

Approaches for Tracking Graduate Student Career Paths

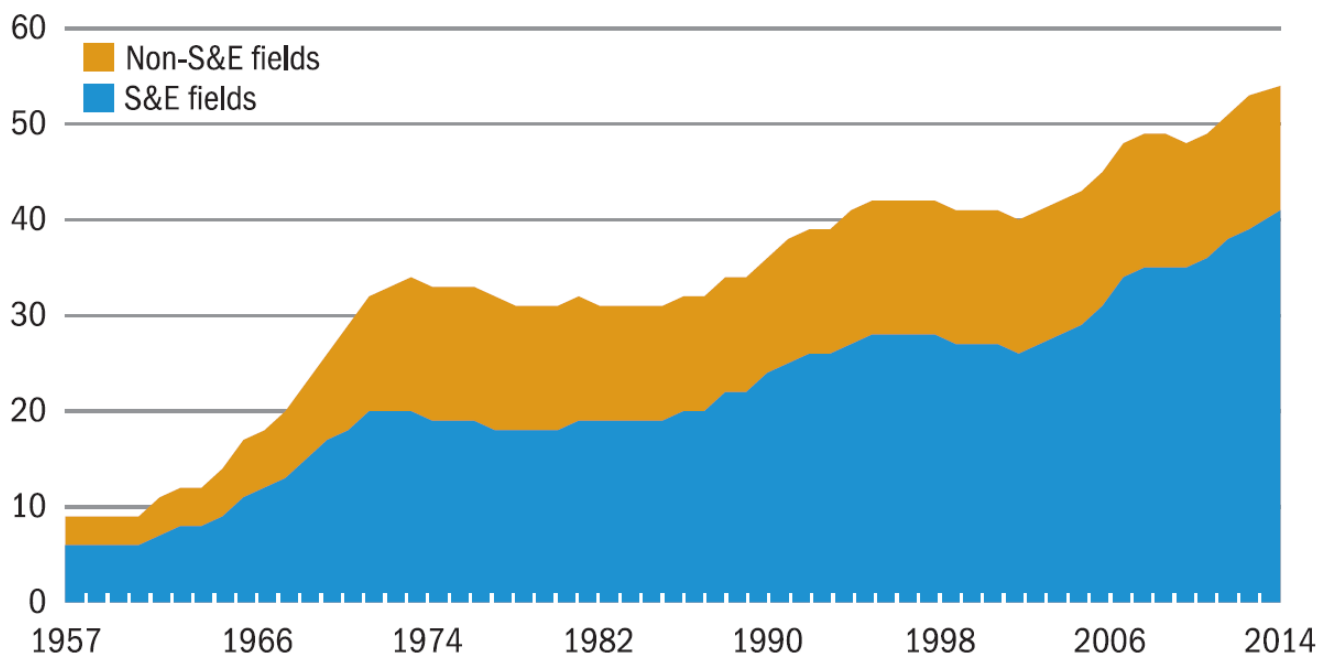
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43rd NEAIR Annual Conference, Baltimore, MD
November 15, 2016

Increase in Number of PhDs Nationally

Doctorates awarded by U.S. colleges and universities: 1957-2014

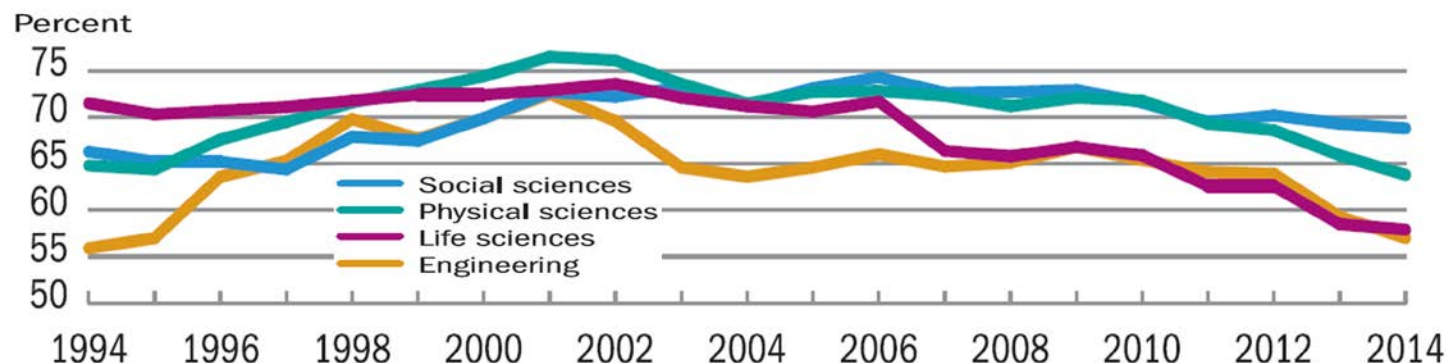
Doctorate recipients (thousands)



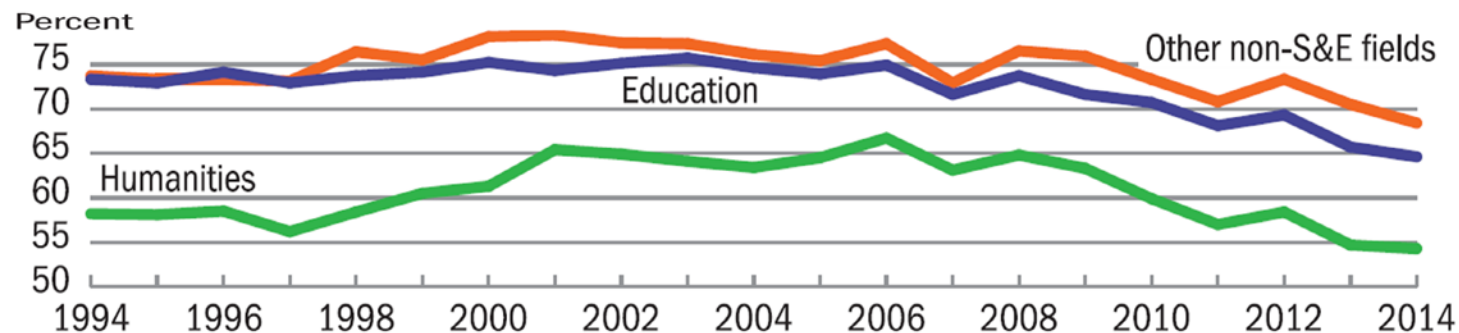
SOURCE: *Doctorate Recipients from U.S. Universities 2014*.

Percent of PhDs with Post-Graduation Employment is Declining Nationally

Definite commitments at doctorate award, by science and engineering fields of study: 1994–2014



Definite commitments at doctorate award, by non-science and engineering fields of study: 1994–2014



NOTE: Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment or a postdoc position in the coming year.

SOURCE: *Doctorate Recipients from U.S. Universities 2014*. Related detailed data: tables 42, 43.

The Shrinking Ph.D. Job Market

INSIDE
HIGHER ED

Job-Seeking Ph.D. Holders Look to Life Outside School

New doctorate holders are grappling with dwindling employment prospects within the academy

THE WALL STREET JOURNAL.

U.S. pushes for more scientists, but the jobs aren't there

The Washington Post

Fix the PhD

No longer a guaranteed ticket to an academic career, the PhD system needs a serious rethink.

nature

Clear Need for More and Better Data

- Alumni outcomes often overlooked as measure of graduate program effectiveness (Council of Graduate Schools, 2014)
 - Undergraduate outcomes have traditionally received more attention
- 54% of PhD students in 2014 CGS student survey reported receiving insufficient information about careers before starting graduate school (CGS, 2014)
- National academic organizations have called on universities to improve graduate alumni tracking
 - American Academy of Arts and Sciences
 - Modern Language Association
 - National Institutes of Health
 - European University Association

Universities are being asked to provide more answers

Where are our graduate student alumni working?

How do we define post-graduate success?

Are we preparing our students for the realities of the job market?

Are we advertising our graduate programs appropriately?

How do employment trends for our institutions' alumni compare to national trends?

Potential Stakeholders in Tracking Graduate Outcomes

Current
students

Prospective
students

Deans,
Administration

Admissions
Offices

Career
Services

Alumni and
Advancement
Offices

Graduate
Programs

Faculty and
Advisors

Program
Review

Outline

1. Overview of graduate outcomes data collection efforts (nationally and at Tufts)
2. Initial data compilation and development process
3. Sources of data
4. Creating a functioning database
5. Enhancing cooperation on campus
6. Next steps and future goals
7. Discussion

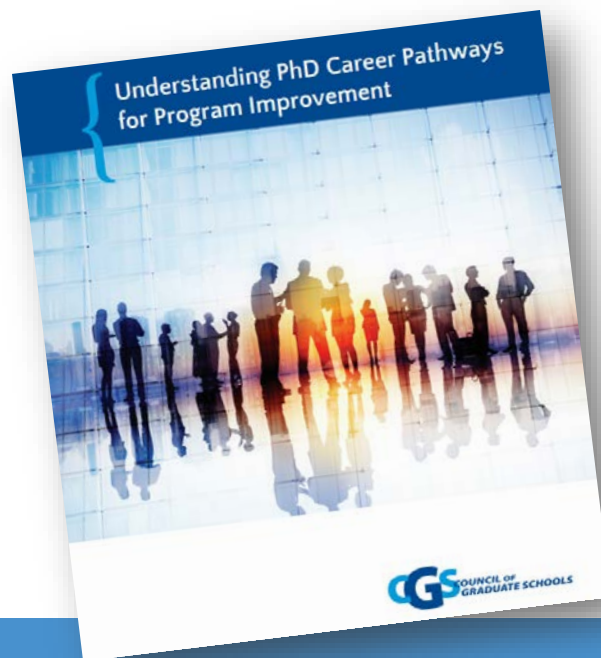
How widespread are efforts to track
graduate student outcomes?

Recent nationwide initiatives to collect graduate outcomes data

- Council of Graduate Schools (CGS)
 - [Career Pathways Project](#)
- National Science Foundation (NSF)
 - [Early Career Doctorates Project](#)
- The Chronicle of Higher Education
 - [PhD Placement Project](#)
- Survey of Earned Doctorates (will discuss in more detail later)

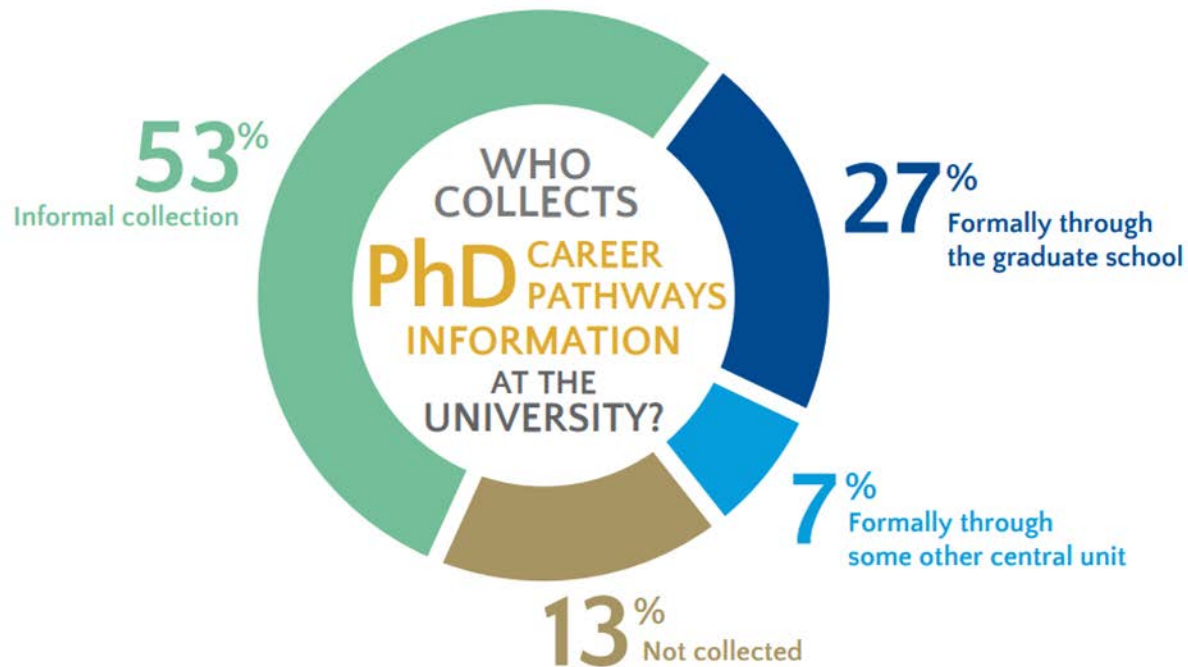
CGS Survey of Graduate Deans

- Survey sent to 271 graduate deans at CGS-member doctoral granting institutions in U.S. and Canada in 2014
- Included questions about deans' efforts to collect data regarding the careers paths of graduate alumni



CGS Survey of Graduate Deans

- 53% of graduate deans reported informal data collection efforts at university; 34% reported formal data collection efforts; 13% reported no data collection efforts



Only 1/3 of universities surveyed engage in formal data collection regarding PhD careers – Why?

Impediments to *collecting* PhD career outcomes data:

Lack of resources (staff, expertise, technology)

Incomplete or outdated alumni contact information

Inconsistent practices for collecting career information across campus

Impediments to *using* PhD career outcomes data:

Incomplete or outdated career data

Data lag – matching outcomes to current state of graduate programs

Skepticism about how data will be used or reluctance to accept findings

National efforts are promising but...

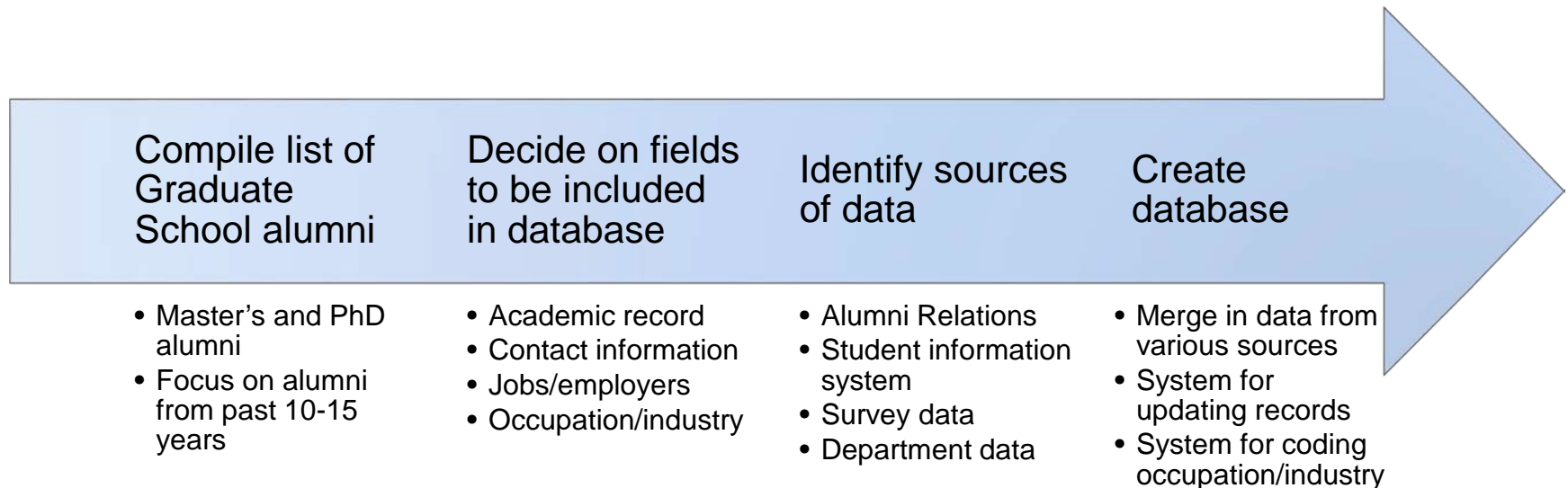
- There is still a need to develop procedures for tracking graduate outcomes within the university
 - Many national surveys are still in pilot phase
 - Not clear what type of data will be available and timeline for release
 - Data collected will not be tailored to needs of each university

Tufts' Graduate Student Outcomes Project

Background

- Mission to enhance relationship between Graduate School and its alumni
- Incomplete picture of what our graduate students are doing after they leave Tufts
- Imbalanced information across departments
- Like many other schools, Tufts' processes for collecting graduate alumni outcomes were informal and decentralized
- The dean's office in the Graduate School of Arts & Sciences is now working in partnership with the Office of Institutional Research & Evaluation to build an alumni database

Initial Development Process



Sources of Alumni Data

Compiling List of Alumni

- Before Institutional Research was brought into this project, the Graduate School had been working with a spreadsheet of Graduate School alumni from the Office of Alumni Relations
- Contains fields including:
 - Name
 - Class Year
 - Degree Program
 - Address
 - Job Title
 - Employer
 - Industry
 - Occupation

Data from Alumni Relations

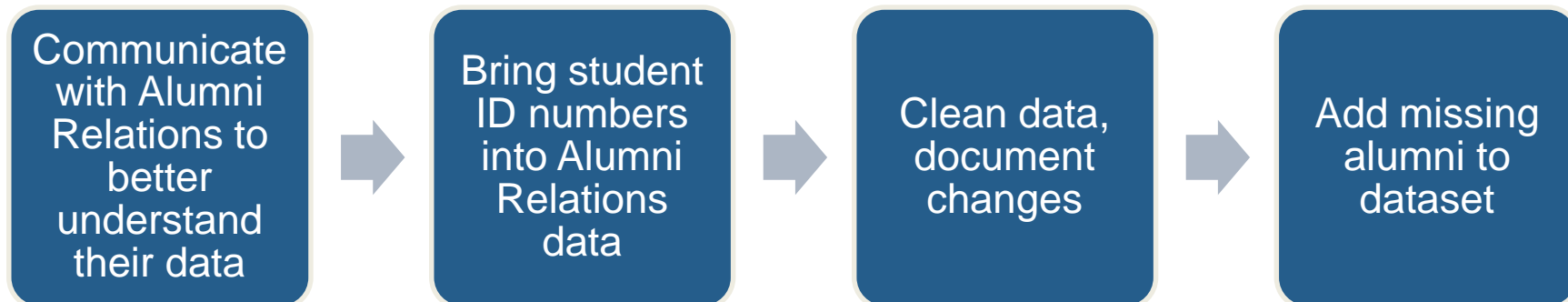
Provides a useful starting point:

- Includes some employment and occupation information
- Has more up-to-date contact information than what is stored in the Student Information System

Problems:

- Unclear how and when data was collected and updated
- Used Advancement ID numbers, not student ID numbers that are used elsewhere at university
- Contained limited information about student academic record
- Lacked demographic information
- Missing graduates and duplicate records

Using Data from Alumni Relations



Merge in fields from Student Information System

- Full name
- All degrees awarded from Tufts
- Graduation dates
- Degree programs
- Demographics
- Advisor information

Survey of Earned Doctorates

- Annual survey of all individuals receiving research doctorates from accredited U.S. institutions
- Sponsored by six federal agencies
- Collects information about individuals' educational background, demographics, post-graduation plans

Survey of Earned Doctorates

- Graduate dean or equivalent must request institution's data and sign form affirming that data will only be used internally for institutional research purposes
- Will receive dataset containing individual-level data for institution's SED respondents dating back to 1920

Fields in Survey of Earned Doctorates Data

Post-Graduate Plans

- Geographic location
- Status of plans (employed, seeking position, other degree program, will not be working)
- Distinguishes between types of positions: postdoc, employment, internship
- Type of employer (education, government, private sector, other)
- Salary
- Primary/secondary work activities

Educational Background

- Institutions that awarded all degrees
- Fields of study for all degrees
- Educational debt
- Sources of financial support in graduate school
- Title of dissertation
- Field of dissertation research
- Start and completion dates for all degrees

Survey of Earned Doctorates Provides an Incomplete Picture of Graduate Outcomes

- Lagged release of data
 - SED data currently available through 2014
- Only collects data regarding employment at time of graduation
 - How many alumni remain in first area of employment? Do postdocs and non-tenure-track faculty move on to tenure-track jobs?
- Only surveys PhD graduates
 - Some graduate schools, such as Tufts', want similar data about Master's graduates
- Does not collect data about specific job titles
- Incomplete information about name of employing organization
 - Employing organizations only available in SED data if employer is an institution with an IPEDS or Mapping the World code

Survey of Earned Doctorates

“...the SED information, coupled with a longer-term data collection effort, might be able to give a broad overview to institutions about the career pathways of their PhD graduates.” – CGS, 2014

Graduate Student Exit Survey

- Administer Graduate Student Exit Survey to students graduating with Master's or PhDs every year
- Include a block of questions about post-graduate career plans
- Because survey responses are confidential, we cannot enter the career information they report into the database

Graduate Student Exit Survey

- Starting in 2015, we inform respondents that post-graduate career information will be shared with Dean of the Graduate School and Career Center, along with student name
 - Allow respondents to check a box if they do not want information to be shared

Graduate Student Exit Survey

- Job title, employer, location, salary
- Type of employer:
 - Closely match categories on Survey of Earned Doctorates:
 - Education, government, private-for-profit organizations, not-for-profit organizations, self-employed (with more detail within each of these categories)
- For jobs in higher education:
 - Tenure-track faculty appointment
 - Non-tenure-track faculty appointment
 - Postdoctoral appointment
 - Staff/Administration position

Data Collected by Graduate Departments

- Some departments collect little information about graduate student outcomes, while others collect a wealth of information
- Data stored in a variety of formats
- Not always clear what data is being collected – First job?
Current job?
- Need to encourage departments to share data with Graduate School and report data in consistent format

Data Setup

Developing Occupation and Industry Categories

- SED categories are helpful for categorizing employers, but graduate dean at Tufts needs more information about alumni occupations and industries
- Looked at a variety of categorization schemes:
 - Tufts Office of Alumni Relations and Career Center
 - National Association of Colleges and Employers
 - Bureau of Labor Statistics
 - Other universities' exit and alumni surveys
- Developed our own occupation and industry categories
 - Used some categories from other categorization schemes
 - Developed new categories based on our interests and degree programs

Data Structure

Person Name	Block 1: Specific Employment Information	Block 2: Occupation, Industry, Employer Type	Block 3: Academic Background	Block 4: Contact Information	Block 5: Demographics
	Source: Grad Exit Survey, Alumni Relations, Department Data	Source: Occupation/ Industry coded by RAs; Employer type from SED or Grad Exit Survey	Source: Student Information System, SED	Source: Alumni Relations	Source: Student Information System
Person 1	Job 1				
Person 1	Job 2				
Person 2	Job 1				

Data Structure

Person Name	Job Title	Employer	First Job	Current Job	Occupation	Industry	Employer Type
Person 1	Post-Doctoral Fellow	Tufts University	Yes	No	Postdoctoral appointment	Higher Education	Education: U.S. 4-year college or university
Person 1	Assistant Professor	Tufts University	No	No	Educator: Faculty (tenured or tenure-track)	Higher Education	Education: U.S. 4-year college or university
Person 1	Research Associate	Company A	No	Yes	Life scientist or physical scientist	Biotechnology	Private-for-Profit Organization: Healthcare
Person 2	Occupational Therapist	Hospital A	Yes	Yes	Occupational or physical therapist	Health Care	Not-for-Profit Organization
Person 3	High School Math Teacher	High School A	Yes	Yes			
					<ul style="list-style-type: none"> Policy analyst or advocate Consultant Non-profit professional Museum or archival professional Librarian Educator: Faculty (tenured or tenure-track) Educator: Teacher or Instructor Education: Administration 		

Next Steps

Work in progress

- Graduate School plans to hire research assistants to help with additional data collection and data entry
 - Primarily will be using data from publicly available online sources
 - [Stanford](#) has had success with this method
- Considering how to best reach out to alumni to collect data beyond first employment
- Discussing best method to update data when new information becomes available
- Data exploration and analysis is next big step
 - Don't yet know how data will be used or received
- Eventually would like to integrate other data
 - For example, connecting outcomes to admissions and time-to-degree

Partnership between Graduate School Dean and Institutional Research

- “...many graduate deans are proven coalition builders who can reach across campus units to enact change, and the support of a variety of stakeholders will be necessary to successfully embed PhD career pathways data collection in institutional cultures” (CGS, 2014).
- Meanwhile, Institutional Research has crucial data expertise and resources

Changing institutional culture

- Graduate School and Institutional Research are working with other key groups on campus to encourage a culture of sharing and using alumni outcomes data:
 - Alumni Relations
 - Career Center
 - Graduate departments

Thank You! Questions?

- Questions, Comments?
 - rebecca.hatch@tufts.edu
- A copy of this presentation will be uploaded to the Tufts OIRE website (and to NEAIR's website)
 - <http://provost.tufts.edu/institutionalresearch/>

References

- Belkin, Douglas. 2016. Job-Seeking Ph.D. Holders Look to Life Outside School. *The Wall Street Journal*. <http://www.wsj.com/articles/job-seeking-ph-d-holders-look-to-life-outside-school-1465924943>
- Council of Graduate Schools. 2014. Understanding PhD Career Pathways for Program Improvement. http://cgsnet.org/ckfinder/userfiles/files/CGS_PhDCareerPath_report_finalHires.pdf
- Jaschik, Scott. 2016. The Shrinking PhD Job Market. Inside Higher Ed. <https://www.insidehighered.com/news/2016/04/04/new-data-show-tightening-phd-job-market-across-disciplines>
- National Science Foundation. 2015. Doctorate Recipients from U.S. Universities. <https://www.nsf.gov/statistics/2016/nsf16300/digest/nsf16300.pdf>
- Vastag, Brian. 2012. U.S. pushes for more scientists, but the jobs aren't there. *The Washington Post*. https://www.washingtonpost.com/national/health-science/us-pushes-for-more-scientists-but-the-jobs-arent-there/2012/07/07/gJQAZJpQUW_story.html
- *Nature*. 2011. Fix the PhD [Editorial]. <http://www.nature.com/nature/journal/v472/n7343/full/472259b.html>