

SUBTASK 11

NSF/SRS POSTDOC DATA PROJECT WORKSHOP

FINAL REPORT

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NSF/SRS POSTDOC DATA PROJECT WORKSHOP
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SRI International, 1100 Wilson Blvd, Suite 2800, Rosslyn, VA

EXECUTIVE SUMMARY

To better understand how experiences in graduate school are related to postdoctoral (postdoc) appointments and, thence, to educational and labor force outcomes, the National Science Foundation (NSF)/Division of Science Resources Statistics (SRS) is engaged in a multi-year Postdoc Data Project to determine the feasibility of gathering more in-depth data on postdocs in the United States. Postdoc appointments affect all sectors of employment – academe; industry, including both nonprofit and for-profit groups; and government.

NSF/SRS is following a systematic plan to determine the types of postdoc data that are needed; the data that are available from existing sources; the gaps in the current data; the impact of those gaps; and the best methods for filling the gaps. This workshop constituted one activity in a series of activities being planned to address these issues. An earlier workshop focused on postdoc policies and practices, and additional workshops are being considered for the future. SRS is also continuing to collect information on how researchers use existing data on postdocs, and work is underway to develop design options for a postdoc data collection effort.

Immediate goals of the Postdoc Data Project are to determine the need for and the feasibility of gathering a broad range of information, including various types of demographic information and data related to the following:

- decisions to take, complete, or leave a postdoc position
- duration of postdoc positions and influencing factors
- federal government and general sources of support (including benefits) and their impact on duration of postdoc positions and migration between institutions
- factors affecting continued participation in a postdoc position, including quality of life issues such as health care access and impact on immediate family
- determinates of a successful postdoc position; career and educational aspirations and expectations
- interactions with researchers across all sectors; advisor relationships
- factors affecting the overall experience

On December 17, 2004, representatives from a range of organizations and institutions with interests in postdoc training and funding convened in a workshop to discuss what data are currently available on postdocs, what data are being used, and what

data are lacking. Three facilitators guided the discussions, using outlines developed by NSF/SRS.

Participants included current and former postdocs, representatives from funding organizations and academic institutions that support postdocs, and researchers who use postdoc data. The workshop participants were tasked with identifying data needs and ways to gather the desired data. They were asked to consider the personal and professional aspects of postdoc appointments and the role of foreign-degreed postdocs in the U.S. research effort. The discussion revolved around the following topics:

Definition of a “postdoc.” Workshop participants recognized that the first step is to define the term “postdoc,” which may have different meanings depending on the institution/organization where the postdoc is training.

Foreign-degreed postdocs. Comprehensive information on foreign-degreed postdocs training in the United States is especially scarce. Because foreign-degreed postdocs comprise a substantial percentage of the postdoc population in this country, workshop participants agreed that gathering data on these individuals is critical. At the very least, participants would like to see data on the numbers of foreign-degreed postdocs, where they are training, and their plans following the postdoc.

Definition of a successful postdoc. Workshop participants were concerned that individuals enter postdoc positions expecting that they will eventually obtain tenure-track faculty positions, yet that outcome is becoming increasingly less likely. Participants suggested that there should be an attempt to broaden the definition of success for a postdoc beyond obtaining a faculty position in academe.

Value of postdoc training. The workshop group was interested in knowing to what extent the postdoc experience prepares individuals for careers outside academe. Participants emphasized that too little is known about the careers of former postdocs. The group felt strongly that there should be a syllabus outlining the key competencies to be acquired during a postdoc and that mechanisms should be established to monitor whether the goals of the syllabus are being met.

Perceptions of postdoc plight. The prevailing notion is that postdocs provide an inexpensive means for conducting research, but perhaps at the expense of the postdocs as individuals. Workshop participants would like to know the conditions under which postdocs must operate: Are they allowed opportunities to conduct their own research? Do they receive benefits? What are their stipend levels? What is the effect of the experience on the postdoc’s family life?

Length of postdoc. A common perception is that postdocs are staying in their positions longer because suitable jobs are not available. Workshop participants suggested that data on the number of junior faculty openings could inform this issue. They would also like data, by discipline, on the average length of time spent in a postdoc and the ideal length of a postdoc.

Pipeline issues. Workshop participants discussed whether too many Ph.D.s are being produced. Data on the number of junior faculty openings and the number of individuals in the Ph.D. pipeline could shed light on this issue. Some participants were concerned about women and minorities dropping out along the path from graduate school to faculty positions and wondered what role the postdoc experience might play in the decision to drop out of the pipeline.

Faculty-postdoc ratio. The general consensus of workshop participants was that the ratio of postdocs to faculty is increasing. This raised several questions: What is the effect of having more postdocs training together? How many postdocs can a principal investigator be expected to mentor? Is the increasing ratio of postdocs to faculty a result of the changing nature of research or the result of a glut of Ph.D.s?

Other areas of interest. Workshop participants also expressed interest in learning about these aspects of the postdoc experience:

- Does the source and type of funding affect the postdoc experience and promote a future career?
- Do postdocs have better outcomes at institutions that have postdoc offices, postdoc policies, and/or good guidelines for postdocs?
- Does loss of benefits while on a postdoc affect career decisions?
- From a funding agency standpoint, how can the postdoc experience be enriched?
- How has the postdoc experience changed over time?

Sources for data collection. Workshop participants were asked to identify potential mechanisms for collecting data on postdocs. The group noted a major drawback of collecting data solely from graduate schools: their focus is on graduate students, not on postdocs. Some participants said that there is no standard way for keeping track of postdocs at universities and that it is particularly difficult to get information on postdocs who train at labs within a university setting. Although the vast majority of postdocs work in academe, participants also expressed interest in gathering information on postdocs who do their training in government, industry, and nonprofit organizations. Several methods for tracking postdocs were suggested, including establishing a national registry, conducting entry and exit surveys, and using immigration data to identify foreign-degreed postdocs. Funding agencies and postdoc offices could be approached to help with such data gathering efforts.

Data priorities. Workshop participants agreed that existing data about the postdoc experience are insufficient. Near the end of the workshop, participants were asked to prioritize their individual data needs, resulting in this list:

- accurate numbers of postdocs by discipline
- information on foreign-degreed postdocs, especially the number staying in the United States after the postdoc appointment has ended
- information on postdocs working outside academe

- effect of the length of the postdoc appointment on career outcomes
- effect of the type of postdoc support on career outcomes
- effect of having a postdoc office and/or guidelines for postdocs at a university
- benefits of a postdoc appointment, especially to those postdocs who ultimately work outside academe
- aspects of the postdoc experience that may discourage pursuit of an academic career

Next steps. On evaluation forms completed at the end of this workshop, participants were asked to suggest next steps for the Postdoc Data Project and to identify additional topics they would like to have addressed. Topics included family issues as they relate to the postdoc experience and career outcomes after the postdoc. More specifically, participants suggested that career paths of individuals who take a postdoc be compared with the career paths of those who do not take a postdoc. Suggested next steps included the following:

- prioritize the issues
- develop a draft survey
- gather new data on the postdoc experience
- convene more workshops
- consider ways to involve the funding agencies

INTRODUCTION

To better understand how experiences in graduate school are related to postdoctoral (postdoc) appointments and, thence, to educational and labor force outcomes, the National Science Foundation (NSF)/Division of Science Resources Statistics (SRS) is engaged in a multi-year Postdoc Data Project to determine the feasibility of gathering more in-depth data on postdocs in the United States. Postdoc appointments affect all sectors of employment – academe; industry, including both non-profit and for-profit groups; and government.

Currently, available information allows estimation of how many persons earning a doctoral degree in science or engineering from a U.S. institution plan to take a postdoc and in what sector. However, it does not allow an understanding of how the individual's decision to take a postdoc in a particular sector relates to future career outcomes. Most importantly, current information does not cover individuals who earn doctorates from foreign institutions and then take postdocs in the United States.

Overall Goals

Overall goals of the Postdoc Data Project include providing ongoing critical information for the following:

- the wide variety of definitions of postdoc positions
- estimates of the number of individuals in these positions by field and sector, and of non-citizens in postdoc positions

- interdisciplinary work in postdoc positions
- persistence in postdoc positions
- relationships between mechanisms of support and outcomes in work
- transitions from education to work
- ultimate career outcomes
- important dynamics in the supply, conditions, productivity, and ultimate impact of this population on the scientific and technological enterprise

Immediate Goals

Immediate goals of the Postdoc Data Project are to determine the need for and the feasibility of gathering a broad range of information, including various types of demographic information and data related to the following:

- decisions to take, complete, or leave a postdoc position
- duration of postdoc positions and influencing factors
- federal government and general sources of support (including benefits) and their impact on duration of postdoc positions and migration between institutions
- factors affecting continued participation in a postdoc position, including quality of life issues such as health care access and impact on immediate family
- determinates of a successful postdoc position; career and educational aspirations and expectations
- interactions with researchers across all sectors; advisor relationships
- factors affecting the overall experience

To address these goals, representatives from a range of organizations and institutions involved in postdoc funding and training convened at a workshop, supported by NSF/SRS, to discuss what data are available, what data are needed, and what major issues surround the postdoc experience (see Appendix A for workshop agenda).

The workshop took place December 17, 2004 at SRI International in Arlington, Virginia. SRI and NSF staff organized the workshop, and SRI prepared this report of the proceedings. Workshop participants included current and former postdocs, representatives from the academic community and funding organizations, and researchers who use existing data on postdocs (see Appendix B for list of attendees).

WORKSHOP STRUCTURE

In preparation for this workshop, the organizers compiled a group of publications on the subject of what information on postdocs is available and what is lacking (see Appendix C for list of articles), and provided these documents to workshop participants in advance of the workshop. NSF/SRS requested that participants complete a “use of sources with postdoc data” table that listed several existing data sources on postdocs (see Appendix D). They were asked to indicate how much they had used these data sources

and what information they felt the data sources lacked. SRI summarized the information from the completed tables. The participants received the summary (included in Appendix D) at the workshop, and the workshop facilitators used the summary to guide discussions.

Three individuals facilitated the workshop: Linda Allen-Benton served as the primary facilitator, David Carroll as the co-facilitator, and Rocco Russo as the facilitator of one breakout group. Allen-Benton and Carroll moderated the other two breakout sessions. Carroll and Russo, representing APPRISE Incorporated, are working on another NSF/SRS-funded project at SRI to consider design options for the Postdoc Data Project. The three facilitators met with SRS and SRI staff a few days before the workshop to discuss how the workshop would be conducted.

The workshop began with a slide show presented by Lydia Snover, Assistant to the Provost for Institutional Research at the Massachusetts Institute of Technology (MIT). Her presentation highlighted the role of the postdoc in a research university, with the primary focus on MIT. She profiled the postdocs at MIT, noting that 28% are female compared to only 16% of MIT's faculty. Dr. Snover expressed interest in getting data that explain the attrition of women. She also noted that comparative data (by institution) on the relationship of postdoc placement to the ultimate success of Ph.D.s would help institutions decide whether they should play more of a role in placing new Ph.D.s.

Dr. Snover's presentation set the tone for the group's initial discussion of postdoc data needs. Following the discussion, workshop participants divided into two breakout groups. One breakout group focused on the topic of foreign-degreed postdocs, and the other breakout group discussed the personal and professional aspects of the postdoc experience. SRS staff convened as a separate group to discuss their reactions to the morning plenary session, including whether the right questions were being asked and the right topics were being addressed.

In the afternoon, a spokesperson from each of the three breakout groups presented a summary to the entire group, which was followed by a discussion period. The group then focused on how and from whom data could be gathered. To conclude the afternoon session, the participants were asked to prioritize their data needs, with each participant identifying her/his top priorities.

WORKSHOP RESULTS

Overview

Over the course of the day, the workshop facilitators led the participants in discussions about the need for and the feasibility of gathering a broad range of information on postdocs. Defining "postdoc" was cited as an essential first step in the process. Another discussion topic, and the subject of one of the breakout sessions, was foreign-degreed postdocs or, more specifically, individuals who earn a doctorate in a foreign country and then obtain a postdoc appointment in the United States. While participants recognized that foreign-degreed postdocs comprise a large proportion of the U.S. postdoc pool, they noted how very little is known about the actual number of

foreign-degreed postdocs, their role in the U.S. research effort, and their career paths upon completion of their postdoc appointments.

A second breakout group met to discuss the personal and professional aspects of the postdoc experience. During this session and the workshop discussions overall, participants noted that many Ph.D.s, especially in certain fields, view the postdoc as a necessary step along the road to a successful career. With that in mind, participants discussed the meaning of success after a postdoc. If the only “true success” is obtaining a tenure-track faculty position, many postdocs will end up disappointed. Participants voiced concern that postdocs receive little information on career paths outside academe and questioned whether postdocs are receiving the kind of training that will allow them to pursue an independent career, whether in academe or not.

Participants also focused on the need to confirm or dispel the widely held notion that postdocs are “exploited,” as well as the idea that people take a postdoc or continue on one because suitable jobs are not available. The group noted that gathering data on the average length of a postdoc (by discipline) and determining the ideal length of a postdoc would help shed light on the question of job scarcity. An underlying question related to these issues is whether too many Ph.D.s are being produced. Participants expressed a need for data on the number of junior faculty positions available compared to the size of the doctoral pool.

Workshop participants also raised the following questions:

- What role does the postdoc experience play in women and minorities dropping out of the pipeline between graduate school and a faculty position?
- What is the role of the mentor and/or the institution in preparing postdocs for the future?
- How do graduate students form their perceptions about the postdoc experience?
- How satisfied are postdocs with their experiences?
- What role does the type of postdoc funding play in career outcomes?
- Given the belief that the ratio of postdocs to faculty is increasing, what is the effect of having more postdocs training together? How many postdocs can one principal investigator (PI) be expected to mentor?

In addition to identifying data needs, workshop participants also discussed how these needs could be met. Graduate school offices were not considered to be the best source of information on postdocs because postdocs are not their primary concern. Several options for gathering data were offered. A voluntary national registry was one suggestion; alternatively, a registry could be created by having funding agencies require PIs to report information on their postdocs. Entry and exit surveys were suggested as a way to collect information on foreign-degreed postdocs. Other suggestions for gathering data on postdocs included working through postdoc associations, supplementing the

Survey of Doctorate Recipients (SDR)¹ with a survey of a sample of foreign doctorates, and using NSF's Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS)² as a model but collecting aggregate data on postdocs from a source other than graduate schools.

These topics are further discussed below.

Specific Topics

Definition of a "postdoc"

To gather data about postdocs, workshop participants agreed that it is first necessary to define "postdoc." One project goal addressed by workshop participants was the need to determine the different definitions of a postdoc used by institutions. At some universities, there is no question about who is or who is not a postdoc. At other schools, however, there are postdoc-like positions that are not called postdocs. Different labels for the same type of position pose a problem for data collection activities.

The SDR, which asks respondents first about their current job and then whether the current job is a postdoc, defines postdoc as "a temporary position awarded in academia, industry, or government primarily for gaining additional education and training in research." Some workshop participants argued that the term postdoc should not be so narrowly defined, but should also include transitional, early career-development positions.

Foreign-degreed postdocs

For the purpose of this report, the foreign-degreed postdoc is defined as an individual who received a doctorate outside the United States but who holds a postdoc appointment in the United States and is typically on a temporary visa. The workshop participants agreed that there are many questions about foreign-degreed postdocs that require answers, such as:

- How many are there?
- Where are they taking the postdoc?
- Can they be enumerated on most campuses?
- How long do they stay in a postdoc?
- Do they leave the United States upon completion of the postdoc?

These questions cannot be answered by existing SRS surveys. The GSS provides the number of postdocs in U.S. universities who are foreign citizens but not how many received their doctorates in foreign countries. Although the SDR collects data on

¹ The SDR, a biennial sample survey of U.S.-degreed Ph.D.s in science and engineering fields, collects employment data (including postdoc appointments).

² The GSS collects annually from graduate schools the number of graduate students enrolled and the number of postdocs in science, engineering, and health-related fields by department/program.

postdocs in the U.S. workforce, it only includes those who received doctorates in the United States.

Participants addressed two developments that may well result in a decrease of international students and postdocs in the United States in the near future: (1) the tightening of visa restrictions, affecting the ability of foreign citizens to study in the United States, and (2) the improvement of educational systems (and, thus, educational opportunities) in many foreign countries, leading to less demand for study/training in the United States. Participants noted that China, in particular, has advanced tremendously the quality of its education system over the last ten years, with the result that many faculty and staff at Chinese institutions are now educated in China. With this in mind, workshop participants agreed on the need to know what the foreign-degreed postdoc pool really is and how it is changing.

Another development that may change the composition of the U.S. workforce is the increase in the number of jobs requiring a security clearance. Workshop participants felt it important to understand what impact the ineligibility of foreign-degreed persons for these positions will have on the workforce, especially if foreign Ph.D.s are better prepared than U.S. Ph.D.s, as some people believe.

The workshop group posed a key question: What exactly is the role of the foreign-degreed postdoc in providing a trained U.S. workforce for the future? Some foreign-degreed postdocs stay on and enter the U.S. workforce after completing their appointments, whereas others go back to their native countries and influence the higher education system there. Although it will be difficult to gather data on foreign-degreed postdocs, the group agreed that, at a bare minimum, information on stay rates is needed, even if it is not possible to follow up these individuals.

The breakout group on foreign-degreed postdocs identified several areas for investigation, in addition to the key questions of how many postdocs have foreign degrees and how many plan to stay in the United States after completing the postdoc appointment:

1. What is the impact of having a large number of foreign-degreed postdocs in the United States?
 - Do they depress postdoc salaries?
 - Do they limit the availability of slots for U.S. graduates?
 - Do they depress the number of positions available for women and minorities?
2. Why are there more foreign-degreed postdocs than in earlier years?
 - Are they better prepared (either from the education they received in a foreign country or the education they received in the United States)?
 - Are they filling a void (are there postdoc positions that cannot be filled by U.S. Ph.D.s)?
 - Do they come with their own money so they have no effect on other positions or the cost of doing research in this country?

3. Are foreign-degreed postdocs being “exploited” and how can this be measured?
 - Do foreign-degreed postdocs feel indentured because their visa status depends on the continuation of their postdoc?
 - Are postdoc salaries in general a form of exploitation, and do foreign-degreed postdocs contribute to this exploitation?

The group also briefly discussed the opposite scenario – the number of U.S.-degreed individuals who go overseas to train. Information is lacking in this area as well. Because of the globalization of science and engineering, it is suspected that the number of such individuals, although still small, is increasing. The SDR sampling frame includes all U.S. doctorates who are U.S. citizens but if they are abroad on the survey reference date, they are considered out of scope and are excluded from data collection.

Although the workshop participants took note of the issue of U.S. doctorates going overseas for postdocs, the consensus was that the focus should be on gathering information about those with foreign degrees who are training in the United States.

Definition of a successful postdoc

Workshop participants indicated that the traditional definition of success for a postdoc has been the acquisition of a tenure-track faculty position. Yet this is becoming less and less likely a career outcome for postdocs. Participants noted that, in most disciplines, many former postdocs go on to have careers outside academe. Hence, there is a disconnect between what postdocs are told by their PIs or mentors and the reality of the job market.

The workshop group voiced concern with respect to how perceptions of the postdoc experience are formed. What are the major contributors to these perceptions? What are the quality of life issues? If the postdoc experience is to be improved as a development activity, it is important to know how graduate students form their perceptions.

The group recognized a problem with what people see as a successful career. A postdoc often feels like a failure if s/he does not get an academic job, perhaps influenced by a PI/mentor who thinks his/her job is the best. Postdocs do not receive exposure to other career paths, so they can become stuck in postdoc positions. Furthermore, there is a disincentive for learning something new or something more because that puts the postdoc behind on producing papers.

Workshop participants felt that full disclosure of information is needed early in students’ careers so they can decide whether they really want to go down the road of being a graduate student and then a postdoc. The group focused on several questions that could shed light on this topic:

- What information is given to students about career opportunities in the field? Is there access to information about nonacademic careers?
- Why are people taking postdocs, and are their expectations being met?

- Should there be an attempt to widen the definition of success, and who should form the definition (agencies, institutions, others)?

Some participants thought it crucial to look at the career outcomes of postdocs beyond tenure-track faculty positions. Perhaps salary or patents could be used as part of a fuller measure of success.

Value of postdoc training

The workshop group pondered whether the correct training is taking place at institutions. What is the quality of the training? Currently there is no way to assess whether value is being added for the person in the postdoc position. Participants noted that once an individual becomes a postdoc (and is no longer paying tuition or attending classes) the institution may only think about what the postdoc is doing in the lab. Participants expressed concern that an individual may enter a postdoc position with only a vague idea of what s/he is supposed to do and may be totally dependent on the PI/mentor to give directions and outline requirements. There is often no system in place to monitor what the PI/mentor is doing for the postdoc. In contrast, medical students know the specific year-by-year requirements for their internships.

One participant – a current postdoc – provided some first-hand knowledge. In his field, a postdoc position is required for anyone wanting to pursue a faculty position. For his first postdoc, he chose a PI he knew and with whom he felt comfortable, and he then received a slot on that person's training grant. But no one asked him what his goals were, except in the vaguest sense. He was told to stay in the lab as much as possible and write as much as possible because those were the keys to getting a faculty position. Now on his second postdoc, he realizes he could have been much more assertive in asking for guidance during the first postdoc.

This participant went on to say that expectations need to be clearly defined. He felt that potential postdocs must face the fact that there is only a 10% chance of becoming a faculty member. He also felt that, at some point, most postdocs are going to realize that they are not going to get a tenure-track faculty position and will then have to figure out what else to do. He concluded that clear expectations on both sides will eliminate a lot of ill feelings.

Given these observations, other participants asked whether institutional guidelines for postdoc mentoring exist, and if so, whether they are being followed. Also, are institutions providing access to information regarding nonacademic careers? The group felt strongly that there should be (1) a syllabus or curriculum outlining the key competencies to be acquired during a postdoc, and (2) mechanisms in place to monitor whether the goals of the syllabus are being met. Participants felt it important to look at how well the postdocs are being trained to pursue an independent career, including outside the academic setting.

Perceptions of postdoc plight

It has been a prevailing sentiment for many years that hiring postdocs is an inexpensive way to get research done but that this practice takes advantage of those hired. Workshop participants asked where the perception of postdoc “exploitation” comes from, and whether it can be quantified if it is really true. One participant offered opposing views of the same requirement to work on a PI’s research project: one postdoc may see the requirement as indentured servitude, whereas another postdoc may consider it a tremendous opportunity.

The group gave several suggestions for getting at the perceived plight of the postdoc. Because the purpose of a postdoc experience is to develop independence, one could ask postdocs whether there is time to work on their own research projects. The foreign-degreed postdocs could be asked whether they feel indentured when their visa status depends on the continuation of their appointment. An examination of postdoc salaries and benefits (or lack thereof) could also shed light on the issue.

Length of postdoc

For decades, researchers and academicians have wondered if the reason individuals stay in postdoc positions so long is that jobs are not available. Gathering information on the average length of postdocs and determining the ideal length of a postdoc were discussed at the workshop. Participants said that determining the ideal length of an appointment should come from the intersection of data gathered from postdocs and data gathered from expert faculty or expert scientists. Because the postdoc situation varies by field, the data must be field-specific. In computer sciences, for example, there appears to be no need for training beyond the Ph.D., whereas the traditional view in biological sciences, in the words of one participant, is “the more training the better.”

In gathering information on the ideal length of a postdoc, the group felt it is imperative to be mindful of the source. For example, a researcher who is asked how long a postdoc should take is likely to answer based on how long s/he was stuck in a postdoc or how much s/he needs postdocs to get a job done. Participants mentioned that some people may view postdocs as a cheap form of labor that allows researchers to continue their work, which implies that it is a system dominated by market forces rather than a real need for additional training. In the day when postdocs were less common, faculty members learned techniques as they conducted their research; there was no need to work in somebody else’s lab to do it.

Participants summarized the data needs in this area as follows:

- number of postdocs and demographics
- ideal length (what is considered adequate training) of a postdoc based on input from both faculty and postdocs (by field)
- actual length of postdocs (by field)
- qualitative data about people who stay in postdocs for a long time (5+ years)

- effect of having independent support on the length of time spent on a postdoc

Once this information is gathered, it could be used to compare the actual length of postdocs to the length that is considered to be ideal and to correlate the length of postdocs with future career paths.

Pipeline issues

One question heard during the workshop was, “Are we overproducing Ph.D.s in the United States?” If people are staying in postdocs longer, is it because there are no jobs available? The group expressed a need for data on the number of junior faculty positions available to compare to current data on the size of the doctorate pool. The lifting of the mandatory retirement age may mean faculty are not retiring as early as expected, resulting in a scarcity of jobs in academe. Participants felt that, if this is true, it is important to know that. Students often go into fields they think are particularly promising and then discover ten years later that they still do not have a real job. Had they known in advance what would happen, they probably would not have gone into those fields.

Another pipeline issue discussed by the group was the attrition of women and minorities somewhere between undergraduate school and a faculty career. Participants indicated that it would be valuable to identify the points at which women and minorities drop out and the reasons for this happening. Is there something about the postdoc that differentially discourages women and minorities from going on to academic positions? Several participants agreed that women often do not apply for faculty positions, especially at major research universities. Is it because they do not want these positions? How can these positions be made more appealing? What makes women and minorities decide not to apply to MIT, for example, but to apply to industry? Part of the answer may lie in the quality of life associated with a postdoc. Women in particular may look at their mentors and say, “I don’t want that life.”

A few participants commented that some institutions are trying to make postdoc positions more flexible and thus enable women to have both a family life and a career. Others said that it does not depend as much on the institution as on the type of funding. The amount of independence and flexibility varies by funding source.

The workshop group agreed that gathering more qualitative information about the postdoc experience is a worthwhile endeavor. Specifically, qualitative information might help answer the question of why women and minorities do not pursue faculty positions in greater numbers and might help identify ways to encourage them to do so.

Faculty/postdoc ratio

The general consensus of the workshop group was that the ratio of postdocs to faculty is increasing. One participant noted that, in past years, the cost of a postdoc was much lower than the cost of a graduate student, resulting in the hiring of postdocs in lieu of graduate students. Has this situation changed, and if so, how has it changed?

According to another participant, an increase in the amount of grant money at an institution causes faculty to push for having more graduate research assistants. If the graduate school wants to limit the number of students, it then becomes necessary for faculty to bring in more postdocs, and perhaps keep them longer, to get the work done. The group asked several questions related to this issue: What is the effect of having more postdocs training together? How many postdocs can a PI be expected to mentor? Is the increasing ratio of postdocs to faculty a result of the changing nature of research or the result of a glut of Ph.D.s? These questions need to be answered, and by both postdocs and faculty.

Other areas of interest

In addition to the topics discussed above, the workshop group expressed interest in learning about the following aspects of the postdoc experience:

- Does the source and type of funding affect the postdoc experience and promote a future career?
- Do postdocs have better outcomes at institutions that have postdoc offices, postdoc policies, and/or good guidelines for postdocs?
- Does loss of benefits while on a postdoc affect career decisions?
- From a funding agency standpoint, how can the postdoc experience be more flexible?
- How has the postdoc experience changed over time?

Sources for Data Collection

SRS needs to know where to go for data on postdocs. The workshop group discussed how and from whom the information could be gathered.

SRS staff noted that it may not be getting a very good count of postdocs from the GSS. According to some participants, the issue may be that the GSS respondent is the graduate school, which is far more focused on graduate students than on postdocs. Especially at institutions where many postdocs work in labs rather than in traditional academic departments, the graduate school may be an inadequate source for accurate data on postdocs. Participants stressed that information is needed on all postdocs who work in a given discipline, regardless of the setting. They suggested that the GSS model could be used as the institutional framework for a data collection but recommended that the respondent be focused on the postdoc.

A general feeling among participants was that some university administrators do not know how many postdocs they have because postdocs are not centrally administered. One participant asked whether anyone knows how many institutions have a centralized system that includes information on postdocs. On recent visits to several institutions, SRS staff found varying situations. An institution with a postdoc office may know more about its postdocs than an institution that does not have a group or office focused on postdoc issues. An institution with an office of international affairs may know about its foreign-

degreed postdocs. The way postdocs are classified can vary by institution. Depending on whom you go to at an institution, you may get different numbers of postdocs.

Participants indicated that some institutions have established mechanisms for tracking postdocs, although this seems to be the exception rather than the rule. It was noted that there are around 400 doctorate-granting institutions, yet only 60 postdoc associations and offices in the country. One participant suggested that there might be a way of encouraging other institutions to keep track of their postdocs by using as models the ones who do keep track.

Participants felt there is value in having a model plan for tracking postdocs, and they agreed that the institutional model would probably be the most fruitful since so much of the postdoc pool resides in academe. One participant suggested, and others agreed, that several different ways could be used to approach the schools, depending on how the school keeps track of its postdocs: through a centralized system, through a postdoc office, or through other means. The approach to use could be determined by asking the institutions a few basic questions. While several participants voiced concern that institutions might not cooperate, others noted that institutions are generally willing to give information when they see it to be in their best interest. Cooperation could be encouraged by promising to give the data back to the institution.

The group considered several ideas for tracking postdocs. One inexpensive way would be to create a voluntary national registry. If postdocs care about the quality of their life, they should want to sign up. However, it is often thought that self-selected samples can be problematic because the people who respond usually have something to say that is either really good or really bad. Keith Micoli, incoming chair of the National Postdoc Association, volunteered to disseminate information about a national registry to the institutions, if the decision is made to form such a registry.

Some participants were also concerned with gathering data on postdocs who are not working in traditional academic departments or in academe at all. It is likely that these postdocs would not be covered by a voluntary national registry. Gathering data through the funding agencies is another possible approach to developing a registry. This would not require agreement from the institutions, and it would move away from self-selection. Because there are a limited number of postdoc funders, a registry could be built by, say, the funding agencies insisting that grant recipients register their postdocs and graduate students by name. Some workshop participants thought this would not work well with foreign-degreed postdocs as they are reluctant to draw attention to themselves.

The group did not consider professional societies an optimal way to identify postdocs because it would involve going to at least 100 different societies and even then all fields would not be covered. Moreover, the societies would not provide good coverage of nonacademics or foreign-degreed postdocs.

Gathering information on foreign-degreed postdocs poses its own set of problems. Because these individuals are not included in the SDR, much less is known about them.

Just locating them would be a difficult task. Some workshop participants suggested using immigration data. They identified three potential sources for developing a sampling frame of foreign-degreed postdocs: (1) the New Immigrant Survey of green card holders (administered by the National Opinion Research Center); (2) data from the Student Exchange Visitor Information Service (SEVIS); and (3) H1B visa data. While none of these sources includes all foreign-degreed postdocs, together they would cover the vast majority.

Participants generally felt that the foreign-degreed postdoc would be best tracked through an institutional framework, which would need to include more than just academic institutions since many foreign-degreed postdocs are trained in industry. Exit surveys were proposed as a means of gathering data on whether the foreign-degreed postdoc is planning to stay in the United States or planning to return to his/her native country. Entry surveys were also proposed as a means of gathering information on foreign-degreed postdocs, but they would be less accurate than exit surveys in terms of identifying future plans.

In summary, the workshop group said that gathering information on postdocs from the graduate schools is probably not the best way to go because they are more focused on graduate students than on postdocs. Furthermore, much of the information that participants deemed most essential can be acquired only from the postdocs themselves. The group agreed, however, that the institution/organization (including national labs and nonacademic employers) is the place to start, as this is where frame development occurs. The organizations should be asked both how they use postdocs and how they support postdocs. In addition, consideration should be given to entry and exit surveys, especially for gathering information on foreign-degreed postdocs, and also to a national registry, possibly linked to funding organizations.

Data Priorities

Workshop participants agreed that existing data on the postdoc experience are insufficient. Near the end of the workshop, participants were asked to prioritize their individual data needs, resulting in this list:

- accurate numbers of postdocs by discipline
- information on foreign-degreed postdocs, especially stay rates
- information on postdocs working outside academe
- effect of the length of the postdoc appointment on career outcomes
- effect of the type of postdoc support on career outcomes
- effect of having a postdoc office and/or guidelines for postdocs at a university
- benefits of a postdoc, especially to those who ultimately work outside academe
- aspects of the postdoc experience that may discourage pursuit of an academic career

As the session adjourned, participants were asked to continue thinking about what data they would like to have on postdocs and why they want it. On a higher level, what is the rationale for further exploration of this issue and what are the policy issues?

Next Steps

NSF/SRS is following a systematic plan to determine the types of postdoc data that are needed; the data that are available from existing sources; the gaps in the current data; the impact of those gaps; and the best methods for filling the gaps. NSF/SRS is following a systematic plan to determine: what postdoc data are needed; what data are available from existing sources; what gaps exist in the current data; what is the impact of those gaps; and what the best methods for filling the gaps are. This workshop constituted one activity in a series of activities being planned to address these issues. An earlier workshop focused on postdoc policies and practices, and additional workshops are being considered for the future. SRS is also continuing to collect information on how researchers use existing data on postdocs, and work is underway to develop design options for a postdoc data collection effort.

On evaluation forms completed at the end of this workshop, participants were asked to suggest next steps for the project and to identify additional topics they would like to have addressed. Topics included family issues as they relate to the postdoc experience and career outcomes after the postdoc. More specifically, it was suggested that the career paths of individuals who take a postdoc be compared with the career paths of those who do not take a postdoc.

With regard to next steps, attendees offered the following suggestions:

- prioritize the issues
- develop a draft survey
- gather new data on the postdoc experience
- convene additional workshops on the postdoc experience and postdoc issues
- consider ways to involve the funding agencies

A summary of the responses to the evaluation form appears in Appendix E.

APPENDIX A

WORKSHOP AGENDA

NSF/SRS POSTDOC DATA PROJECT WORKSHOP

SRI International
December 17, 2004

- 8:00-9:00 Continental breakfast
- 9:00-9:15 **Welcome and introductions**
(Lynda Carlson, Director, Division of Science Resources Statistics, SRS/NSF)
- 9:15-9:30 **Workshop goals and project information**
(Emilda Rivers, Project Leader, Postdoc Data Project, SRS/NSF)
- 9:30-10:00 **What postdoc data do we use and what postdoc data do we need?**
(Lydia Snover, Assistant to the Provost for Institutional Research, Massachusetts Institute of Technology)
- 10:00-11:00 **Group discussion: What postdoc data do we need?**
(Facilitator, Linda Allen-Benton, Co-Facilitator, David Carroll, and workshop participants)
- What are the unmet needs and uses for postdoc data?
 - Which of these needs and uses are most important?
 - How well do the current data collection efforts meet these needs?
 - What are the critical gaps in the current efforts?
 - How often are data needed?
- 11:00-11:15 Coffee Break
- 11:15-12:30 **What postdoc data do we need? Breakout Groups (2)**
Focus on specific topics and discuss in depth the current uses, needs and critical gaps.
Topics: International Postdocs, Professional and Personal Aspects of the Postdoc Experience
- 12:30-1:30 Lunch
- 1:30-2:45 **Findings: Needs for postdoc data**
Presentation and discussions of findings of breakout groups

- 2:45-3:30 **How do we obtain comprehensive data on the postdoc experience?**
(Facilitators and workshop participants)
- How do we contact all postdocs in the U.S., both U.S.- and foreign-degreed, and U.S.-degreed postdocs abroad?
 - How do we contact the most knowledgeable people about the postdoc experience? These could include mentors, people from professional associations, and people from organizations employing former postdocs.
- 3:30-3:45 Coffee Break
- 3:45-4:45 **Prioritizing data needs: The user’s perspective**
(Facilitators and workshop participants)
Prioritize postdoc data needs.
Identify best method(s) to obtain needed postdoc data.
- 4:45-5:30 **Summary and discussion**

Workshop Goals:

- gain a better understanding of the information/data needs on the postdoc experience
- obtain perspectives on best methods to meet these needs

The workshop will assist SRS in identifying postdoc data needs for policy and research from all members of the postdoc community across all sectors of employment. SRS will determine the need for and the feasibility of collecting a broad range of data on experiences in postdoc appointments and how these relate to both graduate education and labor force outcomes in all employment sectors. This workshop is one of several activities planned as part of the Postdoc Data Project to determine the feasibility of gathering in-depth data on postdocs from an independent data collection or as a supplement to existing data collection efforts.

APPENDIX B
LIST OF ATTENDEES
NSF/SRS POSTDOC DATA PROJECT WORKSHOP

SRI International
December 17, 2004

PARTICIPANTS

Eleanor L. Babco
Executive Director
Commission on Professionals in Science and
Technology
Washington, DC

Susan E. Brandon
Assistant Director, Social, Behavioral, &
Educational Sciences
Office of Science & Technology Policy
Executive Office of the President

Lin Ferrand
Associate Dean of the Faculty
Princeton University

Laurel Haak (by teleconference)
Program Officer
COSEPUP
National Research Council

Martin Ionescu-Pioggia
Senior Officer
Burroughs Wellcome Fund
Durham, North Carolina

Rachel Ivie
Principal Research Associate
Statistical Research Center
American Institute of Physics

Carter Kimsey
Program Officer
Division of Biological Infrastructure
National Science Foundation

George Langford
Professor
Dartmouth Medical School

Keith J. Micoli
Department of Pathology
University of Alabama at Birmingham

Frank Shaw
Office of Strategic Planning
National Endowment for the Humanities

Lydia S. Snover
Assistant to the Provost for Institutional
Research
Massachusetts Institute of Technology

Jim Voytuk
Senior Program Officer
Policy and Global Affairs
National Research Council

FACILITATORS

Linda Allen-Benton
Facilitator

David Carroll
APPRISE Incorporated

Rocco Russo
RPR Consulting

NATIONAL SCIENCE FOUNDATION, SCIENCE RESOURCES STATISTICS

Office of the Division Director

Lynda T. Carlson
Division Director

Jeri Mulrow
Senior Statistician

Mary J. Frase
Deputy Division Director

Emilda B. Rivers, NSF Task Leader
Mathematical Statistician

Ronald Fecso
Chief Statistician

Cleo Redline
Senior Survey Methodologist

Carol Manahan
AAAS Science & Technology Policy Fellow

Human Resources Statistics Program

Nancy Leach
Program Director

Nirmala (Nimmi) Kannankutty
Senior Analyst

Joan S. Burrelli
Senior Analyst

Julia D. Oliver
Survey Statistician

Susan T. Hill
Director, Doctorate Data Project

John Tsapogas
Senior Analyst

Science and Engineering Indicators Program

Rolf F. Lehming
Program Director

Alan I. Rapoport
Senior Analyst

Robert K. Bell
Senior Analyst

Mark C. Regets
Senior Analyst

GUESTS

Jean Flagg-Newton
National Institutes of Health/Fogarty
International Center

Lluana McCann
National Science Foundation/Office of
Integrative Activities

Kara Haas
House of Representatives Science Committee

Barbara Thompson
National Science Foundation/Office of
International Science and Engineering

Tirumalai Kamala
National Institutes of Health/National Institute of
Allergy and Infectious Diseases

James Lightbourne
National Science Foundation/Education and
Human Resources

SRI INTERNATIONAL, SCIENCE AND TECHNOLOGY POLICY PROGRAM

Prudy Brown, SRI Task Leader

Senior Research Analyst

Lori Thurgood

Senior Research Analyst

Adrian Tyler

Research Analyst

APPENDIX C

MATERIALS PROVIDED TO ATTENDEES

Advance materials

Draft Agenda

The Postdoc Data Project: An Overview

Table on Use of Sources with Postdoc Data

Logistical Information

Articles

Benderly, B.L. (2004). "NSF Employee Postdocs: An Unknown Quantity." "Who, where, and how many NSF employee postdocs are there? How much do they earn? What benefits do they receive? How long do they stay in their jobs? No one really knows." <http://nextwave.sciencemag.org/cgi/content/full/2004/11/04/7> (requires Nextwave or AAAS subscription)

Commission on Professionals in Science and Technology. (December 2002). *Postdocs: What We Know and What We'd Like to Know*. Proceedings of NSF/CPST/Professional Societies Workshop (summary only). Washington, D.C. Workshop that brought together various groups to discuss the data available on postdocs, how data should be collected and the data needs. <http://www.cpst.org/postdoc.pdf>

Kelly, T.P, W.P. Butz, S. Carroll, D.M. Adamson, G.A. Bloom, editors. (2004). *The U.S. Scientific and Technical Workforce: Improving Data for Decisionmaking*. Conference Proceedings. CF-194-OSTP/SF. RAND Corporation. Collection of information on what the government and other data users think of available data on the S&T workforce. Summary and conclusions: <http://www.rand.org/publications/CF/CF194/CF194.sum.pdf>
Full report: <http://www.rand.org/publications/CF/CF194/CF194.pdf>

Regets, Mark. (1998). *Has the Use of Postdocs Changed?* NSF Brief 99-310. This brief examines the self-reported postdoc histories of holders of science and engineering Ph.D.s from U.S. schools to address the question whether the use of postdocs has changed. An example of how the available data on postdocs is used. <http://www.nsf.gov/sbe/srs/issuebrf/sib99310.pdf>

Materials provided at workshop

Agenda for the NSF/SRS Postdoc Data Project Workshop

List of Attendees

The Postdoc Data Project (brochure)

Summary of Responses to the Table on Uses of Sources with Postdoc Data

The Postdoc Data Project: An Overview

Copies of slides from Lydia Snover's Power Point presentation: The Role of the Postdoctoral Appointment at a Research University

Copies of articles provided in advance (see list above)

List of Other Related Resources and copies of four articles (marked by * in the list below)

- Babco, E. and J. Jesse. (2003). *What Does the Future of the Scientific Labor Market Look Like?* Commission on Professional in Science and Technology: Washington, DC. This report presents statistics outlining the changes in the U.S. scientific workforce over the past 20-30 years. <http://www.cpst.org/Future.pdf>
- Barnhill, R.E., H.S. Frasier and D. Stanzione. (2004). "Support of Graduate Students and Postdoctoral Researchers in the Sciences and Engineering: Impact of related Policies and Practices." *Council of Graduate Schools Communicator* 37:12 pages. Article focuses more on graduate students, but there is a continuum of training between the two groups. <http://www.cgsnet.org/pdf/AugSeptComm2004.pdf>
- * Burelli, J.S. (2004). *Info Brief: Emigration of US-born S&E doctorate recipients*. NSF 04-327. . "Despite efforts of science and technology groups in the United States and abroad to encourage American scientists to work overseas, relatively few U.S.-born S&E doctorate recipients from U.S. universities plan to work or study abroad at the time of receiving their doctorates. In contrast, a large number of students come to the United States to earn S&E doctorate degrees, and many foreign-born U.S.-trained S&E doctorate recipients remain in the United States." <http://www.nsf.gov/sbe/srs/infbrief/nsf04327/start.htm>
- Butz, W.P, T.K. Kelly, D.M. Adamson, G.A. Bloom, D. Fossum, M.E. Gross. (2004) *Will the Scientific and Technology Workforce Meet the Requirements of the Federal Government?* RAND Corporation. Requests for data needs listed in Chapter 5. Data used throughout report. <http://www.rand.org/publications/MG/MG118/>
- Freeman, R., E. Weinstein, E. Marincola, J. Rosenbaum, and F. Solomon (2001). "Competition and Careers in Biosciences." *Science* 294:2293-2294. Discusses tournament model and why it is not good for science and trainees (graduate students and postdocs). This article also includes important data. <http://www.sciencemag.org/cgi/reprint/294/5550/2293.pdf>
- Garrison, H.H., S.A. Gerbi, and P.W. Kincade. (Oct. 2003) "In an Era of Scientific Opportunity, Are There Opportunities for Biomedical Scientists?" *FASEB Journal* express article 10.1096/fj.03-0836life. Article discusses various issues, the declining number of tenure-track jobs, the decrease in number of US citizen PhDs, decrease in the frequency and length of postdoctoral appointments and the changing nature of the workforce. Example of a professional society's use of data collected. http://www.fasebj.org/cgi/reprint/03-0836lifev1?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&author1=Garrison&andorexactfulltext=and&searchid=1101318516012_2165&stored_search=&FIRSTINDEX=0&sortspec=relevance&resourcetype=1&journalcode=fasebj
- * Hill, S.T., T.B. Hoffer, and M.J. Golladay (2004). *Info Brief: Plans for Postdoctoral Research Appointments among Recent US Doctorate Recipients*. NSF 04-308. "This *InfoBrief* draws on data from the past decade of the Survey of Earned

Doctorates (SED) to examine recent trends in the numbers of new doctorate recipients from U.S. institutions who accept postdoctoral positions. The data include only individuals who received research doctorates in the United States and do not reflect postdocs as a whole, as many U.S. postdoctoral positions are filled by persons who earned their doctorates outside of the United States.”

<http://www.nsf.gov/sbe/srs/infbrief/nsf04308/start.htm>

- * National Research Council, Committee on Science, Engineering, and Public Policy. (2000). *Enhancing the Postdoctoral Experience for Scientists and Engineers: A Guide for Postdoctoral Scholars, Advisers, Institutions, Funding Organizations, and Disciplinary Societies*. National Academy Press: Washington, DC. Study performed by NAS by interviewing many different stakeholders. It includes recommendations for postdocs, faculty, institutions, funding organizations and disciplinary societies. Example of how data available is used to make policy recommendations. Discusses general issues with regards to the postdoctoral experience. <http://www.nap.edu/books/0309069963/html/>

National Science Board. *Science and Engineering Indicators–2004*. National Science Foundation: Arlington, VA. (NSB 04-01).

Nerad, M., and J. Cerney. (1999). “Postdoctoral Patterns, Career Advancement and Problems.” *Science* 285:1533-1535. Article discussing the report, “PhDs-Ten Years Later.” Brings up the changing nature of the postdoc experience, employment trends by postdoc history and gender, major reasons for choosing a postdoc and effects of having a family on careers. Example of how data can be used to advocate for change.

<http://www.sciencemag.org/cgi/reprint/285/5433/1533.pdf>

- * Rapoport, A.I. (1998). *Issue Brief: What Is the Debt Burden of New Science and Engineering Ph.D.s?* NSF 98-318. “This issue brief discusses the indebtedness of new doctoral recipients resulting from their undergraduate and/or graduate education.” Indebtedness rates are increasing. Over half of US citizen S&E Ph.D.s report debt at graduation; 32% of new U.S. citizen Ph.D.s report having at least \$10,000 in debt; 17% have over \$20,000 in debt.”

<http://www.nsf.gov/sbe/srs/issuebrf/sib98318.pdf>

Teitelbaum, M.S. (2003). “Do We Need More Scientists?” *The Public Interest* No. 153, pp. 40-53. “Despite the recent economic downturn, prominent scientific associations, business leaders, and academics continue to predict ‘looming shortfalls’ in America’s science and engineering professions. Countering the prevailing view, Michael S. Teitelbaum reveals that few, if any, shortages exist in these fields and shows why proposed solutions to this illusory problem are profoundly misguided.”

<http://www.thepublicinterest.com/archives/2003fall/article2.html>

Teitelbaum, M.S. (2002). "The US Science and Engineering Workforce: An Unconventional Portrait." Paper prepared for the GUIRR Summit. Document argues that there is no a shortage of US-produced PhDs since the careers in science and engineering are not attractive relative to other career opportunities. <http://www.phds.org/reading/guirr2002/teitelbaum.php>

Postdoc Survey Information

Survey of Earned Doctorates (SED) Sponsors: NSF/ NIH

"The SED is designed to obtain data on the number and characteristics of individuals receiving research doctoral degrees from U.S. institutions. The results of the survey are used to assess trends in Ph.D. production. This information is used frequently by educational and labor force planners within the Federal Government and in academia."

<http://www.nsf.gov/sbe/srs/ssed/start.htm>

Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS)

Sponsors: NSF/NIH/NASA/Dept. of Energy

"The GSS survey obtains data on the number and characteristics of graduate science and engineering (S&E) students enrolled in U.S. institutions. The results of the survey are used to assess trends in financial support patterns and shifts in graduate enrollment and postdoctorates."

<http://www.nsf.gov/sbe/srs/sgss/start.htm>

Survey of Doctorate Recipients (SDR) Sponsors: NSF/ NIH/National Endowment for the Humanities/Dept of Education/ USDA/ NASA

"The SDR is designed to provide demographic and career history information about individuals with doctoral degrees. The results of this survey are vital for educational planners within the Federal Government and in academia. The results are also used by employers in all sectors (education, industry, and the government) to understand and predict trends in employment opportunities and salaries in S&E fields for doctorate holders and to evaluate the effectiveness of equal opportunity efforts." This is the only source of longitudinal data on individuals having held a postdoc position.

<http://www.nsf.gov/sbe/srs/ssdr/start.htm>

A Guide to Surveys by, for, and of Postdocs (2002) *Science's* Nextwave Postdoc Network. Collection of surveys published on NextWave.

<http://nextwave.sciencemag.org/cgi/content/full/2002/06/17/6>

Sigma Xi's Postdoc Survey of individual postdocs at institutions

"The survey asks important questions that postdocs and institutions want answered. Survey questions focus on postdocs' research activities, career goals and perceptions of the policies and practices at their institutions." Data from surveys is scheduled for release in March 2005. <http://postdoc.sigmaxi.org/>

Collection of past surveys on postdocs:

http://postdoc.sigmaxi.org/questions/existing_surveys/past_surveys/view

APPENDIX D

TABLE ON USE OF SOURCES WITH POSTDOC DATA

In advance of the workshop, invitees were sent a table (see pages 30-32) on their use of sources that include data on postdocs. Nine workshop invitees completed the table, and their responses are summarized below. All nine respondents answered that they use data on postdocs. The number of people who gave each response is shown in parentheses.

What postdoc data would you like to have but do not have?

- Data on foreign Ph.D.s holding U.S. postdocs, including country of origin, host institution, field of study, source of funding, type of position, stay rates (4).
- Information on career paths immediately after the postdoc (3).
- Data on the length of postdocs (3) and effect of benefits or lack thereof (3).
- Number of people on postdocs by field of study (2) – data that are rich enough to support crosstabulation by field (SDR’s sampling rate is too low for this) (1).
- Demographic information (place of birth, gender, race/ethnicity, citizenship) (2).
- Data showing the effects of having a postdoc on one’s career (2) and receipt of honors and awards (1).
- Salary by field, institution, citizenship (2).
- Data on postdocs in biomed research or those associated with NIH projects and data on those who are DoD supported (1).
- Data on whether people stay on postdocs because they can’t find jobs (1).
- Data allowing comparison of staffing mix (RAs, fellows, postdocs) with that of other institutions (1).
- Data that include postdocs in research labs and centers, not just academic departments (1).
- Longitudinal data (1).
- Reasons for taking postdocs (1).

How might you use the additional postdoc data?

- To answer the question “Is a postdoc experience good for the postdoc’s career?” This information would be used to inform graduate students, faculty, and members of the scientific community (2).
- To calculate future needs for researchers and the available supply (1).
- To inform future policies on postdoc training (1).
- To get a more timely picture of the postdoctoral population across disciplines (1).
- To point out the importance of welcoming and facilitating travel for international researchers, data on postdocs from other countries (1).
- To develop new areas of funding (1).
- To assess the magnitude of postdoc-related issues for specific government agencies (1).

How has not having this postdoc data impacted you or your organization?

- It is difficult to make coherent, informed policy recommendations (1).
- We can't say whether the training received by postdocs is appropriate or how to change the training system without data on career outcomes of postdocs (1).
- It is difficult to provide a picture of the STEM workforce without having enough information about the postdoc population (because they comprise such an integral portion of this workforce) (1).
- We have to do a lot of guessing (1).
- We can't estimate the effect of not having data that doesn't exist (1).

DATA SOURCES

Survey of Earned Doctorates (6 reported using this source)

Variables:

- Demographics (3)
- Citizenship/visa status (2)
- Field (1)
- Career aspirations (1)
- Mode of support (1)
- Initial intentions to take a postdoc (1)

Uses:

- To study career patterns of our graduates (1)
- To see if number of postdocs is changing in relation to permanent employment (1)
- For policy studies (1)

Would like:

- Record-level data from our peers (1)
- Access to fine field data and race/ethnicity data (1)
- Data collected more often and made available closer to collection date (1)

Survey of Doctorate Recipients (5 reported using this source)

Variables:

- Demographics (2)
- Citizenship (1)
- Occupation (1)
- Sector of employment of postdocs (1)
- Years since doctorate for postdocs (1)
- Length of postdoc (1)

Uses:

- To track the number of postdocs by field and occupation (1)
- For policy studies (1)

Would like:

- More online field data (1)

- Large enough sample to look at postdocs by field
- More timely data (1)
- Qualitative data
- Data on length of postdoc (1)
- Longitudinal data (1)
- Stay rates of non-U.S. citizens (1)
- Data collected more often and made available closer to collection date (1)

Survey of Graduate Students and Postdoctorates (5 reported using this source)

Variables:

- Demographics (3)
- Citizenship (2)
- Field (2)
- Mode of support (1)

Uses:

- To compare with institutional peers (1)
- To get a more complete picture of the total postdoc population (since foreign-degreed postdocs are included) (1)

Would like:

- Data on postdocs in other employment settings (e.g., national labs) (1)
- Better demographics on postdocs (1)
- Citizenship data (1)
- Individual data on postdocs, not just department-level data (1)

National Survey of Recent College Graduates (1 reported using this source)

Variables:

- Demographics (1)
- Field (1)
- Occupation (1)
- Salary (1)

Uses:

- Not used for postdoc data (1)

Would like:

- More timely data (1)

One respondent also cited three professional societies that collected data on postdocs: American Chemical Society; American Geophysical Union/American Geological Institute; and American Institute of Physics. The surveys were part of a multidisciplinary effort and included a series of core questions, one of which addressed postdoctoral appointments. The data from these surveys were used to complement data from the NSF data sources.

Table on Use of Sources with Postdoc Data

Postdoc Data Project – Pre-Workshop Information

1. Are you using data on postdocs?

Yes a) Please complete the attached Table titled “Use of sources with postdoc data.”

b) Answer the remaining questions below on general data needs.

No, please use the space below to tell us why you do not use postdoc data.

2. What postdoc data would you like to have but do not have?

3. How might you use the additional postdoc data?

4. How has not having this postdoc data impacted you or your organization?

Table 1. Use of sources with postdoc data

- Please complete this table based on your use of postdoc data.
- Each row provides a different source. For each source you use, answer the questions in the columns labeled C through F.
- The first row is provided as an example of how to complete the table.
- Use the extra rows provided on page 3 to list additional sources that you use.
- Please return this completed table by **December 3, 2004**. We will use this information to facilitate discussions at the December 17th Postdoc Data Project workshop.

Thank you!

<i>Column A</i> Name of source/ (sponsor)	<i>Column B</i> Source description	<i>Column C</i> Do you use this data source?	<i>Column D</i> What specific data items/variables are you using?	<i>Column E</i> How do you use the data?	<i>Column F</i> What would make this source more useful to you?
Decennial Census (EXAMPLE)	Collects data every 10 years on personal demographics (incl.citizenship), economic characteristics, and housing physical and financial characteristics.	<input type="checkbox"/> Yes <input type="checkbox"/> No	Demographics Job titles	Determine the number of international scientists living in USA	Data collected more often More information on job duties Job titles more specific
1. Survey of Earned Doctorates (SED)/(NSF)	Collects data on number and characteristics of all individuals receiving S&E research doctorates from US institutions	<input type="checkbox"/> Yes <input type="checkbox"/> No			
2. Survey of Doctoral Recipients (SDR)/ (NSF)	Collects demographic and longitudinal career information of individuals receiving S&E doctorates from US institutions	<input type="checkbox"/> Yes <input type="checkbox"/> No			
3. Survey of Graduate Students and Postdoctorates in S&E	Collects data on the number and characteristics of graduate S&E students and postdoctorates enrolled in US institutions Data collected at department/program level for	<input type="checkbox"/> Yes <input type="checkbox"/> No			

Name of source/ (sponsor)	Source description	Do you use this data source?	What specific data items/variables are you using?	How do you use the data?	What would make this source more useful to you?
(GSS)/(NSF)	institution (Masters and PhD)				
4. National Survey of Recent College Graduates (NSRCG)/ (NSF)	Collects information on recent bachelors and master's S+E degree earners. 25,000 S+E	<input type="checkbox"/> Yes <input type="checkbox"/> No			
5. Baccalaureate and Beyond Longitudinal Study / (DOE)	Provide information concerning education and workplace experience after completing bachelor's degree	<input type="checkbox"/> Yes <input type="checkbox"/> No			
6. Additional source		NOT APPLICABLE			
7. Additional source?		NOT APPLICABLE			
8. Additional source?		NOT APPLICABLE			

Add any comments to additional sheets as needed.

APPENDIX E

SUMMARY OF WORKSHOP EVALUATION FORM RESPONSES

Attendees at the Postdoc Data Project Workshop were given an evaluation form, which they were asked to complete and return following the workshop. Forms were received from 12 attendees, including 8 workshop invitees, 2 SRS staff, and 2 attendees with other affiliations.

For the most part, the participants were satisfied with the topics covered at the workshop and the time allowed for discussion of these topics. Participant evaluators considered both the articles provided in advance and the table requesting information on uses of postdoc data to be useful.

In addition to providing information on what they liked best and least about the workshop, participant evaluators provided a list of additional topics for future discussion and a list of further steps they would like to see taken.

The aggregate responses to the evaluation questions, as well as open-ended comments are provided below.

1. Did this workshop provide a thorough discussion of the needs for and uses of postdoc data?
 - Very thorough (4)
 - Thorough (7)
 - Somewhat thorough (1)
 - Not at all thorough (0)

Comments: NONE
2. How would you rate the:
 - a. Time allowed for group discussion
 - Too short (1)
 - Too long (0)
 - Right amount of time (11)

Comments:

 - Right amount of time relative to the total length of the workshop.
 - Right amount of time, went over time but was good.
 - b. Time allowed for break-out discussion
 - Too short (1)
 - Too long (0)
 - Right amount of time (11)

Comments:

 - Right amount of time relative to the total length of the workshop.
 - Too short, not the organizers' fault since time compressed.

- Right amount of time, we discussed many issues – could have talked longer but covered a lot of ground.
- c. Usefulness of pre-workshop articles (for materials see Appendix C)
- Very useful (3)
 - Useful (6)
 - Somewhat useful (2)
 - Not at all useful (0)
- Comments:
- I had already seen all but one. They were a good length and framed the issues pretty well. It's a big topic that can't be covered by a short list.
 - Not applicable.
 - I'm biased.
- d. Usefulness of pre-workshop information questions/table (see Appendix C)
- Very useful (2)
 - Useful (6)
 - Somewhat useful (1)
 - Not at all useful (0)
- Comments:
- Not applicable.
 - Very useful, good to have input prior to workshop.
3. We discussed postdoc data needs and uses related to international, professional, and personal experiences. What other topics did you want to discuss?
- Outcomes.
 - Variances of career paths of Ph.D.s with postdocs vs. those without postdocs.
 - For the time allowed and the group size, the number of topics and the topics themselves were appropriate.
 - Foreign research in universities, industry, and government.
 - A sense of the larger picture – why is the system of doing science (Tech and Engineering) at this point in time in the U.S. set up the way it is?
 - Impact of previous policy decisions (e.g. the Bayh-Dole Act).
 - Sense of historical perspective on the issue.
 - What happens after postdoc?
 - Diversity.
 - Family issues (more detail).

4. What did you like least about the workshop?
 - Didn't discuss the reason for learning about this "small" segment of the STEM workforce.
 - Didn't discuss how to handle interdisciplinary issues.
 - The date.
 - It would have been helpful to have a public university represented.
 - Same answer as for #3 (repeated in the bullets that follow).
 - A sense of the larger picture – why is the system of doing science (Tech and Engineering) at this point in time in the U.S. set up the way it is?
 - Impact of previous policy decisions (e.g., the Bayh-Dole Act).
 - Sense of historical perspective on the issue.
 - Overemphasis on MIT.
 - The kickoff talk – I think it skewed the workshop towards the large academic institutions.

5. What did you like best about the workshop?
 - Variety of viewpoints represented.
 - The varying input from different groups (academe, professional society, government).
 - Free thinking group sessions.
 - The location is beautiful. The size of the groups made it possible to have group discussion effectively.
 - Ample discussion.
 - The ideas expressed were good since people did not limit their ideas.
 - Very, very well designed. The facilitators were very skilled at what they did, i.e., in facilitating the discussions, in encouraging questions, and in steering the discussions back on track whenever it seemed in danger of getting bogged down.
 - First group discussion did not really set the tone – not very helpful – should have asked for more participation by invitees.
 - The interaction around the table of participants.
 - The organization was excellent, and the SRI staff were extremely helpful and efficient.

6. What next steps would you like to see pursued on the topics discussed?
 - Do a sample collection of some of the data.
 - See some prioritization of the data collected, of the issues discussed.
 - A draft of the proposed survey.
 - Create a national database (registry) where each entity (institution, individual) can update profile upon email prompt.
 - More discussion.
 - Think about past(?) students.
 - More workshops to continue and move the discussions forward.
 - How to involve funding agencies in moving this effort forward.
 - Actual movement toward gathering new data on postdoc experience.