

Where in the world? How in the world? The Challenges of Collecting Data around the Globe

Karen Grigorian and Shana M. Brown
NORC at the University of Chicago
Chicago, IL, U.S.
www.norc.org

Daniel Foley
National Science Foundation
National Center for Science and Engineering Statistics
Alexandria, VA, U.S.
www.nsf.gov/statistics

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Disclaimer and Acknowledgments

Disclaimer

- This paper reports research undertaken by staff at the National Center for Science and Engineering Statistics (NCSES) at the U.S. National Science Foundation and NORC at the University of Chicago.
- The views expressed are attributable to the authors and do not necessarily reflect those of NORC or those of the SDR sponsors, NCSES and the U.S. National Institutes of Health.

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Presentation Overview

Background

- International Mobility of Highly Skilled Employees
- Why it is important to collect representative data on both U.S. and Non-U.S. Residing SEH Doctorates

Methods and Strategies

- **Where in the World** – Finding an International Sample of Doctorates
- **How in the World** – Collecting Data from an International Sample of Doctorates

Conclusion

- EU General Data Protection Regulation
- Summary

Mobility of Highly Skilled Workers is Rising

A recent study shows that the growth of high-skilled migration is outpacing the growth of low-skilled migration worldwide.

~ Kerr, Sari Pekkala, William Kerr, Çağlar Özden, and Christopher Parsons. 2016. "Global Talent Flows." Journal of Economic Perspectives, 30 (4): 83-106. DOI: 10.1257/jep.30.4.83

Highly skilled workers are an important part of the workforce and are highly sought after employees.

- They have greater resources and opportunities to be mobile.
- Workers with training in science and engineering are actively recruited by countries around the world.
- Monitoring the career pathways and employment patterns of these highly skilled workers requires a global approach.

~The Organisation for Economic Co-operation and Development (OECD) (2008). The Global Competition for Talent: Mobility of the Highly Skilled. ISBN: 978-92-64-04774-7.

Increased mobility also makes it more challenging to systematically survey and monitor a highly skilled labor force.

Survey of Doctorate Recipients Overview

- Longitudinal survey of SEH doctorates earned from U.S. academic institution sponsored by the U.S. NSF's NCSSES
- Conducted every 2 years; Sample members (SMs) typically selected 2-3 years after SEH PhD award and remain eligible for inclusion in the sample through age 75
- Web, mail SAQ, and CATI survey modes; collects data on doctorates' demographic, education, and employment information
- SDR collects data from ~120,000 U.S.-trained individuals...

**regardless of their citizenship at birth,
current citizenship,
or their current country of residence.**

History of International Component in SDR

- Before the 2003 SDR cycle – Excluded as ineligible and dropped if out of U.S. for 2 consecutive cycles
- 2003 SDR – Feasibility study to include out of U.S. SMs
- 2006/2008 SDR – Sampled those predicted to be out of the U.S. and reported on the international group separately as ISDR
- 2010 to 2017 SDR – Fully integrated sample maximizing survey response regardless of participant's predicted and actual location

The 2017 cycle showed that 12.5% of the U.S. trained SEH doctorate population resides outside the U.S

SEH Doctorates in and out of the U.S. are different

2017 SDR U.S. residing and non-U.S. residing estimates

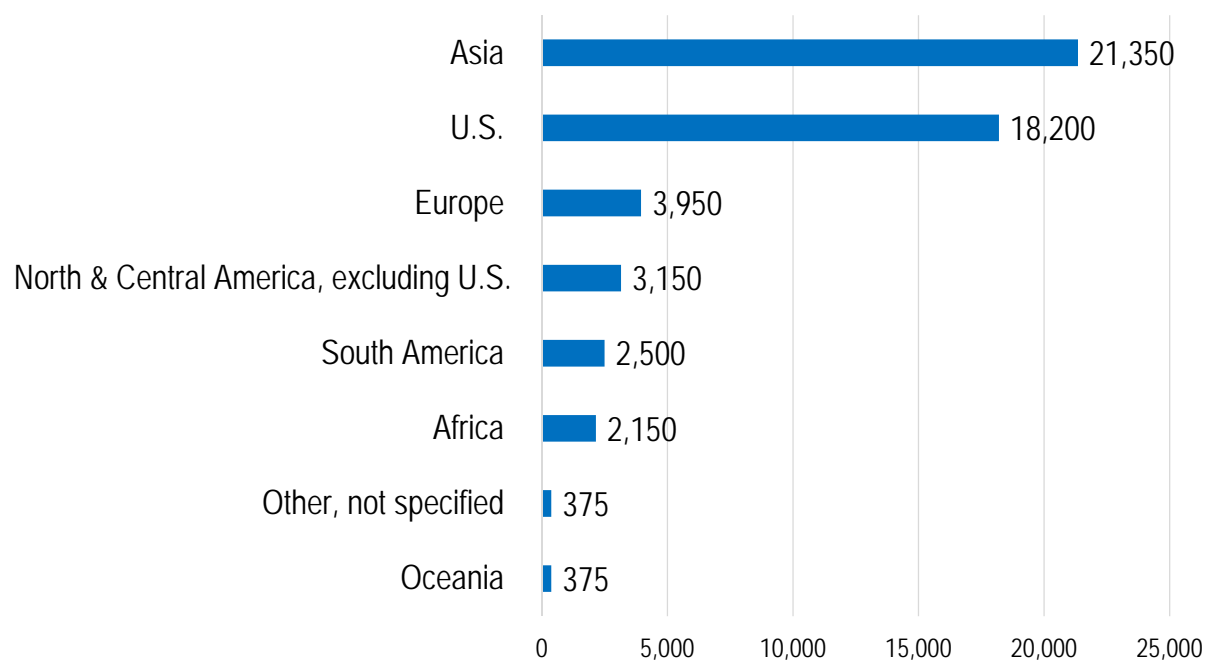
- Demographically, non-U.S. residing are more likely to be...
 - Male
 - Hispanic or non-Hispanic Asian
 - Non-U.S. born and not currently a U.S. citizen
 - Degreed in economics or engineering
- Regarding employment outcomes, the 2017 SDR data show...
 - 91% of the non-U.S. residing were employed versus 84% of those in the U.S.
 - 49% of the non-U.S. residing who were employed were primarily engaged in R&D activities versus 42% residing in the U.S.
 - 65% of the non-U.S. residing who were employed worked at an educational institution versus 43% in the U.S.

~ National Science Foundation, National Center for Science and Engineering Statistics, Survey of Doctorate Recipients: 2017. <https://ncesdata.nsf.gov/doctoratework/2017>

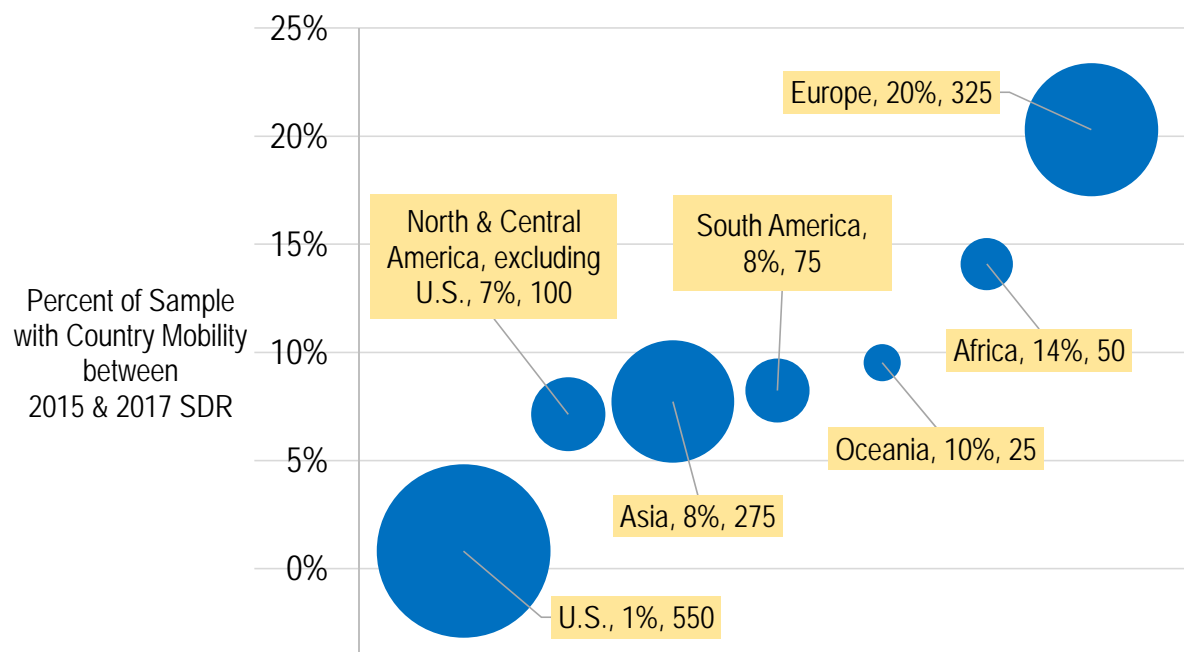
Non-U.S. Born in 2017 SDR (unweighted), Current Citizenship by World Region

- Individuals most likely to reside out of the U.S. are those not born in the U.S. and those that don't have current U.S. citizenship:
 - ~52,000 individuals in the 2017 sample are not U.S. born (42%) and 28% of those were outside of the U.S.
 - Of the not U.S. born, 65% remain non-U.S. citizens and of those, 41% are located outside of the U.S (compared to 6% of those that became U.S. citizens)
- So if 35% of the non-U.S. born now have U.S. citizenship, where do the remaining ~33,800 non-U.S. born hold their citizenship?

Non-U.S. Born in 2017 SDR (unweighted), Current Citizenship by World Region



2015-2017 SDR Country-level Mobility Patterns by Initial World Region in 2015



Methods and Strategies Overview

Where in the World – Finding an International Sample of Doctorates

- Where do we think they are?
- What do we need to do to locate them?
- How well did we do in recent rounds?

How in the World – Collecting Data from an International Sample of Doctorates

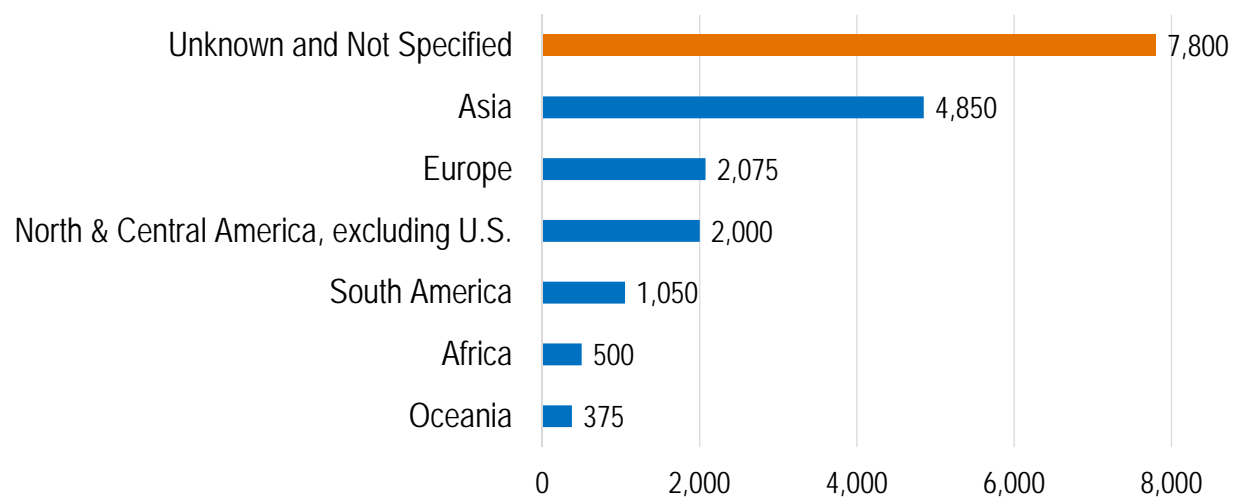
- What do we need to do differently to contact international SMs and collect data?
- How well did we do in recent rounds?

Where in the World – Finding an International Sample of Doctorates

- Biggest challenge in SDR: **Locating individuals!!**
- In the 2017 cycle...
 - 39% of the sample required locating, including those for which we did not have a predicted location
 - 23% ended the cycle with unknown eligibility

Where in the World – Finding an International Sample of Doctorates

2017 SDR Unknown and non-U.S. Predicted Locations



Online Locating Resources for Non-U.S. SMs

- Limits to resources traditionally relied on for locating U.S. individuals:
 - Accurint® or similar resources, limited to U.S. addresses/phones
 - Translated websites don't always have full functionality
 - Staff directories on university sites – limitations on individual contacting info
- Found success with:
 - WorldCat or other academic publication search tools: author and co-author contacting information
 - Proquest or other dissertation search tools: dissertation advisor
 - Focusing on email searches
 - Sites providing information about formatting addresses and phones; and time zone calc

**Like for locating for SMs within the US,
there is no one magic online source/tool/technique!!**

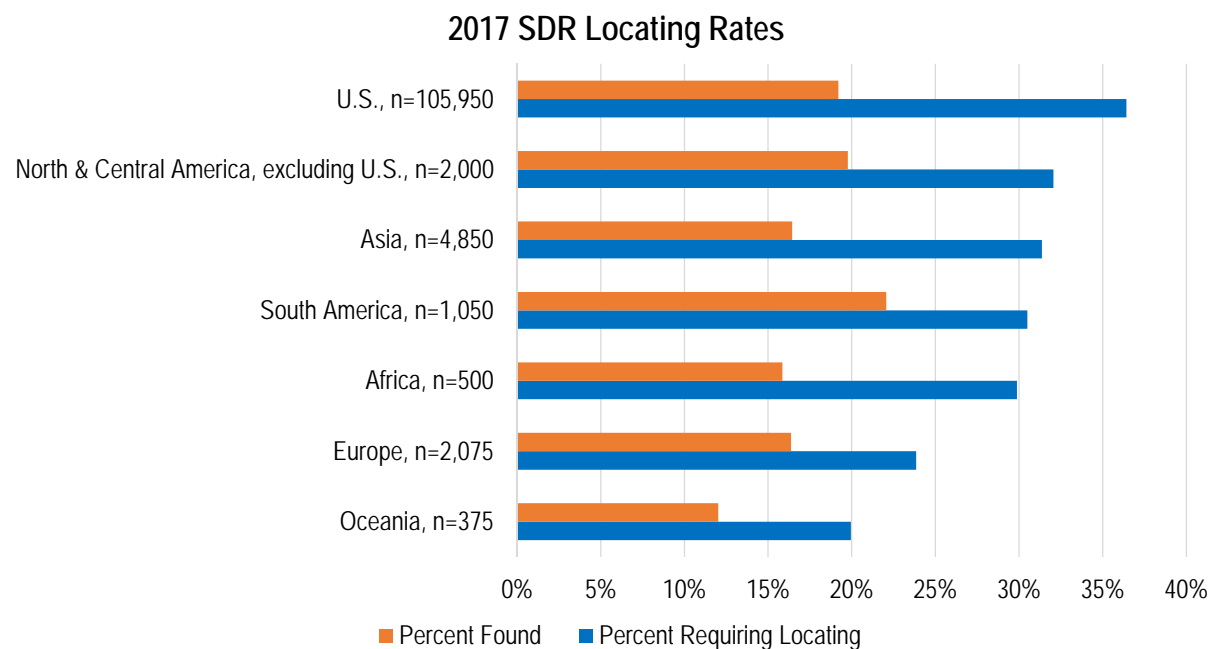
Staffing for Locating Non-U.S. SMs

- Time zones
 - NORC locations: NM (Mtn) & IL (Central)
 - Calling hours 9am – 8pm respondent time
 - Normal working hours – 7 days w/day/eve hours
 - Special overnight hours (3am)
- Languages
 - U.S.-trained, but gatekeepers and contact persons may not speak English
 - Hire staff who read/speak languages other than English
 - 2017 staff languages: Arabic, Chinese, French, German, Gujarati, Hindi, Italian, Japanese, Korean, Punjabi, Spanish, Telugu, Turkish
 - Make assignments based on what we do know (e.g., country of birth, last known location, postgrad location, etc.)

Capture of non-U.S. contacting information

- Information required to successfully call and mail from the U.S. to non-U.S. locations: May be formatted for in country use
- Case management system (CMS) captures additional required phone and mailing address fields
- Review formatting prior to mailings

Locating Rates for 2017 SDR by Predicted World Regions



2017 SDR World Region Movers (n= 3,600)

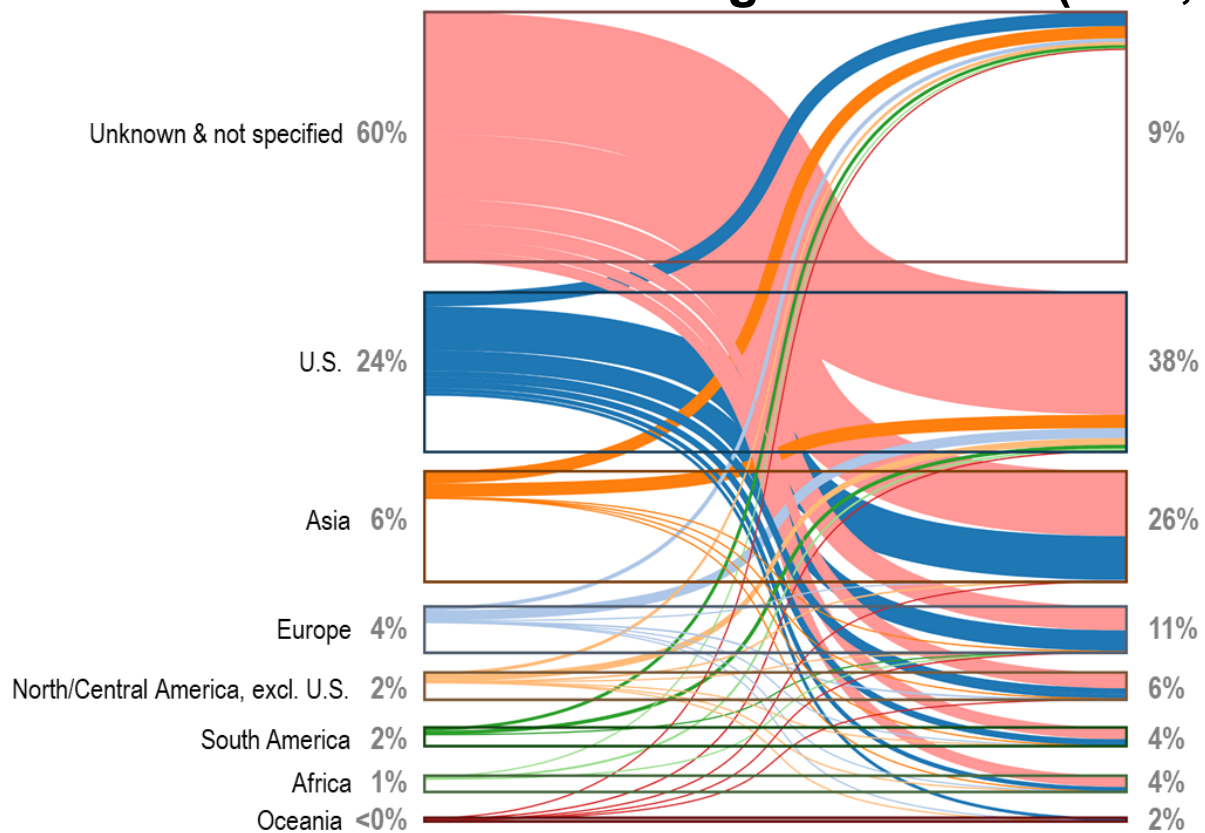
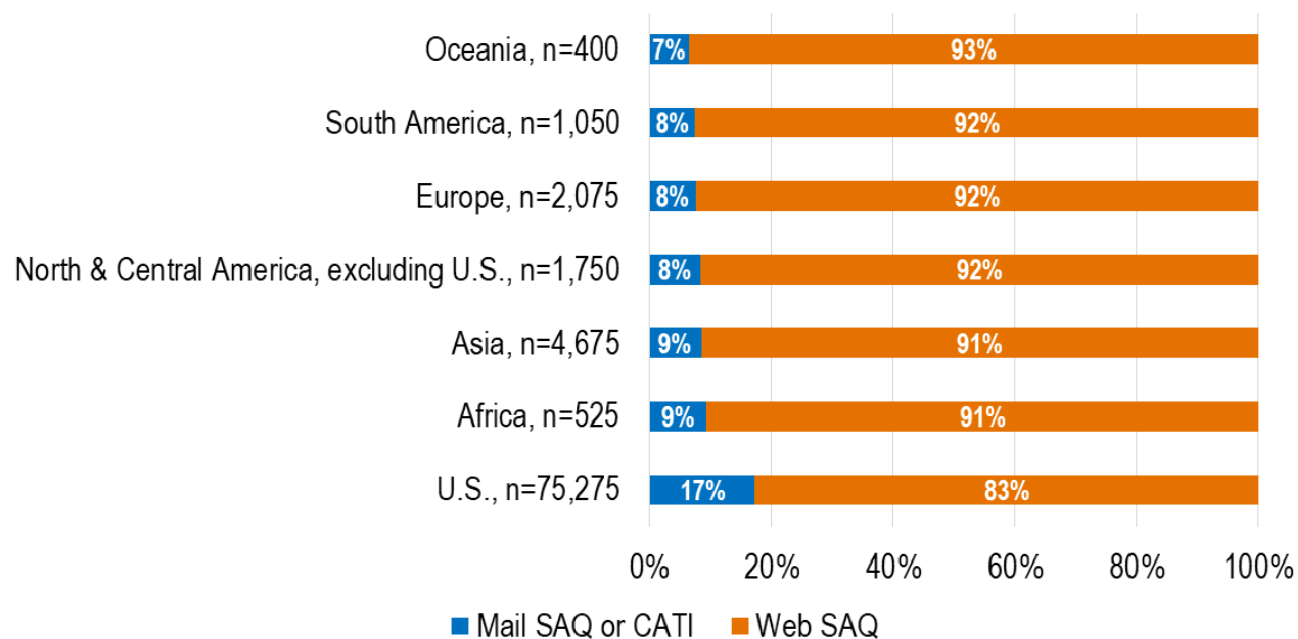


Diagram created using SankeyMATIC

How in the World – Collecting Data from an International Sample of Doctorates

2017 SDR Completion Modes by World Region



Survey Question Modifications for non-U.S. SMs

- Survey originally developed for U.S. respondents
- Over time made modifications to CAI and paper survey
- Modified survey items
 - Employer industry
 - Federal support
 - Salary and Earned income
 - U.S. visa status
 - Contacting information and location of employer

Adjustments for Contacting Protocol for non-U.S. SMs

- Mailing outside of the U.S.: Postage & BREs
- Dialing outside of the U.S.: Dialer & Timezones
- Staffing hours and language
- Incentives: Policy not to sent monetary incentives outside of the U.S., funded by U.S. federal gov't
- Toll-free number and email

Cooperation Rates for 2015 & 2017 SDR by World Regions

Predicted World Region	2015	2017
	78,320 Surveys	85,739 Surveys
U.S.	88%	90%
Europe	93%	95%
Asia	90%	93%
North & Central America, excluding U.S.	92%	92%
South America	94%	96%
Africa	88%	94%
Oceania	92%	96%
Unknown and Not Specified	81%	81%
Overall	88%	90%

Global Perspective

- SDR is conducted by a U.S. organization on behalf of the U.S. National Science Foundation
 - Are SMs who live and work outside of the U.S. interested in participating?
 - Do they think they are eligible for the study?
 - Do they feel any obligation to support U.S. sponsored research?
- Monitoring the political, social, and environmental climate
 - Examples:
 - Turkey in the 2017 SDR,
 - U.S. international relations,
 - National time of mourning,
 - Country or region-specific holidays,
 - Political or social turmoil,
 - Earthquakes and other natural disasters

EU General Data Protection Regulation (GDPR)

- GDPR **applies to Personal Data** and protects EU residents from privacy/data breaches
 - Affects any org that has Personal Data on EU residents, regardless of org's location
- How might GDPR affect future **locating strategies and methods** for the SDR?
 - Availability of information online
 - May inhibit contact persons from providing information about the SM
 - May provide SMs an excuse why they will not provide their contacting information
- How might GDPR affect future **data collection strategies and methods**?
 - Consent and privacy statements; Explicit opt out policies may be needed
 - New refusal codes and FAQs; Be ready to tell SMs the types of data on file
 - The 'right to be forgotten'
 - 72 hour breach notification

~ EUGDPR.org/the-regulation

In Summary...

- 36% of U.S. SEH doctorates were awarded to temporary visa holders in the 2014 and 2015 academic years and 22% of them planned to leave the U.S. upon graduation
- Collecting data from doctorates that leave the U.S. will continue to be an important aspect of the SDR for years to come.

Thank you!

Shana M. Brown
NORC at the University of Chicago
Chicago, IL

Brown-Shana@norc.org