

# Survey of Doctorate Recipients

## About the Survey

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The Survey of Doctorate Recipients (SDR) provides demographic, education, and career history information from individuals with a U.S. research doctoral degree in a science, engineering, or health (SEH) field. The SDR is sponsored by the National Center for Science and Engineering Statistics and by the National Institutes of Health. Conducted since 1973, the SDR is a unique source of information about the educational and occupational achievements and career movement of U.S.-trained doctoral scientists and engineers in the United States and abroad.

## Survey Description

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### 1. Survey Overview (2017 Cycle)

- a. **Purpose:** The Survey of Doctorate Recipients (SDR), conducted by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation, provides data on the characteristics of science, engineering, and health (SEH) doctorate degree holders. It samples individuals who have earned an SEH research doctoral degree from a U.S. academic institution and are less than 76 years of age. The SDR provides data useful in assessing the supply and characteristics of the nation's SEH doctorates employed in educational institutions, private industry, and professional organizations, as well as in federal, state, and local governments.
- b. **Data collection authority:** The information is solicited under the authority of the National Science Foundation Act of 1950, as amended, the America COMPETES Reauthorization Act of 2010, and the Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA). The Office of Management and Budget control number is 3145-0020.
- c. **Major changes to the recent cycle:** Field of study reporting for the 2017 SDR is revised and updated to better align with the new NCSES Taxonomy of Disciplines (ToD) which more closely aligns with the Classification of Instructional Programs (2010) issued by the National Center for Education Statistics. The 2017 survey data includes both traditional field of study aggregations as well as new field of study aggregations based on the ToD.

### 2. Key Survey Information

- a. **Frequency:** Biennial.
- b. **Initial year of survey:** 1973.
- c. **Reference period:** The week of 1 February 2017.
- d. **Response unit:** Individuals with an SEH research doctorate degree from a U.S. academic institution.
- e. **Sample or census:** Sample.
- f. **Population size:** Approximately 1,103,200 individuals.
- g. **Sample size:** A total of 124,580 individuals.

#### **h. Key variables:**

- Demographics (e.g., age, race, sex, ethnicity, and citizenship)
- Educational history
- Employment status
- Field of degree
- Occupation

### **3. Survey Design**

**a. Target population:** The SDR target population includes individuals that meet the following criteria:

- Earned an SEH research doctorate degree from a U.S. academic institution prior to 1 July 2015
- Are not institutionalized or terminally ill on 1 February 2017
- Are less than 76 years of age as of 1 February 2017

**b. Sample frame:** The Doctorate Records File (DRF) constructed from the annual Survey of Earned Doctorates (SED), which is a census survey of all recipients of U.S. research doctoral degrees.

**c. Sample design:** The SDR uses a fixed panel design with a sample of new doctoral graduates added to the panel in each biennial survey cycle. For the 2017 SDR, all doctorates who were included in the 2015 SDR sample and who remained age eligible for the 2017 survey were retained, and a sample of new graduates who had earned their degrees between 1 July 2013 and 30 June 2015 were added. The new graduates sample was selected using a stratified sample design, where the strata were defined by fine fields of study listed in the SED.

### **4. Data Collection and Data Processing**

**a. Data collection:** The SDR uses a trimodal data collection approach: self-administered questionnaire (via mail), self-administered online survey (preferred by at least 4 out of 5 respondents), and computer-assisted telephone interview (CATI).

**b. Data processing:** The data collected in the SDR are subject to both editing and imputation procedures. The SDR uses both logical imputation and statistical (hot deck) imputation as part of the data processing effort.

**c. Estimation techniques:** Because the SDR is based on a complex sampling design and subject to nonresponse bias, sampling weights are created for each respondent to support unbiased population estimates. The final analysis weights account for:

- Differential sampling rates
- Adjustments for unknown eligibility

- Adjustments for nonresponse
- Adjustments to align the sample distribution with the DRF distribution with respect to gender, race and ethnicity, degree year, and degree field

## 5. Survey Quality Measures

- Sampling error:** Estimates of sampling errors associated with this survey were calculated using the replicate weights included with the data file.
- Coverage error:** Any missed doctoral graduates within the DRF derived from the SED would create undercoverage in the SDR. The potential for overcoverage due to self-reporting errors in the SED is minimized by comparing and evaluating the SEH fields reported in the SED against the subsequent SDR reported information.
- Nonresponse error:** The weighted response rate for the 2017 SDR was 69%; the unweighted response rate was 70%. Analyses of SDR nonresponse trends were used to develop nonresponse weighting adjustments to minimize the potential for nonresponse bias in the SDR estimates. A hot deck imputation method was used to compensate for item nonresponse.
- Measurement error:** The SDR is subject to reporting errors from differences in interpretation of questions and by modality (Web, mail, and CATI). To reduce measurement errors, the SDR questionnaire items were pretested in focus groups and cognitive interviews.

## 6. Data Availability and Comparability

- Data availability:** Data from 1993 to present are available at the SDR website, <https://www.nsf.gov/statistics/srvydoctoratework/>.
- Data comparability:** Year-to-year comparisons can be made among the 1993 to 2017 survey cycles because many of the core questions remained the same. Small but notable differences exist across some survey years, such as the collection of occupation data based on more recent versions of the occupation taxonomy. Also, the SDR target population definition has changed over time as follows:
  - Surveys conducted before 1991 included individuals who received doctoral degrees in fields other than SEH and individuals who received their degrees from non-U.S. institutions.
  - Surveys conducted before 2010 did not cover SEH doctorates residing outside of the United States.
  - In 2010 and 2013, coverage of SEH doctorates residing outside of the United States included only those having graduated since 2001.
  - The 2015 SDR sample design improved population coverage in the 2015 and 2017 survey cycles to include all SEH doctorates awarded by U.S. institutions, regardless of the academic year of award or the recipient's post-graduation residency location.

Caution is recommended when interpreting or analyzing trends that span pre- and post-1991 surveys, pre- and post-2010 surveys, and pre- and post-2015 surveys given the noted changes in the survey design and target population.

Overlap in sample cases across survey cycles support longitudinal analysis using SDR data.

## 7. Data Products

- a. **Publications:** Data from the SDR are published in NCSES InfoBriefs and data tables, available at <https://www.nsf.gov/statistics/srvydoctoratework/>.

Information from this survey is also included in *Science and Engineering Indicators* at <https://www.nsf.gov/statistics/indicators/> and *Women, Minorities, and Persons with Disabilities in Science and Engineering* at <https://www.nsf.gov/statistics/wmpd/>.

- b. **Electronic access:** The SDR public use data are available in the SESTAT data tool (<https://ncesdata.nsf.gov/sestat/sestat.html>) and in downloadable public use data files (<https://ncesdata.nsf.gov/datadownload/>). Access to restricted data for researchers interested in analyzing microdata can be arranged through a licensing agreement. For more information on licensing, see <https://www.nsf.gov/statistics/license/>.

## 8. Contact Information

Daniel Foley  
Project Officer  
Human Resources Statistics Program  
National Center for Science and Engineering Statistics  
National Science Foundation  
2415 Eisenhower Avenue, Suite W14200  
Alexandria, VA 22314  
Phone: (703) 292-7811  
E-mail: [dfoley@nsf.gov](mailto:dfoley@nsf.gov)