Inventory of NIH Training and Educational Programs

An overview of NIH research training and educational programs, and their participants, in FY2010

September 12, 2012

Completed for NIH Office of Extramural Research by Ripple Effect Communications, Inc. under contract GS-10F-0365T
Conducted with funding from NIH Evaluation Set-Aside Award #11-6003 OD-OER

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Introduction

Background

The goals of this project were to inventory all research training and related programs supported by the NIH to determine the total contribution that NIH makes to research training, especially of populations underrepresented in biomedical science. Specifically, we aimed to determine the total number of individuals supported, and the characteristics of those individuals, including their career level.

At the outset of this project, we had the following assumptions.

- Many, but not all, of the training programs that NIH supports were known.
- Many training programs supported participants, but the full number was unknown.
- Evaluative data on some programs has been collected to enable evaluation of the overall success of NIH programs to increase diversity, but quantitative data had not been collected.

Purpose

The purpose of this inventory was to centrally capture and analyze the following information:

- A list of extramural research training or training-like programs that met the following criteria:
  - Resulted in grants or contracts funded in FY2010
  - Sought to expand science interest, skills, and knowledge
- A list of intramural training programs that met the following criteria:
  - Resulted in financial support of students, post-docs, or scientists in FY2010
  - Were designed specifically to train individuals, or to expand the science interest, skills, and knowledge of individuals supported
- The number of active FY2010 extramural awards per program, and the total intramural funding for FY2010 training programs, and whether programs were "diversity-targeted"
- Data on the total number of participants during FY2010, and their demographic characteristics, where available

Types of NIH Programs

NIH supports intramural and extramural research training and career development programs.

Intramural

There are several trans-NIH intramural programs that are coordinated by the Office of Intramural Research:

- Individual Research Training Awards (IRTA), including the NCI IRTA known as Cancer Research Training Award (CRTA)
  - Student (for high school, undergraduate, and graduate students over the summer)
  - Postbaccalaureate (for recent college graduates with bachelor's degrees)
  - Technical (for college graduates with bachelor's or Master's degrees)
  - Postdoctoral (for postdoctoral researchers)
- Graduate Partnership Program (GPP) – for graduate students conducting their dissertation research at the NIH
- Community College Summer Enrichment Program – for community college students

- Undergraduate Scholarship Program (USP) – for undergraduate students with exceptional financial need

There are many other intramural programs that are unique to one or more ICs; these are not coordinated centrally.

Extramural

For extramural programs, NIH uses funding opportunity announcements (FOAs) to announce programs. In almost all cases, even when programs are issued by the Office of the Director (as is the case for omnibus or "parent" announcements), the ICs issue and administer the awards. The best known research training program is the Ruth L. Kirschstein National Research Service Award (NRSA) program, which includes both individual fellowship awards (F30, F31, F32, F33) and institutional research training awards (T32, T34, T35, T90, TL1, and TU2). Non-NRSA programs can also be classified into individual and institutional awards.

Individual award programs

At the start of our analysis, known individual awards for research training and career development included the following NRSA and non-NRSA programs.

Type	Activity Code	Career Level
Fellowship (F)	F33 (NRSA)	Senior
	F32 (NRSA)	Postdoc
	F31 (NRSA)	Predoc
	F30 (NRSA)	Predoc (dual degree)
	F05	Postdoc or faculty (international)
Career Development (K)	K01	Postdoc or faculty
	K02	Faculty
	K05	Faculty
	K07	Faculty
	K08	Postdoc or faculty
	K22	Postdoc
	K23	Postdoc or faculty
	K24	Faculty
	K25	Postdoc or faculty
	K99	Postdoc
Supplement	Diversity Supplement	High School through faculty
	Reentry Supplement	Postdoc or faculty
	Other	IC-specific supplements

Because all of the F and K awards and awardees are tracked centrally in NIH's administrative database (IMPACII), information about them is readily available and complete. The Diversity and Reentry Supplements are tracked by each IC, with regular reports coordinated by the OD (OER and ORWH, respectively). To gather information about other, IC-specific supplements (such as supplements to institutional research training awards), we specifically asked for data on this type of program to be reported in this inventory.

Institutional award programs

Compared to the individual programs, we were much less confident about the scope of institutional programs. Although all awards are tracked centrally, it is sometimes difficult to determine which awards support individuals as participants, particularly in the case of R25 research education awards, some of which provide research training or training-like experiences for participants, and others of which focus on curriculum development.

At the start of this project, we knew of the following institutional programs.

Type	Activity Code	Description
Research Training (T)	D43	International training
	T15	Continuing education[1]
	T32 (NRSA)	Predoc and Postdoc trainees
	T34 (NRSA)	Undergraduate trainees
	T35 (NRSA)	Predoc and Postdoc trainees (Short term)
	T37	International training
	T90 (NRSA)	Interdisciplinary research training
	TL1 (NRSA)	Linked training component (U54 award)
	U2R (NRSA)	International training
Research Education	R25	Research education – participatory
	R25	Research education – curriculum development
	R90	Interdisciplinary research education
Career Development (K)	K12	Clinician mentored career development
	K30	Curriculum awards (currently inactive)
	KL2	Linked career development component (U54 award)
	KM1	Multi-year mentored career development
Other	P30	Faculty support through Recovery Act (ARRA) funding

We expected the inventory would help us identify which programs within a given activity code (such as the R25) supported participants, but that there would also be other institutional programs, like the P30, that supported participants, that we would reveal through the inventory.

Another concern for our data collection efforts was gathering participant-level information. In contrast to the individual programs, the scope of NIH support in institutional programs extends beyond the awardee. Institutional programs are designed to support many individuals per award, but reporting and centrally capturing information on the number, names, and outcomes of the participants in IMPACII was not universally required in FY2010, other than for NRSA and NLM training programs. Reporting requirements for other programs varied, and were specified in the FOA.

Types of Data Tracking

As described above, there are various ways of determining the scope of research training programs.

[1] A name change of the T15 program is pending; the new name will be "Institutional research training programs at the pre-masters, pre-doctoral, and postdoctoral levels".

Some intramural programs are coordinated centrally, but accessing fundamental information about those trainees proved difficult. IC-specific intramural programs were not coordinated centrally; therefore, we expected reporting information to vary based on IC.

For extramural programs, IMPACII provides the infrastructure for reporting on all awards; and we expected IMPACII to have award- and awardee-level information for programs where formal appointments were required, and for all individual awards. However, we expected to encounter some difficulty identifying which programs supported individuals, and, for those programs that supported individuals, in gathering information about participants in programs that did not require appointment forms.

Recent efforts have been made to enhance reporting on the individual level. At the beginning of FY2010, the following changes were implemented:

- All postdoctoral researchers supported by NIH were required to create an eRA Commons account[2], which necessitates establishing a profile in IMPACII.
- The All Personnel Report replaced the Senior/Key Personnel Report as part of the Non-competing Continuation Progress Report (PHS 2590); with its introduction, NIH began to collect information on individuals with a month or more of effort on research grants.

More recently, in early 2012, NIH began to accept electronic applications for administrative supplements, including diversity and re-entry supplements.

These changes will not collect information on all individuals in training and related activities, but they are steps in the right direction. Until more information is routinely collected, the results of this inventory should help fill the gaps in understanding the numbers and characteristics of individuals in training and related programs, but it will not be possible to provide the kind of comprehensive information required to formally assess the value of the supported training experiences.

Furthermore, with the exception of the supplement programs, this report does not include students or postdocs employed as research assistants and research associates on NIH research grants. An internal study to estimate the total number of individuals supported in such ways is pending.

Process

Details of the process we undertook are provided in Appendix 1. Briefly, we designed the inventory using Microsoft SharePoint and InfoPath systems. After incorporating feedback from pilot participants, the inventory was distributed to NIH staff. To supplement the data collected from the inventory, we requested centralized data from the Division of Information Services (DIS) within OER, including both award-level data and participant-level data when available from appointment forms, the ARRA enumeration study (a study of jobs created with ARRA funding), and the Diversity data report on the NIH intranet[3]. We collapsed the data into what we considered "program level" so that we could compare it with the inventory data (see Appendix 1).

[2] http://grants.nih.gov/grants/guide/notice-files/NOT-OD-09-140.html
[3] http://inport.nih.gov/investigators_and_trainees/nihOnly.aspx

All of the data we received was examined for completeness and accuracy. To avoid double-counting, we compared the data received through the inventory to that from OER. In cases where information was available from both sources, we generally opted for the inventory data (see Appendix 10 for details).

We uncovered two issues of concern with regard to the centralized data:

- We were unable to locate institutional information for the majority of Diversity Supplement awards because they could not be identified in IMPACII, despite such information being requested in the All Personnel Report.
- The current appointment form that feeds into IMPACII does not accommodate career level reporting for participants appointed to research education (R25) awards and scholars appointed to institutional career development (K) awards; they are classified as "Participants" and "Scholars", respectively.
- Many institutional programs did not have data on the number of participants because reporting on appointment forms was not required.

All programs were classified as "Research Training" or "Educational." Programs that did not support participants were excluded (see Appendix 9 for selected programs of this type).

Results

Overview of Programs

Scope of Support for all Research Training and Educational programs

In total, NIH supported at least 249 research training and educational programs in FY2010 at a cost of $2.4 billion. This corresponds to more than 11,000 awards and more than 120,000 participants.

These estimates are likely minimum calculations, for the following reasons:

- Funding data was not reported for three programs.
- The inventory did not capture the number of awards made under each program.
- As described, 15% of programs provided no participant data.

Caveats

The completeness, accuracy, and exhaustiveness of this report is considered in detail in Appendix 8; however, a few points are included here as caveats.

- In total, only 65% of extramural programs were catalogued in NIH's central database, IMPACII (corresponding to 58% of all NIH extramural and intramural programs).
- As we investigated the data from IMPACII, we found 1,530 records in which the FOA numbers were missing from the grant record in IMPACII. Furthermore, we found incomplete reporting of participants for a substantial percentage of programs, with only 56% of programs reporting actual data, 28% reporting estimated data, and 15% reporting no data on the number of participants.
- As one measure of exhaustiveness, we examined the issuing IC for each of the programs. We did not have complete reporting from each IC in any case. The intramural programs were distributed among seven ICs and OIR, while the extramural programs from the inventory were distributed among 15 ICs, plus OBSSR, and ORWH. Finally, the extramural

programs found in centralized data sources (including IMPACII) were distributed among every IC except CC, NIAAA, NIAID, and NIMHD.

Evaluations

Although we gathered no data about evaluations of the programs that were reported through IMPACII, we know that many are regularly evaluated, including the Kirschstein-NRSA programs and the individual K award programs. Of the 103 programs reported in the inventory, only 11 (11%) reported as having been evaluated (see list below). A similar percentage of both intramural and extramural programs were evaluated (12% compared to 10%, respectively).

Intramural programs evaluated (Research Training and Educational)

- CC - ACGME Graduate Medical Education
- CC - Residency in Oncology Pharmacy Practice
- OD/OIR - Undergraduate Scholarship Program for Individuals from Disadvantaged Backgrounds

Extramural programs evaluated (Research Training and Educational)

- FIC - AIDS International Training and Research Program (D43)
- FIC - International Research Ethics Education And Curriculum Development Award (Bioethics D43)
- FIC - International Clinical, Operational, and Health Services Research and Training Award (ICOHRTA D43)
- FIC - Global Research Training in Population Health (D43)
- NCRR - Science Education Partnership Award (SEPA R25)
- NCRR - Research Centers in Minority Institutions Program (G12)
- NHLBI - Programs to Increase Diversity Among Individuals Engaged in Health-Related Research (R25)
- NHLBI - Summer Institute Program to Increase Diversity in Health-Related Research (R25)

Finding: Only 11% of the 103 programs identified in the inventory (as Research Training or Educational Programs) reported having been evaluated.

Classification of programs

We investigated the type of participation that occurred in each program.

- All programs in which participants were appointed, and their appointment information was stored in IMPACII were classified as "research training and research training-like experiences."
- All of the programs collected through the inventory were classified into one of the following types:
  - Research training and research training-like experiences
  - Educational experiences, either in-person or via electronic/distant educational experiences with interactive components

Programs without participants were excluded (including educational experiences without interactive components); Appendix 10 contains some examples.

The classic example of research training and training-like experiences is the Kirschstein-NRSA T32 program. We collected data on 222 programs of this type:

- 201 extramural award programs: 35,385 participants
- 3 contract programs: 39 participants
- 18 intramural programs: 6,502 participants

An example of a program providing in-person educational experiences was the Science Education Partnership Award (SEPA). In the electronic/distance learning arena, the NIDCD contract program, "It's a Noisy Planet" was a typical example. In all, we collected data on 27 programs of these types:

- 16 R25 extramural award programs: 78,533 participants
- 2 T15 extramural award programs: 463 participants
- 1 contract program: 633 participants
- 8 intramural programs: 93 participants

We found that programs that were educational in nature had a disproportionately high percentage of the total number of participants; 79,722 of the 121,648 participants (66%). This disproportionality was largely due to two programs: the NCRR R25 Science Education Partnership Award (SEPA) with 63,050 participants, and the NIDA R25 Science Education Drug Abuse Partnership Award with 15,180 participants. These two were by far the largest programs; the overwhelming majority (96%) of programs had less than 1,000 participants. To avoid possible distortions by the few programs with a large number of participants, we focused our analysis on research training programs; an analysis of the educational programs is included in Appendix 6.

Research Training Programs

Scope of Support

Of the 249 programs we captured, 222 (89%) were classified as supporting research training. The estimated funding and estimated numbers of awards and participants are shown below.

Research Training			Programs		Estimated Funding		Estimated Awards		Estimated Participants	
Programs			**N**	**%**	**$**	**%**	**N**	**%**	**N**	**%**
Intramural and Extramural - all sources			**222**	**100%**	**$2,285,979,067**	**100%**	**11,256**	**100%**	**41,926**	**100%**
Intramural	All sources: Inventory		18	8%	$280,455,255	12%	N/app	0%	6,502	15%
		Trans-NIH programs	7	3%	$264,538,500	11%	N/app	0%	6,093	15%
		IC-specific programs	11	5%	$15,916,755	1%	N/app	0%	409	1%
Extramural	All sources: Inventory, IMPACII, Other Sources		204	92%	$2,005,523,812	88%	11,256	100%	35,424	84%
	Inventory	All programs	62	27%	$358,028,431	15%	N/avail	0%	9,827	23%
		Institutional awards	47	21%	$187,158,633	8%	N/avail	0%	7,429	18%
		Contract	3	1%	$4,842,584	0%	N/avail	0%	39	0%
		Supplement	5	2%	$4,504,152	0%	N/avail	0%	313	1%
		Other awards (G12, P20, P50, U54)	7	3%	$161,523,062	7%	N/avail	0%	2,046	5%
	IMPACII	All programs	140	63%	$1,504,967,072	66%	9,932	88%	24, 071	57%
		Institutional awards	71	32	$861,931,255	38%	2,800	25%	16,940	40%
		Individual F and K awards	69	31%	$643,035,817	28%	7,132	63%	7,131	17%
	Other sources	All programs	2	1%	$142,528,309	6%	1,324	12%	1,526	4%
		P30 ARRA enumeration	1	0%	$71,521,207	3%	141	1%	343	1%
		Div Supp report	1	0%	$71,007,102	3%	1,183	10%	1,183	3%

In total, NIH supported more than 41,000 participants in FY2010 in research training and training-like programs. The majority of participants were supported through programs tracked centrally in IMPACII (24,071; 57%) or other sources (1,526; 4%). However, a significant number of participants (9,827; 23%) were supported through programs that are not tracked centrally and were only identified as a result of this inventory.

Finding: Approximately one-quarter of the participants in NIH research training programs were identified through the inventory (extramural programs). These individuals are not captured or tracked centrally in NIH data systems.

Context

To place the results in context, we considered "formal" extramural programs in comparison to "informal" extramural programs.

Formal programs: All of the Kirschstein-NRSA programs (fellowships and training grants), other fellowship and training programs, and all of the individual and institutional career development programs were considered "formal" research training programs. In other words, all T, K, and F activity codes.

Informal programs: All other extramural programs were considered "informal" programs.

	Programs		Estimated Funding		Estimated Awards		Estimated Participants	
	N	%	$	%	N	%	N	%
All Extramural	**204**	**100%**	**$ 2,005,523,812**	**100%**	**11256**	**100%**	**35424**	**100%**
"Formal" (T, K, F)	134	66%	$ 1,448,165,368	72%	9,591	85%	23,435	66%
Inventory	13	6%	$ 46,835,928	2%	N/avail	-	745	2%
IMPACII	121	59%	$ 1,401,329,440	70%	9,591	85%	22,690	64%
"Informal" (all others)	70	34%	$ 557,358,444	28%	1,665	15%	11,989	34%
Inventory	49	24%	$ 311,192,503	16%	N/avail	-	9,082	26%
IMPACII	21	10%	$ 246,165,941	12%	1,665	15%	2,907	8%

A majority of the participants (66%) were in "formal" extramural programs, while 34% of the participants were in "informal" extramural programs. Most of the "formal" extramural programs and participants were reported through IMPACII and other centralized sources. Most of the "informal" extramural programs and participants were reported through the inventory.

Findings: About two-thirds of the research training extramural participants were in "formal" programs, which were reported primarily through centralized sources. Remaining extramural participants were supported through "informal" programs that were reported primarily through the inventory.

Duration

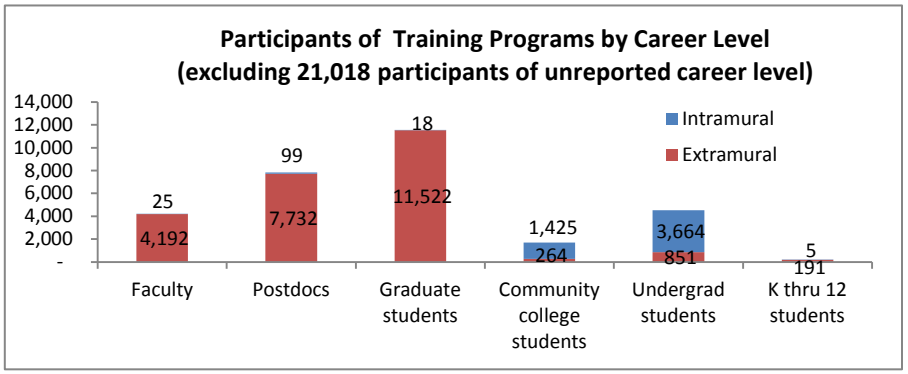
Of the 222 research training programs, almost all (87%) provided support for more than 8

weeks. Only four programs reported providing support for a period between 1 – 8 weeks (and no programs indicated providing support for a shorter duration than 1 week); 25 programs did not report a standard duration.

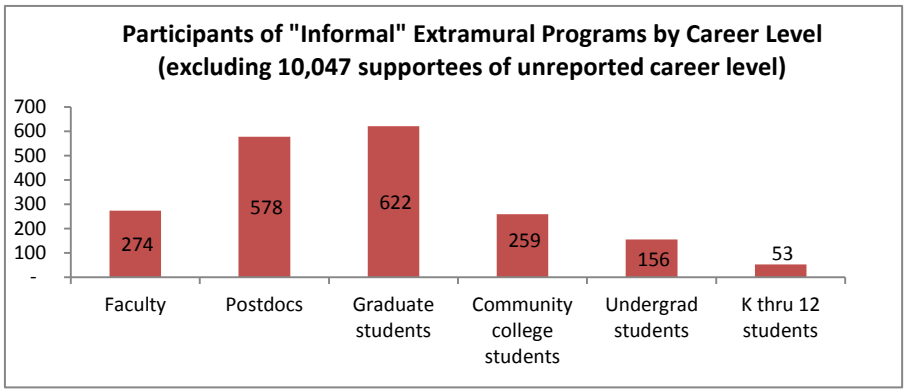
Finding: Most of the research training programs reported provided experiences of more than 8 weeks.

Career Levels

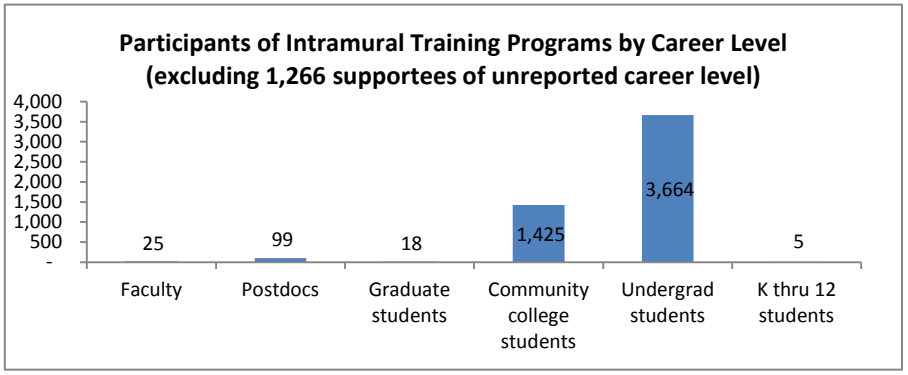
Of the 29,988 participants at known career levels, 14% were faculty, 26% were postdocs, 38% were graduate students, 6% were community college students, 15% were undergraduate students, and 1% were K thru 12 students. For the purposes of this report, individuals known to be at the postbaccalaureate career level were considered in the same category as graduate students.



When we excluded the extramural "formal" programs and focused on the informal programs, we found the distribution of extramural program participants to be more balanced among the career levels. However, the more even distribution might be an artifact of a smaller but more diverse sample size.



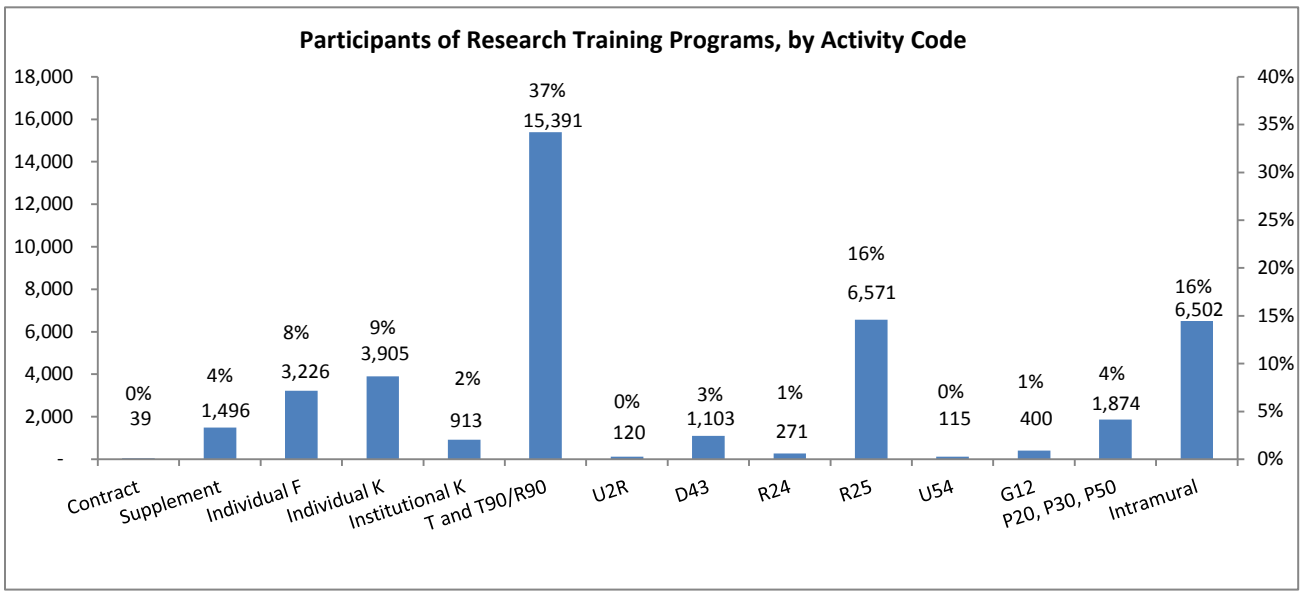
We examined the distribution of intramural programs by career level and found the distribution among intramural programs to be skewed towards career levels that formal extramural programs (such as Kirschstein-NRSA) support only in a limited way (i.e., undergraduates and



community college students). However, we note that the intramural program may have under-reported the number of participants. We know from other sources that the NIH Intramural Research Program reported employing a total of 3,635 postdocs in 2009[4].

Types of Awards

The largest percentage of participants came from institutional training awards, followed by research education awards, and then individual career development and fellowship awards.



Finding: Institutional training awards account for the majority of participants in research training programs. Beyond NIH's formal NRSA research training grants, participants were most likely to be supported by R25 research education programs. The number of participants supported by R25 research education programs was comparable to the number of participants in the intramural program.

Stipend or Salary Support

Almost all of these programs provided stipends or salaries to the participants, which is always the case for NIH's formal research training programs, and it turned out to be largely the case for informal programs as well. Of the 80 research training programs that were reported through the training inventory, 95% provided a stipend or salary. The programs that did not provide stipends or salaries for research training experiences were the following four research education programs:

- NIGMS Short Courses in Integrative and Organ Systems Pharmacology
- NIGMS Postbaccalaureate Research Education Program (PREP)

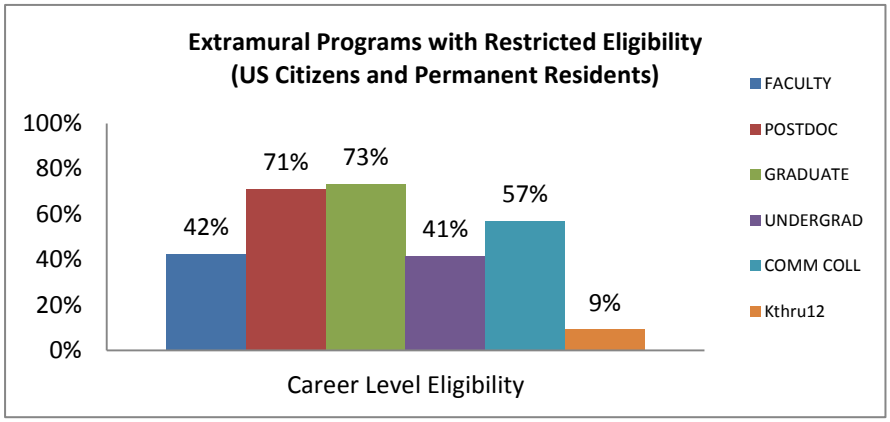
[4] National Science Foundation – National Institutes of Health Survey of Postdoctorates at Federally Funded Research and Development Centers. September 2010. Prepared by RTI International, Project Number 0210119.000.800.500.

- NIMH Mentoring Programs to Diversify the Mental Health and Substance Abuse HIV/AIDS Research Workforce through Innovative Educational Initiatives
- NINDS Diversity Research Education Grants in Neuroscience

Finding: Almost all research training programs provided a stipend or salary to participants.

Citizenship

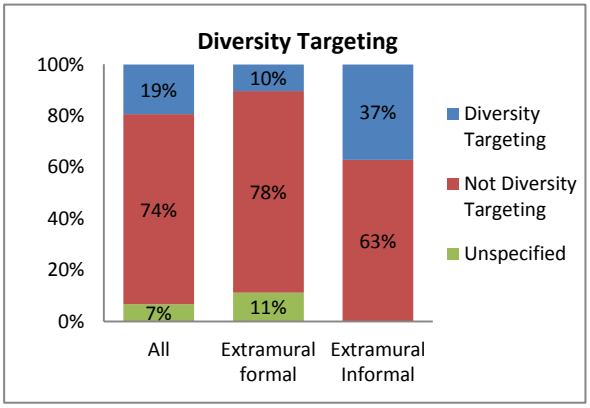
We determined whether participant eligibility was restricted to US citizens and permanent residents for the subset of 80 research training or training-like programs reported through the inventory. We determined that 34 programs (43%) had open eligibility. We also examined the requirement for US citizenship or permanent residency by the career level of the participant. The graph shows that eligibility was more likely to be restricted in programs for postdocs or graduate students (71% and 73%, respectively), than in programs for faculty, undergraduates, or community college students (42%, 41% and 57%, respectively), or programs for K thru 12 students (9%).



Finding: More than half of the research training programs included in the inventory restricted eligibility to US citizens and permanent residents.

Diversity Targeting

Of the research training programs, 43 (19%) had a primary goal to increase diversity. For fifteen programs, the extent to which they targeted diversity could not be determined from the FOA. Within the extramural programs, those that were classified as informal were more often diversity targeting than those classified as formal.



Finding: About 20 percent of the research training programs were diversity targeting. Informal extramural programs were more often diversity targeting than formal extramural programs.

Individual Characteristics (Demographics)

Total Programs	Data Collected on Number of Participants		Estimated Number of Participants
222 All Research Training	Yes:	193 (87%)	41,926
	No:	29 (13%)	Unknown
134 Extramural Formal	Yes:	125 (93%)	23,075
	No:	9 (7%)	Unknown
70 Extramural Informal	Yes:	50 (71%)	12,349
	No:	20 (29%)	Unknown
18 Intramural	Yes:	18 (100%)	6,502

As described and as shown in the table, we were able to gather data about the number of participants from only a subset of the identified programs (193 of the 222 research training or training-like programs).

Overall, of the research training programs that collected data on the total number of participants:

- 65% collected data on race
- 65% collected data on ethnicity
- 67% collected data on sex
- 38% provided data on other diversity characteristics (disabled, disadvantaged, resident of a low or middle income country)

Within the programs that collected data on each of the demographic variables, the participant had the option to withhold data; therefore, the demographic data we have represents a maximum of 51%, 52%, or 60% of the actual participants for race, ethnicity, and sex, respectively.

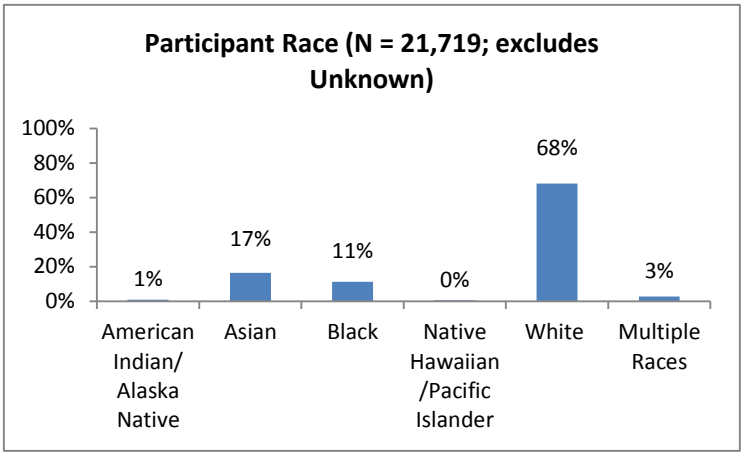
Furthermore, we found a marked difference between the mode of data collection and the completeness of information. Specifically, although we were able to obtain a total number of participants for all the intramural programs, we were unable to obtain any data on the race, ethnicity, sex, or any other demographic characteristics of the individuals supported by intramural programs.

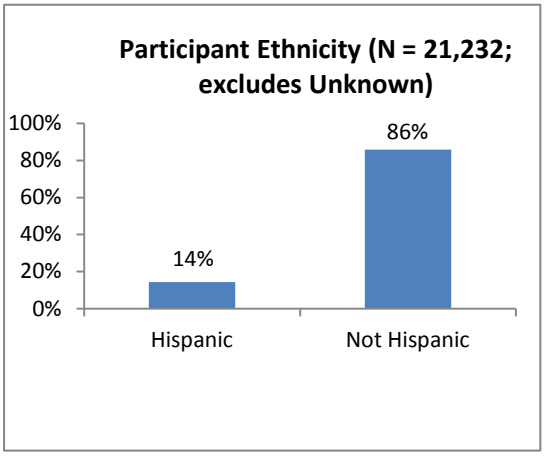
There was also a difference in completeness among extramural programs, depending on whether they were classified as formal versus informal (recall that most formal programs had data collected and stored in centralized data sources, while data on most informal programs was reported through the inventory). As shown in the table, the programs reported through centralized data sources were more likely than the extramural programs reported in the inventory to include demographic data.

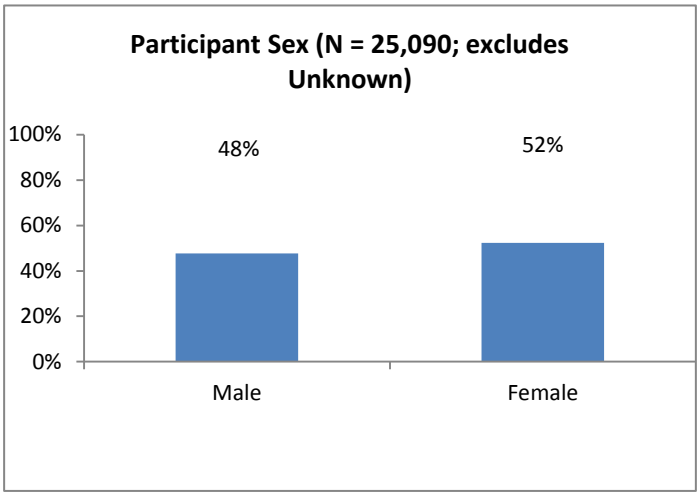
Finding: Availability of demographic information varied, and depended on the particular demographic category, the data source (centralized versus dispersed), and whether the program was intramural or extramural.

	Data Collected on Number of Participants		Data Collected on Participant Race		Race Reported	Data Collected on Participant Ethnicity		Ethnicity Reported	Data Collected on Participant Sex		Sex Reported	Maximum Participant Representation		
Program	Program	Participant	Program	Program	Participant	Program	Program	Participant	Program	Program	Participant	Race	Ethnicity	Sex
222 TOTAL	29 (13%)	Unknown	0 (0%)	0 (0%)	None	0 (0%)	None	None	0 (0%)	None	None	52%	51%	60%
	193 (87%)	41,926	126 (65%)	126 (65%)	26,609 (63%)	125 (65%)	26,343 (63%)	21,232 (81%)	129 (67%)	25,449 (61%)	25,090 (99%)			
134 Extra. Formal	9 (7%)	Unknown	0 (0%)	0 (0%)	None	0 (0%)	None	None	0 (0%)	None	None	88%	84%	97%
	125 (93%)	23,075	112 (90%)	112 (90%)	22,690 (99.5%)	112 (90%)	22,690 (99.5%)	19,365 (86%)	112 (90%)	22,690 (99.5%)	22,467 (99%)			
70 Extra. Informal	20 (29%)	Unknown	0 (0%)	0 (0%)	None	0 (0%)	None	None	0 (0%)	None	None	14%	15%	21%
	50 (71%)	12,349	14 (28%)	14 (28%)	3,919 (31%)	13 (26%)	3,653 (31%)	1,867 (51%)	17 (34%)	2,759 (22%)	2,623 (95%)			
18 Intra.	18 (100%)	6,502	0 (0%)	0 (0%)	None	0 (0%)	None	None	0 (0%)	None	None	0%	0%	0%

We excluded all participants of unknown race, ethnicity, sex, or other characteristic to determine the percentage of participants with known demographics of all the participants of programs able to provide a total number of participants. The table below shows the four demographic categories (race, ethnicity, sex, and other, which included disabled, disadvantaged, and residency in a low or middle income country (LMIC)). The racial, ethnic, and sex demographic of participants are shown in the graphs below.





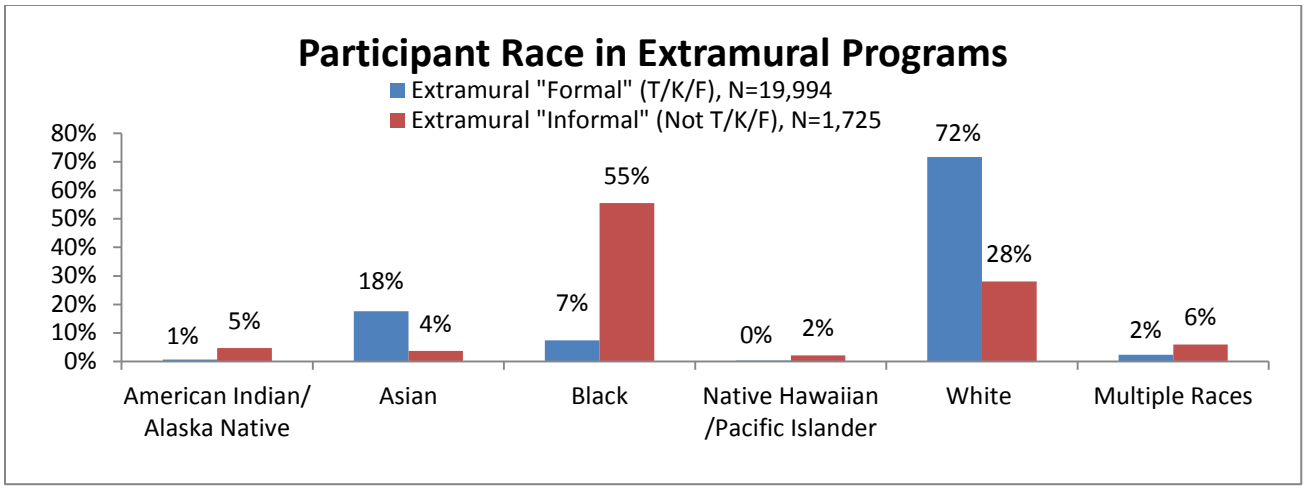


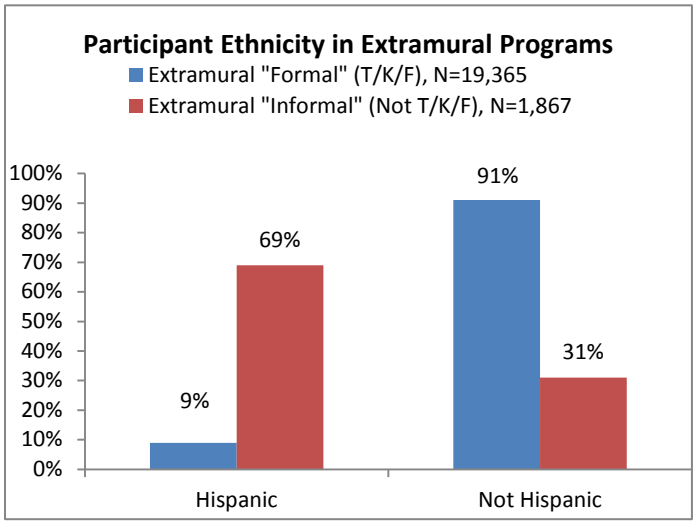
We were unable to calculate percentages for disabled, disadvantaged, and LMIC residents in the population because we were unable to assess how many participants were not disabled, not disadvantaged, and not LMIC residents. The number of participants that were in each category is shown:

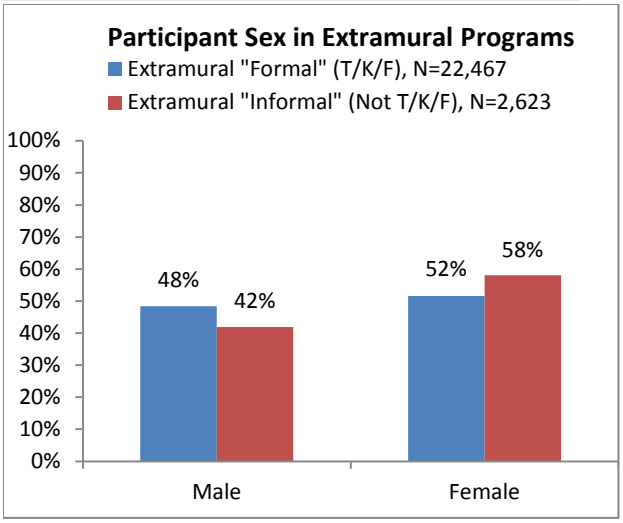
- Disabled participants: 303
- Disadvantaged participants: 1,517
- Participants from LMIC: 1,379

Finding: The majority of participants with known racial and ethnic demographics were White and not Hispanic. There were slightly more females supported than males.

We also compared demographic distributions between "formal" and "informal" extramural research training programs. As a group, the individuals in the informal programs were more diverse than the individuals in the formal programs. Some of the differences may be accounted for by the order of magnitude difference between the population sizes (as shown in the graphs); nevertheless, the differences are striking.

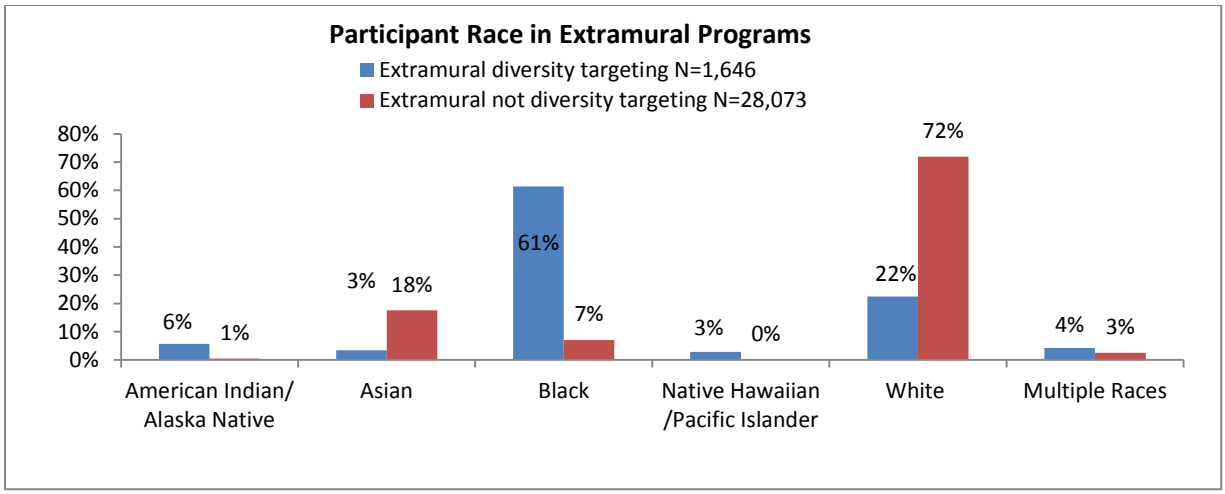


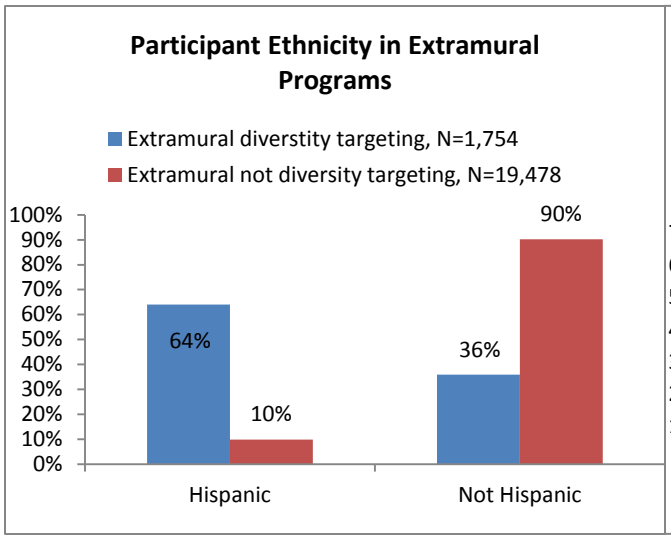


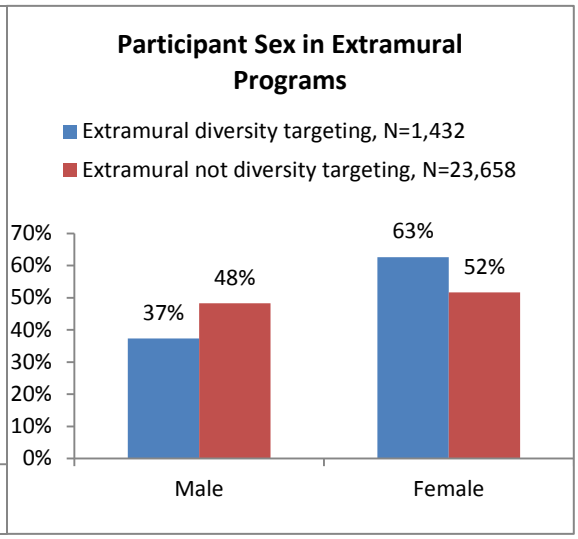


Finding: Participants in informal extramural research training programs were more diverse than participants in formal extramural programs, reflecting a higher concentration of diversity targeted programs in the former group.

Finally, we compared demographic distributions between diversity targeted and untargeted extramural research training programs. As a group, the individuals in the informal programs were more diverse than the individuals in the formal programs, which we expected because of the targeted nature of the programs.





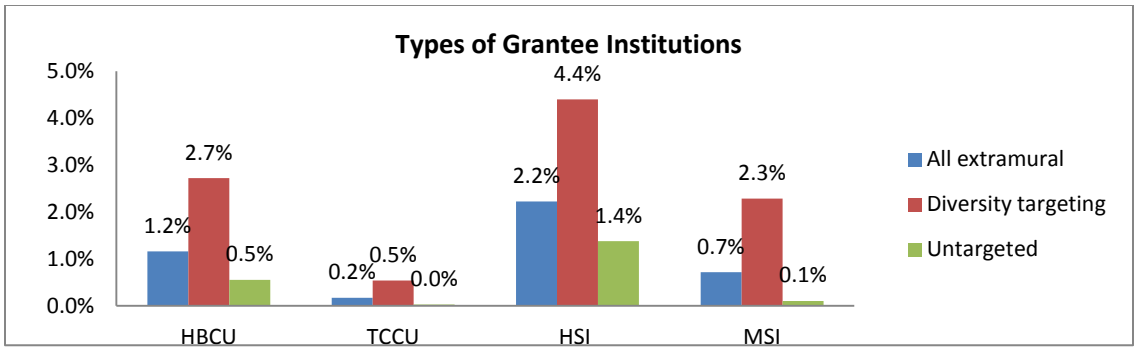


Institutional Characteristics

We examined the total number of institutions supported and the number of institutions in each of the following categories:

- Historically Black Colleges and Universities (HBCUs)
- Tribally Controlled Colleges and Universities (TCCUs)
- Hispanic Serving Institutions (HSIs)
- Minority or Minority-Serving Institutions (MSIs)

The inventory data was self-reported as to whether the supported institutions fit into the four categories. For the data from centralized sources, DIS staff classified each supported institution as belonging to one of the first three categories or not. Classification was based on government definitions of HBCUs, TCCUs, and HSIs. MSI data was not available for programs reported in centralized sources. Approximately 5% of the institutions supported were of the designations listed above. Diversity-targeted programs were more likely to support institutions with one of the designations than untargeted programs.



Conclusions

Terminology

Despite efforts to clarify terms as we completed this inventory, we found confusion about what constitutes a participant. Questions such as the following were raised repeatedly.

- Does the person have to be participating in laboratory research activities?
- Do they have to be receiving a stipend?
- What about duration – is there a lower limit?

Recommendation: NIH may wish to develop more formal definitions of "participants" to ensure that comparisons can be made between programs.

In addition, we encountered many situations in which one "program" could not be classified uniformly. For example, an R25 "program" defined at the level of the Funding Opportunity Announcement (FOA), might have allowed for several types of support (i.e., hands-on research training experience in the laboratory, curriculum/course based training, or museum visits for participants). Some FOAs that allowed for multiple types of support require the type of support to be specified in the application; some FOAs allowed each institutional awardee to offer multiple types of program support. This issue was most prominent with the R25 activity code; we have no evidence whether it occurred for other activity codes.

Recommendation: NIH may wish to require more uniform support within one Funding Opportunity Announcement – particularly for the R25 activity code. We are aware of a pending effort to address this issue.

Programs and Participants

In total, NIH supported at least 249 training and education programs in FY2010 at a minimum total cost of $2.4 billion. This corresponds to more than 11,000 awards, and more than 120,000 participants. The majority of NIH's training and training-like support is directed to individuals at the graduate student and postdoctoral levels.

Intramural programs accounted for slightly more than 10% of all the training and education programs.

Research training programs accounted for the majority of support as measured by percentage of programs (89%), percentage of total costs (96%), and awards (99%) supported. However, educational programs "touched" more individuals and accounted for 66% of the total participants catalogued in this report.

Research Training Programs

Most of the training programs were classified as research training or training-like; there were at least 222 training and education programs in FY2010 at a minimum total cost of $2.3 billion. This corresponds to more than 11,000 awards, and more than 41,000 participants. Research training programs were distributed between individual fellowships, individual and institutional career development awards, institutional training awards, and institutional research education awards. Institutional training awards accounted for the majority of participants of research training programs.

Educational Programs

Programs providing educational experiences represented slightly more than 10% of all programs identified, and provided support for experiences of varying length. Compared to research training programs, the eligibility for educational programs was spread over a greater distribution of career levels, and less concentrated at advanced levels. Most of the participants of educational programs were supported by the research education (R25) activity code, which is not restricted to a particular career level.

Research Education R25 Awards

The R25 research education program was the most used activity code, perhaps because:

- There is currently no omnibus or "parent" announcement and each IC must develop its own FOA
- R25 awards provide support for the broadest range of activities, from research training to educational experiences to curriculum development

The R25 research education program supported the most participants, largely because of two programs that supported educational experiences to a total of more than 75,000 individuals.

Program Evaluation

Though most of NIH's formal training programs are routinely evaluated, only 3% of the 80 training programs identified in the inventory reported having been evaluated. This low evaluation rate may be due to the small number of programs in this category that collect individualized data for participants.

Recommendation: NIH may wish to consider instituting a stronger requirement for evaluation of training and education programs.

Stipend or Salary Support

Almost all of the research training programs and one-third of the educational programs provided stipends or salaries to the individuals supported.

Citizenship

More than half (57%) of the research training programs restricted eligibility of participants to US citizens. The educational programs were evenly distributed as to whether they restricted eligibility to US citizens and permanent residents.

The finding that many programs did not restrict eligibility was an important observation, particularly for R25 programs (which were evenly split between open and restricted eligibility), because NIH's program policy guidance for R25 research education programs indicates that unless strongly justified on the basis of exceptional relevance to NIH, "research education programs should be used primarily for the education of U.S. citizens."

Diversity targeting programs

Almost one-third (29%) of all NIH training and educational programs were diversity-targeted, with individual diversity characteristics more commonly used than institutional diversity characteristics to address the populations of interest.

Regardless of whether the program was diversity targeting or not, we had the following overall findings:

- In total, less than five percent of the grantee institutions funded by NIH were classified as HBCUs, TCCUs, HSIs, or MSIs[5]
- Of the participants with known race, the majority race was White (68%), followed by Asian (16%), and Black (11%)
- Of the participants with known ethnicity, 86% were not Hispanic
- Of the participants with known sex, 52% were women and 48% were men

Data collection and storage

Individualized data and participant demographics

NIH has some level of individualized data for the participants of approximately two thirds of the training programs. However, NIH has the *actual* number of participants for only 55% of training programs. The number of individuals about which some individual data is known corresponds to approximately 28,000 individuals, or approximately 23% of the total number of known participants.

Once individual-level data is obtained, it almost always includes demographic information; more than 27,000 of the participants on which NIH has collected individualized data have also reported their demographic characteristics.

The availability of individualized information varied greatly, depending on the demographic variable, the data source (centralized versus dispersed), and whether the program was intramural or extramural.

[5] HBCU = Historically Black Colleges and Universities; TCCU = Tribally Controlled Colleges and Universities; HSIs = Hispanic Serving Institutions; MSIs = Minority Serving Institutions

- Differences based on the demographic variable are likely to be related to the individual's willingness to provide information within each metric. For example, sex was the most commonly reported variable, followed by race and ethnicity. From other studies of NIH data, we know that degree information is another variable that is likely to be reported.
- Programs that were reported in centralized sources were more likely to include individualized data than programs reported through the inventory. NIH may wish to consider converting more of the dispersed-reporting IC programs into centralized reporting.
- Finally, there was a marked difference between availability of individualized data in the intramural and extramural programs, with slightly more than one third of intramural programs having individualized data, and approximately two thirds of extramural programs having individualized data. NIH may wish to synchronize its policies for intramural data collection and storage with those used for extramural research training.

Recommendation: NIH may wish to consider instituting a stronger requirement to store program participation information in a centralized location.

Completeness of data found in centralized sources

Despite the higher level of availability of information on the programs that were reported centrally, some issues with respect to completeness and accuracy were uncovered.

IMPACII, in combination with xTrain, was not able to provide a complete picture of the scope of NIH research training and training-like programs, especially the institutional programs. A requirement for all training programs to formally "appoint" their participants, through xTrain, could help address this issue. Broader implementation of the All Personnel Report would also improve data collection and reporting, but only if accompanied by requiring the reporting of Commons ID for all participants in some form of training status.

Recommendation: NIH may wish to take steps to promote more complete data collection.

The current xTrain appointment form was not designed to accommodate career level reporting for participants appointed to research education awards and scholars appointed to institutional career development awards. As described above, all R25 research education participants are classified as participants, regardless of career levels.

Recommendation: NIH may wish to consider modifying the appointment form to provide career levels for participants of all institutional awards. Alternatively, other ways to determine the career level of participants from information that is already provided (such as terminal degree) could be developed.

Within our limited study, we found that 1,530 records in IMPACII were missing an FOA number.

Recommendation: NIH may wish to require the FOA number in all electronic progress reports and other forms, and promote greater enforcement or manual curation of the FOA number in paper-based forms.

We were unable to locate institutional information for the majority of Diversity Supplement awards because they could not be identified in IMPACII. For this study, we relied on data collected by OER in its own yearly inventory on use of the Diversity Supplement. However, the current collection instrument that OER is using does not collect the grant number of the parent awards to which the supplement is added. Since eRA recently launched a tool to accept supplement applications electronically, NIH may no longer need to collect this information through a yearly inventory since the data on supplement applications will now be submitted electronically and stored centrally in IMPACII.

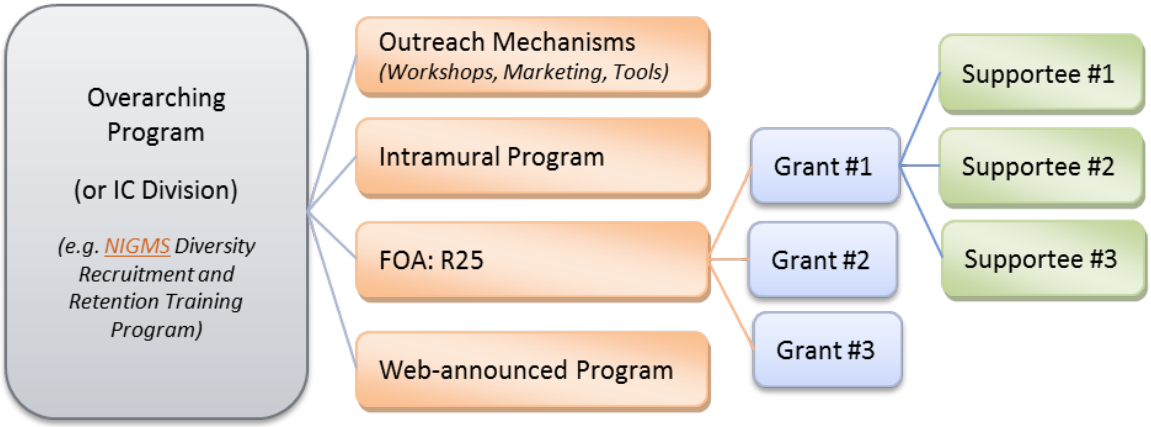
Recommendation: NIH may wish to consider modifying the diversity supplement collection instrument so that parent grant numbers are collected from ICs at the same time as award information and diversity characteristics. Alternatively, this issue may resolve itself when supplement requests are required to be submitted electronically.

Appendices

Appendix 1: Detailed Process

Step 1: Designing the Data Structure and the Process for the Inventory

We captured data structure requirements before building and launching the inventory. Based on our previous experience with cataloguing diversity programs at NIH, we anticipated confusion about what constitutes a program and at what level data were being sought. For example, the figure below shows the various program "levels" that may exist. This program inventory was designed to determine the total number of participants, and associated demographics, for each program (as defined by the second (orange colored) level in the figure below). One program almost always had more than one grant.



Ripple Effect worked with OER to design the database structure, to develop clear instructions to explain the meaning of "program", and to capture relevant data fields from the inventory respondents. The inventory was developed using Microsoft SharePoint and InfoPath software, and was released to a small number of respondents in a pilot.

During the pilot period, it became apparent that some ICs wanted to report on all training programs, including programs that did not have participants. Although such reporting was outside the scope of this project, we wanted to accommodate the desire. The instructions did not promote such reporting; however, we provided a pathway for ICs to report minimal information on training programs that did not have participants. A selection of these programs is included in Appendix 9, but it should not be considered an exhaustive list. For the sake of this analysis, such programs have been excluded from the data presented in this report.

After incorporating feedback from the pilot participants, the inventory was distributed to NIH staff. The full inventory and the instruction set are included in Appendix 2.

The audience for the inventory was NIH staff involved in administering extramural and intramural training programs. To reduce reporting burden on the NIH community, we implemented two time-saving features. First, the names of all the programs that were pre-identified as training programs were pre-populated in the inventory. Second, information on centrally tracked programs was not requested in the inventory. Programs such as National Research Service Awards (NRSAs) are examples of centrally tracked programs in which information is required about trainees at the time of appointment to and

termination from the program at their grantee institution. This data, which is submitted via xTrain or on paper-based appointment forms, is stored in IMPACII. Other programs, such as the extramural diversity supplement and the intramural research training award (IRTA) were already recorded centrally, but not in IMPACII. Finally, awards that support an individual's training and career development (such as fellowships and individual career development awards) were also excluded from the inventory, because of the centralized reporting required for PDs/PIs of such NIH awards.

Step 2: Data Collection and Cleaning

Inventory Data Collection

The list of pre-identified programs was distributed to ICs along with a link to the inventory in a memo (full text contained in Appendix 2) from the Deputy Director for the Office of Extramural Research to stress the importance of developing a comprehensive response from each IC. IC Directors, or their delegates, were asked to engage IC staff in the completion of the inventory. Most IC and Office contacts completed their inventory within the designated time period; however, some programs required additional follow-up, and the full inventory was not completed for several months.

All data collected through the inventory was examined for completeness. All records that contained feedback or concerns in response to the final question "Please provide any additional comments" were examined. In these cases, the contact person provided on the form was contacted. When we received additional information from the contact person, we updated the record for that program.

All programs were examined, but we only changed incorrect data in the "institutional/individual" program designation (which we determined based on the activity code). Based on our knowledge of the NIH grants process, we found instances in which the reported data was incorrect; however, we decided to maintain the integrity of the data as it was reported. It was outside the scope of this project to examine all fields for all reported programs for accuracy.

To avoid double-counting, we compared the data we received through the inventory to the data we received from DIS. In instances where the program was reported in both places, we compared the two sources and chose the more complete data source to include in the analysis. However, if the same program was reported in both places, but one source referred to a subset of the FOAs for that program, and the other source referred to a different subset of the FOAs for that program, we kept the program in both locations. In all but two cases, we chose the inventory data over the data we received in the DIS Report; Appendix 10 contains a full list of the choices made.

Non-inventory Data Collection

To supplement the data collected from the inventory, we requested information from the OER Office of Research Information Systems (ORIS), Division of Information Services (DIS), Statistical Analysis and Reporting Branch (SARB). We refer to the data we received from this data collection effort as the "DIS report".

The Division of Information Services collected data in one of four ways:

1. For all individual Fellowship (F05, F30, F31, F32, and F33) and Career Development (K01, K02, K07, K08, K23, K24, K25, and K99) awards, data was drawn from grant record files in IMPACII on the PD/PI.
2. For all institutional career development (K12, KL2, and KM1), Research Training (T15, T32, T34, T35, T90/R90, TL1, and U2R) and Research Education (R25) awards, institutional data was drawn from grant record files in IMPAC II, and supplemented with appointee data drawn from trainee/fellow files in IMPACII, which are populated from appointment information collected electronically (via xTrain) or on paper (via appointment forms).
3. For RFA-OD-09-005, Recovery Act Limited Competition: Supporting New Faculty Recruitment to Enhance Research Resources through Biomedical Research Core Centers (P30), we received data from only one IC, therefore we engaged OER/ORIS/DIS/SARB to assist with data collection for this program. We attained our estimate of FY2010 support by using enumeration reporting data for FY2010 (in which personnel information is based on FY2009 work). Notably, the estimate derived from the enumeration study (460 people) was higher than the number of jobs reported in ARRA recipient reporting files (329.4 jobs); however, enumeration results correspond to personnel (regardless of time spent on the grant), while the ARRA reporting files correspond to full-time-equivalent jobs and do not necessarily represent the total number of persons involved.
4. For the diversity supplement, we used the data report on the NIH intranet at InPORT[6]. The source data for the InPORT data report was collected via email submissions from the awarding ICs, and does not correlate with what PDs/PIs reported on the All Personnel Reports submitted with their progress reports. In fact, DIS staff were able to identify records for only 7 individuals supported by diversity supplements in IMPACII (with data collected from progress reports), compared to the 1,150 supplements noted in the InPORT summary.

To create a comparable "program level" to the data from the inventory, we collapsed the data received from the DIS report:

- One FOA with participants from multiple grants at multiple ICs was collapsed into one record for the issuing IC
- Multiple parent FOAs for the same activity code were collapsed into one record, with the issuing IC identified as trans-NIH
- Unknown FOAs for a particular activity code were collapsed into one record; the issuing IC was identified as unknown to keep them separate from the parent FOA record described above (more details on "unknown" FOAs are provided in the Accuracy of Collected Data section)

As we further investigated the data from IMPACII, we found 1,530 records in which the FOA numbers were missing from the grant record. DIS reported the following details:

- 1,286 records were non-competing renewals (Type 5 & 7). The progress report form does not have a place to enter the FOA number. Therefore the original FOA number from the competing grant application gets bridged down to the renewal record. If there is no FOA number on the original competing application, this field will be blank.
- 79 records were administrative supplements (Type 3). These also have the original FOA number from the competing grant application bridged down. Again, if there is no FOA number on the original competing application, this field will be blank.
- 165 records were competitive applications or renewals (Type 1 & 2). These are all applications that were submitted through a paper-based process, in which the requirement for an FOA

[6] http://inport.nih.gov/investigators_and_trainees/nihOnly.aspx

number is not automatically enforced. The FOA number for these 165 records potentially could be determined by examining the applications individually.

As a matter of course, DIS assumes that blank FOA numbers correspond to an unsolicited application for a "parent" FOA[7] for which no FOA number was assigned (this could happen for applications submitted on paper-based forms rather than electronic forms; all electronic submissions are required to include FOA numbers). Although electronic submission of competing grant applications is now required for almost all activity codes, the transition from paper- to electronic- based submissions has been gradual[8]; it is possible that support provided in FY2010 to a participant could have originated from a grant in which the original competing application was not submitted electronically. Therefore, we originally anticipated that the data with unknown FOA numbers corresponded to applications submitted in response to parent announcements. However, upon further examination, we encountered data with unknown FOA numbers for activity codes for which there is no parent funding announcement (K12, K23, R25, T15, T34). Therefore, we do not know the reason for the missing FOA numbers.

Finding: 1,530 records in IMPACII were missing an FOA number, indicating data quality issues. The scope of the missing FOA numbers extended beyond applications submitted in response to parent announcements.

Three research education programs that were known not to support participants were excluded from the data. Several other determinations were made for each program. We used our knowledge of NIH programs and known information including the activity code and the title of the program to make the following determinations:

- Whether the program was diversity targeted or not
- Whether the program was research training or educational
    - For the R25 programs, which can support either research training with participants or educational curriculum based programs, we examined each FOA individually to determine the classification
- The duration of the supported experience
    - All R25 programs were classified with "Unknown" duration
- Whether or not individuals at each of the following career stages were eligible for the program
    - K through 12 (primary and secondary) students
    - Community College students
    - Undergraduate students
    - Graduate students
    - Postdoctoral researchers
    - Faculty participants

Finally, to enable a comparable analysis of programs by career level, we asked DIS staff to classify the participants into either K thru 12, community college, undergrad, grad, postdoc, or faculty. DIS staff was able to accommodate our request for the individual fellowships and career development awards, and for the institutional training awards, but not for the institutional career development, institutional

[7] http://grants.nih.gov/grants/guide/parent_announcements.htm
[8] http://grants.nih.gov/grants/ElectronicReceipt/files/timeline_NIH_transitions.pdf

research education, or program project awards. The table below shows the available reporting options for data from IMPAC II.

Awards	Type
KL2, K12, KM1	Scholar
R25, R90, RL5, RL9	Participant
T32, T35, T90, TL1, TU2, T34, T15	Trainee (Subtypes of Postdoc, Predoc, and Undergrad are determined by the stipend amount)

The K activity codes use "scholar" as the only training level classification, and the R activity codes use only "participant." Therefore, we examined the FOAs for each of these activity codes; where possible, we classified the FOA as allowing appointees at a particular career level. However, there were many FOAs that escaped classification because they allowed for multiple career levels (such as pre-doc and post-doc). In such cases, the data was provided on the "total" level only, and not reported by career level.

Finding: The current appointment form was not designed to accommodate career level reporting for participants appointed to research education awards and scholars appointed to institutional career development awards.

Appendix 2: Memo to IC and Office Directors

To: IC Directors

From: Deputy Director for Office of Extramural Research (OER), NIH

Subject: IC help with inventory of non-NRSA training and training-like programs

Dear {IC Director}:

I'm asking for your help in generating a complete inventory of all NIH training-related and science education programs. NIH has a number of training and education programs that operate outside the authority offered by the National Research Service Award (NRSA) Act of 1974. Unlike NRSA programs, where there is a statutory obligation to track recipients[1], many of the non-NRSA programs have no centralized data collection and therefore no reliable record of the individuals or even the number of individuals involved. In the absence of such information, it is difficult to identify programs that have been successful or to know how NIH training activities align with our understanding of attrition points for different gender, race and ethnic groups[2]. The Office of Extramural Research (OER) has taken steps to improve data collection by extending the NRSA-based *xTrain appointment system* to programs including institutional career development (K12/KL2) and research education grants (R25), but even for these programs, full information will not be available for several years.

In order to improve our understanding of these training and education programs, I'm asking you to identify one (or more) individual(s) in your IC, who is familiar with your intramural and/or extramural training programs and can complete a simple, well-tested, web-based, data collection limited to those programs that currently have no centralized data collection. Please note that the inventory specifically excludes NRSA programs, Intramural Research Training Awards (IRTA), diversity supplements, and individual career development (K) awards where the requested information is already available centrally. Programs (R25 and institutional career development K12/KL2) that were early adopters of *xTrain* also are excluded.

The inventory, however, should include most R25, D43, D71, K12, KL2, P20 and comparable grants and supplements. Some of these training- and education-like programs will be described in Funding Opportunity Announcements (FOAs) that appeared in the NIH Guide and others will have no FOA. Some programs may be funded through contracts or may operate under the auspices of your Intramural Program. Some programs will provide salaries or stipends to trainees and others will expose K-12 or undergraduate students and others to activities designed to convey the excitement of science. It will be

[1] NIH has maintained records on NRSA recipients and has generated a number of evaluation studies that can be found at http://grants.nih.gov/training/outcomes.htm#fundedgrants.

[2] Ginther, DK, Schaffer, WT, Schnell, J, Masimore, B, Liu, F, Haak, LL, and Kington, RS, *Diversity in Academic Biomedicine: An Evaluation of Education and Career Outcomes with Implications for Policy* (September 22, 2009). Available at SSRN: http://ssrn.com/abstract=1677993v

important to receive information on all such training, education, and career development programs that currently lack a central data collection.

The inventory is not limited to programs that target underrepresented groups or institutions. All training, education, and career development programs without a central data collection should be included.

This will be **one-time** data collection on programs as they existed in **FY 2010**. The inventory can be found at https://oepsps.od.nih.gov/inventory and has been pre-populated with many IC programs, but others will need to be added. We are aware that both GAO and OMB have conducted similar surveys this year and we have used the collected information to pre-populate as much of the data as possible. All entries will require IC input, and some entries may need to be deleted if they correspond to programs that have been reported centrally.

Please send the name(s) of the individual(s) who will coordinate your IC's response to Dr. Jennifer Pohlhaus by September 26, 2011. Each IC's full response is requested by October 24, 2011. We expect the web-based inventory to be easy to use, but if questions arise, Dr. Pohlhaus will be happy to help. If you have questions about the overall goals of this effort, please call Dr. Walter Schaffer.

SALLY J. ROCKEY, Ph.D.
Deputy Director for Extramural Research
National Institutes of Health

CC:

Francis Collins

Lawrence Tabak

Michael Gottesman

Sally Rockey

Kathy Hudson

James Anderson

Jennifer Pohlhaus

Walter Schaffer

Appendix 3: Inventory Instrument

The complete form that was used for the inventory is provided as a separate 21-page attachment, "Training Inventory Form." The form was created through InfoPath, and used logic and rules to hide or show sections or questions as a result of the answers to other questions (the "Rule Inspector" attachment contains 65 pages of rules that were applied within the document and is available upon request).

Appendix 4: Programs Collected by the Training Inventory Instrument

IC and Name of Program	Ann. Number	Activity Code
1. CC - ACGME Graduate Medical Education	N/A	Intramural
2. CC - Clinical Pharmacokinetics Research Fellowship	N/A	Intramural
3. CC - Residency in Oncology Pharmacy Practice	N/A	Intramural
4. CC - Clinical Research Training Program	N/A	Intramural
5. FIC - AIDS International Training and Research Program	PAR-10-219	D43
6. FIC - International Implementation_ Clinical_ Operational and Health Services Research Training Award fo	PAR-10-218	U2R
7. FIC - International Research Ethics Education And Curriculum Development Award (Bioethics)	PAR-10-174	R25
8. FIC - Fogarty International Clinical Research Scholars and Fellows Program (FICRS-F)	RFA-TW-07-001	R24
9. FIC - Global Infectious Disease Research Training Program (GID)	PAR-10-260 and PAR-10-260	D43
10. FIC - International Clinical Operational and Health Services Research and Training Award (ICOHRTA)	RFA-TW-06-002	D43
11. FIC - Informatics Training for Global Health (ITGH)	RFA-TW-09-001	D43
12. FIC - International Training and Research in Environmental and Occupational Health (ITREOH)	RFA-TW-06-004	D43
13. FIC - Global Research Training in Population Health (POP)	RFA-TW-05-002	D43
14. FIC - Fogarty International Collaborative Trauma and Injury Research Training Program (TRAUMA)	RFA-TW-09-002	D43
15. FIC - Millennium Promise Awards Non-communicable Chronic Diseases Research Training Program (NCoD)	PAR-08-175	D43
16. NCI - Cancer Education Grants Program	PAR-08-120	R25
17. NCI - NCI Cancer Education and Career Development Program	PAR-10-165	R25
18. NCI - Cancer Research Interns (CRI)	N/A	Intramural
19. NCI - CCR-JHU Master of Science in Biotechnology Concentration in Molecular Targets and Drug Discovery Te	N/A	Intramural
20. NCI - Paul Calabresi Career Development Award For Clinical Oncology	PAR-10-155	K12/KL2/KM1
21. NCI - Supplements to the National Cancer Center for High School and Undergraduate Student Research Experi	N/A	Supplement
22. NCI - Supplements to the National Cancer Institute (NCI) Cancer Education and Career Development Program	N/A -	Supplement
23. NCI - Supplements to the Paul Calabresi Career Development Award for Clinical Oncology	N/A -	Supplement
24. NCRR - Science Education Partnership Award (SEPA)	PAR-10-206	R25
25. NCRR - Research Centers in Minority Institutions Program	PAR-11-132	G12
26. NCRR - Clinical Research Education and Career Development (CRECD) in Minority Institutions	RFA-RR-07-005	R25
27. NCRR - IDeA Networks of Biomedical Research Excellence (INBRE)	PAR-08-150	P20
28. NCRR - Research Centers in Minority Institutions Infrastructure for Clinical and Translational Research	PAR-08-262	U54

IC and Name of Program	Ann. Number	Activity Code
29. NEI - The NEI Mentored Clinical Scientist Development Program Award	PAR-09-083	K12/KL2/KM1
30. NHLBI - Short-Term Research Education Program to Increase Diversity in Health-Related Research	RFA-HL-08-016	R25
31. NHLBI - NHLBI Minority Undergraduate Biomedical Education Program	RFA-HL-05-109	R25
32. NHLBI - Research Scientist Award for Minority Institutions	RFA-HL-02-012	R25
33. NHLBI - Programs to Increase Diversity Among Individuals Engaged in Health-Related Research (PRIDE)	RFA-HL-10-019	R25
34. NHLBI - Clinical Hematology Research Career Development Program	RFA HL-06-006	K12/KL2/KM1
35. NHLBI - Career Development Program in the Genetics and Genomics of Lung Diseases	RFA HL-07-004	K12/KL2/KM1
36. NHLBI - Global Health Initiative	BAA No. NHLBI-HV-09-12 and NHLBI-HV-09-13	Contract
37. NHLBI - Comprehensive Sickle Cell Centers	RFA-HL-06-008	U54
38. NHLBI - NHLBI Research Career Development Programs in Vascular Medicine	RFA-HL-05-002	K12/KL2/KM1
39. NHLBI - Summer Institute Program to Increase Diversity in Health-Related Research	RFA-HL-04-035	R25
40. NHLBI - Summer Institute for Training in Biostatistics II	RFA HL-09-009	T15
41. NIAID - NIAID Science Education Awards	PAR-08-003	R25
42. NIAID - Intramural NIAID Research Opportunities	N/A	Intramural
43. NICHD - Short Courses in Population Research	PA-06-507	R25
44. NICHD - Women's Reproductive Health Research (WRHR) Career Development Program	RFA-HD-09-026	K12/KL2/KM1
45. NICHD - Child Health Research Career Development Award (CHRCDA) program	RFA-HD-07-010	K12/KL2/KM1
46. NICHD - Male Reproductive Health Research (MRHR) Career Development Program	RFA-HD-05-040	K12/KL2/KM1
47. NICHD - NICHD Continuing Education Courses	N/A	T15
48. NIDA - Training in Computational Neuroscience From Biology to Model and Back Again	RFA-DA-06-010	T90/R90
49. NIDA - NIDA Research Education Grants in Drug Abuse and Addiction	PAR-04-054, PAR-06-550, PAR-07-221	R25
50. NIDA - Science Education Drug Abuse Partnership Award	PAR-99-076, PA-02-070, PAR-05-105, PAR-06-518, PAR-08-145, PAR-10-227	R25

IC and Name of Program	Ann. Number	Activity Code
51. NIDA - Diversity-promoting Institutions Drug Abuse Research Program (DIDARP) (R24)	PAR02-016, PAR05-069, PAR09-011, PAR-11-060	R24
52. NIDA - Training in Neuroimaging_ Integrating First Principles and Applications (T90)	RFA-DA-06-011	T90/R90
53. NIDA - Research Education Grants for Statistical Training in the Genetics of Addiction	PAR-08-081	R25
54. NIDA - Mentored Clinical Scientists Development Program Award	PAR-02-076	K12/KL2/KM1
55. NIDA - Mentoring Programs to Diversify the Mental Health and Substance Abuse HIV_AIDS Research Workforce t	PAR-07-386	R25
56. NIDCD - It's A Noisy Planet Protect Their Hearing	N/A	Contract
57. NIDCR - NIDCR Summer Dental Student Award	N/A	Intramural
58. NIDDK - NIDDK Short-term Education Program for Under-represented Persons (STEP-UP)	DK11-011	R25
59. NIDDK - NIDDK Education Program Grants	PAR-10-092	R25
60. NIDDK - Pacific Island-Alaska Native Summer Internship Program	N/A	Contract
61. NIEHS - Short-Term Educational Experiences in Research (STEER) in Environmental Health Sciences for Undergr	RFA-ES-06-009	R25
62. NIEHS - NIH_NIEHS Summer Internship Program	N/A	Intramural
63. NIEHS - NIEHS Administrative Supplements for Summer Research Experiences for Students and Science Teachers	N/A	Supplement
64. NIGMS - Short Courses in Integrative and Organ Systems Pharmacology	RFA-GM-08-010	R25
65. NIGMS - Initiative for Maximizing Student Development (IMSD)	PAR-09-104	R25
66. NIGMS - MBRS Research Initiative for Scientific Enhancement (RISE)	PAR-06-548 and PAR-10-004	R25
67. NIGMS - Bridges to the Baccalaureate Program	PAR-07-411	R25
68. NIGMS - Bridges to the Doctorate Program	PAR-07-410	R25
69. NIGMS - Postbaccalaureate Research Education Program (PREP)	PAR-07-432	R25
70. NIGMS - Native American Research Centers for Health (NARCH)	N/A	Contract
71. NIGMS - Research Centers in Trauma_ Burn_ and Peri-Operative Injury (P50)	PAR-09-048	P50
72. NIGMS - Short Courses on Mathematical_ Statistical_ and Computational Tools for Studying Biological Systems	PA-09-002	R25
73. NIGMS - Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Research Education Exp	RFA-MH-10-070	R25
74. NIMH - Silvio O. Conte Centers for Basic and Translational Mental Health Research	PAR-08-194	P50
75. NIMH - Programs of Excellence in Scientifically Validated Behavioral Treatment	RFA MH-08-080	R25
76. NIMH - Education Programs of Excellence in Scientifically Validated Behavioral Treatment	RFA-MH-09-110	R25
77. NIMH - MENTAL HEALTH RESEARCH EDUCATION GRANTS	PAR-02-087	R25

IC and Name of Program	Ann. Number	Activity Code
78. NIMH - NIMH Research Education Grants	PAR-08-079	R25
79. NIMH - Mentoring Programs to Diversify the Mental Health and Substance Abuse HIV_AIDS Research Workforce t	PAR-07-386	R25
80. NIMHD - NCMHD Minority Health and Health Disparities International Research Training	RFA-MD-08-006	T37
81. NINDS - NINDS Diversity Research Education Grants in Neuroscience	PAR-07-456	R25
82. NINDS - NINDS Research Education Programs for Residents and Fellows in Neurology Neurosurgery Neuropathol	RFA-NS-10-002	R25
83. NINDS - Senator Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers	RFA-NS-08-002	U54
84. NINDS - Summer Program in the Neurological Sciences	N/A	Intramural
85. NINDS - Graduate Partnership Program (GPP)	N/A	Intramural
86. NINDS - NIH-National Capital Consortium (NCC) Vascular Neurology Residency Program	N/A	Intramural
87. NINDS - NINDS-University of Virginia Neurosurgery Residency Program	N/A	Intramural
88. NLM - Environmental Health Information Partnership	N/A	Intramural
89. NLM - Sacred Root Native American Information Fellowship Program	N/A	Intramural
90. NLM - LHNCBC Medical Informatics Training Program	N/A	Intramural
91. NLM - NLM Associate Fellowship Program	N/A	Intramural
92. NLM - NLM_AAHSL Leadership Development Program	N/A	Intramural
93. NLM - Biomedical Informatics	N/A	Intramural
94. OD_OBSSR - Limited Competition Strengthening Behavioral and Social Science in Medical School Education	RFA-OD-10-014	R25
95. OD_OIR - Graduate Program Partnerships	N/A	Intramural
96. OD_OIR - Post-baccalaureate Intramural Research Training Award Program	N/A	Intramural
97. OD OIR - Post-doctoral Intramural Research Training Award Program	N/A	Intramural
98. OD_OIR - Student Intramural Research Training Award Program	N/A	Intramural
99. OD_OIR - Technical Intramural Research Training Award	N/A	Intramural
100. OD_OIR - Undergraduate Scholarship Program for Individuals from Disadvantaged Backgrounds	N/A	Intramural
101. OD_OIR - Community College Summer Enrichment Program	N/A	Intramural
102. OD_ORWH - Building Interdisciplinary Research Careers in Women's Health (BIRCWH)	RFA OD11-002	K12/KL2/KM1
103. OD_ORWH - Research Supplements to Promote Re-entry into Biomedical and Behavioral Research Careers	PA-08-191	Supplement

Appendix 5: Programs Collected by OER (using IMPACII, the ARRA enumeration study, and the Diversity Supplement instrument)

IC and Name of Program	Ann. Number	Activity Code
1. FIC - International Research Scientist Development Award (IRSDA)	PAR04-058, PAR07-014, PAR10-066	K01
2. FIC - International Research Ethics Education And Curriculum Development Award	TW04-001, TW06-003, TW08-002	R25
3. FIC - Phase II Comprehensive ICORHTA-Aids/Tb	PAR08-155, TW06-005	U2R
4. NCCAM - NCCAM International Postdoctoral Fellowship	PA03-050	F05
5. NCCAM - Predoctoral Research Training In Complementary And Alternative Medicine	PAR00-023	F31
6. NCCAM - Ruth L. Kirschstein National Research Service Awards For Individual Predoctoral Fellowship Training In Complementary And Alternative Medicine	PAR07-384	F31
7. NCCAM - Postdoctoral Research Training In Complementary And Alternative Medicine	PA01-088	F32
8. NCCAM - Ruth L. Kirschstein National Research Service Awards For Postdoctoral Training In Complementary And Alternative Medicine	PAR07-319	F32
9. NCCAM - Cam Practitioner Research Education Project Grant Partnership Competitive Renewal	PAR04-097, PAR08-095	R25
10. NCI - Multidisciplinary Fellowships In Cancer Nanotechnology Research	CA08-003	F32
11. NCI - NCI Mentored Research Scientist Development Award To Promote Diversity	PAR03-016, PAR06-220, PAR09-052	K01
12. NCI - The Howard Temin Award	PAR03-104	K01
13. NCI - Cancer Prevention, Control, Behavioral, And Population Sciences Career Development Award	PAR04-055, PAR06-381, PAR09-078	K07
14. NCI - NCI Mentored Clinical Scientist Research Career Development Award To Promote Diversity	PAR03-002, PAR06-221, PAR09-050	K08
15. NCI - Paul Calabresi Career Development Award For Clinical Oncology	PAR04-096, PAR06-449	K12
16. NCI - NCI Mentored Patient-Oriented Research Career Development Award To Promote Diversity	PAR03-006, PAR06-222, PAR09-051	K23
17. NCI - Pathway To Independence Award In Cancer Nanotechnology Research	CA09-015	K99
18. NCI - Recovery Act Limited Competition: Institutional Comparative Effectiveness Research Mentored Career Development Award	OD10-011	KM1
19. NCI - Cancer Nanotechnology Training Centers (CNTCS)	CA09-014	R25
20. NCI - Cancer Education Grants Program	PAR03-093, PAR05-065, PAR06-540	R25
21. NCI - National Cancer Institute (NCI) Cancer Education And Career Development Program	PAR03-148, PAR06-511	R25

IC and Name of Program	Ann. Number	Activity Code
22. NCRR - Institutional Clinical And Translational Science Award	RM06-002, RM07-002, RM07-007, RM-08-002, RM09-004	KL2
23. NCRR - NCRR Science Education Partnership Award (SEPA)	RR04-004, PAR05-068, PAR06-549, PAR06-080	R25
24. NCRR - Clinical Research Education And Career Development (CRECD) In Minority Institutions	RR06-003, RR07-005	R25
25. NCRR - Training Clinical Veterinarians In Nonhuman Primate Clinical Medicine	RR06-006	R25
26. NCRR - Institutional Clinical And Translational Science Award	RM06-002, RM07-002, RM07-007, RM08-002, RM09-004	TL1
27. NEI - NEI Institutional Clinical Scientist Development Program	PAR03-068	K12
28. NHGRI - K 23 With Emphasis On Therapeutic Interventions Employing Genomic Or Proteomic Technologies	HG05-013	K23
29. NHGRI - Initiative To Maximize Research Education In Genomics	PAR09-245	R25
30. NHGRI - National Research Service Awards Institutional Training Grants In Genomic Analysis	PA99-028	T32
31. NHGRI - Training In Genomics And Hemoglobinopathies	HG05-002	T90/R90
32. NHLBI - NHLBI Ruth L. Kirschstein National Research Service Awards For Individual Predoctoral MD/PhD Fellows	PA08-021 and PA09-232	F30
33. NHLBI - Mentored Career Development Award To Promote Faculty Diversity/Re-Entry In Biomedical Research	HL05-015, HL08-015, HL10-012	K01
34. NHLBI - Mentored Career Award For Faculty At Minority Serving Institutions	HL05-016, HL10-011	K01
35. NHLBI - Cultural Competence And Health Disparities Academic Award	HL04-012	K07
36. NHLBI - Pediatric Transfusion Medicine Academic Career Awards	HL07-001	K07
37. NHLBI - Notice Of Limited Competition Request For Competing Applications: NHLBI HBCU Research Scientist Award	HL04-118	R25
38. NHLBI - Short-Term Research Education Program To Increase Diversity In Health-Related Research	HL05-018, HL07-013, HL10-013	R25
39. NHLBI - Computational Modeling For Heart, Lung, Blood, And Sleep Biologists: Introductory Courses	HL07-002	T15
40. NHLBI - Minority Institutional Research Training Program	HL08-017, HL10-014	T32
41. NIA - Promoting Careers In Aging And Health Disparities Research	PAR08-033	K01
42. NIA - Unknown	Unknown	K07

IC and Name of Program	Ann. Number	Activity Code
43. NIA - Paul B. Beeson Clinical Scientist Development Award In Aging	AF06-005, AG07-001, AG08-006, AG09-012, AG10-010	K08
44. NIA - Summer Research Training In Aging For Medical Students	AG10-007	T35
45. NIAMS - Mentored Clinical Investigator Career Development Awards In Muscle Disease Research	PA05-051	K08
46. NIBIB - NIBIB Interfaces Initiative For Interdisciplinary Graduate Research Training	EB08-003	T32
47. NICHD - Career Development Awards: Child Abuse And Neglect Research	PA99-133	K01
48. NICHD - Child Health Research Career Development Award	HD05-027, HD06-011	K12
49. NICHD - Rehabilitation Research Career Development Programs	HD05-112, HD06-010	K12
50. NICHD - Women's Reproductive Health Research (WRHR) Career Development Program	HD08-014	K12
51. NICHD - Pediatric Critical Care Scientist Development Program (PCCSDP)	HD08-022	K12
52. NICHD - Unknown	Unknown	K12
53. NICHD - Mentor Award: Phase II	HD05-115, HD06-103	T32
54. NICHD - NICHD Institutional Predoctoral Training Program In Reproductive, Perinatal And Pediatric Epidemiology	PAR05-130	T32
55. NICHD - Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Predoctoral Training Program In Systems Biology Of Developmental Biology & Birth Defects	PAR08-054	T32
56. NICHD - NICHD'S Institutional Predoctoral And Postdoctoral Training Program In Reproductive, Obstetric, Perinatal And Pediatric Epidemiology And Pharmacoepidemiology	PAR08-271	T32
57. NIDA - Unknown	Unknown	K02
58. NIDA - NIDA Mentored Clinical Scientists Development Program Award In Drug Abuse And Addiction	PAR07-346	K12
59. NIDA - NIDA Research Education Grants In Drug Abuse And Addiction	PAR04-054, PAR06-550, PAR07-221	R25
60. NIDA - Training In Translational Research In Neurobiology Of Disease	DA06-008	T32
61. NIDA - Training In Computational Neuroscience: From Biology To Model And Back Again	DA06-010	T90/R90
62. NIDA - Training In Neuroimaging: Integrating First Principles And Applications	DA06-011	T90/R90
63. NIDCD - Special Topic Education Course: Exploring Auditory And Vestibular Biology	DC08-003	R25
64. NIDCR - NIDCR Individual Predoctoral Dental Scientist Fellowship	PAR05-034	F30
65. NIDCR - NIDCR Individual NRSA Predoctoral Dental Scientist Fellowship	PAR08-119	F30
66. NIDCR - NIDCR Dentist Scientist Pathway To Independence Award	PAR09-256	K99
67. NIDCR - Oral Health Research Education Grants	PAR-06-160, PAR06-506	R25
68. NIDCR - NIDCR Kirschstein-NRSA Institutional Clinical Research Training Award	DE05-008	T32
69. NIDCR - Ruth L. Kirschstein National Research Service Award (NRSA) Instiutional Dental Research Training Progam	PAR05-101	T32

IC and Name of Program	Ann. Number	Activity Code
70. NIDCR - Dental School Joint DDS Or DMD/Masters Degree NRSA Research Training Program	PAR07-332	T32
71. NIDDK - NIDDK Mentored Research Scientist Development Award	PAR02-065, PAR06-066	K01
72. NIDDK - NIDDK Mentored Clinical Scientist Award To Promote Diversity In Health-Related Research	DK06-015	K08
73. NIDDK - Mentored Clinical Scientist Research Career Development Award	PAR09-085	K08
74. NIDDK - Multidisciplinary K12 Urologic Research (Kure) Career Development Program	DK07-006	K12
75. NIDDK - Niddk Short-Term Education Program For Under-Represented Persons (Step-Up)	DK06-008	R25
76. NIDDK - Short-Term Training For Medical Students	PAR04-090	T35
77. NIEHS - Institutional Patient-Oriented Career Development Programs In The Environmental Health Sciences	ES06-005	K12
78. NIEHS - Human Genes And The Environment Research Training Program	ES07-002	T32
79. NIEHS - NRSA Institutional Training Grants In Environmental Health Sciences	PAR00-038	T32
80. NIGMS - NIH Predoctoral Fellowship Awards For Students With Disabilities	PA00-068	F31
81. NIGMS - Ruth L. Kirschstein National Research Service Awards For Individual Predoctoral Fellows Inpharmd/Phd Programs	PA09-029	F31
82. NIGMS - Ruth L Kirschstein NRSA Program For NIGMS Marc Predoctoral Fellowships	PAR03-114	F31
83. NIGMS - Strengthening Behavioral And Social Science In Medical School	OD05-001	K07
84. NIGMS - Mentored Clinical Scientist Development Award In Anesthesiology, Clinical	PAR98-084	K08
85. NIGMS - Institutional Research And Academic Career Development Award	PAR02-152, PAR06-470	K12
86. NIGMS - Bridges To The Baccalaureate Program For Underrepresented Students	PAR02-084,PAR07-039,PAR07-411	R25
87. NIGMS - Initiative For Maximizing Student Diversity (Imsd)	PAR05-132, PAR06-553	R25
88. NIGMS - MBRS Research Initiative For Scientific Enhancement (Rise)	PAR06-548, PAR05-127	R25
89. NIGMS - Bridges To The Doctorate For Underrepresented Students	PAR07-040	R25
90. NIGMS - Chemistry-Biology Interface Predoctoral Training	PA92-063	T32
91. NIGMS - Predoctoral Research Training In Biostatistics	PAR04-132	T32
92. NIGMS - Predoctoral Training At The Interface Of The Behavioral And Biomedical Sciences	PAR06-503	T32
93. NIGMS - Predoctoral Training In Bioinformatics And Computational Biology	PAR99-146	T32
94. NIGMS - MARC Undergraduate Student Training In Academic Research (U-Star) Program	PAR02-033	T34
95. NIGMS - MARC Undergraduate Student Training In Academic Research, Institutional National Research Service Award (NRSA) Research Training Grant	PAR07-337	T34
96. NIGMS - Unknown	Unknown	T34
97. NIMH - Scientist Development Award For New Minority Faculty	PAR99-169	K01

IC and Name of Program	Ann. Number	Activity Code
98. NIMH - Paul B. Beeson Patient-Oriented Research Career Development Award In Aging	AG06-005, AG07-001, AG08-006, AG09-012, AG10-011, AG10-011	K23
99. NIMH - NIMH Research Education Grants	PAR-05-153, PAR06-494	R25
100. NIMH - NIMH Career Opportunities In Research Education And Training (Cor) Honors Undergraduate Research Training Grant	PAR01-008	T34
101. NIMH - National Institute Of Mental Health (NIMH) Career Opportunities In Research (Cor) Honors Undergraduate Research Training Grant	PAR08-093	T34
102. NINDS - International Neuroscience Fellowship	PAR06-227	F05
103. NINDS - NINDS Medical Student Dual Degree Md/Phd Or Md/Mph Fellowships	PA01-100	F30
104. NINDS - Career Development Award To Promote Diversity In Neuroscience Research	PAR02-106, PAR05-071, PAR09-065	K01
105. NINDS - NINDS Mentored Research And Clinical Scientist Development Awards In Translational Research	PAR05-160	K01
106. NINDS - NINDS/NIMH Mentored Research Career Development Award In Aids Reserach	PA03-086	K08
107. NINDS - Neurological Sciences Academic Development Award (Nsada)	PAR03-103	K12
108. NINDS - Neurological Sciences Academic Development Award (Nsada)	PAR08-197	K12
109. NINDS - Biobehavioral Methods To Improve Outcomes Research	PA05-142	K23
110. NINDS - NINDS Research Education Programs For Residents And Fellows In Neurology And Neurosurgery	NS09-001	R25
111. NINR - Ruth L. Kirschstein National Research Service Award (NRSA) For Individual Predoctoral Fellows In Nursing Research	PAR05-091	F31
112. NINR - Ruth L. Kirschstein National Research Service Award (NRSA) For Individual Predoctoral Fellows In Nursing Research	PAR09-227	F31
113. NINR - NINR Mentored Research Scientist Development Award For Underrepresented Or Disadvantaged Investigators	PAR05-134, PAR09-074	K01
114. NINR - NINR Mentored Research Scientist Development Award For Underrepresented Or Disadvantaged Investigators	PAR07-003, PAR09-072	K01
115. NLM - Institutional Grants For Research Training In Biomedical Informatics	LM06-001	T15
116. Trans NIH - Ruth L. Kirschstein National Research Service Awards For Individual Predoctoral Md/Phd And Other Dual Doctoral Degree Fellows	PA-05-151, PA-09-207, PA-10-107, PA-99-089	F30
117. Trans NIH - Ruth L. Kirschstein National Research Service Awards For Individual Predoctoral Fellowships To Promote Diversity In Health-Related Research	PA-00-069, PA=06-481, PA-07-106, PA-09-209, PA-10-109	F31
118. Trans NIH - Ruth L. Kirschstein National Research Service Awards For Individual Predoctoral Fellows	PA-04-032, PA-09-208, PA-07-002, PA-10-108	F31

IC and Name of Program	Ann. Number	Activity Code
119. Trans NIH - Ruth L. Kirschstein National Research Service Awards (NRSA) For Individual Postdoctoral Fellows	PA-00-104, PA-03-067, PA-06-373, PA-07-107, PA-09-210, PA-10-110	F32
120. Trans NIH - Ruth L. Kirschstein National Research Service Awards (NRSA) For Individual Senior Fellows	PA09-211	F33
121. Trans NIH - Mentored Research Scientist Development Award	PA-00-019, PA-06-001, PA-09-040, PA-10-056	K01
122. Trans NIH - Independent Scientist Award	PA00-020, PA-06-527, PA-09-038, PA-10-057	K02
123. Trans NIH - Academic Career Award	PA-00-070, PA-08-152, PA-09-041	K07
124. Trans NIH - Mentored Clinical Scientist Research Career Development Award	PA-00-003, PA-06-512, PA-09-042, PA-10-059	K08
125. Trans NIH - Mentored Patient-Oriented Research Career Development Award	PA-00-004, PA-05-143, PA-09-043, PA-10-060	K23
126. Trans NIH - Midcareer Investigator Award In Patient-Oriented Research	PA-00-005, PA-04-107, PA-08-151, PA-09-037, PA-10-061, PA-98-053	K24
127. Trans NIH - Mentored Quantitative Research Development Award	PA-02-127, PA-06-087, PA-09-039, PA-10-062	K25
128. Trans NIH - NIH Pathway To Independence Award	PA-06-133, PA-07-297, PA-09-036, PA-10-063	K99
129. Trans NIH - Recovery Act Limited Competition: Supporting New Faculty Recruitment to Enhance Research Resources through Biomedical Research Core Centers	RFA-OD-09-005	P30
130. Trans NIH - Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Research Training Grants	PA-02-109, PA-06-468, PA-08-226, PA-10-036	T32

IC and Name of Program	Ann. Number	Activity Code
131. Trans NIH - Jointly Sponsored Ruth L. Kirschstein National Research Service Award Institutional Predoctoral Training Program In The Neurosciences	PAR02-017, PAR05-055, PAR08-101	T32
132. Trans NIH - Ruth L. Kirschstein National Research Service Award Short-Term Institutional Research Training Grants	PA-05-117, PA-08-227	T35
133. Trans NIH - Interdisciplinary Research Consortium	RM06-008	TL1
134. Trans NIH - Research Supplements to Promote Diversity in Health-Related Research	PA-08-190 and PA-05-015	Supplement
135. Unknown - Unknown	Unknown	F30
136. Unknown - Unknown	Unknown	F31
137. Unknown - Unknown	Unknown	F32
138. Unknown - Unknown	Unknown	K01
139. Unknown - Unknown	Unknown	K08
140. Unknown - Unknown	Unknown	K23
141. Unknown - Unknown	Unknown	K99
142. Unknown - Unknown	Unknown	R25
143. Unknown - Unknown	Unknown	T15
144. Unknown - Unknown	Unknown	T32
145. Unknown – Unknown	Unknown	T35
146. Unknown – Unknown	Unknown	K24

Appendix 6: Analysis of Educational Programs

This section includes an analysis of all the programs that supported in-person educational experiences, or electronic/distant educational experiences with interactive components.

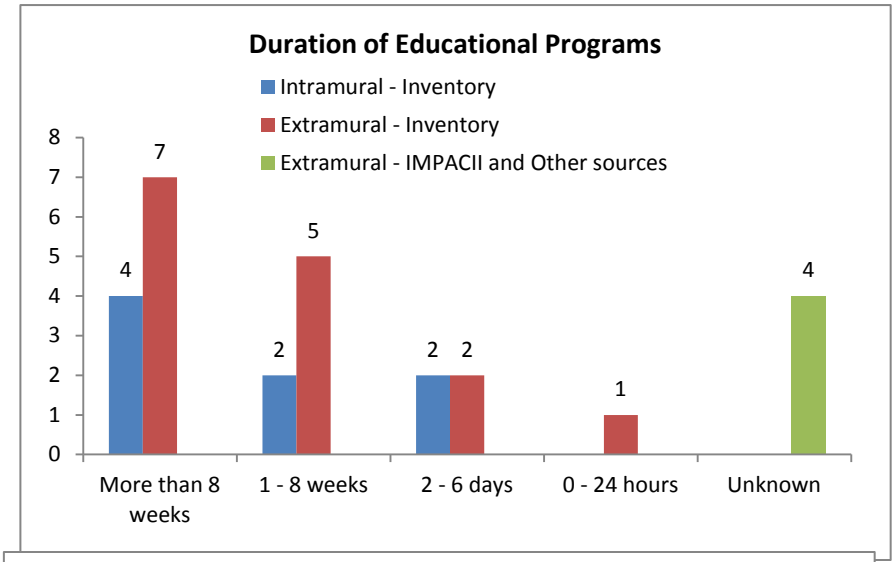
Scope of Support

Of the programs in this report, 27 (11%) were classified as educational. The estimated funding, and estimated numbers of awards and participants for these programs was determined (table below).

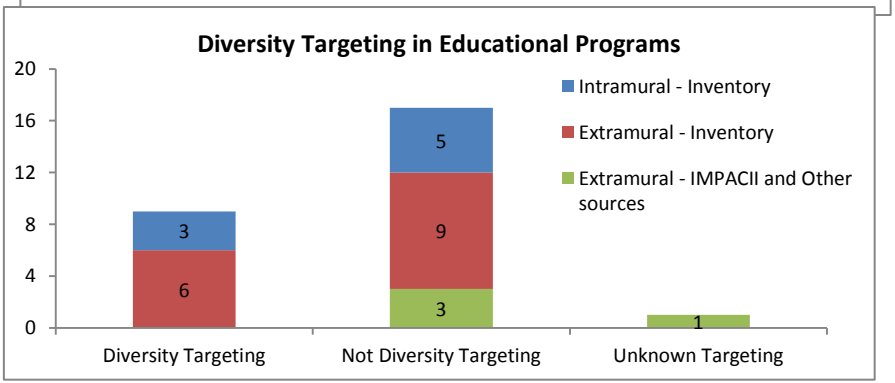
	Programs		Estimated Funding		Estimated Awards		Estimated Participants	
	N	%	$	%	N	%	N	%
All sources	**27**	**100%**	**$86,473,325**	**100%**	**125**	**100%**	**79,722**	**100%**
Intramural	8	30%	$1,320,095	2%	N/app	-	93	0%
IC-specific programs (Inventory)	8	30%	$1,320,095	2%	N/app	-	93	0%
Extramural	19	70%	$85,153,230	98%	125	100%	79,629	100%
Institutional awards (Inventory)	14	52%	$58,242,189	67%	N/avail	-	78,935	99%
Contract (Inventory)	1	4%	$500,000	1%	N/avail	-	633	1%
Institutional awards (IMPACII)	4	15%	$26,411,041	31%	125	100%	61	0%

Duration

Of the 27 educational programs, 41% supported an experience of more than 8 weeks, 26% supported 1-8 weeks, 15% supported 2-6 days, and only 4% supported durations of less than one day. There were four programs (15%) with unknown duration; these programs were the ones reported through centralized data sources such as IMPACII, where this variable is not catalogued.



Diversity Targeting



Within the educational programs, 9 (33%) were diversity targeting, 17 (63%) were not diversity targeting, and 1 (4%) had unknown diversity targeting.

Activity Codes

As was the case for the overall programs, the most used activity code for research training was R25 research education (16 programs). There were only 11 other programs, distributed between contract, institutional training (T and T90/R90), and intramural mechanisms. Only two of the educational programs were of an electronic type (one contract and one R25); all the remaining educational programs had an in-person component.

The contract program had 633 participants, the two institutional training programs had 463 participants, the research education programs had a total of 78, 533 participants, and the intramural programs had 93 participants.

Stipend or Salary Support

The total subset of educational programs that were reported through the training inventory (23) were examined as to whether they provided a stipend or salary to participants. We found a total of seven programs (30%) that provided stipends or salaries.

Citizenship

We quantified whether participant eligibility was restricted to US citizens (or US permanent residents and nationals) for the subset of 23 educational programs reported through the inventory, and we determined that about half of the programs (12) had open eligibility that wasn't restricted (four intramural programs, seven research education programs, and one T15 training program).

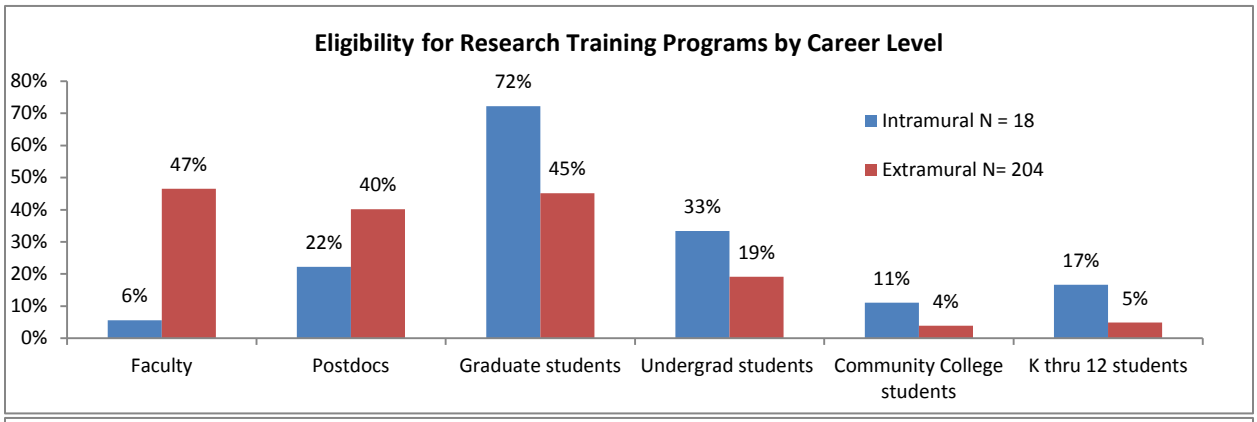
Appendix 7: Analysis of all Training and Educational Programs (Combined)

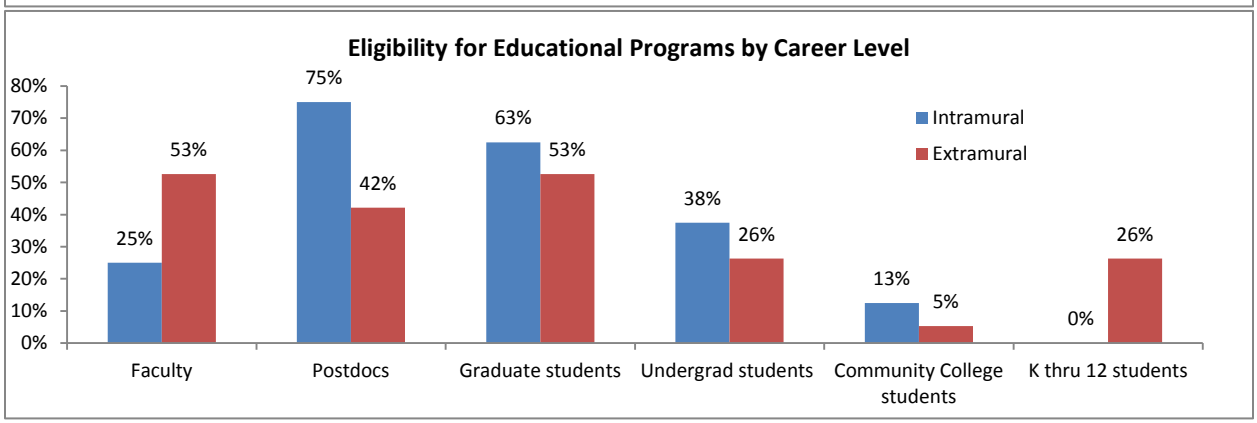
Eligibility by Career Level

Each program was classified by the career levels of the participants eligible for the program. Overall, faculty, postdocs, and graduate students were eligible for the most programs.

- Faculty were eligible for 108 programs (43%)
- Postdocs were eligible for 100 programs (40%)
- Graduate students were eligible for 120 programs (48%)
- Undergrad students were eligible for 53 programs (21%)
- Community college students were eligible for 12 programs (5%)
- K thru 12 students were eligible for 18 programs (7%)

The graphs show the distribution of program eligibility for intramural and extramural programs. Compared to research training and training-like programs, the eligibility for educational programs was spread over a greater distribution of career levels, and less concentrated at advanced levels.

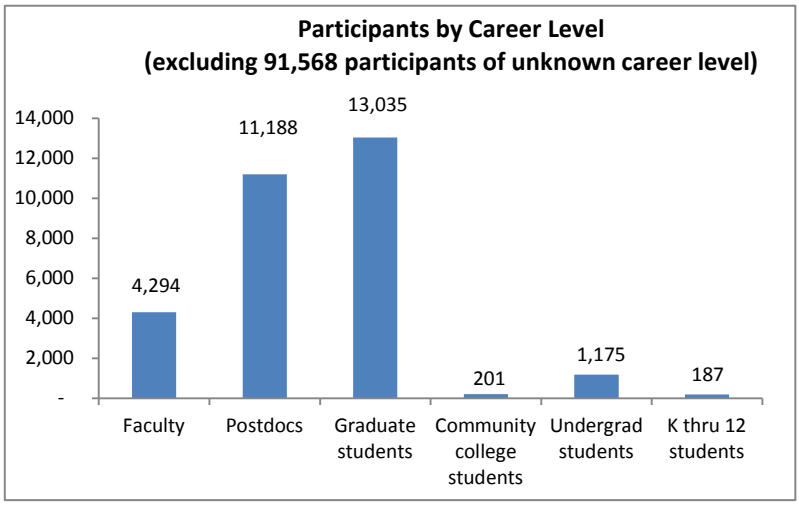




Participants by Career Level

We were able to determine the number of participants at each career level for only some of the programs. Specifically, of the estimated 121,648 participants in this report, 75% (91,568) had an

unknown career level. Of the remaining 25% participants at known career levels, 14% were faculty, 37% were postdocs, 43% were graduate students, less than 1% were community college students, 4% were undergraduate students, and 1% were K thru 12 students. For the purposes of this report, individuals known to be at the postbaccalaureate career level were considered in the same category as graduate students.



Finding: The majority of NIH's training support is directed to individuals at the graduate student and postdoctoral levels.

Types of Institutions

For the extramural programs, we examined the total number of institutions supported and the number of institutions in each of the following categories:

- Historically Black Colleges and Universities (HBCUs)
- Tribally Controlled Colleges and Universities (TCCUs)
- Hispanic Serving Institutions (HSIs)
- Minority or Minority-Serving Institutions (MSIs)

The inventory data was self-reported as to whether the supported institutions fit into the four categories. For the data from centralized sources, DIS staff classified each supported institution as belonging to one of the first three categories or not. Classification was based on government definitions of HBCUs, TCCUs, and HSIs.

Almost all (221) of the 223 extramural programs supported at least one institution. There were a total of 10,612 institutions supported, but less than 5% of the institutions had any of the designations listed above.

	Programs		Institutions					
	Total Extramural	**Total reporting support to at least one institution**	**Total**	**HBCU**	**TCCU**	**HSI**	**MSI**	**All Other**
Extramural - Inventory	77	76	2,869	58	16	90	76	2,629
Extramural - IMPACII and Other sources	146	145	7,743	65	2	146	N/app	7,530

Total	**223**	**221**	**10,612**	**123**	**18**	**236**	**76**	**10,159**
				1.2%	**0.2%**	**2.2%**	**0.7%**	**95.7%**

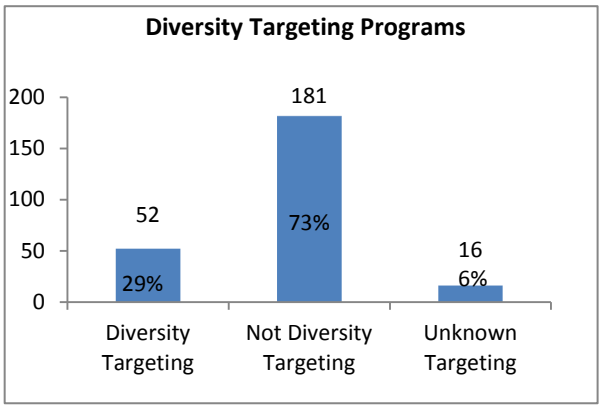
Note that the total number of HBCU, TCCU, HSI, and MSI institutions may be overrepresented in this table, because they will be counted more than once if they are supported by more than one program. For example, because the data is not linked between programs, if Program A reports that they supported Institution A and Institution B, and Program B reports supporting Institution B and Institution C, the overall total will show that each program supported two institutions, for a total of 4 institutions.

Finding: Less than five percent of the training and educational grantee institutions funded by NIH were classified as HBCUs, TCCUs, HSIs, or MSIs.

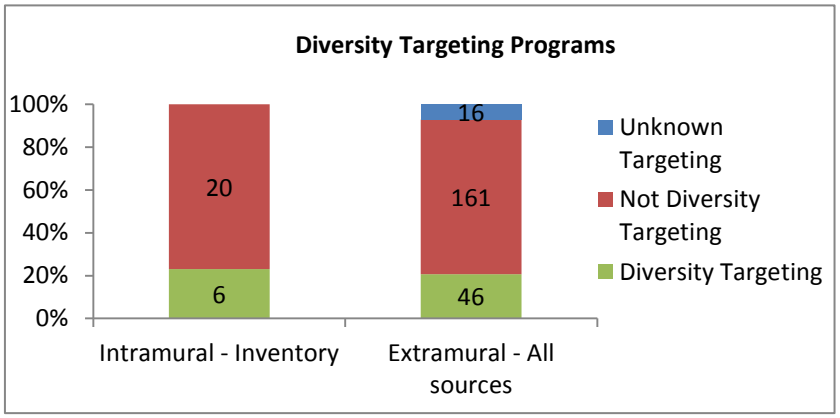
Diversity-Targeting

Because many training programs have as one of their goals to increase the diversity of the biomedical workforce, we quantified the number of programs whose primary purpose was to increase at least one of the following:

(1) Diversity
(2) The presence of racial and ethnic minorities, persons with disabilities, or persons from disadvantaged backgrounds in the program
(3) The participation of "minority" or "minority-serving" institutions"



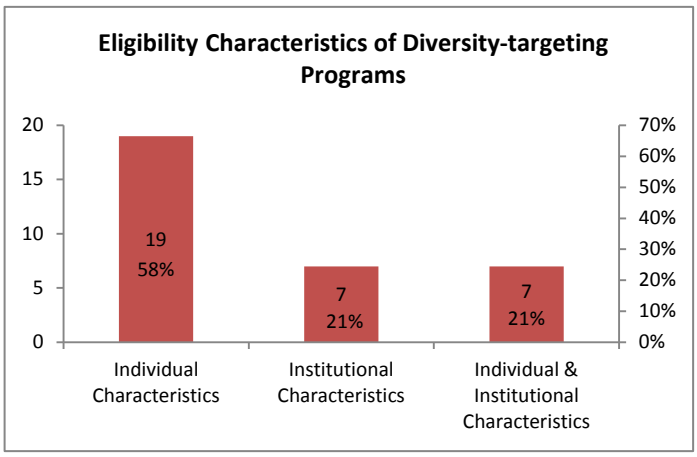
Overall, we found that 52 (29%) programs were diversity-targeted, 181 (73%) programs were not diversity-targeted, and 16 (6%) programs were unknown targeting because the FOA number and title were unknown (as described below). The distribution for intramural programs versus extramural programs reported in the inventory versus in IMPACII and other sources is shown in the graph.



In the inventory, ICs were asked to specify the type of eligibility characteristics for their diversity targeting programs:

- individual characteristics (such as membership in a minority group, disabled status, disadvantaged status, or women),

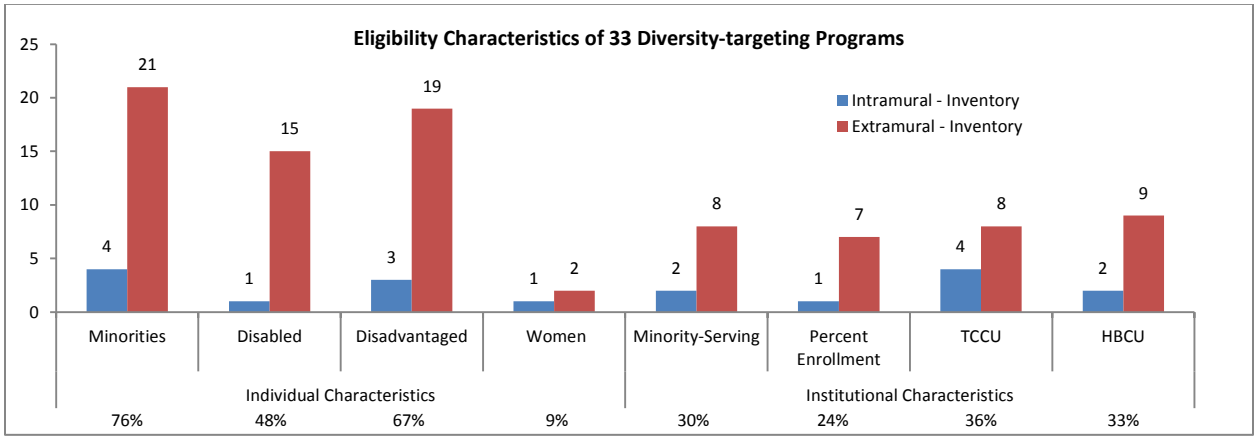
- institutional characteristics (such as minority-serving institutions, a percentage enrollment of minorities in the institutions, TCCU status, or HBCU status), or
- both individual and institutional characteristics.



This component was not determined for the extramural programs stored in IMPACII and other centralized sources because it was not available in the database and we did not examine each funding opportunity in detail. For the 33 diversity targeted programs reported in the inventory (6 intramural, and 27 extramural), we found that the majority of programs (19; 58%) determined their eligibility criteria by individual diversity characteristics, and an equal number (7; 21%) used institutional characteristics and a combination of individual and institutional characteristics.

The percentage of inventory-reported diversity-targeted programs that used various individual and institutional characteristics to define eligibility characteristics are shown in the graph below (see the percentages underneath each column group). Note that the characteristics are not mutually exclusive, and one program often had more than one diversity eligibility characteristic.

Finding: Almost one-third of NIH training programs were diversity-targeted. Individual diversity characteristics were more commonly used than institutional diversity characteristics to define the population of interest.

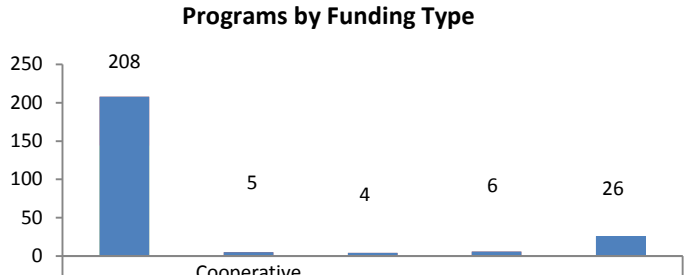


The following three programs indicated that the diversity-targeting eligibility was being a woman.

- NCRR Science Education Partnership Award (PAR-10-206)
- Intramural NIAID Research Opportunities
- It's a Noisy Planet – Protect their Hearing (NIDCD contract)

Funding Types and Activity Codes

Most of the programs we catalogued were grants (84%), followed by intramural programs (10%), with a minimal number of cooperative agreements, contracts, and supplements (2% each).



	Grant	Cooperative Agreement	Contract	Supplement	Intramural
Intramural - Inventory	0	0	0	0	26
Extramural - Inventory	64	4	4	5	0
Extramural - IMPACII and Other sources	144	1	0	1	0
Total	208	5	4	6	26

Finding: Intramural programs account for slightly more than 10% of the training programs.

Appendix 8: Metrics of Completeness, Accuracy, and Exhaustiveness

For this section, we considered the sum total of programs, whether they were classified as research training or educational.

Completeness: Inclusion of program participant data in IMPACII

Between both of our data sources (the inventory and centralized data sources under the purview of IMPACII), we collected data on 249 programs.

- **Intramural.** There were 26 intramural programs that were collected through the inventory; 19 of these were IC-specific programs, and 7 were trans-NIH programs (Undergraduate Scholarship Program for Individuals from Disadvantaged Backgrounds, Student IRTA, Postbaccalaureate IRTA, Graduate Program Partnerships, Community College Summer Enrichment Program, Technical IRTA, and Postdoctoral IRTA).
- **Extramural.** There were 223 extramural programs that were collected through the inventory, IMPACII, and other sources (P30 ARRA enumeration study report and Diversity supplement report).

Type	Data Source	Description	Programs N	Programs %	IMPACII Purview
Intramural and extramural from all sources			**249**	**100%**	
Intramural	All sources: Inventory		26	10%	
		Trans-NIH programs (i.e., IRTA)	7	3%	
		IC-specific programs	19	8%	
Extramural	All sources: Inventory, IMPACII, Other Sources		223	90%	Yes
	Inventory	All programs	77	31%	Yes
		Institutional awards	61	24%	Yes
		Contract	4	2%	Yes
		Supplement	5	2%	Yes
		Other (G12, P20, P50, U54)	7	3%	Yes
	IMPACII	All programs	144	58%	Yes
		Institutional awards	75	30%	Yes
		Individual F and K awards	69	28%	Yes
	Other sources	All programs	2	0.8%	Yes
		P30 ARRA enumeration study	1	0.4%	Yes
		Supplement (Diversity report)	1	0.4%	Yes

In total, only 144 of the total programs were catalogued in NIH's central database, IMPACII (corresponding to 58% of all the programs, or 65% of extramural programs that fall within the purview of inclusion in IMPACII). When institutional programs were considered alone, the percentage of programs catalogued in IMPACII dropped to 49%.

Finding: IMPACII data does not give a complete picture of the scope of NIH research training and training-like programs, especially the institutional programs.

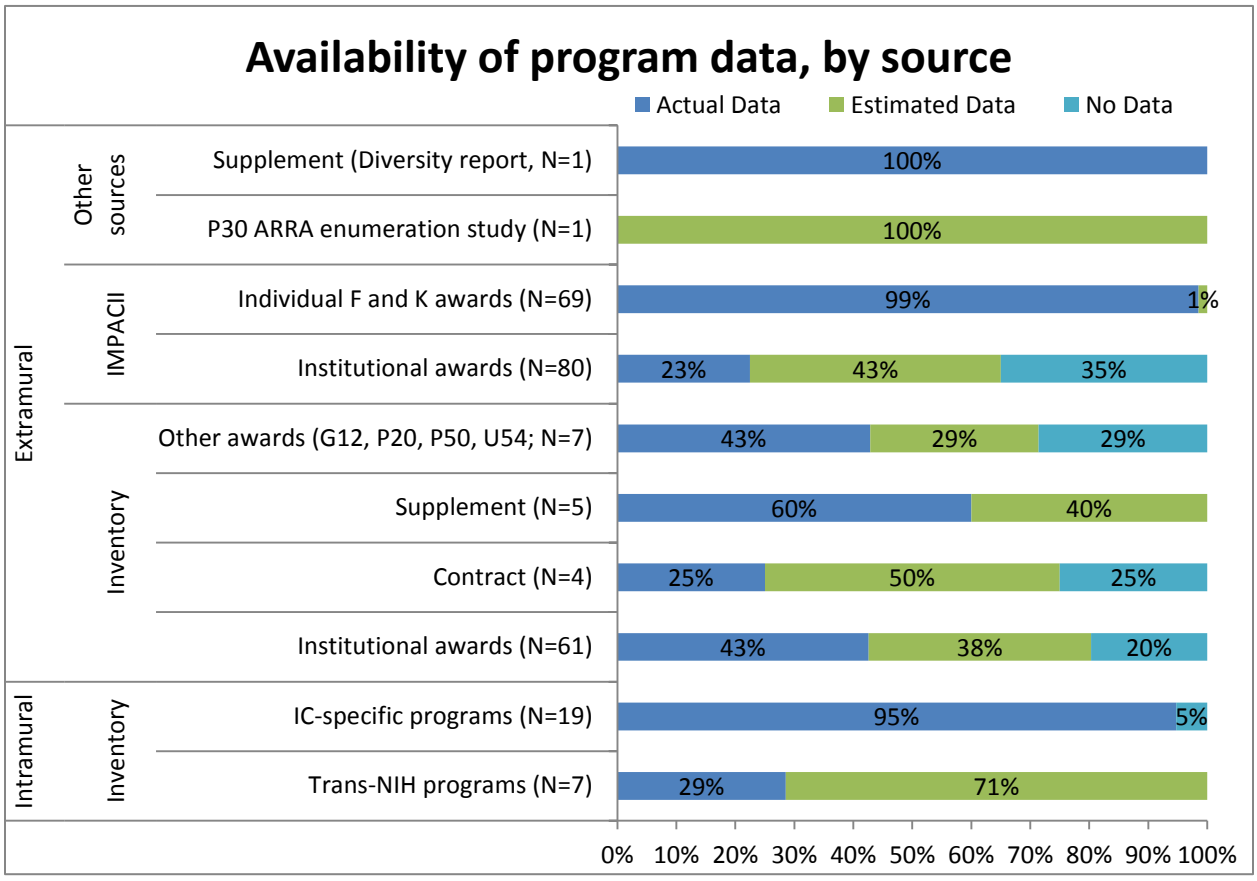
Accuracy

As we investigated the data from IMPACII, we found 1,530 records in which the FOA numbers were missing from the grant record in IMPACII. The details of these how these inaccuracies may have evolved are further described in Appendix 8.

Of the programs that we analyzed, we found incomplete reporting of the number of participants, with only 140 (56%) of all programs reporting actual data, 70 (28%) reporting estimated data, and 38 (15%) reporting no data on the number of participants.

	Actual participant data		Estimated participant data		No participant data	
Programs	**N**	%	**N**	%	**N**	%
Overall	**140**	**55%**	**70**	**28%**	**39**	**15%**
Intramural	20	77%	5	19%	1	4%
Extramural	120	53%	65	29%	38	17%

Therefore, any participant data in this report reflects a maximum of 84% of the programs (210 of 249). The distribution between actual, estimated, and no data for each type of program is shown below. Programs from IMPACII that were classified as having estimated data received that classification because the program itself was in IMPACII, but only a fraction of the grantee institutions for that program provided data on the number of participants for that program.



Finding: NIH has the actual number of participants for only 55% of its training and educational programs.

Furthermore, of those programs that reported either actual or estimated data on the total number of participants, most of the programs were unable to report the career level of the participants (more details are described below).

To properly evaluate long term success of training programs, as to whether the supported individuals remain in the biomedical research workforce, it would be necessary to have identifying information about each individual supported. For all the IMPACII programs, we assumed that individualized information was available (and also that demographic variables were available for the individuals) if we had actual or estimated data on the number of participants. For the programs reported via the inventory or through other sources (enumeration study and Diversity Supplement report), we determined whether individualized information was available, and if so, whether the individualized information included demographic variables.

			Programs with individualized information			Programs with individualized information including demographic variables			
Programs			N	% of total	Participants	N	% of total	% of programs w individualized information	Participants
Intramural and Extramural from all sources			**155**	**62%**	**28,632**	**148**	**55%**	**95%**	**27,503**
Intramural	All sources: Inventory		10	38%	1,190	4	15%	40%	69
		Trans-NIH programs	2	29%	845	0	0%	0%	0
		IC-specific programs	8	42%	345	4	21%	50%	69
Extramural	All sources: Inventory, IMPACII, Other Sources		145	65%	27,442	144	60%	99%	27,434
	Inventory	All programs	23	30%	2,127	22	14%	96%	2,119
		Institutional awards	19	31%	1,960	18	13%	95%	1,952
		Contract	1	25%	12	1	25%	100%	12
		Supplement	3	60%	155	3	40%	100%	155
		Other awards (G12, P20, P50, U54)	0	0%	0	0	0%	0%	0
	IMPACII	All programs	121	84%	24,132	121	84%	100%	24,132
		Institutional	52	69%	17,001	52	69%	100%	17,001
		Individual F and K	69	100%	7,131	69	100%	100%	7,131
	Other sources	All programs	1	50%	1,183	1	50%	100%	1,183
		P30 ARRA enumeration	0	0%	0	0	0%	0%	0
		Div Supp report	1	100%	1,183	1	100%	100%	1,183

In almost all cases (95% of the time), when individualized data was collected, demographic variables were included in the data collection (overall, demographic variables were available on 27,503 of the 28,632 known individual participants).

Finding: NIH has demographic data on approximately 28,000 participants in training and educational programs. Participant data from many programs remains elusive, which may hinder the ability to evaluate the outcomes and effectiveness of those programs.

Of the intramural programs, data was collected at the individualized level for only 10 of the 26 total programs (38%), corresponding to 1,190 individuals supported. None of the trans-NIH intramural programs had demographic variables in their individualized information, but 50% of the IC-specific intramural programs that collected data individually had demographic variables as part of the data collection.

Of the extramural programs, data was collected at the individualized level for 65% of programs; however, programs reported in the inventory were less likely to have individual data than programs reported in IMPACII and through other centralized sources. Individual F and K awards reported in IMPACII always had individualized data because the awards are made directly to individuals. Institutional awards reported in the inventory had individualized data only 31% of the time while institutional awards reported in IMPACII had individualized data 69% of the time. Supplements had individualized data in three of the five programs reported via the inventory, and the one program (Diversity Supplement) reported centrally. One of the four contracts had individualized data, and none of the less-used activity codes including G12, P20, P50, and U54, and the one P30 ARRA program reported in the enumeration study had individualized data.

Findings: There was a marked difference between availability of individualized data in the intramural and extramural programs.

> ***Approximately 1/3 of the intramural programs had individualized data.***
>
> ***Approximately 2/3 of the extramural programs had individualized data.***
>
> > ***Extramural programs reported in the inventory were less likely to have individual data than extramural programs reported in centralized sources.***

Exhaustiveness of Data Collected

It is difficult to quantify whether this report showcases an exhaustive list of training programs. As one measure of exhaustiveness, we examined the issuing IC for each of the programs. The 26 intramural programs were distributed among seven ICs and OIR, while the 74 extramural programs were

distributed among 15 ICs, plus OBSSR, and ORWH. Finally, the 115 extramural programs found in centralized data sources (including IMPACII) were distributed among every IC except CC, NIAAA, NIAID, and NIMHD.

Finding: This report likely does not cover all the training programs supported by NIH.

Appendix 9: Selected Training and Educational Programs that do not Support Participants

IC and Program Name	Ann. Number	Activity Code
1. NCCAM - CAM Practitioner Research Education Project Grant Partnership Competitive Renewal	PAR-08-095	R25
2. NHLBI - Support of Competitive Research (SCORE) Pilot Project Award	PAR-06-492 and PAR-08-027	SC2
3. NHLBI - Support of Competitive Research (SCORE) Research Advancement Award	PAR-06-491 and PAR-08-026	SC1
4. NHLBI – Coordination Core for Programs to Increase Diversity Among Individuals Engaged in Health-Related Research (PRIDE)	RFA-HL-10-028	R25
5. NIA - Aging Research Dissertation Awards to Increase Diversity	PAR-08-250	R36
6. NIBIB - Team-based Design in Biomedical Engineering	PAR-10-140	R25
7. NIDCD - Inner Ear Biology Course at Woods Hole	RFA 008 003	R25
8. NIDDK – NIDDK Education Program Grants	PAR-06-554	R25
9. NIDCR - Oral Health Research Education Grants	PAR-06-506	R25
10. NIEHS - Hazardous Materials Worker Health and Safety Training	RFA-ES-09-004	U45
11. NIEHS - Hazmat Training at DOE Nuclear Weapons Complex	RFA-ES-09-003	U45
12. NIGMS - Support of Competitive Research (SCORE) Pilot Project Award	PAR-08-027	SC2
13. NIGMS - Support of Competitive Research (SCORE) Research Advancement Award	PAR-06-491 and PAR-08-026	SC1
14. NIGMS - Support of Competitive Research (SCORE) Research Continuance Award	PAR-08-028	SC2
15. NIMH - NIMH Minority Infrastructure Support Program	PAR-01-029	R24
16. NIMH - Seeding National Mentoring Networks to Enhance Diversity of the Mental Health Research Workforce	RFA-MH-10-050	U24
17. OD_OBSSR - Institute on Systems Science Research	N/A	Contract
18. OD_OBSSR - National Coalition for Health Professional Education in Genetics (NCHPEG) - Genetics for Social and	N/A	Contract
19. OD_OBSSR - Randomized Clinical Trials	N/A	Contract
20. OD_OBSSR - Summer Institute on Social Work Research	N/A	Contract
21. OD_OBSSR - Web-based Learning Opportunities - Behavioral and Social Science Research Interactive Textbook and E	N/A	Contract

Appendix 10: Programs Reported through the Inventory and the DIS Report

Program	DIS report: Total grants	DIS report: Total grants reporting	DIS report: Total institutions supported	Inventory: Total institutions reported	Which one used?
PAR-08-120	16	0	15	43	Inventory
PAR-09-083	4	3	4	7	inventory
RFA-HL-08-016	10	0	10	35	inventory
RFA-HL-05-109	1	0	1	1	Inventory
RFA-HL-10-019	6	0	5	6	Inventory
RFA-OD-09-005	Only provided by NHLBI even though a trans-NIH program				DIS
RFA-HL-06-006	6	1	6	6	Inventory
RFA-HL-07-004	8	0	8	8	Inventory
RFA-HL-09-009	8	0	7	8	Inventory
PAR-08-003	8	0	4	4	Inventory
PA-06-507	4	0	4	7	Inventory
RFA-HD-09-026	7	1	7	7	Inventory
RFA-OD-09-006 RFA-OD-06-004	13 15	10 11	13 15	29 (ORWH)	Included ORWH entry from inventory (not NICHD)
RFA-HD-07-010	9	2	9	8	Inventory
RFA-HD-05-040	2	1	2	2	Inventory
PAR-08-081	3	0	3	3	Inventory
PAR-02-076	1	0	1	1	Inventory
PAR-07-386	5	1	5	5	Inventory
RFA-ES-06-009	11	0	11	11	Inventory
RFA-GM-08-010	4	0	4	1	Inventory
PAR-07-411	29	9	24	143	Inventory
PAR-07-410	8	6	8	25	Inventory
PAR-07-432	18	7	18	26	Inventory
PA-09-002	4	0	3	5	Inventory
RFA-MH-10-070	5	4	5	19	Inventory
RFA-MH-08-080	10	0	10	7	Inventory
RFA-MH-09-110	1	0	1	1	Inventory
PAR-02-087	2	1	2	2	Inventory
PAR-08-079	13	3	12	12	Inventory
PAR-07-456	5	0	3	4	Inventory
RFA-NS-10-002	6	0	6	16	Inventory