Using Data to Inform Science Workforce Policies and Programs

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National Academies of Science (NAS)

Next Generation Researchers Initiative

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Biomedical Labor Market Trends in Industrial Sector and Income

![Percentage of biomedical scientists](image1)

![Median income](image2)

*Adjusted to 2014 US dollars.

Biotechnology firms, hospitals, and drug companies are the biggest employers.
Median Income of PhD Biological and Medical Scientists by Age Group and Industry Sector, pooled 2002-2014

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Private</th>
<th>Academic</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>$55,167</td>
<td>$45,088</td>
</tr>
<tr>
<td>40-49</td>
<td>$97,094</td>
<td>$62,590</td>
</tr>
<tr>
<td>50-59</td>
<td>$109,908</td>
<td>$72,676</td>
</tr>
<tr>
<td>60-64</td>
<td>$113,917</td>
<td>$98,299</td>
</tr>
<tr>
<td>65+</td>
<td>$103,401</td>
<td>$124,660</td>
</tr>
</tbody>
</table>

Source: American Community Survey (ACS), 2002-2014 pooled data, ipums.org
PhD Biological and Medical Scientists in the Private Sector by Industry Type, 1990-2014

Source: American Community Survey (ACS), ipums.org
Demographics: Age

The majority of the biomedical workforce is under 45 years old, ranging from 64% in 2002 to 55% in 2013.

Demographics: Diversity
Demographics: Family-Work Life Balance

WORK–LIFE BALANCE
Most married researchers have children during crucial times in their careers, and have a spouse who is employed.

- Age of youngest child: 0–5, 6–17, 18+

82% of married researchers aged 40–49 have children in the household.

Men aged 30–39 are 7 times more likely than women of that age to have a non-working spouse.
Research and Evaluation

• Representation Study
  – Women and minorities overrepresented in training; underrepresented in independent research
Heggeness et al., *Academic Medicine*, 2016
Research and Evaluation

• Representation Study
  – Women and minorities overrepresented in training; underrepresented in independent research

• Modeling Women in Leadership Study
  – With no policy intervention, women’s representation in RPGs increases only 4-6%
Zeng & Heggeness, Will the Gender Diversity of Young Scientists Today Improve the Diversity of Older Cohorts in the Future?, *Under Review*
Research and Evaluation

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• NIH-Funded Aging Workforce
  – Young scientists are funded at similar rates to older scientists
Heggeness et al., *Cell Stem Cell*, 2016
Other National Initiatives

- Federal Commission for Evidence-Based Policymaking
  - Larger efforts to generate policies using data and evaluations

- Census Initiatives
  - Innovation Measurement Initiative (IMI)
    - Huge potential to benefit NIH/NSF and other federal agencies that fund scientists
    - Origins in Starmetrics
    - [http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_172730.pdf](http://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_172730.pdf)
  - Master Demographic File (MDF)
    - Master File with core demographics which can be linked to administrative records for evaluation studies
  - American Opportunity Study
    - [http://www.census.gov/about/adrm/linkage/projects/aos.html](http://www.census.gov/about/adrm/linkage/projects/aos.html)
Barriers to Innovating Data

• Barriers to Data Access:
  – Difficult for social science researchers to access federal data making evaluation and research on biomedical scientists challenging

• To reduce barriers, encourage collaboration:
  – Across agency (Census, NIH, NSF, USDA)
  – Among federal agencies and researchers within:
    • Fed. Statistical Research Data Centers (FSRDCs)
    • Interagency Agreements (IAA) with researchers
Collaborative Partnerships are KEY

• Very important to PARTNER with social scientists who have training in evaluation and understand issues of causality and how to correct for it
  – E.g.: *Nature* Jan 5, 2017 publication and corresponding working paper
  – Across agency (e.g. NIH with Census)
  – Across entity (e.g. NIH with academic experts; Census with academic experts)

• These partnerships provide validity in:
  – How to structure evaluations and research that provide explanatory reasons
  – Help identify factors that work for making the workforce the most vital and rigorous that it can be
Thank you

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