

**“Postdoc Data Project: Design Options”
Summary Report**

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Division of Science Resources Statistics

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Table of Contents

Introduction	1
Postdoc Data User Needs	2
<i>Federally Sponsored Research Studies</i>	2
<i>Academic Research Studies</i>	3
<i>SRS Postdoc Workshops</i>	3
<i>Summary of Postdoc Data User Needs</i>	4
Existing SRS Postdoc Information Resources	5
Postdoc Data Project Study Requirements	6
<i>Operational Definition of a Postdoc</i>	6
<i>Coverage of Postdoc Population Segments</i>	6
<i>Coverage of Postdoc Subject-Matter Issues</i>	7
Potential Postdoc Frames	7
<i>List Sources for Temporary Resident Ph.D.s and Professional Ph.D.s</i>	7
<i>Developing Postdoc Information for Nonacademic Organizations</i>	8
Other Postdoc Surveys	9
Design Options	9
<i>Postdoc Information</i>	10
<i>Information from Institutions and PIs</i>	12
<i>Information on S&E Pipeline Issues</i>	12
Recommendations	13
Recommended Postdoc Sample Development Procedures Diagram	17
Recommended Alternate Postdoc Sample Development Procedures Diagram	18

Postdoc Data Project: Design Options

Summary Report

The Division of Science Resources Statistics (SRS) at the National Science Foundation (NSF) is engaged in a multi-year project, the Postdoc Data Project, to determine the need for and the feasibility of gathering in-depth information on postdocs in the U.S. This report presents design options for a comprehensive postdoc information strategy that would expand available information about postdocs beyond the limited currently government-collected data on counts and demographic characteristics and would meet many of the identified data user needs for postdoc information. Issues addressed include expanding the current coverage of postdocs to foreign-degreed doctoral holders in U.S. postdoc positions, professional Ph.D. postdocs, and nonacademic postdocs. The design options discussed would expand the content of information on postdocs to include detailed data related to the quality of the postdoc experience. The report includes a discussion of postdoc data user needs, a synopsis of how well current SRS and other existing sources meet the postdoc data needs, and a discussion of what would be required to fill the data gaps. The report concludes with design options and recommendations for SRS to explore in the next phase of the Postdoc Data Project in order to develop a comprehensive postdoc information strategy.

Introduction

A number of research studies have highlighted the importance of postdoc appointments in the development of our nation's science and technology resources.¹ Postdoc appointments are expected to enhance the skills of recent Ph.D.s; a postdoc is expected to develop research skills, begin a program of independent research, and possibly learn more about a related field or sector. It is also perceived that postdocs make major contributions to the U.S. research enterprise.

However, there are persistent concerns that postdoc appointments are not fulfilling the purpose for which they are intended. A number of studies have raised questions about the efficacy of the postdoc system and have made policy recommendations for enhancing postdoc experiences.² There also are concerns that the high proportion of postdoc appointments held by international Ph.D.s has an adverse impact on the U.S. research enterprise and on the opportunities for U.S. residents.

To address this increasing interest in postdocs, the Postdoc Data Project is identifying the specific information needed by researchers, decision-makers, and other postdoc data users, assessing whether existing information resources meet those needs or could meet

¹See, for example, Enhancing the Postdoctoral Experience for Scientists and Engineers: A Guide for Postdoctoral Scholars, Advisers, Institutions, Funding Organizations, and Disciplinary Societies (2000) and National Science Foundation. Postdoctoral Appointments: Roles and Opportunities – Report on a Workshop. NSF: Arlington. May 11-13, 2003.

² See, for example, National Research Council. Postdoctoral Appointments and Disappointments: A Report of the Committee on a Study of Postdoctorals in Science and Engineering, 1981 and William Zumeta. Extending the Educational Ladder – The Changing Quality and Value of Postdoctoral Study, 1984.

those needs with certain enhancements, and examining alternatives that might better meet the postdoc data user needs.

In support of the Postdoc Data Project, the project team on this design options study conducted the following activities:

- Research on Postdoc Data User Needs
- Assessment of Existing SRS Postdoc Information Resources
- Establishment of the Postdoc Data Project Study Requirements
- Investigation of Potential Supplemental Postdoc Frames
- Review of the Performance of Other Postdoc Surveys
- Identification and Assessment of Design Options

Our research found important gaps in the coverage and content of existing SRS postdoc information that present barriers to postdoc researchers and decision-makers, and that are not being adequately filled by other federal or nonfederal information sources. However, there is a substantial base of postdoc information and resources that can serve as the foundation for a comprehensive postdoc information strategy, including: a well-developed SRS survey infrastructure that covers many of the postdoc population segments and some of the important postdoc content issues, a number of potential sources of frames for the missing postdoc segments, and excellent examples of survey instruments and data collection procedures from previous and current postdoc studies. Because those resources are available, we are recommending that SRS pursue an integrated information strategy that targets the development of comprehensive and sustainable data collection on the postdoc population and with members of the postdoc community.

Postdoc Data User Needs

The Postdoc Data Project has pursued a number of initiatives to clarify the information needs of researchers, decision-makers, and other data users to finalize goals and set priorities, including:

- Postdoc Site Visits
- Postdoc Literature Review
- Postdoc Focus Groups
- Postdoc Workshops

As part of the design options task, we reviewed the findings from these initiatives, expanded the literature review to cover additional research studies, and participated in the SRS postdoc workshops to develop a comprehensive statement of data user needs.

Federally Sponsored Research Studies

Starting in 1969, there have been a number of federally sponsored research studies that have directly or indirectly considered postdoc policy issues. These studies have recommended that NSF and SRS develop information that can inform postdoc decision-

makers and others in the postdoc community, including information on the following topics:

- International Postdocs
- Ph.D. Equivalent Professional Degrees³ Postdocs
- Nonacademic Postdocs
- Quality of Postdoc Experiences
- Career Transitions of Postdocs

These reports identify the need for SRS to broaden data collection efforts to include population segments that are currently missed (i.e., nonacademic postdocs, foreign-degreed postdocs, and professional Ph.D. postdocs). In addition, they identify the need for postdoc experience data, as well as longitudinal data that allow researchers to study which postdoc policies lead to the best outcomes, both from the perspective of the individual and the nation.

Academic Research Studies

Academic institutions want to create an environment in which postdocs can flourish. However, institutions find that they have inadequate information on which policies and practices are most effective over time. In particular, academic research studies have identified the need for information on how postdoc policies affect career outcomes, as well as information on how to facilitate the transition of postdocs to nonacademic careers.

SRS Postdoc Workshops

The SRS Postdoc Data Project sponsored two workshops to develop a better understanding of postdoc data user needs. In the first workshop, on December 17, 2004, SRS included representatives from a range of organizations with interests in postdocs. They identified key topics for the Postdoc Data Project research agenda and made recommendations on data priorities. In the second workshop, on July 21 and 22, 2005, SRS invited a more focused audience of staff from federal agencies that train and fund postdocs. They developed a detailed statement of seven key postdoc policy issues for federal agencies.

Participants in the first workshop mainly focused on data coverage issues for temporary resident and nonacademic postdocs. The postdoc content issues of highest priority were postdoc compensation and benefits, the value and quality of the postdoc experience, and pipeline issues related to the decisions by undergraduates, graduates, and postdocs on whether to pursue an S&E career.

Participants in the second workshop mainly focused on postdoc content issues, with a particular emphasis on how their agencies' policies affect the experiences of postdocs and

³ The Ph.D. equivalent professional degrees of interest are those in medical and related fields, including: M.D., D.O., D.D.S., and D.V.M. In the remainder of this report, we will refer to this population segment as professional Ph.D.s. Currently the SDR includes only research PhDs.

the building of the nation's intellectual capital. Participants also focused on the feasibility of creating and maintaining a nationally sustainable data source that provides centralized information on demographics, performance, and career outcomes for postdocs.

Summary of Postdoc Data User Needs

Over the past decade, decision-makers, researchers, and other data users have recommended that the federal government fund comprehensive research on postdoc issues. Activities conducted for the Postdoc Data Project indicated that there remains a need for improvement in the coverage and content of postdoc data.

Postdoc Coverage Issues: Postdoc data users recommend the development of comprehensive information to cover all postdoc population segments, including:

- Residency Status – Information on both U.S. resident and international postdocs, including both U.S. degreed temporary residents and foreign degreed temporary residents.⁴
- Ph.D. Type – Information on postdocs who have research Ph.D.s and on those who conduct research but have Ph.D. equivalent professional degrees.
- Employment Sector – Information on postdocs in all sectors, including academia, government, industry, and other types of organizations.

Postdoc Content Issues: Postdoc data users also recommend the development of comprehensive information on postdocs, including:

- Population Statistics – Information on the population of postdocs in all sectors and disciplines, including: postdoc counts, sources of funding, employment sector, duration of appointments, country of Ph.D., compensation, and benefits.
- Postdoc Quality and Experience Indicators – Information directly from postdocs regarding the amount of training and guidance received, as well as the number of opportunities to conduct independent research and author publications.
- Institutional Data – Information from organizations that employ postdocs regarding structures and procedures in place for supporting postdocs during their time with the organization and during career transition.
- Principal Investigators – Information from principal investigators with research grants regarding their decision to employ postdocs, the recruiting process, the role of postdocs in the research process, and support provided to postdocs in research and career transitions.

⁴ In this document, we use the term “international postdocs” to refer to temporary residents who are filling postdoc positions. Within that group, there are two population segments of interest – postdocs who got their Ph.D.s at a U.S. institution (referred to as U.S.-degreed temporary residents) and postdocs who got their Ph.D. at a foreign institution (referred to as foreign-degreed temporary residents).

- Career Transitions – Longitudinal information for both U.S.-degreed and foreign-degreed Ph.D.s regarding career aspirations and the progression from doctoral programs, through postdoc positions, to permanent employment outcomes.
- Pipeline Issues – Information from undergraduates, graduates, and postdocs regarding their perceptions of S&E career paths, including postdoc appointments, and the impact those perceptions have on their decision to pursue an S&E career.

Some of this information is already available through existing SRS surveys and other information has been collected in smaller-scale or one-time research studies. However, many of the important data elements have never been collected, and none of the existing resources meet the need for comprehensive information on all postdoc segments. Moreover, information that allows researchers and decision-makers to examine postdoc trends is limited to the data available from SRS surveys.

Existing SRS Postdoc Information Resources

SRS fulfills the legislative mandate of the National Science Foundation Act to provide information on science and engineering resources for policy formulation by conducting 11 periodic surveys, as well as a variety of other data collections and research projects. Three surveys furnish postdoc information – the Survey of Earned Doctorates (SED), the Survey of Doctorate Recipients (SDR), and the Survey of Graduate Students and Postdocs (GSS).

The Survey of Earned Doctorates (SED) is an annual census of individuals receiving their first research doctoral degree from a U.S. academic institution. It collects information on postgraduation plans, including the intent to take a postdoc⁵. An important limitation of the SED is that it does not cover two important postdoc segments, professional Ph.D.s and foreign-degreed temporary residents. In terms of content, the SED furnishes only limited information on the decision to take a postdoc.

The Survey of Doctorate Recipients (SDR) is a biennial longitudinal survey of a sample of doctoral recipients in S&E fields. It collects information on the employment status of U.S.-degreed S&E research Ph.D.s, including postdocs. The 1995 and 2006 SDR surveys included special postdoc modules. Like the SED, the SDR does not cover professional Ph.D.s and foreign-degreed temporary residents. Additionally, the SDR is limited to S&E Ph.D.s; it does not include research Ph.D.s in other fields. While the SDR does provide information on the employment status of postdocs, it does not provide more detailed information of interest to researchers and decision-makers on the quality of the postdoc experience and the value of the research that postdocs are conducting.

The Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS) is an annual survey that collects aggregate information on graduate students, postdoctorates, and nonfaculty research staff. It furnishes useful administrative information on postdocs,

⁵ The fact that the SED only captures graduates who plan to take a postdoc is an important limitation because plans may change after the survey. Some students who plan to take a postdoc position might not, while some students that did not plan to take a postdoc position might.

but the coverage is limited to U.S. academic institutions. Additionally, SRS has concerns about the precision of postdoc counts provided via the GSS due to the challenges respondents face in defining and locating postdocs within their institutions.

Postdoc Data Project Study Requirements

The Postdoc Data Project is tasked with defining the study requirements for the development of a comprehensive information strategy. Project requirements should include: developing an operational postdoc definition, identifying the postdoc population segments to include, and establishing priorities for the postdoc content issues to cover.

Operational Definition of a Postdoc

If SRS determines that a postdoc data collection effort is needed, the Postdoc Data Project will need an operational definition of a postdoc for purposes of building a sample frame and screening potential respondents. To meet the needs of researchers, decision-makers, and other data users, the frame will need to include the entire universe of individuals considered to be postdocs according to the diverse set of definitions that have been established by organizations with postdoc interests. Our research shows that the GSS postdoc definition is one of the most inclusive, but that SRS may need to implement modifications to ensure the inclusion of all postdocs of interest.

To develop a better understanding of GSS postdoc data, the Postdoc Data Project will conduct a pilot postdoc Response Behavior Survey (RBS) during the 2005-2006 GSS reporting period. The RBS pilot may furnish some information on how to make the GSS definition more inclusive. However, additional record-keeping studies and cases studies may be required to develop a complete understanding of the best postdoc definition.

Coverage of Postdoc Population Segments

The user needs research demonstrated that many researchers have a particular interest in one or more subgroups in the postdoc population. The following table identifies the postdoc population segments and their coverage by the existing SRS data resources.

To meet all of the user needs, the Postdoc Data Project would have to develop an information strategy that fills the identified gaps in coverage, including professional Ph.D.s, foreign-degreed temporary residents, nonacademic postdocs, and non S&E postdocs. The coverage table shows that all of the noncovered postdoc population groups of interest represent at least 10 percent of the postdoc population.

Coverage of Postdoc Population Segments by GSS, SED, SDR

Segment	GSS	SED	SDR	Notes
Type of Ph.D.				
Research Ph.D.	X	X	X	85% of GSS postdocs
Professional Ph.D.	X			15% of GSS postdocs
Type of Field				
S&E	X	X	X	89% of SED postdocs
non S&E		X		11% of SED postdocs
Residency/Citizenship Status and Source of Ph.D.				
U.S. Degree Citizen/Permanent	X	X	X	42% of GSS postdocs
U.S. Degree Temporary	*	X	X	58% of GSS postdocs
Foreign Degree Temporary	*			
Sector				
Academic	X	X	X	80% of SED postdocs**
Nonacademic		X	X	20% of SED postdocs**

*Covered by GSS, but U.S. degree not separated from foreign degree.

**Estimated from an informal data run of SED data.

Coverage of Postdoc Subject-Matter Issues

The existing SRS surveys support analysis on many important postdoc subject-matter issues. However, the data user needs research identified gaps in the coverage of important postdoc subject-matter issues. Given the large number of topics not fulfilled, SRS would have to prioritize among the postdoc research needs and establish new research programs to meet them. In that process, SRS will need to consider which information objectives are consistent with the mission of SRS and which are more appropriately addressed by other organizations.

Potential Postdoc Frames

List Sources for Temporary Resident Ph.D.s and Professional Ph.D.s

One approach to developing a sample frame for postdocs would identify list sources that can supplement the existing postdoc frames. We conducted research to identify list sources for the two postdoc population segments that are not covered by existing SRS resources - foreign-degreed temporary residents and professional Ph.D. recipients.

There are a number of potential sources for building a frame of foreign-degreed temporary residents, including:

- SEVIS – The Student and Exchange Visitor Information System collects information on all J-1 visa postdocs from their host institutions.

- Government Records – The Department of Homeland Security has information systems for H1-B and other relevant visa groups.
- Organizational Records – Individual organizations have to keep records of their J-1 and H-1B visa employees.⁶

Establishing access to data sources for foreign-degreed temporary residents is a potential barrier to frame development. SRS is working with the Department of Homeland Security to understand the potential for gaining access to DHS records. In addition to these ongoing efforts, we recommend that SRS investigate an alternative approach of working with postdoc host organizations (academic and nonacademic) to develop a frame of foreign-degreed temporary residents.

We were able to identify multiple lists of Ph.D. equivalent professionals that would be good sources of information for this postdoc population segment. The American Medical Association licenses Redi-Mail Direct Marketing to provide list management and sourcing for the AMA and many other professional associations.⁷ Additionally, the GSS shows that 22 percent of academic postdocs with a Ph.D. equivalent professional degree have federally funded fellowships or traineeships as their sources of support. This may mean that NIH fellowship and traineeship lists would be another source available to identify Ph.D. equivalent professional postdocs.

Developing Postdoc Information for Nonacademic Organizations

A second approach to developing a sample frame for postdocs would select a sample of establishments that employ postdocs and obtain lists of postdocs from those establishments. Such an approach would require information on both academic and nonacademic postdocs.

To explore the potential for gathering information on postdocs from nonacademic organizations, we had informal discussions with a few nonacademic organizations that employ postdocs. In those discussions, we did not uncover any major barriers to collecting postdoc counts and characteristics similar to the GSS data items from these organizations. Specific findings include:

- Organizational postdoc definitions were consistent with the GSS postdoc definition.
- Most of the organizations had centralized human resources records for postdocs.
- All of the organizations indicated that they would be able to furnish the information requested in “Item 8” of the GSS survey (i.e., the postdoc item).

⁶ Most foreign degreed temporary resident postdocs have a J-1 visa (for scholars) or an H-1B visa (for temporary workers). U.S. degreed temporary residents who have an F-1 visa (for students) can be employed as a postdoc as part of a one-year practical experience extension of their F-1 visa.

⁷ Information retrieved from www.redimail.com on January 6, 2006.

These findings show that nonacademic establishments have postdoc data that are similar to the data from academic establishments. However, these discussions did not assess whether the organizations would be willing to participate in an NSF effort to develop a list of postdocs for purposes of developing a sample frame. Further research is needed to determine the feasibility of obtaining postdoc lists and developing a sample frame from these organizations.

Other Postdoc Surveys

Other governmental and nongovernmental organizations have conducted research studies on postdocs and have periodic data collection programs that include postdocs. Those studies offer the Postdoc Data Project examples of research methods and opportunities for the development of information on postdocs. Four such research studies are:

- Postdoctoral Appointments and Disappointments
- PhD's: Ten Years Later
- Enhancing the Postdoctoral Experience for Scientists and Engineers
- Sigma Xi Postdoc Survey

Additionally, some professional societies conduct periodic surveys of their members, including annual or periodic member surveys and annual surveys of new research doctorates. The International Institute for Education conducts a yearly survey with institutions that host foreign postdocs. These resources also furnish valuable information to the Postdoc Data Project. However, none of them meet the needs identified by the postdoc data user needs research in a consistent and sustainable way.

Design Options

To meet all the information needs identified in the data user needs research, it is our assessment that the Postdoc Data Project would need to develop a comprehensive information strategy that expands the coverage of data collection on postdocs and enhances the content of information collected about postdocs. Postdoc data collection would need to cover all types of postdocs in all economics sectors. Data would need to be collected from postdocs, both when they are postdocs and later in their career, as well as from institutions and PIs. SRS also would need to consider what it can reasonably contribute to the understanding of S&E pipeline issues as part of the postdoc data collection process.

In this research project, we developed options for fulfilling all aspects of postdoc data user needs, including postdoc data, information from PIs and institutions, and information on S&E pipeline issues. However, we expect that SRS will have to prioritize among these competing information needs and select design options that address the highest priority postdoc information needs. We first outline the options for meeting all needs and then make recommendations for an approach that we believe meets the highest priority needs.

Postdoc Information

We considered four options for developing information about postdocs.

- Integrated Postdoc Information Strategy – Development of postdoc information by enhancing existing SRS surveys and developing complementary surveys.
- Nonintegrated SRS Postdoc Survey – Design and implementation of a new SRS Postdoc Survey that does not make use of existing SRS surveys.
- Meta-Analysis – Development of an SRS sponsored clearinghouse for postdoc data.
- Case Studies – Design and implementation of case studies to fill postdoc information gaps.

In the following discussion, we outline the research activities that would be associated with each approach.

Option #1 - Integrated Postdoc Information Strategy

An integrated postdoc information strategy would make use of existing SRS resources whenever possible. The integrated approach might include the following components:

- Enhancement of Aggregate Postdoc Statistics – To develop aggregate statistics for the entire population of postdocs, SRS would implement a Postdoc Establishment Survey of Nonacademic Organizations and enhance the postdoc content of the GSS.⁸ [Note: One purpose of the nonacademic establishment survey is to improve postdoc population statistics. A second purpose of the survey is to furnish a measure-of-size for foreign postdocs in nonacademic establishments for the development of the postdoc sample frame.]
- Postdoc Sample Frame – The development of a postdoc sample frame that is based on SED respondents, supplemented with a frame of foreign postdocs (from DHS sources or from host institutions) and a frame of postdocs with Ph.D. equivalent professional degrees (from list sources).
- Postdoc Sample – Periodic selection of a sample of postdocs from the postdoc frame. Each sample would represent a postdoc cohort that would be tracked over time.
- Postdoc Entry Survey – Administration of a postdoc entry survey that is targeted to be completed during the first year of the postdoc’s appointment.

⁸ One enhancement of the GSS content would be obtaining separate counts of U.S. degreed and foreign degreed “foreign” postdocs.

- Postdoc Longitudinal Data – Collection of information on postdoc experiences and career progression by adding the postdoc sample to the SDR. The existing SDR questions would furnish information on career progression. A special postdoc module or follow-up survey would be needed to collect information on postdoc experiences.

Option #2 - Nonintegrated Postdoc Information Strategy

A nonintegrated postdoc information strategy would focus on the development of new data collection procedures that are dedicated to collection of information on postdocs. In the nonintegrated approach, the postdoc sample would be developed independently of the SED and the postdoc data collection would be conducted independently of the Survey of Doctorate Recipients. The nonintegrated approach might include the following components:

- Enhancement of Aggregate Postdoc Statistics – To develop aggregate statistics for the entire population of postdocs, SRS would implement a Postdoc Establishment Survey of Nonacademic Organizations and enhance the postdoc content of the GSS. [Note: One purpose of the nonacademic establishment survey is to improve postdoc population statistics. A second purpose of the survey is to furnish a measure-of-size for the development of a sample of postdocs.]
- Postdoc Sample – The development of a postdoc sample that uses a two-stage sample procedure. In the first stage, a sample of organizations that employ postdocs would be selected using the measures of size developed from the GSS and the nonacademic postdoc establishment survey. In the second stage, lists of postdocs would be obtained from sampled organizations and a sample of postdocs would be selected.
- Postdoc Entry Survey – Administration of a postdoc entry survey that is targeted to be completed during the first year of the postdoc’s appointment.
- Postdoc Longitudinal Data – Collection of information on postdoc experiences and career progression through follow-up surveys conducted over time.

Option #3 - Meta-Analysis Strategy

In this option, SRS would not directly fund new data collection, but would use its resources to facilitate the analysis and dissemination of information from existing SRS and nonSRS data sources. The strategy might include: establishment of a repository for research findings; proactive efforts to identify research by SRS, NSF, and other researchers that should be included in the repository; grants to extramural researchers to conduct analyses of SRS data; grants to extramural researchers for analysis of nonSRS data or case studies; and, periodic workshops to increase awareness of and encourage use of the information repository.

Option #4 - Case Study Strategy

In this option, SRS would directly support cases studies to develop a better understanding of postdocs, their expectations, their experiences, and their career goals. Cases studies are useful in both the development of research hypotheses and in developing a better understanding of quantitative research findings. Case studies are also useful for developing a better understanding of complex relationships, such as the linkage between postdocs, principal investigators, and institutions. The case studies could be conducted by SRS staff, SRS contractors, or by researchers who apply for SRS grants.

Information from Institutions and PIs

To furnish the complete set of information identified in the postdoc data user needs research, information would have to be gathered from principal investigators (PIs) and institutions. PIs would provide information on the role of postdocs in the research enterprise and on their involvement with postdocs in training and career development. Institutions would provide information on their postdoc practices, including personnel practices and career development support. Issues in the development of such information include:

- **Study Sponsor** - One important question is whether SRS is the right organization to gather such information. It may be more appropriate for the agencies that fund postdocs directly through fellowships and traineeships, and indirectly through research grants to take responsibility for collecting information on how their funds are used and to relate the findings directly to their funding decisions. However, an agency-sponsored study would appropriately focus on PIs and institutions with funding from that agency, while a study conducted by SRS would have a broader scope that is generalizable to all PIs and institutions with postdocs, regardless of the funding source.
- **Linked vs. Unlinked Data** - If SRS determines that gathering information from PIs and institutions is feasible and is within the scope of its mission, it is important to consider whether the information will be linked to the survey of postdocs. A linked sample of PIs and/or institutions would require a postdoc survey respondent to name the PI on his or her grant and identify the institution for which he or she works. That would allow researchers, decision-makers, and other data users to directly link the experiences of individual postdocs to the policies and practices of PIs and institutions. However, that may not be the best way to gather information on the overall policies and practices of PIs and institutions as a group.

Information on S&E Pipeline Issues

One area of concern to decision-makers is that the postdoc system may represent a barrier, rather than an effective tool, in the development of a high quality S&E workforce. In some S&E fields, it is not unusual for a student to spend ten years completing a Ph.D. and one or more postdoc appointments. Compared to other occupations, it is perceived that the training phase for members of the S&E workforce is significantly longer and more difficult. There is an interest in how individuals' perceptions might affect their decisions to pursue an S&E career.

In part, the SED, the proposed postdoc entry survey, and the SDR can furnish information on why individuals chose to select an S&E career and take a postdoc. However, the broader questions of how highly qualified students at the undergraduate or even high school level choose whether to pursue an S&E career appear to be beyond the scope of the Postdoc Data Project and SRS surveys. The Postdoc Data Project can contribute to the development of information by including questions on career decisions in its data collection activities. However, this issue needs to be considered more broadly and appears to be beyond the scope of the Postdoc Data Project.

Recommendations

The postdoc data user needs research presents a convincing case that SRS should take an active role in the development of postdoc data with broad coverage of postdoc population segments and postdoc policy issues. Our research showed that much of the information needed by postdoc researchers and decision-makers is not currently available from SRS, other government agencies, or nongovernmental sources. Further, it appears that the type of information needed is consistent with the mission of SRS. We examined a number of options for meeting postdoc information needs, including development of an integrated postdoc information strategy, meta-analysis of available postdoc data, case studies of postdoc experiences, and fielding a nonintegrated SRS Postdoc Survey.

We recommend that SRS adopt the integrated postdoc information strategy for a number of reasons.

- **Content and Coverage** – The main finding from the postdoc data user needs research was that postdoc researchers and decision-makers needed additional coverage of postdoc subject-matter issues and broader coverage of postdoc population segments. Only a survey-based approach is likely to yield that result.
- **Cost** – Since the strategy would make use of the existing infrastructure of SRS surveys, it is likely to cost less than a strategy that implements a nonintegrated survey.
- **Sustainability** - To the extent that the strategy requires fewer resources, it is likely to be more sustainable. In addition, if funding for postdoc data collection is available intermittently, using the existing survey infrastructure would minimize the need to start up and shut down special postdoc data collection activities.
- **Analytic Advantages** – The integrated option allows analysts to directly compare the career outcomes for research Ph.D.s who take postdocs to those who do not using the same set of survey measurements.

Implementation of the integrated postdoc information would involve the following research activities (the diagrams on page 17 and 18 provide details for steps 2 and 3 of the proposed approach):

- Step 1 – Develop comprehensive statistics on the postdoc population by enhancing the GSS postdoc data and implementing a Postdoc Establishment Survey of Nonacademic Organizations (i.e., government, nonprofits, and industry). [Note: GSS postdoc statistics do not include nonacademic postdocs and do not distinguish between foreign postdocs with a U.S. degree and those with a degree from a foreign institution.]
 - Postdoc Establishment Survey – One way that SRS can develop a frame of nonacademic organizations that employ postdocs is by making use of data from the SED. In the SED, new research doctorates indicate their post graduation plans, including the intent to take a postdoc. The SED collects information on the specific institutions where respondents plan to take postdocs. A recent SRS data run identified over 1,700 postdocs that identified a nonacademic organization as the location of their planned postdoc appointment. SRS could conduct a census of such organizations, or could use SED responses to estimate a measure-of-size for such organizations and select a probability proportionate to size (PPS) sample.
 - GSS Enhancement – The value of postdoc data provided by the GSS could be enhanced by asking institutions to provide more detail on foreign postdocs, providing separate counts for those with U.S. Ph.D.s and those with Ph.D.s from a foreign institution. Using those data, SRS could estimate the share of foreign postdocs already covered by the SDR (i.e., those with U.S. Ph.D.s) and the share that are not already covered by the SDR (i.e., those with Ph.D.s from foreign institutions).
- Step 2 – Develop a comprehensive frame of postdocs that includes all types of postdocs.
 - U.S. Research Degrees – The core postdoc sample frame would be developed from responses to the SED for a target cohort of Ph.D.s. The sample file would need to include information on the respondent’s residency status, as well as on the respondent’s post graduation plans.
 - Foreign Research Degrees – The core frame would need to be supplemented with foreign postdocs that are not included in the core frame (i.e., those that received their Ph.D. or Ph.D. equivalent degree from a foreign institution). There are two potential ways to supplement the frame. One method is to get information from the Department of Homeland Security. A second method is to select a sample of institutions that host foreign postdocs using measures-of-size from the GSS and the Nonacademic Postdoc Establishment Survey and get a list of such postdocs from the sampled institutions.
 - Ph.D. Equivalent Degrees – The basic frame also would need to be supplemented with postdocs that have a Ph.D. equivalent professional

degree, since they do not complete the SED. We have identified list sources that appear to furnish an efficient sample frame for such postdocs.

- Step 3 – Select and screen a sample of postdocs.
 - Selection – The postdoc frame discussed above includes both individuals that have postdocs and those that do not have postdocs. For example, SED respondents include those who planned to take postdocs and those who did not plan to take postdocs. Some of those who planned to take postdocs may have changed their plans. Some of those who did not plan to take postdocs may have eventually taken postdocs, either because they were not able to find other employment or because they found that a postdoc better met their needs than the job they took. An efficient and unbiased postdoc sample would give all members of the frame the opportunity to be selected, but would select those with the highest probability of being postdocs at the highest rate.
 - Deduplication – Because the postdoc frame will be developed from multiple sources, it will have duplicate records. For example, if an organization provides a list of foreign postdocs, but does not provide information on the source of their Ph.D. (i.e., U.S. institution or foreign institution), any U.S. degreed foreign postdocs will be in the frame twice. An efficient approach to deduplication is to select a sample, and then assess whether the selected unit was duplicated in the frame.
 - Screening – The final step in the sampling process (usually included as part of the survey) is to screen each sampled unit for survey eligibility, i.e., are they actually employed as a postdoc.
- Step 4 – Conduct the Postdoc Entry Survey: For a Ph.D. cohort, SRS would conduct a survey of postdocs regarding their reasons for taking a postdoc, their expectations from the postdoc, and any initial experiences with the postdoc. (Note: The survey could include individuals that initially took a postdoc, but have since moved on to other positions.)
- (Optional) Step 4A – Linked Institutional and PI Data: Each respondent could be asked to identify the institution and the PI for their postdoc appointment. A follow-up survey could be conducted to obtain information about postdoc policies from the institution and to collect information about the postdoc’s appointment from the PI.
- Step 5 – Longitudinal Data Collection for Postdoc Entry Survey Respondents: SRS will need longitudinal data on subsequent postdoc experiences, as well as data on the career progression for interviewed postdocs. This could be accomplished by collecting information in the context of the SDR interviewing process.

- SDR Instrument – Each cohort of Postdoc Entry Survey respondents could be scheduled for inclusion in later SDR surveys. For example, respondents might be included in the first SDR following the Postdoc Entry Survey, and then could be included in an SDR once every ten years thereafter.
- Postdoc Experience Follow-Up – As part of the SDR, respondents are asked whether their current position is a postdoc. Based on their responses to that question, Postdoc Entry Survey respondents could be targeted for follow-up data collection that would gather additional information on their postdoc experiences.⁹
- Step 6 – Estimation and Reporting: In the short run, each cohort of Postdoc Entry Survey respondents could be used to develop estimates of initial experiences for postdocs. Over time, the career progression of postdocs could be tracked and compared to the career progression of individuals that did not take postdocs.

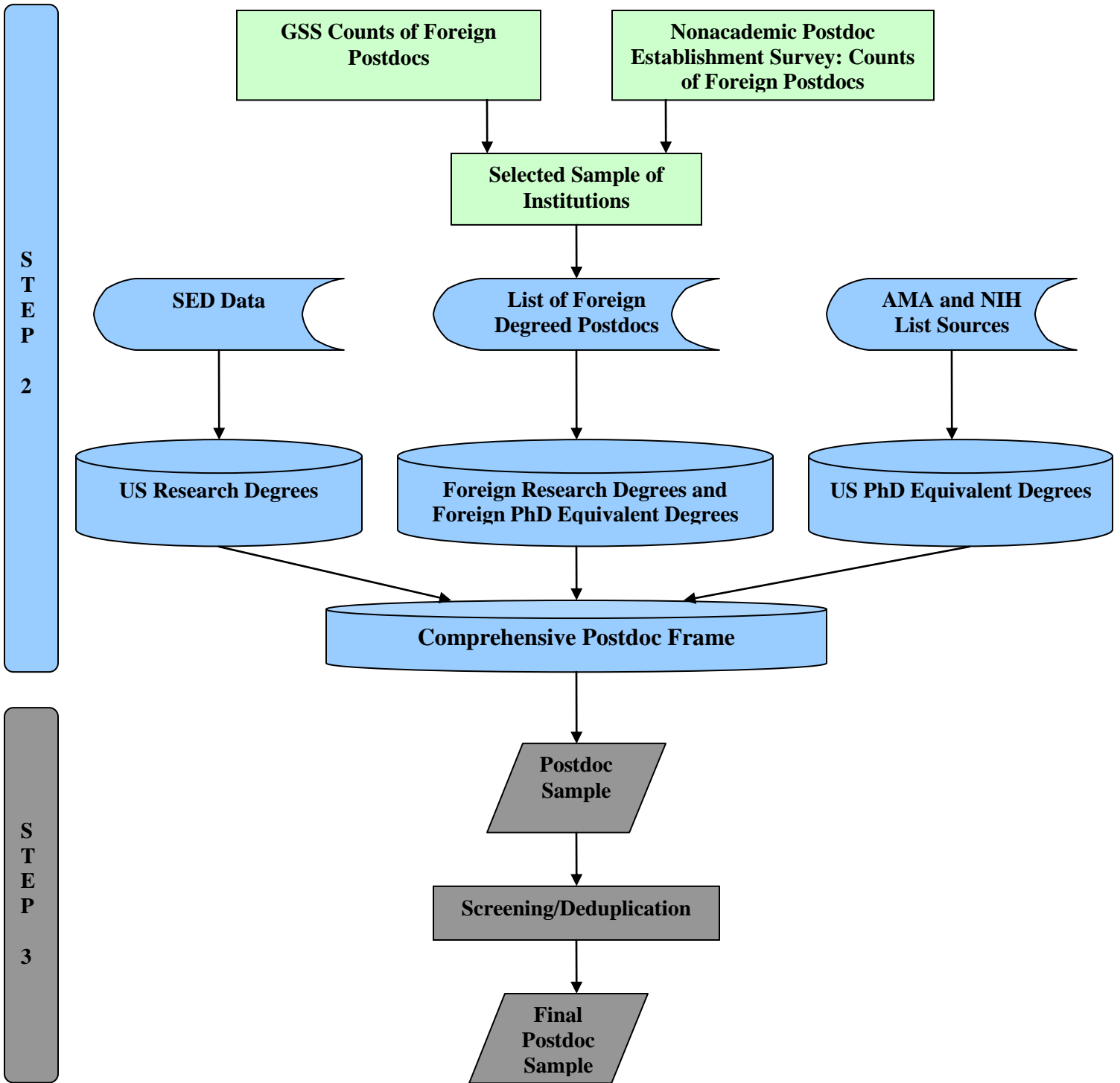
If this option were selected, SRS would need to be careful to minimize the impact of the integrated postdoc information strategy on other surveys. Some issues that would have to be addressed include:

- SDR Statistics – The SDR should continue to publish statistics that do not include the supplemental postdoc data. That would maintain the consistency of SDR trend data.
- SDR Response Rate – Special postdoc data should be collected through follow-up surveys so that the SDR response rate is not affected by questionnaire length.
- Supplemental Sample – The postdoc sample should be treated as a supplement to the SDR so that one could measure the incremental costs incurred on the SDR by the postdoc data collection and make the budget requests necessary to meet postdoc information needs.

While we recommend that SRS establish the development of an integrated postdoc information strategy as its highest priority, we also recommend that SRS consider other postdoc research activities if funds are available. Meta-analysis of postdoc data and case studies of postdocs and their experiences both have the potential to offer significant new insights into the postdoc experience. In addition, more systematic data collection from institutions and principal investigators also seems worthwhile, though this research may be more consistent with the mission of agencies that fund postdocs and basic research.

⁹ The postdoc experience follow-up would include questions on current experience for respondents that are still postdocs, as well as questions on the transition for those respondents that just moved from a postdoc position to a non postdoc position.

Recommended Postdoc Sample Development Procedures



Recommended Alternate Postdoc Sample Development Procedures

