sciences	28,188	2,983	10.6	4,612	16.4	7,595	26.9
Social Sciences	64,301	4,069	6.3	9,249	14.4	13,318	20.7
Arts and Humanities	52,016	--	--	6,319	12.1	6,319	12.1
Education	46,560	--	--	12,534	26.9	12,534	26.9
Health	8,006	2,767	34.6	1,867	23.3	4,634	57.9
Other	30,471	224	.7	2,217	7.3	2,441	8.0
TOTAL	301,140	10,356	3.4	51,289	17.0	61,645	20.5

Note: Detail of percentages may not add to total because of rounding.

Table C-9

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1968-69

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	13,506	229	1.7	2,734	20.2	2,963	21.9
Physical Sciences	29,333	39	.1	5,776	19.7	5,815	19.8
Engineering	30,994	17	.05	5,058	16.3	5,075	16.4
Biological Sciences	29,402	3,215	10.9	4,880	16.6	8,095	27.5
Social Sciences	68,875	4,316	6.3	9,650	14.0	13,966	20.3
Arts and Humanities	56,317	--	--	6,396	11.4	6,396	11.4
Education	54,900	--	--	13,179	24.0	13,179	24.0
Health	8,752	2,946	33.7	1,540	17.6	4,486	51.3
Other	30,857	259	.8	2,233	7.2	2,492	8.0
TOTAL	322,936	11,021	3.4	51,446	15.9	62,467	19.3

Note: Detail of percentages may not add to total because of rounding.

Table C-10

Predoctoral Students Receiving Support from Training Grants, Fellowships, and Traineeships Compared to Full-Time Graduate Enrollment, 1969-70

Field	Full-Time Graduate Enrollment	Total NIH and NIMH Trainees*	Trainees as Percentage of Full-Time Enrollment	Total Students Supported as Reported in Part I	Part I Support as Percentage of Full-Time Enrollment	Total Students Supported (Parts I and II)	Total Students Supported as Percentage of Full-Time Enrollment
Mathematics	14,023	238	1.7	2,006	14.3	2,244	16.0
Physical Sciences	27,737	40	.1	4,459	16.1	4,499	16.2
Engineering	31,654	19	.06	4,323	13.7	4,342	13.7
Biological Sciences	30,646	3,354	10.9	4,906	16.0	8,260	27.0
Social Sciences	73,822	4,268	5.8	8,676	11.8	12,944	17.5
Arts and Humanities	56,594	--	--	5,054	8.9	5,054	8.9
Education	60,702	--	--	10,619	17.5	10,619	17.5
Health	9,961	3,026	30.4	1,767	17.7	4,793	48.1
Other	35,821	270	.8	741	2.1	1,011	2.8
TOTAL	340,960	11,215	3.3	42,551	12.5	53,766	15.8

Note: Detail of percentages may notaadd to total because of rounding.
* Estimate

APPENDIX D

FIELDS OF STUDY

Headings of FICE Survey	Headings of OE Survey of Enrollment for Advanced Degrees
Mathematical sciences	Mathematical subjects Computer science and systems analysis
Physical sciences	Physical sciences
Engineering	Engineering Architecture
Biological sciences	Biological sciences Agriculture Forestry
Social sciences	Social sciences (including history) City planning Geography Psychology
Arts and humanities	English and journalism Fine and applied arts Folklore Foreign languages and literature Philosophy Religion
Education	Education Library science
Health professions	Health professions
Other	Business and commerce Home economics Law Military science Records management Trade and industrial training Miscellaneous fields

APPENDIX E

AGENCIES AND PREDOCTORAL FELLOWSHIP, TRAINEESHIP, AND TRAINING GRANT PROGRAMS INCLUDED IN SURVEY

Part I

Atomic Energy Commission

- Health Physics Traineeships
- Industrial Medicine Traineeships (Included Industrial Hygiene thru 1965-66, last year of program)
- Laboratory Graduate Fellowships
- Nuclear Science and Engineering Fellowships
- Trainees (1965-66)

Department of Housing and Urban Development

- Urban Studies Fellowship Program (1967-68)

Department of the Interior

- Bureau of Commercial Fisheries Fellowships (No new awards reported after 1967-68).
- Federal Water Pollution Control Administration
  - Training Grants and Research Fellowships (Reported by Public Health Service from 1960-61 through 1966-67)

National Aeronautics and Space Administration

- Traineeships (1962-63)

National Science Foundation

- Graduate Fellowships
- Graduate Traineeships (1964-65)

Office of Education

- EPDA, Title V - C&D Teacher Fellowships (1966-67)
- EPDA, Title V - E Teacher Fellowships (1966-67)
- Fellowships for Teachers of the Handicapped
- Library and Information Science Fellowships (1966-67)
- NDEA Title IV Graduate Fellowships

NDEA Title VI Language Fellowships
Research Training Fellowships (1966-67)
Title III, HEA, Faculty Development Fellowships (1966-67)

Public Health Service

Bureau of Health Professions Education and Manpower
Training Traineeships
Allied Health Advanced Traineeships (1967-68)
Dental Fellowships (1967-68)
Nurse Fellowships (1964-65)
Nurse Traineeships
Public Health Traineeships
Environmental Health Service Fellowships, Traineeships, Training Grants (1961-62)
National Institute of Mental Health Fellowships
National Institute of Health Fellowships

Social and Rehabilitation Service

Administration on Aging Traineeships (1967-68)
Child Welfare Traineeships (1963-64)
Rehabilitation Services Administration Traineeships

Part II

Public Health Service

National Institutes of Health Training Grants
National Institute of Mental Health Training Grants

Note: Dates following program titles indicate first year for which data were included in this survey. These dates coincide with the first year of program operation. If no date or other notation appears beside program names, data on them are included for all ten years of the survey.

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