

## **Appendix C**

### **Technical Notes on Survey Methodology**



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The Fall Staff survey is conducted biennially as part of the National Center for Education Statistics' (NCES) Integrated Postsecondary Education Data System (IPEDS).<sup>1</sup> IPEDS collects staffing data in order to fulfill the NCES congressional mandate to report on the condition of postsecondary education in the United States. Fall Staff data were requested from 8,746 postsecondary institutions in the fall 1995.

#### Data Covered in the Report

The data in this report for 1995 are for the 50 states and the District of Columbia and exclude the outlying territories. Data are presented for both the total postsecondary institutions and for the subset that are classified as institutions of higher education (IHEs). In 1995, there were about 8,598 postsecondary institutions eligible for Title IV federal financial aid at the 4-year, 2-year, and less-than-2-year level in the 50 states and the District of Columbia. Of these, about 3,716 were accredited at the college level as IHEs by an agency recognized by the U.S. Department of Education. While over half of the total postsecondary institutions are in the category of other postsecondary, over 95 percent of total postsecondary staff are employed in institutions of higher education. More detailed information over a longer period of time has been collected on IHEs.

Eligible postsecondary education institutions completed either the Consolidated survey (IPEDS-CN) or the Fall Staff survey (IPEDS-S). The IPEDS-S survey form collected data on the race and sex of staff from all higher education institutions and all other schools offering a baccalaureate or higher degree. The CN survey was completed by all other postsecondary institutions that were not sent the Fall Staff survey. The information by level of detail requested on each survey form is shown below:

Form Type	Institutions	Data Requested By:
S	All higher education institutions and all other schools offering a baccalaureate or higher degree	Employment status Sex Occupational categories Race/ethnicity categories Salary class intervals Tenured categories New hires categories
CN	All other schools	Employment status Sex Occupational categories

#### Past Surveys

The Fall Staff survey is one of the eight components of IPEDS, which began in 1986. The 1995 survey covers all postsecondary institutions that are eligible for Title IV including universities and colleges, as well as institutions offering technical and vocational education beyond the high school level. Prior to

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<sup>1</sup> Other IPEDS surveys include Institutional Characteristics, Fall Enrollment, Fall Enrollment in Occupational Specific Programs, Completions, Finance, Salaries, Academic Libraries, and Consolidated.

that time, similar data were collected through the Higher Education General Information Survey (HEGIS), established in 1966. HEGIS, however, covered only those institutions accredited at the college level by an agency recognized by the Secretary of the U.S. Department of Education. Between 1987 and 1991, the Fall Staff data were collected in cooperation with U.S. Equal Employment Opportunity Commission (EEOC). EEOC collected data on staff through its Higher Education Staff Information (EEO-6) report from all postsecondary institutions within its mandate, that is, institutions having 15 or more full-time employees. NCES, using the IPEDS system, collected data from all other postsecondary institutions, including all 2- and 4-year higher education institutions with fewer than 15 full-time employees and a sample of less-than-2-year schools. NCES and EEOC collected staff data biennially in odd-numbered years. The IPEDS files from 1987 to 1991 combine data from the EEO-6 and the IPEDS staff survey to create the IPEDS Fall Staff data file. In 1993 for the first time, all schools formerly surveyed by EEOC were surveyed by NCES. Additionally, all less-than-2-year schools eligible for participation in Title IV federal financial aid programs were included in the data collection. In previous years, a sample of this group was drawn to represent the total.

### **Related Surveys**

Additional data on full-time faculty are available through the IPEDS Faculty Salaries, Tenure, and Fringe Benefits survey. This survey has been conducted for most years since 1966, initially through HEGIS and later through IPEDS. NCES also sponsors the National Survey of Postsecondary Faculty (NSOPF), a nationally representative sample survey that provides detailed information on higher education faculty and departments. The NSOPF surveys have been conducted in 1988 and 1993. Historical data prior to the 1970s are also available on faculty in institutions of higher education and have been summarized in the *Digest of Education Statistics*, which is published annually.

### **Institutional Universe and Response Rates**

A universe of 9,217 postsecondary institutions was initially identified as eligible to participate in Title IV programs based on verified responses to the IPEDS 1994-95 Institutional Characteristics survey. Fall Staff survey forms were mailed out during October and November 1995, and survey results were collected from January to July 1996. During this time period, institutions determined to be out of scope of the survey were deleted from the universe. These deletions resulted from formal notification by IPEDS state coordinators, the Department of Education eligibility notices, and followup telephone calls. Included in the deletions were (1) institutions that were duplicates of others on the file; (2) institutions that had closed or merged with another institution, and thus were no longer a legitimate institution or branch; (3) institutions that no longer offered postsecondary programs; and (4) schools that did not conform to the IPEDS definition of an institution or branch. At the conclusion of this process, 8,746 institutions remained on the file, of which 8,598 were from the 50 states and the District of Columbia. The final universe was also adjusted to reflect institutions that changed from one sector to another subsequent to survey mailout. The Fall Staff survey had an overall response of 87.0 percent (see table C-1).

**Table C-1. Number of institutions<sup>1</sup> in the 1995 Fall Staff survey and survey response rates, by survey form and sector of institution: 50 states and the District of Columbia**

Survey form and sector of institution	Mailed <sup>2</sup>	Final universe	Number responded	Response rate
Total .....	9,217	8,598	7,476	87.0
Survey form				
IPEDS-S.....	4,293	4,101	3,628	88.5
IPEDS-CN.....	4,924	4,497	3,848	85.6
Sector				
Central office .....	104	69	69	100.0
Public 4-year or above .....	628	617	588	95.3
Private, nonprofit, 4-year or above.....	1,998	1,929	1,576	81.7
Private, for-profit, 4-year or above.....	181	184	140	76.1
Public 2-year .....	1,283	1,251	1,213	97.0
Private, nonprofit, 2-year.....	623	589	521	88.5
Private, for-profit, 2-year.....	724	634	548	86.4
Public, less than 2-year.....	294	282	255	90.4
Private, nonprofit, less-than-2-year.....	282	245	203	82.9
Private, for-profit, less-than-2-year.....	3,100	2,798	2,363	84.5

<sup>1</sup>See table C-2 for the number of institutions receiving the survey form, number of institutions responding, and response rate for HEGIS and non-HEGIS institutions for the 50 states and the District of Columbia.

<sup>2</sup>Surveys were mailed to institutions in the U.S. and its outlying areas. All data reported elsewhere in this report, however, are based on institutions in the 50 states and the District of Columbia.

Table C-2 reports the number of institutions in the universe and the number responding for the 50 states and the District of Columbia by control and level of institution. The response rate for total postsecondary institutions was 87.0 percent and for the institutions of higher education, 93.7 percent. Response for the “other postsecondary” group was 81.9 percent. Of the total universe of 8,598 institutions, 3,716 were institutions of higher education and 4,882 were classified as other postsecondary; however, 96 percent of staff were in the 3,716 institutions of higher education.

### Survey Conduct and Editing

Followup for nonresponse on the IPEDS-CN survey was started in December 1995 by letter. Telephone followup for nonresponse on the IPED-S survey began in January 1995 and continued with a second telephone followup in February 1995. The Postsecondary Education Telephone System (PETS) was used to collect data from the nonrespondents to the surveys in that group of institutions for which IPEDS state coordinators were not responsible for followup.

**Table C-2. Response rates of postsecondary institutions receiving the Fall Staff survey, by control and level of institution: 50 states and the District of Columbia.**

Level of institution	Total	Public	Private		
			Total	Nonprofit	For-profit
All postsecondary.....	8,598	2,211	6,387	2,765	3,622
4-year.....	2,762	646	2,116	1,931	185
2-year.....	2,506	1,283	1,223	589	634
Less than 2-year.....	3,330	282	3,048	245	2,803
Higher education.....	3,716	1,709	2,007	1,692	315
4-year.....	2,252	636	1,616	1,509	107
2-year.....	1,449	1,071	378	179	199
Less than 2-year.....	15	2	13	4	9
Other postsecondary.....	4,882	502	4,380	1,073	3,307
4-year.....	510	10	500	422	78
2-year.....	1,057	212	845	410	435
Less than 2-year.....	3,315	280	3,035	241	2,794
<b>Institutions responding</b>					
All postsecondary.....	7,476	2,117	5,359	2,302	3,057
4-year.....	2,336	617	1,719	1,578	141
2-year.....	2,314	1,245	1,069	521	548
Less than 2-year.....	2,826	255	2,571	203	2,368
Higher education.....	3,480	1,654	1,826	1,547	279
4-year.....	2,088	608	1,480	1,379	101
2-year.....	1,381	1,044	337	164	173
Less than 2-year.....	11	2	9	4	5
Other postsecondary.....	3,996	463	3,533	755	2,778
4-year.....	248	9	239	199	40
2-year.....	933	201	732	357	375
Less than 2-year.....	2,815	253	2,562	199	2,363
<b>Response rate</b>					
All postsecondary.....	87.0	95.8	83.9	83.3	84.4
4-year.....	84.6	95.5	81.2	81.7	76.2
2-year.....	92.3	97.0	87.4	88.5	86.4
Less than 2-year.....	84.9	90.4	84.4	82.9	84.5
Higher education.....	93.7	96.8	91.2	91.4	88.6
4-year.....	92.7	95.6	91.6	91.4	94.4
2-year.....	95.3	97.5	89.1	91.6	86.9
Less than 2-year.....	73.3	100.0	69.2	100.0	55.6
Other postsecondary.....	81.9	92.2	80.7	70.4	84.0
4-year.....	48.6	90.0	47.8	47.2	51.3
2-year.....	88.3	94.8	86.6	87.1	86.2
Less than 2-year.....	84.9	90.4	84.4	82.6	84.6

NOTE: Table represents response rate for higher education and other postsecondary institutions for the 50 states and the District of Columbia.  
 SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), "Fall Staff," and "Consolidated" surveys (IPEDS-S and IPEDS-CN), 1995.

On the CN survey, all forms were edited for major reporting and processing errors. Survey responses were edited for interyear consistency. Total lines were generated and compared to the reported totals. If there were differences, and they were within an acceptable range of tolerance, the generated total replaced the reported total. If a difference appeared larger than a simple arithmetic error, the institution was contacted to resolve the discrepancy.

On the S survey, all forms were edited for reporting and processing errors. Survey responses were edited for internal and interyear consistency. Addition checks were performed by adding down the columns and comparing generated with reported totals. If there were differences, and they were within an acceptable range of tolerance, the generated total replaced the reported total and the cell was flagged with the proper imputation code. If a difference exceeded the designated range, institutions were contacted for verification/correction. Addition checks were also performed by generating totals for men and women across columns in each line of data submitted on the form, checks were also made comparing total faculty, line 22, with total faculty, line 107.

### **Method of Imputation for the 1995 IPEDS Fall Staff Survey**

This section discusses the imputation methods used to compensate for missing data in the 1995 IPEDS Fall Staff survey. The first section provides a brief review of the data collected in the survey and the data available for imputation. The second section discusses the extent of nonresponse. The last section summarizes the methods used to handle the missing data.

#### **The 1995 IPEDS Fall Staff Survey**

The 1995 IPEDS Fall Staff survey collected data on the number of staff employed in all postsecondary institutions in the United States. Two survey forms were used: the S form and the CN form. The S form was used for higher education institutions and schools offering a baccalaureate or higher degree. It collects detailed data on the number of staff by characteristics, including sex (male and female), employment status (full time and part time), occupational activities (8 categories), race/ ethnicity (7 categories), and income categories (6 to 9 categories). The 1995 S form contained six parts, collecting detailed counts of full-time faculty members, other full-time and part-time employees, and staff from contracted or donated services. There are over 2,000 data items on this form. The CN form was an abridged version of the S form. The 1995 CN form consisted of 34 data items counting staff by sex, employment status, and occupational categories.

The survey forms were designed as a series of tables and data are collected for the cells and in the margins of the tables. The constraint in the data was that the data items corresponding to the table cells had to add to the items on the row margins and the column margins, and in turn, the items on margins have to add to the table total.

The IPEDS Fall Staff survey is a recurring survey conducted every 2 years. The last one was conducted in 1993. Most institutions in the 1995 survey were also included in 1993 survey. The core data items were the same for both 1993 and 1995, although new items were added to the 1995 survey forms to provide more income classes at the upper tail. The new items collected in the 1995 IPEDS-S form, found in Part C and Part E, were not included in the imputation.

## Number of Responding and Nonresponding Institutions

Table C-3 shows the number of responding and nonresponding institutions in 1995 and their status in 1993. Among the 8,846 institutions (including 100 closed institutions) included in the survey, 4,637 received the CN form, and the remaining 4,209 institutions received the S form. Most institutions that participated provided complete responses on all items. Partial nonresponse was relatively rare. It mainly occurred among the CN form institutions because institutions provided data about the total number of employees but failed to provide the counts by specific categories. Most institutions included in both 1993 and 1995 also received the same forms for both years. There were 773 new institutions in 1995.

**Table C-3. Number of institutions by response status\***

Survey form type	Number of institutions				
	Total	Complete respondents	Partial respondents	Nonrespondents	Closed
Total	8,846	6,901	684	1,161	100
1995 CN form .....	4,637	3,228	669	667	73
1993 CN form .....	3,983	2,857	535	528	63
1993 S form.....	7	4	2	1	0
New .....	647	367	132	138	10
1995 S form .....	4,209	3,673	15	494	27
1993 S form.....	3,993	3,524	14	433	22
1993 CN form .....	90	62	1	22	5
New .....	126	87	0	39	0

\*U.S. and outlying areas.

## Imputations

Nonresponding institutions to the 1995 Fall Staff survey were divided into two primary categories: institutions that either responded or were imputed in 1993; and new institutions in 1995. For institutions with data from 1993, a cold-deck imputation method was used to replace missing data in the current survey with prior data. This method is known as a “cold” deck because the source of data for imputation came from a prior survey. Adjustments were made to the cold-deck imputed value to reflect the changes in trends over time. For new institutions, a hot-deck imputation method was used based on data from the current survey. The hot-deck imputation was conducted using WESDECK, a SAS macro developed by Westat. WESDECK performs hot-deck imputation using a set of hard and soft boundaries that make up the imputation classes. Hard boundaries are non-negotiable, whereas soft boundaries may be crossed if insufficient donors are available.

For nonresponding institutions with 1993 data, the data items were imputed in sequence. For the CN form, the data items on the total lines were imputed first (total female full time, female part time, male full time, male part time). Then, the data items that were components of the total were imputed by apportioning the imputed total to individual items. The rates of change were calculated by selecting a peer group of institutions from the 1995 data and generating the percent change from 1993 to 1995. The donor groups were matched with the recipient institutions by institutional characteristics (level, control, locale, region, and Carnegie classification), enrollment size and the pattern of staff distribution in 1993. For the S form, an additional step was involved to first impute the table total (by employment activities), which was distributed to items along the items on the total line (by race and sex); and the total line items were then distributed to the cells (by income and occupational category). The values in the table cells were added



across the rows to generate the items on the column total. Lastly, a final edit check was conducted to ensure that the imputed values conformed with the constraints that the values of items in the column and row totals sum to the overall table total.

For new institutions with missing data, a donor was selected among all institutions with complete responses on similar characteristics in terms of enrollment size, sector, and type. A restriction was imposed so that donors were only used once. Due to their specific characteristics, historically black institutions (HBCUs), and tribal institutions were imputed separately using donors from each of their respective groups.

An imputation flag variable was included in the data file to identify cases with imputed data and the method of imputation.

