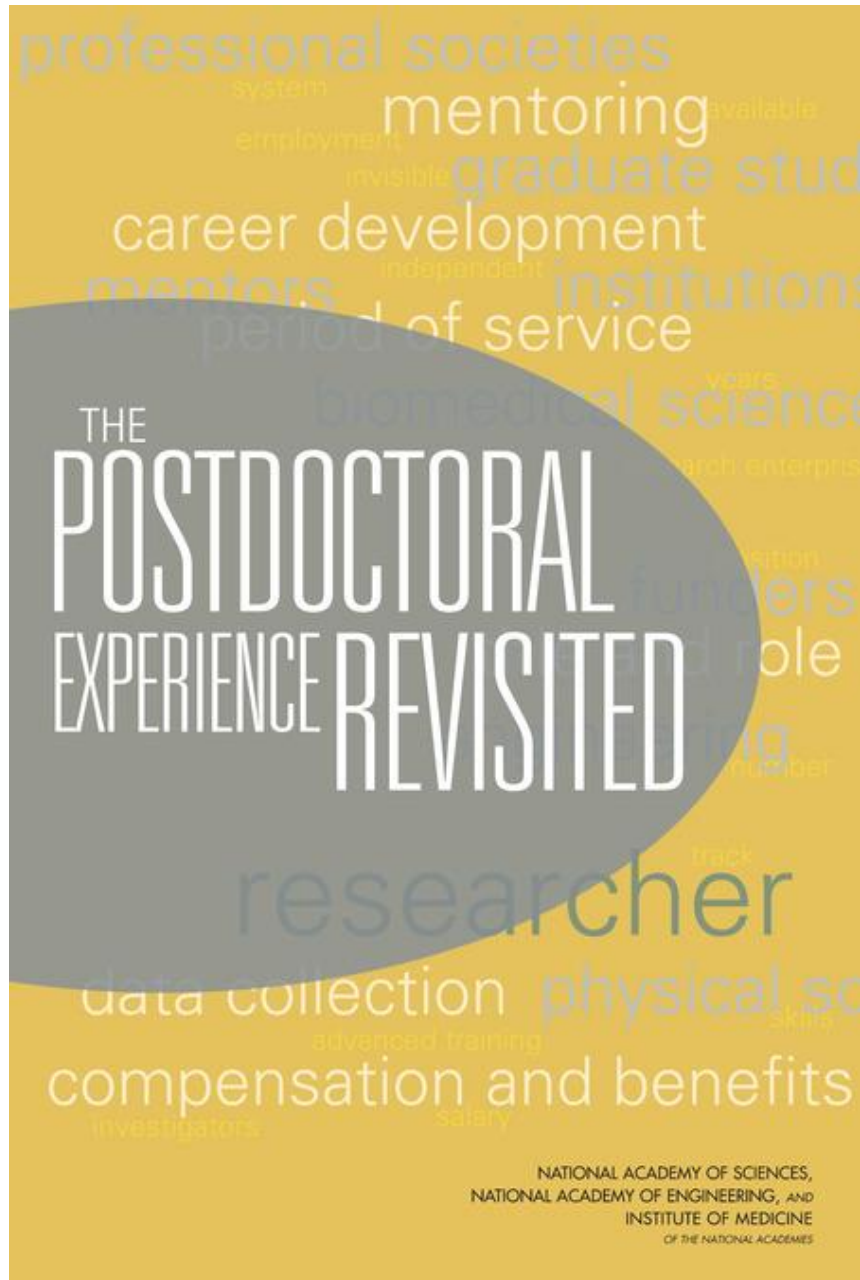


The State of the Postdoctoral Experience for Scientists and Engineers Revisited

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THE
**POSTDOCTORAL
EXPERIENCE REVISITED**

NATIONAL ACADEMY OF SCIENCES,
NATIONAL ACADEMY OF ENGINEERING, AND
INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

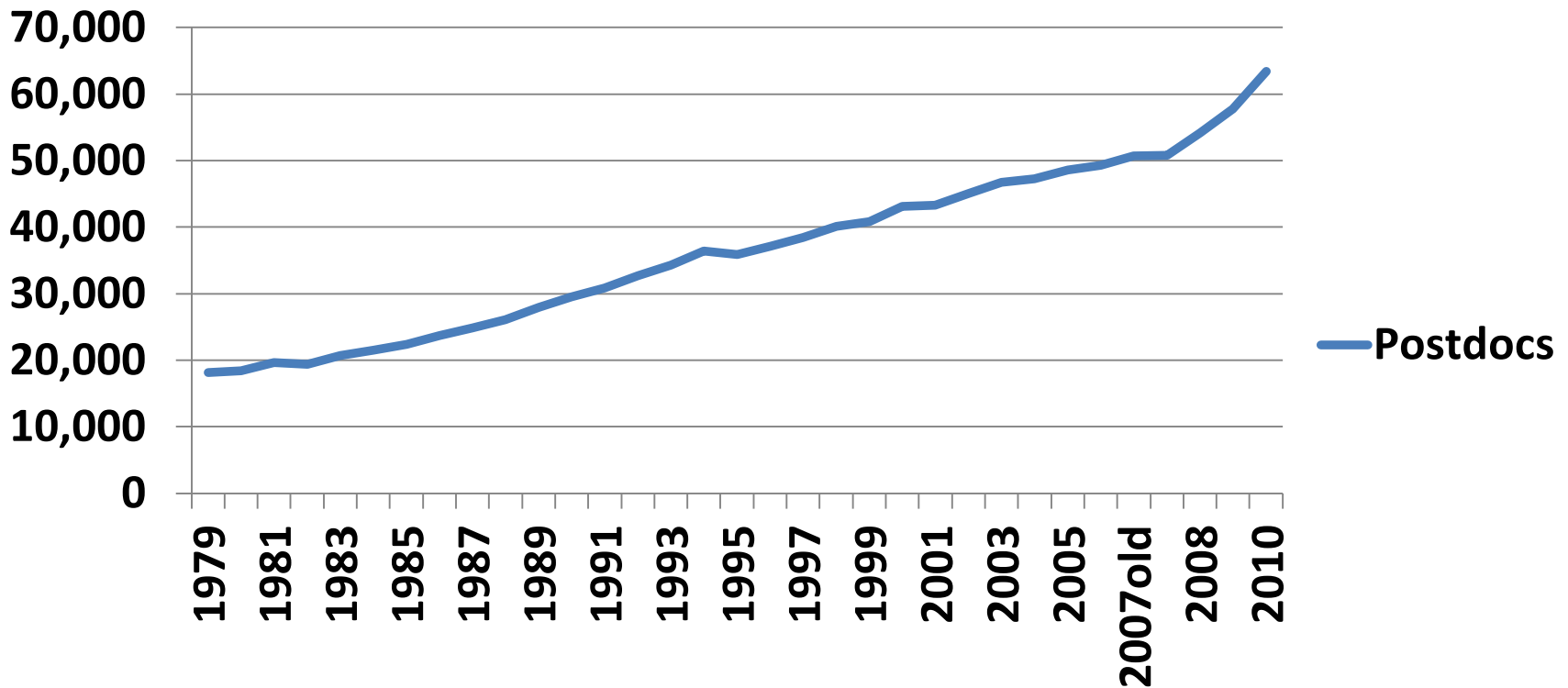
General Facts

- US has large and growing population of postdoctoral researchers primarily working at universities
- Undercounting has been a significant problem
- Population of postdoctoral researchers has increased in recent years
- Postdoctoral phenomena has spread to fields other than the physical and biomedical sciences
- Postdoctoral pay is relatively low
- Many postdoctoral fellows end up working in non-research positions

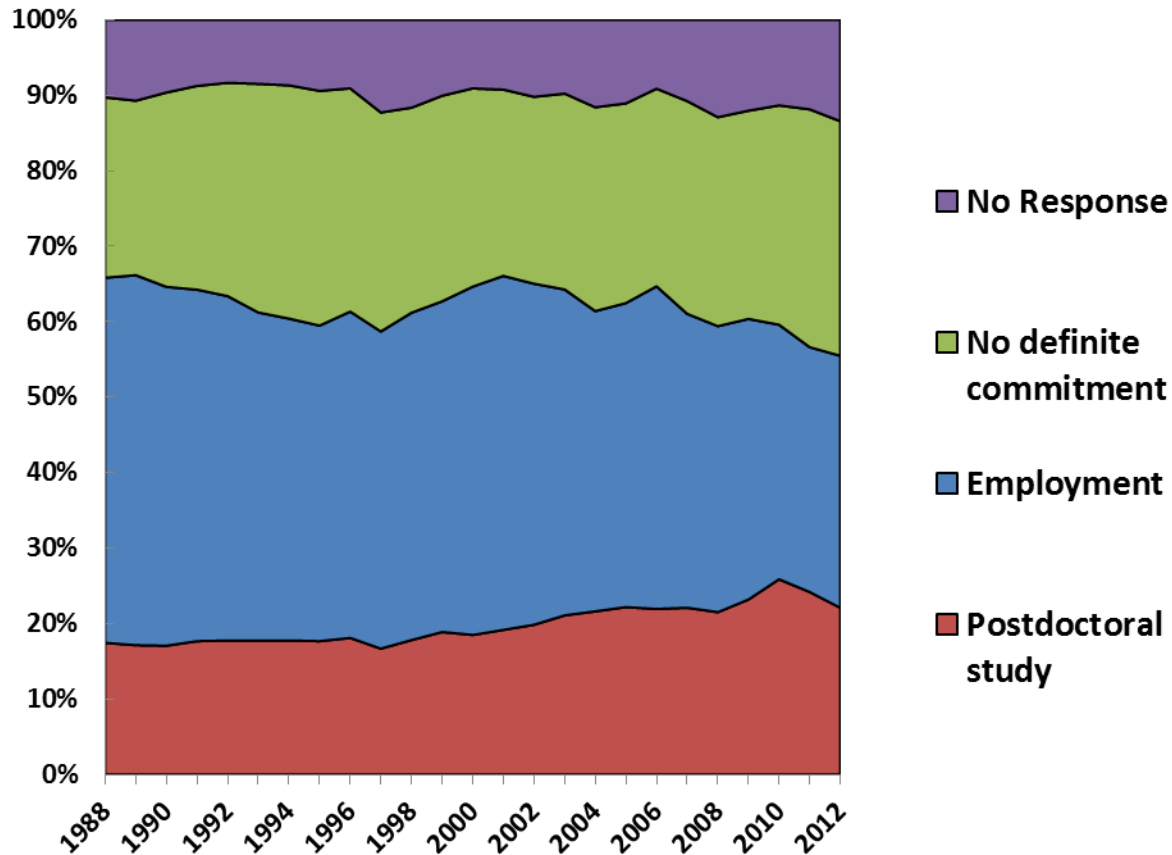
Measurement Issues

GSS

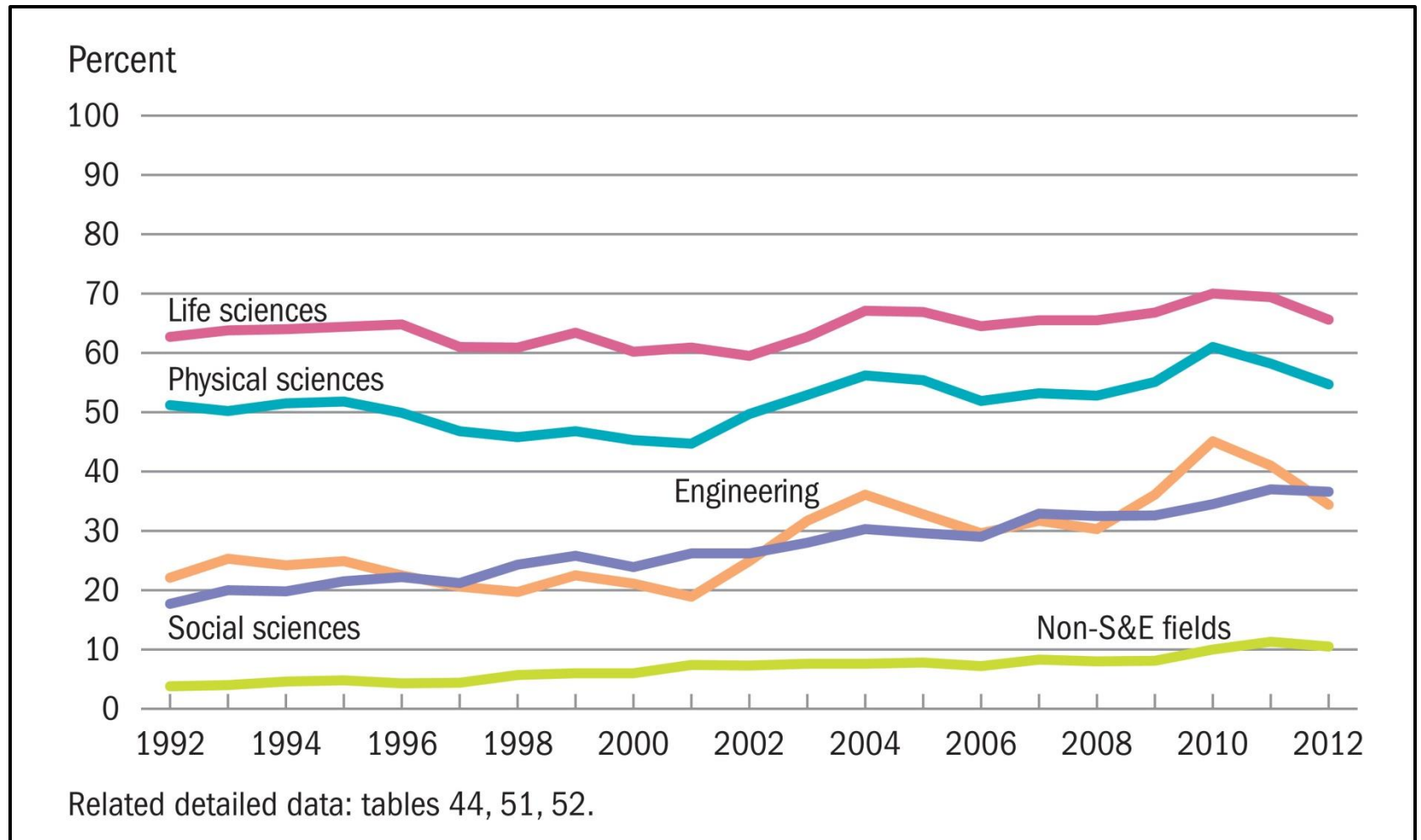
Postdoctoral researchers in science, engineering, and health: 1979–2010



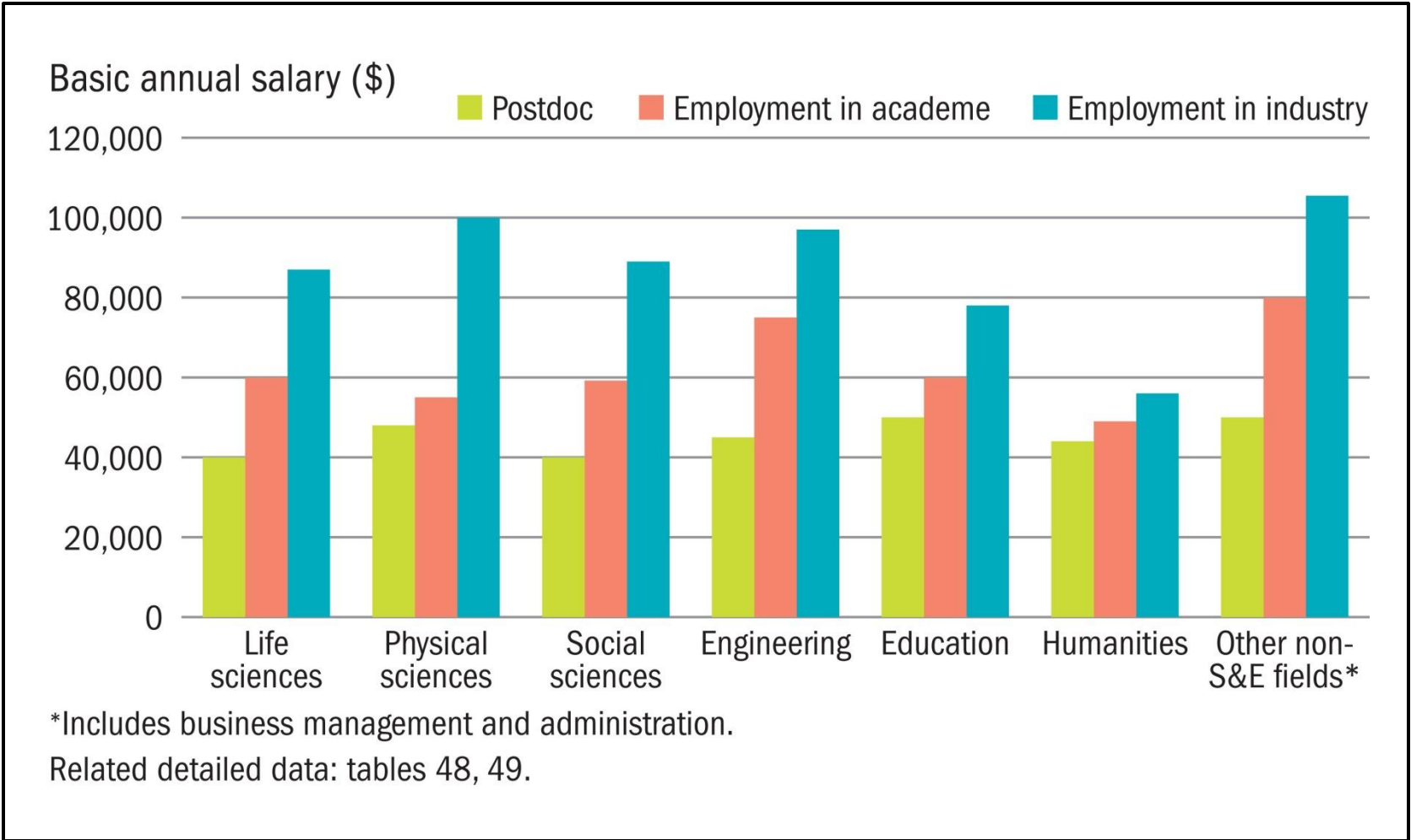
Postgraduation Plans: US-trained Doctorates



Postdoc rate, by field of study, new PhDs: 1992–2012



Median basic salary of doctorate recipients with definite commitments in the United States, by position type and field of study: 2012



Postdoctoral Salaries Reported by New PhDs in 2013 (SED data)

- Life Sciences: **\$40,000**
- Physical Sciences: **\$50,000**
- Social Sciences: **\$42,120**
- Engineering: **\$45,000**
- Non science and engineering: **\$50,000**

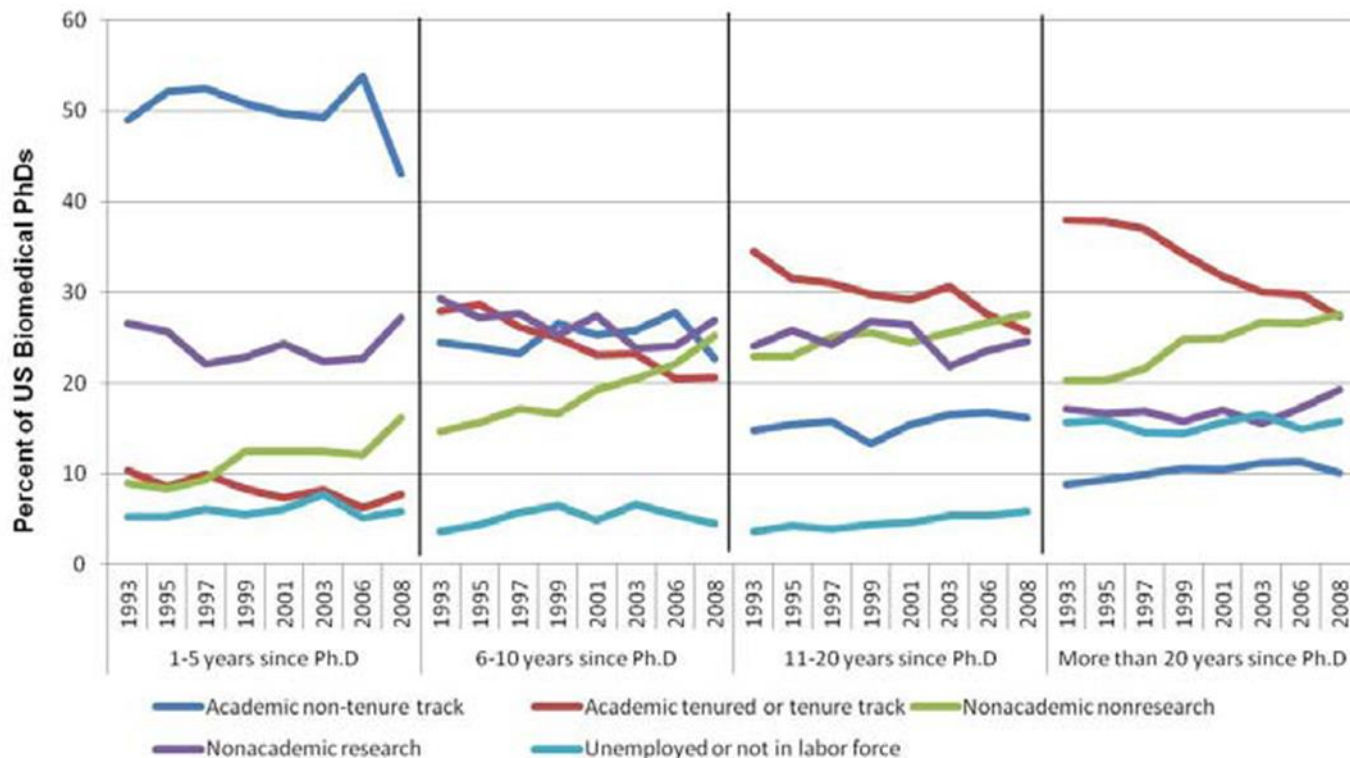
Starting Nine-month Faculty Salaries Assistant Professors, Research Public Universities 2013-2014

- Engineering: \$84,011
- Biological and Biomedical: \$74,176
- Math and Statistics: \$67,382

OSU Data

Paula Stephan Georgia State University & NBER

Employment Outcomes by Cohort, Biomedical Sciences



Recommendations

Six

- Period of Service
- Title
- Career Development
- Compensation and Benefits
- Data Collection
- Mentoring

Period of Service

- ***Period of Service:* Postdoctoral appointments for a given postdoctoral researcher should total no more than 5 years in duration, barring extraordinary circumstances.**
- Requires direct action by the funding agencies and institutions
 - Funding agencies should assign each postdoctoral researcher an identifier and keep a record of length of service
 - Institutions should maintain a record of how long postdocs remain in that position and that information should be provided to funding agencies as part of grant proposals

Title

- **The title of “postdoctoral researcher” should be applied only to those people who are receiving advanced training in research.** When the appointment period is completed, the postdoctoral researchers should move on to a permanent position externally or be transitioned internally to a staff position with a different and appropriate designation and salary.
- Action required:
 - Funding agencies should be consistent in labeling of postdoctoral researchers and require evidence that advanced research training is a component of the postdoctoral experience
 - Institutions should create or identify professional positions for people who are conducting research but not receiving training, and these people should receive appropriate remuneration, benefits and privileges.

Labor Market-related Recommendations

- Many postdoctoral researcher issues are labor market related
- Example
 - Dramatic increase in PDs in engineering has a good deal to do with economic crisis and fact that jobs in industry became less available
- Rather than address labor market issues directly, Committee addressed three components of it
 - Career development
 - Compensation and benefits
 - Data collection

Career Development

- ***Career Development:*** Host institutions and mentors should, beginning at the first year of graduate school, make graduate students aware of the wide variety of career paths available for Ph.D. recipients, and explain that postdoctoral positions are intended only for those seeking advanced research training. Career guidance should include, where feasible, the provision of internships and other practical experiences. **The postdoctoral position should not be viewed by graduate students or principal investigators as the default step after the completion of doctoral training.**

Rationale

- Recommendation grew out of an awareness on part of committee that many individuals arrive at their first postdoctoral position without having given thought to what their careers goals are.

Implementation

- Required action
 - Institutions, especially those with graduate student populations, should provide multiple engagement activities to explore all avenues of career development. Funding agencies should help to support these efforts.
 - Professional societies should gather and disseminate information about the full range of career paths within their discipline. Useful activities include collecting statistics about job openings and salaries, identifying individuals in various sectors who can provide career advice, and organizing career fairs at professional meetings.
 - Mentors, in addition to providing guidance based on their own experience, should become familiar with and disseminate information about all forms of career development opportunities available at the institution or through their professional society.
 - Postdocs and graduate students have a responsibility to participate in the career development opportunities provided by their institutions, to explore other sources of information such as professional societies, and use career-development tools such as myIDP.

Compensation*

- ***Compensation and Benefits of Employment:*** Current postdoctoral salaries are low. Salaries should be increased to (1) reflect the qualifications of postdoctoral scholars, (2) address the slow progress the community has made toward implementing salary increases as recommended in several National Research Council reports, and (3) adjust the relative wage of postdoctoral researchers to appropriately reflect their value and contribution to research.
- The NIH should raise the NRSA postdoctoral starting salary to **\$50,000** (2014 dollars), and adjust it annually for inflation. Postdoctoral salaries should be appropriately higher where regional cost of living, disciplinary norms, and institutional or sector salary scales dictate higher salaries.

* Two of the committee members do not support the recommendation for a prescriptive “salary standard” based upon one particular field and funding agency.

Rationale

- Focus on NIH is because data on starting postdoctoral salaries reveal that the starting salary prescribed by the National Institutes of Health for the Ruth L. Kirschstein National Research Service Award (NRSA) postdoctoral award has become the de facto standard for many disciplines and on many academic campuses.

Five Approaches Considered for Determining Appropriate Minimum

- Indexing to
 - Contemporaries who have but a college degree
 - Graduate stipends
 - Newly hired assistant professors
- Inflation adjustment of previous recommendations
- Research Grade Evaluation Guide
- All suggest a salary of around \$50,000

Result

- Indexing to
 - Contemporaries who have only a college degree: **\$49,911** in 2012
 - Graduate stipends: Average total cost (including tuition) for graduate students in science and engineering was **\$51,000** in 2011
 - Newly hired assistant professors in 2013-2014: Two-thirds starting salary of new faculty in biomedical sciences (nine month salary): **\$49,700**
- Inflation adjustment and NIH's response to recommendation made in 2000: **\$54,800**
- Research Grade Evaluation Guide: beginning researcher starts at GS-11 or minimum of **\$50,800** in 2014

Benefits

- In addition, host institutions should provide benefits to postdoctoral researchers that are appropriate to their level of experience and commensurate with benefits given to equivalent full-time employees.

Implementation Includes

- **Implementation**
 - Federal agencies should require host institutions to provide documentation of the salary a postdoctoral researcher will receive with all grant proposals.
 - Professional societies should collect data on salaries for all positions and make these publicly available

Data Collection

- ***Data Collection:*** Current data on the postdoctoral population, in terms of demographics, career aspirations, and career outcomes are neither adequate nor timely. Every institution that employs postdoctoral researchers should collect data on the number of currently employed postdoctoral researchers and where they go after completion of their research training, and should make this information publicly available. **The National Science Foundation should serve as the primary curator for establishing and updating a database system that tracks postdoctoral researchers, including non-academic and foreign-trained postdoctoral researchers.**

Alternative Methods

- Recognizing that this recommendation on data collection has been made many times before with little effect, the committee stresses that research institutions and professional societies should explore what they can do to enrich what is known about postdoctoral researchers and that all institutions make better use of new technologies and social and professional networks to collect relevant and timely data.

Actions

- Funding agencies must improve their data collection on the postdoctoral segment of the workforce.
- Host institutions should assist in the data collection... This information should be made publically available, particularly to prospective postdoctoral researchers.
- Funding agencies should look favorably on grant proposals that include outcome data for an institution's postdoctoral researchers
- Professional societies should utilize their networks to collect information about career paths of their members and make this data easily available.

Implementation

- Funding agencies, particularly NSF due to its congressional mandate, must improve its data collection on this segment of the workforce. NSF should work with other research agencies, particularly NIH, to develop more reliable means of collecting data on postdocs during and after their appointments. The use of a common identifier system for each postdoc is one promising approach.
- Institutions should assist in the data collection efforts by remaining consistent with their labeling of postdoctoral researcher, keeping track of new hires and departures, and conducting exit interviews to determine career outcomes of the postdoctoral population. This information should be made available to prospective postdocs.
- Professional societies should utilize their networks to collect information about career paths of their members and make this data easily available.

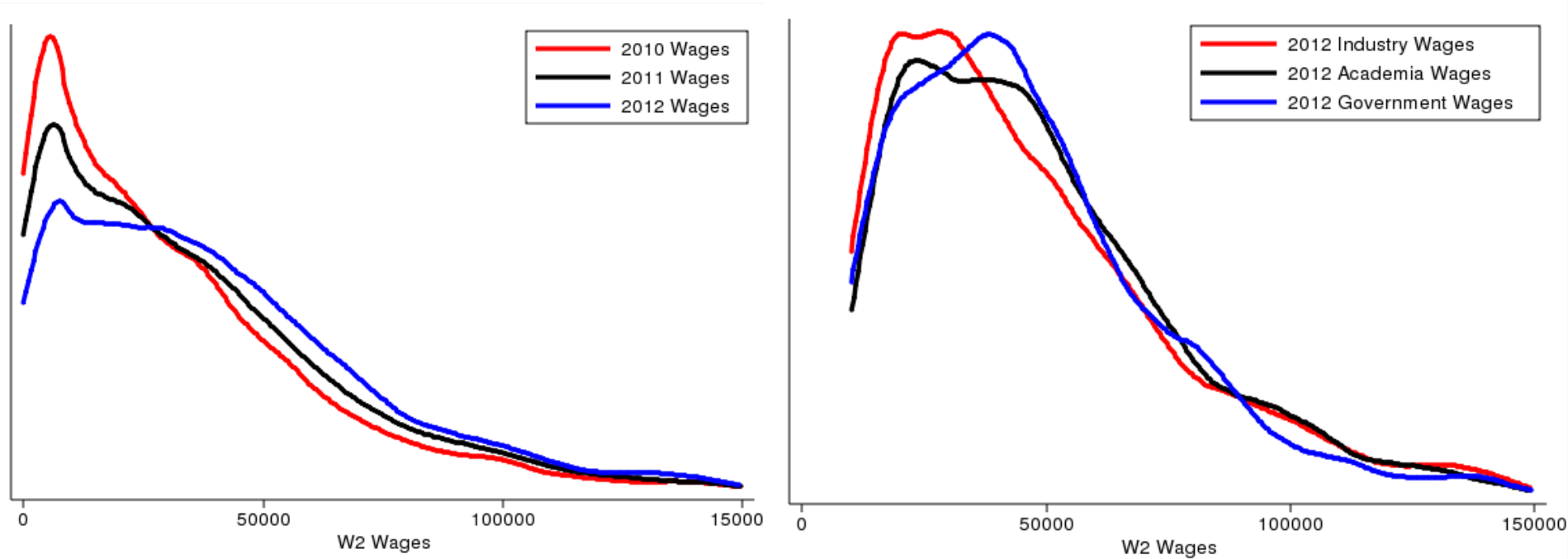
Examples of Data Collection

- University of Michigan for PhD recipients
- https://secure.rackham.umich.edu/academic/information/program_statistics/#b
- Matching of administrative data for federal grants received by students and postdocs with Census Data—UMETRICS

Earnings – 1, 2 and 3 Years After Leaving

2010 cohort

Wage Distribution - All Sources



- Wages grew in 2011 and 2012 across all sectors
- Average Wage is highest in Industry and Academia

Mentoring

- ***Mentoring:*** Mentoring is an essential component of the postdoctoral experience and entails more than simply supervision. Mentoring should not be solely a responsibility of the principal investigator, although he or she should be actively engaged in mentoring. **Host institutions should create provisions that encourage postdoctoral researchers to seek advice, either formally or informally, from multiple advisors, in addition to their immediate supervisor. Host institutions and funding agencies should take responsibility for ensuring the quality of mentoring through evaluation of, and training programs for, the mentors.**

