

Survey Description

1. Survey Overview (2017 survey cycle)

- a. **Purpose:** The Survey of Earned Doctorates (SED) collects data on the number and characteristics of individuals receiving research doctoral degrees from U.S. academic institutions.
- b. **Data collection authority:** The information collected by the SED is solicited under the authority of the National Science Foundation Act of 1950, as amended, and the America COMPETES Reauthorization Act of 2010. The Office of Management and Budget control number is 3145-0019, expiration date 31 May 2020.
- c. **Survey contractor:** RTI International.
- d. **Major changes to recent survey cycle:** None.

2. Key Survey Information

- a. **Frequency:** Annual.
- b. **Initial survey year:** Academic year 1957–58.
- c. **Reference period:** Academic year 2016–17 (1 July 2016 to 30 June 2017).
- d. **Response unit:** Individuals.
- e. **Sample or census:** Census.
- f. **Population size:** 54,664.
- g. **Sample size:** Not applicable.
- h. **Key variables:** Key variables of interest are listed below.
 - Academic institution of doctorate
 - Baccalaureate-origin institution (U.S. and foreign)
 - Birth year
 - Citizenship status at graduation
 - Country of birth and citizenship
 - Disability status
 - Educational attainment of parents
 - Educational history in college
 - Field of each degree earned ($N = 331$ fields)
 - Graduate and undergraduate educational debt
 - Marital status, as well as the number and age of dependents

- Postgraduation plans (e.g., work, postdoc, other study or training)
 - Primary and secondary work activities
 - Source and type of financial support for postdoctoral study or research
 - Type and location of employer
 - Basic annual salary
- Race and ethnicity
- Sex
- Sources of financial support during graduate school
- Type of academic institution (e.g., historically black colleges and universities, Carnegie codes, public or private) awarding the doctorate

3. Survey Design

- a. **Target population:** The population for the 2017 SED consists of all individuals receiving a research doctorate from a U.S. academic institution in the 12-month period beginning 1 July 2016 and ending 30 June 2017. A research doctorate is a doctoral degree that (1) requires completion of an original intellectual contribution in the form of a dissertation or an equivalent culminating project (e.g., musical composition) and (2) is not primarily intended as a degree for the practice of a profession. The most common research doctorate degree is the PhD. Recipients of professional doctoral degrees, such as MD, DDS, DVM, JD, DPharm, DMin, and PsyD, are not included in the SED.
- b. **Sample frame:** The total universe in 2017 included 54,664 persons from 428 institutions that conferred research doctorates.
- c. **Sample design:** The SED is a census.

4. Data Collection and Processing

- a. **Data collection:** Three modes of data collection are used in the SED: self-administered Web survey, self-administered paper questionnaire, and computer-assisted telephone interviewing (CATI). The self-administered Web survey is the primary mode of SED completion. When students apply for graduation, institutional coordinators at the universities give students the link to the survey registration website (institutional coordinators at a small number of universities hand out both a paper questionnaire and the link to the survey registration website). Students who sign up at the survey registration website receive PIN and password information via e-mail, as well as the URL of the SED Web survey. The proportion of SED completions using the Web has increased each year since it was introduced in 2001, and it reached 94.9% in 2017.

Paper questionnaires are mailed to institutional coordinators at the universities. For most institutions, paper questionnaires are used as reference copies. For a small number of institutions, the institutional coordinator distributes the paper questionnaires to students receiving research doctorates. The institutional coordinators then collect the completed questionnaires and return them to the survey contractor for editing and data entry.

Both the Web survey and paper questionnaire are used in follow-up contacts via e-mail and mail to nonrespondents. If the series of follow-up emails and mailings is unsuccessful, the survey contractor attempts to reach nonrespondents to complete an abbreviated survey by CATI. Approximately 2% of SED completions each year are from CATI. At the end of data collection phase, institutional coordinators are contacted to obtain information on a small number of critical SED data items for nonrespondents from their institution.

- b. **Data processing:** The data collected in the SED are subject to automated editing and coding procedures. Imputation is not performed for missing survey data items except for the month value used in calculation of the age at doctorate and time to degree variables.
- c. **Estimation techniques:** The survey is a census, which does not require any sampling; weighting is not used to adjust for nonresponse.

5. Survey Quality Measures

- a. **Sampling error:** Not applicable because the SED is a census.
- b. **Coverage error:** Due to the availability of comprehensive lists of doctorate-granting institutions and the institutions' high levels of participation in the survey, coverage error of institutions is minimal. Because the graduate schools collect the survey data from degree recipients at the time of doctorate completion, coverage error for the universe of doctorate recipients is also minimal. Comparisons of the institutions and the number of research doctorate recipients covered by the SED with the total number of doctorate recipients (including nonresearch doctorate degree recipients) reported by institutions to the [National Center for Education Statistics](#) confirm that there is minimal coverage error of doctorate recipients. In 2017, a small number of doctorate-granting institutions declined to fully enumerate their academic year 2017 doctorate recipients, resulting in a small percentage (approximately 0.1%) of undercoverage in the universe.
- c. **Nonresponse error:**

Unit nonresponse. Of the 54,664 individuals granted a research doctorate in 2017, 91.4% completed the SED. Limited number of SED critical data items (doctoral institution, year of doctorate, field of doctorate, type of doctorate, and, if available, baccalaureate institution, master's degree institution, and sex) are constructed for nonrespondents from commencement programs, graduation lists, and other similar public records. Nonresponse was concentrated in certain institutions with 43 institutions accounting for 69% of the total unit nonresponse.

Item nonresponse. Among the 54,664 individuals who received a research doctorate in 2017, item nonresponse rates for the five key SED demographic variables—sex, citizenship, country of citizenship, race and ethnicity, and location after graduation—range from 0.0% for sex to 7.6% for location after graduation.

- d. **Measurement error:** Measurement error in the SED is attributable to several sources including errors in respondent reporting and errors that occur during data processing. Data reported by respondents about their educational history, including degree institutions and field of study, that are not coded within the survey instrument are reviewed and coded by trained coders. Average coding error rates were 0.24% for institution coding, 0.58% for fields of study coding, and 0.17% for "Other—specify" back coding.

6. Data Comparability

- a. **Data availability:** Each year's survey data are compiled into the Doctorate Records File (DRF) and trend data are available back to 1957–58; more limited information (sex, institution, field, and year of doctorate) is contained on the DRF for PhDs who graduated in 1920–56.
- b. **Data comparability:** Because of procedural changes implemented during the 1990 survey cycle to improve the completeness of race, ethnicity, and citizenship data, the data from 1990 and later years are not directly comparable to data before 1990.

7. Data Products

- a. **Publications:** The data from this survey are published annually in a series reporting on all fields of study, the latest edition of which is [Doctorate Recipients from U.S. Universities: 2017](#).

Additional data from this survey for earlier years are published in *Science and Engineering Doctorates: 1960–91* (NSF 93-301). Also available is the interagency report [U.S. Doctorates in the 20th Century](#), which provides an overview of the development of a national resource—the American system of doctoral education—from 1900 to 1999.

Information from the survey is also included in the series [Science and Engineering Degrees](#), in [Science and Engineering Degrees, by Race/Ethnicity of Recipients](#), in [Science and Engineering Indicators](#), and in [Women, Minorities, and Persons with Disabilities in Science and Engineering](#).

- b. **Electronic access:** Access to tabular data on selected variables from 1958 onward is now available in an [interactive data tool](#) from the National Center for Science and Engineering Statistics (NCSES). Users can create custom tables of the number of doctorate recipients by academic discipline and institutional characteristics of either the doctorate-granting institution or the baccalaureate-granting institution of doctorate recipients.

NCSES created the [SED Tabulation Engine](#) in 2007 to strengthen the confidentiality protections applied to SED data while still meeting the needs of SED data users. This tool provides users with limited access to race and ethnicity, sex, and citizenship data from 2007 onward in a way that does not disclose personally identifiable information. Content from the SED Tabulation Engine will eventually transition to the NCSES [interactive data tool](#).

- c. **Restricted access:** Access to restricted data for researchers interested in analyzing microdata can be arranged through a [licensing agreement](#). For more information, see the [NCSES Licensing Page](#) (<http://www.nsf.gov/statistics/license/>).

8. Contact Information

For additional information about this survey, or the methodology report, please contact:

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