Chapter 26: National Household Education Surveys Program (NHES)

1. OVERVIEW

The National Household Education Surveys Program (NHES) conducts telephone surveys of the noninstitutionalized, civilian population of the United States. These surveys are designed to provide information on educational issues that are best addressed by contacting households rather than schools or other education institutions. They offer policymakers, researchers, and educators a variety of statistics on the condition of education in the United States.

Purpose

To (1) provide reliable estimates of the U.S. population regarding specific education-related topics; and (2) conduct repeated measurements of the same educational phenomena at different points in time.

Components

The NHES program for a given year typically consists of (1) a screener (an interview that collects household composition and demographic data); and (2) two or three surveys (extended interviews addressing specific education-related topics). However, in 1999, the surveys collected information on key indicators from the broad range of topics addressed in previous NHES survey cycles.

Adult Education. Surveys on this topic were administrated in 2005, 2003, 2001, 1999, 1995, and 1991.

The 2005 Adult Education Survey (AE-NHES:2005) collected data about participation in the following types of formal adult education activities: English as a Second Language (ESL), basic skills and high school completion, postsecondary degree and diploma programs, apprenticeships, work-related courses, and personal interest courses. Information on a new topic, informal learning activities for personal interest, was gathered as well.

The 2003 Adult Education for Work-Related Reasons Survey (AEWR-NHES:2003) collected information about participation in college and university degree or certificate programs taken for work-related reasons, postsecondary degree programs taken for work-related reasons, apprenticeships, work-related courses, and work-related informal learning. Additionally, the survey explored factors associated with participation or nonparticipation in adult education activities.

The Adult Education and Lifelong Learning Survey (AELL-NHES:2001) was administered in 2001. It collected data on type of program, employer support, and credential sought for participation in the following types of adult education activities: ESL, adult basic education, credential programs, apprenticeships, work-related. courses, and personal interest courses. Some information on informal learning activities at work was gathered as well.

In 1999, the Adult Education Survey (AE-NHES:1999) included questions on education background, work experience, participation in adult education (including participation through distance learning), literacy activities, community involvement, adult demographic characteristics, and household characteristics. Eligible respondents were 16 years of age or older who were not currently enrolled in 12th grade or below and not institutionalized or on active duty in the U.S. Armed Forces.

AE-NHES:1995 included questions concerning respondents' participation in basic skills courses, ESL courses, credential (degree or diploma) programs, apprenticeships, work-related courses, personal development/interest courses, and interactive video or computer training on the job. Information collected on programs and courses included the subject matter, duration, cost, location and sponsorship, and employer support. Nonparticipants in selected types of adult education were asked about their interest in educational activities and barriers to participation. Extensive background, employment, and household information were collected for each adult. Eligible respondents included civilians age 16 and older not currently enrolled in secondary school.

In AE-NHES:1991, eligible respondents were persons 16 years of age or older, identified as having participated in an adult education activity in the previous 12 months. The information collected on programs and up to four courses included the subject matter, duration, sponsorship, purpose, and cost. A smaller sample of nonparticipants in adult education also completed interviews about barriers to participation. Information on the household and the adult's background and current employment was also collected in this survey.

Before- and After-School Programs and Activities.

The Before- and After-School Programs and Activities Survey, conducted in 2005 and 2001 (ASPA-NHES:2005 and ASPA-NHES:2001), collected detailed information from parents of 9,580 children in kindergarten through eighth grade about the before- and after-school arrangements in which their children participated, including care by relatives or nonrelatives in private homes, before- or after-school programs in centers and in schools, activities that might provide adult supervision in the out-of-school hours, and children's self-care. Items also addressed continuity of care arrangements, parental perceptions of quality, reasons for choosing parental care, and obstacles to participation in nonparental arrangements. Information was also collected on children's health and disability

status and on characteristics of the parents and household.

Civic Involvement.
Civic Involvement Surveys were administered in 1999 and 1996. The 1999 Youth Survey (Youth-NHES:1999) expanded on one of the 1996 surveys: the 1996 Youth Civic Involvement Survey (YCI-NHES:1996). It included questions on the school learning environment, family learning environment, plans for future education, participation in activities that promote or indicate personal responsibility, participation in community service or volunteer activities, exposure to information about politics and national issues, political attitudes and knowledge, skills related to civic participation, and type and purpose of community service. A subset of youth who reported participation in community service were asked additional questions about their service experiences. Eligible respondents were youth in the grades 6 through 12.

Three Civic Involvement Surveys were conducted in 1996: the Parent and Family Involvement in Education/Civic Involvement Survey (PFI/CI-NHES:1996), the Youth Civic Involvement Survey (YCI-NHES:1996), and the Adult Civic Involvement Survey (ACI-NHES:1996). They included questions on sources of political information, civic participation, and knowledge and attitudes about government. YCI-NHES:1996 also provided an assessment of the opportunities that youth have to develop the personal responsibility and skills that would facilitate their taking an active role in civic life. Eligible respondents were (1) parents of students in grades 6 through 12 (including homeschooled students in those grades), (2) youth in grades 6 through 12, and (3) adults.

Early Childhood Education and School Readiness.
Early Childhood Education Surveys were conducted in 2005, 2001, 1995, and 1991, and a School Readiness Survey was conducted in 2007 and 1993.

The Early Childhood Program Participation Survey of 2005 (ECPP-NHES:2005) was the fifth collection for this topic. It provided data on the early childhood program participation of infants, toddlers, and preschoolers as well as the ability to measure change over time. It gathered information on the nonparental care arrangements and education programs of preschool children, consisting of care by relatives; care by persons to whom the children were not related; and participation in day care centers and preschool programs, including Head Start. Eligible respondents to ECPP Surveys were the parents of children between birth and 3rd grade. The interview was conducted with

the parent most knowledgeable about the child's education or care.

ECPP-NHES:2001 gathered information on the nonparental care arrangements and education programs of preschool children, which included care by relatives; care by persons to whom the children were not related; and participation in day care centers and preschool programs, including Head Start.

ECPP-NHES:1995 included questions on children's participation in care or education provided by relatives, nonrelatives, Head Start programs, and center-based programs. It also collected information on the early school experiences of school-age children, home literacy activities, health and disability status, and parent and family characteristics.

The Early Childhood Education Survey (ECE-NHES:1991) included questions on participation in nonparental care or education; characteristics of programs and care arrangements; and early school experiences, including delayed kindergarten entry and retention in grade. In addition, parents were asked about activities that children engaged in with parents and other family members, inside and outside the home. Information on family, household, and child characteristics was also collected. Eligible respondents to this survey were the parents or guardians of the sampled 3- to 8-year-olds who were most knowledgeable about the children's education.

The School Readiness Survey of 2007 (SR-NHES:2007) collected information on early learning and readiness for entering school: specifically, participation in preschool or other types of center-based care and education, including Head Start; children's developmental accomplishments, including literacy and numeracy skills; educational activities with family members; plans for kindergarten enrollment; and the role of parents in preparing their child for kindergarten. The survey also collected data on the amount and type of television viewing by preschoolers.

SR-NHES:1993 included questions on the developmental characteristics of preschoolers; school adjustment, and teacher feedback to parents, for kindergartners and primary school students; center-based program participation; early school experiences; home activities with family members; and health status. Extensive information was collected on family and child background characteristics—including parents' language and education, income, receipt of public assistance, and household composition—to permit the identification of at-risk children. Eligible respondents to this survey were the parents or

guardians of the sampled children (ages 3 through 7 in 2nd grade or below and children ages 8 and 9 in 1st or 2nd grade) who were most knowledgeable about the children's education.

Household Library Use. The Household and Library Use Survey (HHL-NHES:1996) was part of the 1996 NHES screener and consisted of a brief set of questions regarding public library use. Questions addressed the distance to the closest public library, household use of a public library in the past month and year, ways in which the public library was used, purposes for which the public library was used, and detailed household characteristics. Eligible respondents were those adults who completed the screener interview.

Parent and Family Involvement in Education. Surveys on this topic were conducted in 2007, 2003, 1999, and 1996.

The 2007 Parent and Family Involvement in Education Survey (PFI-NHES:2007) collected information on school choice, homeschooling, school characteristics (including school type, lowest and highest grades at the school, school religious affiliation, and whether the school was a magnet or charter school), student experiences in school, teacher feedback on the child's school performance and behavior, family involvement in school, family help with homework, family involvement in activities outside of school, factors affecting family involvement, and community support.

PFI-NHES:2003 focused on children and youth in kindergarten through grade 12 and addressed school experiences, family participation in schools, school practices to involve and support families, family involvement in schoolwork, and family involvement outside of school. Homeschooling parents were asked about their reasons for choosing, and resources for implementing, homeschooling. The involvement of nonresidential parents was also addressed, when applicable. In addition, information was collected on the child's or youth's health and disability status and on child and parent demographic characteristics. A total of 12,430 interviews were completed with parents of eligible children. The survey provided current national, cross-sectional estimates for the population of interest and provided the ability to examine change over time.

In 1999, the Parent Survey (Parent-NHES:1999) had six sets of questions, appropriate for six subgroups of children: children age 2 and younger, children ages 3 through 6 years and not yet in kindergarten, children in kindergarten through the 5th grade, youth in the 6th through 8th grades, youth in the 9th through 12th grades,

and children from age 5 through 12th grade who were receiving homeschooling. The survey included questions on the following topics (although not all were covered for all populations): demographic characteristics, current school- or center-based program enrollment status, center-based program participation before school entry, homeschooling, school characteristics, school readiness skills, participation in early childhood care and programs, training and support for families of preschoolers, parents' satisfaction with children's schools, children's academic performance and behavior, family involvement with children's schools and school practices to involve families, before- and after-school programs and nonparental care, parents' expectations about children's college plans and costs, family involvement in educational activities outside of school, child health and disability, parent/guardian characteristics, and household characteristics. The Parent Survey was administered to the parent or guardian most knowledgeable about the education of each sampled child from birth through 12th grade.

In 1996, the survey on parent involvement was combined with one on civic involvement, forming PFI/CI-NHES:1996. It included questions on the schools of the sampled children, communication with teachers or other school personnel, school practices to involve parents, children's homework and behavior, and learning activities with children outside of school with their families. Information was also collected on students' experiences in school, children's personal and demographic characteristics, household characteristics, and children's health and disability status. Eligible respondents were the parents or guardians of the sampled children ages 3 through 20 and in 12th grade or below who were the most knowledgeable about their education.

School Safety and Discipline. The 1993 School Safety and Discipline Survey (SS&D-NHES:1993) included questions on the school learning environment, discipline policy, safety at school, victimization, the availability and use of alcohol and drugs, and alcohol and drug education. The survey also included questions on peer norms for behavior in school and substance use. Extensive family and household background information and data about the characteristics of the school that the child attended were collected. Eligible respondents were the parents or guardians of the sampled children in grades 3 through 12 and youth in grades 6 through 12 who were most knowledgeable about the child's education.

Periodicity

NHES has been conducted in the spring of 1991, 1993, 1995, 1996, 1999, 2001, 2003, 2005, and 2007. NHES is currently undergoing a major redesign to address response rate and potential coverage issues. The next data collection is anticipated for 2012.

2. USES OF DATA

NHES provides descriptive data on the educational activities of the U.S. population and offers policymakers, researchers, and educators a variety of statistics on the condition of education in the United States. Each NHES survey collects specific data based on a set of research questions that guide the development of the questionnaire. As described above, the main subject areas for the NHES program are:

- ➢ Adult education and lifelong learning;

- ➢ Before- and after-school programs and activities;

- ➢ Early childhood education and school readiness; and

- ➢ Parent and family involvement in education; and

Analysts should review the instrument for each survey to identify areas of particular interest to them.

3. KEY CONCEPTS

See the survey documentation for definitions specific to any one NHES survey.

Household Members. Individuals who think of the sampled household as their primary place of residence, including persons who usually stay in the household but are temporarily away on business or vacation; in a hospital; or living at school in a dormitory, fraternity, or sorority.

4. SURVEY DESIGN

Target Population

Noninstitutionalized, civilian members of households in the 50 states and the District of Columbia. Because the topical surveys change from one NHES to the next,

the specific age or grade criteria for the target populations also change. In general, there are three educational populations of interest: (1) younger children from birth through 5th grade; (2) older children (i.e., youth) in the 6th through 12th grades; and (3) adults not enrolled in 12th grade or below. The respondent is usually the parent or guardian of the child who is most knowledgeable about the education or care of the sampled child, the sampled youth, or the sampled adult.

Sample Design

The NHES samples are selected using random-digit-dialing (RDD) methods. Telephone numbers are randomly sampled, and a screener is administered to sampled households. About 45,000 to 64,000 households are screened for each administration. Individuals within households who meet predetermined criteria are then sampled for more detailed or extended interviews.

Sampling Households. Two general sampling approaches have been taken: list assisted and a modified Mitofsky-Waksberg method. The list-assisted method has been used since the 1995 administration.

The sampling frame for NHES:2007, NHES:2005, and NHES:2003 was all telephone numbers in 100-banks (i.e., sets of numbers with the same first 8 digits of the 10-digit telephone number) with one or more listed residential telephone numbers as of the third quarter of 2006, September 2004, and September 2002, respectively. A stratified two-phase list-assisted sample was used in order to support design goals for national-level and subdomain statistics for the NHES surveys.

NHES:2007. In the first phase of sampling, a sample of 476,170 telephone numbers was drawn, with telephone numbers in areas with high percentages of Black or Hispanic residents sampled at higher rates than those in areas with low percentages. The sampling frame contains estimates of race/ethnicity distributions from the 2000 census, which are used to identify high concentrations of Black or Hispanic telephone exchanges. The sampling rate in the high- Black or Hispanic concentration stratum was nearly twice that in the low-Black or Hispanic stratum.

In the second phase, within each race/ethnicity stratum, the sampled telephone numbers were stratified as mailable or nonmailable according to whether a mailing address was able to be matched to the telephone number. Mailable status was used because it has been found to improve the efficiency of the sample by facilitating the oversampling of mailable numbers (which are more likely to be residential). Within each

of the four strata defined by the combinations of Black or Hispanic concentration and mailable status, telephone numbers were subsampled at different rates in order to attain the final phase 2 allocation. The phase 1 sample sizes were determined by calculating the minimum number of telephone numbers expected to be needed from each race/ethnicity stratum in order to attain the desired phase 2 sample sizes in the race/ethnicity-by-mailable strata, based on mailable distributions within each race/ethnicity stratum computed from NHES:2005. The screener unit response rate in 2007 was 52.8 percent

NHES:2005. In the first phase of sampling, a sample of 350,000 telephone numbers was drawn, with telephone numbers in areas with high percentages of Black and Hispanic residents sampled at higher rates than those in areas with low percentages. The sampling frame contained the Census 2000 counts of persons in the area by race and ethnicity. Race and ethnicity information was obtained for zip codes served by the telephone exchange and then aggregated. A 100-bank was classified in the high-Black or Hispanic concentration stratum if its population was either at least 20 percent Black or at least 20 percent Hispanic. The banks that did not meet this requirement were classified in the low-Black or Hispanic concentration stratum. The sampling rate in the high-Black or Hispanic concentration stratum was nearly twice that in the low-Black or Hispanic concentration stratum. While telephone exchanges do not correspond exactly to census tracts or blocks, this approach is still effective at increasing the sample yield for Blacks, Hispanics, and Asians.

In the second phase, within each Black or Hispanic stratum, the sampled telephone numbers were classified as mailable or nonmailable according to whether they could be matched to a mailing address in the white pages of the telephone directory or in another database. Within each of the four strata defined by the combinations of Black or Hispanic concentration and mailable status, telephone numbers were subsampled at different rates. In the low-Black or Hispanic stratum, telephone numbers in the mailable substratum were sampled at a rate about 72 percent higher than numbers in the nonmailable substratum; in the high-Black or Hispanic stratum, telephone numbers in the mailable substratum were sampled at a rate about twice as high as that used for numbers in the nonmailable substratum.

In this manner, a sample of 207,000 telephone numbers was initially selected for NHES:2005. The remaining 143,000 telephone numbers from the first phase sample of 350,000 were held in reserve. Assuming that 49

percent of the sampled telephone numbers would belong to households and assuming a screener unit response rate of 65 percent, it was expected that about 59,380 screening interviews would be completed. For example, 25,260 screeners were expected to be completed in stratum 1 (mailable, high-Black or Hispanic concentration). This was calculated by taking the final NHES:2005 phase 2 allocation to stratum 1 (51,490 telephone numbers) and multiplying it by the expected residency rate (84 percent) to get the approximate number of residential telephone numbers (43,250). For the 60 percent of residential numbers that were randomly designated to receive the standard protocol, a 69 percent expected response rate was used to estimate the expected number of completed screeners; for the remaining 40 percent, a 43 percent initial cooperation rate was used to estimate the expected number of completed screeners. These calculations resulted in a total of 25,260 expected completed screeners for stratum 1. However, after the release of the initial sample of 207,000 telephone numbers, it was determined that the residency rates in the mailable strata were lower than expected. Thus, an additional 34,000 telephone numbers, subsampled from the 143,000 numbers in the reserve sample at the same rates used for the original sample, were released. The total number of telephone numbers released for the study was 241,000, including the 34,000 reserve telephone numbers. The screener unit response rate was 67 percent, and the number of households with completed screening interviews was 58,140.

NHES:2003. In the first phase of sampling, a sample of 144,300 telephone numbers was drawn, with telephone numbers in areas with high percentages of Black and Hispanic residents sampled at higher rates than those in areas with low percentages of Black and Hispanic residents. The sampling frame used in the study contained the Census 2000 counts of persons in the area by race and ethnicity. A 100-bank was classified in the high-Black or Hispanic concentration stratum if its population was either at least 20 percent Black or at least 20 percent Hispanic. The banks that did not meet this requirement were classified in the low-Black or Hispanic concentration stratum. The sampling rate in the high-Black or Hispanic concentration stratum was nearly twice that in the low-Black or Hispanic stratum.

In the second phase, within each Black or Hispanic stratum, the sampled telephone numbers were classified as mailable or nonmailable according to whether they could be matched to a mailing address in the white pages of the telephone directory or in another database. Within each of the four strata defined by the combinations of Black or Hispanic concentration and mailable status, telephone numbers were subsampled at

different rates. In the low-Black or Hispanic stratum, telephone numbers in the mailable substratum were sampled at a rate about 47 percent higher than numbers in the nonmailable substratum; in the high-Black or Hispanic stratum, telephone numbers in the mailable substratum were sampled at a rate about 63 percent higher than numbers in the nonmailable substratum.

In this manner, a sample of 109,800 telephone numbers was selected for NHES:2003. (The remaining 34,500 telephone numbers from the first-phase sample of 144,300 were held in reserve. The reserve sample was not used.) Assuming that 49 percent of the telephone numbers would belong to households and assuming a screener unit response rate of 69 percent, it was expected that about 37,000 screening interviews would be completed. However, the actual unweighted residency rate was 45 percent, and the screener unit response rate was 65 percent. Thus, the number of households with completed screening interviews was 32,050.

NHES:2001. In 2001, a two-phase list-assisted method was also used. In the first phase of sampling, telephone numbers were stratified according to the percent of Black or Hispanic residents in the exchange. Exchanges with at least 20 percent Blacks or at least 20 percent Hispanics were classified as high-Black or Hispanic, and all other exchanges were classified as low-Black or Hispanic. Telephone numbers in the high-Black or Hispanic stratum were sampled at a rate of about 1 in 810, and telephone numbers in the low-Black or Hispanic stratum were sampled at a rate of about 1 in 1,560. The first-phase sample of telephone numbers was processed using the Genesys ID-Plus process to identify nonworking and business numbers. As part of this process, the telephone numbers were matched to white pages listings, and the matches were flagged. Thus, for each telephone number in the first-phase sample, the listed status (i.e., whether or not it is listed in the white pages) is known. Within each race/ethnicity stratum, the telephone numbers in the first-phase sample were stratified according to the white pages listed status; the overall number of telephone numbers selected in phase 1 was 206,180.

In the second phase, telephone numbers within each of the four strata defined by the combinations of Black or Hispanic concentration and listed status were subsampled at different rates: 0.71 for the high-Black or Hispanic listed stratum; 0.95 for the high-Black or Hispanic unlisted stratum; 0.73 for the low-Black or Hispanic listed stratum; and 0.94 for the low-Black or Hispanic unlisted stratum. The total number of telephone numbers selected in phase 2 was 179,210.

In the 1995, 1996, and 1999 administrations of NHES, a list-assisted method was used. This approach involves selecting a simple random sample of telephone numbers from all telephone numbers in 100-banks that have at least one telephone number listed in the white pages (called the listed stratum). Telephone numbers in 100-banks with no listed telephone numbers (called the zero-listed stratum) are not sampled. Because the list-assisted approach is an unclustered design, it results in estimates with lower variances than the clustered alternative methods. However, this method also incurs a small amount of coverage bias because households in the zero-listed stratum have no chance of being included in the sample. (See "Coverage error," in section 5 below, for a discussion of coverage bias. See Casady and Lepkowski [1993] for a further description of the list-assisted method.)

For the surveys fielded in 1996, the goal of making estimates at the state level for characteristics of household members and for household library use also determined the number of telephone numbers selected. A target of 500 screened households per state was set. A sample of 500 households is large enough that, if 30 percent of the households in a state have a given characteristic, differences of 6 percent can be detected. Due to nonresponse at the screener level and lower residency rates than expected, 500 screeners were not completed in some states. The lower number of responses limits the ability to make estimates for some subgroups within states. Analysts should examine the standard errors for subgroups of interest to evaluate the precision of within-state estimates.

The NHES surveys fielded in 1991 and 1993 used a modified version of the Mitofsky-Waksberg method of RDD, in which a fixed number of telephone numbers is sampled from 100-banks. (See Brick and Waksberg [1991] for a further description of the modified Mitofsky-Waksberg method used in NHES.)

Oversampling households for Blacks and Hispanics. One of the goals of the NHES program is to produce reliable estimates for subdomains defined by race and ethnicity. In a 64,000-household design in which every household has the same probability of being included, the number of completed interviews would not be large enough to produce reliable estimates of many characteristics of Black and Hispanic youth. Therefore, in each NHES administration, telephone numbers in areas with high concentrations of Blacks and Hispanics are oversampled.[1]

A computer file containing census characteristics for telephone exchanges is used to stratify telephone exchanges into low- and high-Black or Hispanic concentration strata. Any telephone exchange not found in the file is assigned to the low-Black or Hispanic concentration stratum. High-Black or Hispanic concentration exchanges are defined as those having at least 20 percent Black or 20 percent Hispanic persons living in the area.[2] The telephone exchanges in the two strata are identified, and a systematic sample is drawn in each stratum. The sampling fraction used in the high-Black or Hispanic concentration stratum is two times the fraction used in the low-Black or Hispanic concentration stratum. Oversampling by the characteristics of the telephone exchange has two effects. First, the oversampling increases the sample sizes for Blacks and Hispanics because they are more heavily concentrated in the exchanges that are oversampled. Second, the sampling errors for estimates of these groups are reduced due to the increased sample sizes. On the other hand, not all race/ethnicity groups are found in the oversampled exchanges. Thus, differential sampling rates are applied to persons depending on their exchanges. Using differential rates increases the sampling errors of the estimates, partially offsetting the benefit of the larger Black and Hispanic sample. However, the net result is an increase in precision of estimates for Blacks and Hispanics. The technical report *Effectiveness of Oversampling Blacks and Hispanics in the NHES Field Test* (Mohadjer 1992) indicates that oversampling is successful in reducing the variances for estimates of characteristics of Blacks and Hispanics by approximately 20 to 30 percent over a range of statistics examined. The decreases in precision for estimates of the groups that are not oversampled and for estimates of totals are modest, ranging from about 5 to 15 percent.

Approaches to household enumeration. The approach to screening households has also changed over the course of the NHES program. Changes have been made in the methods of enumerating members of households that are contacted and the amount of information collected in the screener about the household and its members. In 1991, a split-enumeration design was used; all households were

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[1] In 1993, areas with high percentages of Asians/Pacific Islanders were also sampled at a higher rate; this was discontinued in later administrations because the new vendor for numbers used in the list-assisted sampling did not have this information available. NHES considered reintroducing an Asian/Pacific Islander oversampling strategy in 2001. However, it was determined that more precision in other racial/ethnic groups would have been lost than was warranted, given the amount of extra precision that would have been gained for Asians/Pacific Islanders.

[2] For the 1993 NHES, high Asian/Pacific Islander concentration exchanges were defined as those having at least 20 percent Asian/Pacific Islander persons living in the area.

screened for ECE-NHES:1991, and a subset of households was screened for AE-NHES:1991. In 1993, when SR-NHES:1993 and SS&D-NHES:1993 were fielded, households were enumerated only when there were household members age 20 or younger. The only information collected in both 1991 and 1993 was the first name, age, and sex of household members. In both 1995 and 1996, all screened households were fully enumerated. The 1995 administration included a test of an expanded screener that was used in 1996, but dropped from later NHES administrations. The 1996 screener collected educational and demographic information on household members and included a brief topical survey. The 1999 screener again collected first name, age, and sex of household members, but not all households were fully enumerated; thus, if the screener respondent said there were no children in the household and the household had not been preselected for an adult education interview, the screener information was not collected.

Sampling within households. The within-household sample designs for the NHES collections are determined by the specific goals of the surveys administered and by the combination of surveys administered in a specific year. Brief summaries of the within-household sampling for the various NHES administrations are given below, by year.

2007 NHES surveys—SR-NHES:2007, and PFI-NHES:2007. Originally, an Adult Education for Work Related Reasons (AEWR) module was planned. The sampling scheme took this survey into account.The sampling scheme for within-household sampling was designed to satisfy the sample requirements discussed earlier, while keeping respondent burden to a minimum. To carry out this sampling scheme, several flags and/or random numbers were set prior to screening (i.e., at the time the sample of telephone numbers was drawn). The first specified whether the adult sampling algorithm was to be run for a particular household (in order to determine whether an adult was to be selected). Each telephone number received one of three possible designations: household was designated for the adult sampling algorithm to be run; household was designated for the adult sampling algorithm to be run only if there were no eligible children in the household; or household was not designated for the adult sampling algorithm to be run. The expected number of completed screeners for stratum 1 was calculated in the following manner: First, the final NHES:2007 phase 2 allocation to stratum 1 (74,480 telephone numbers) was multiplied by the expected residency rate for cases in this stratum (73 percent) to get the expected number of residential

telephone numbers in stratum 1 (54,370). Next, for the 60 percent of those residential numbers that were randomly designated to receive the standard protocol, a 63 percent expected response rate was applied to the expected number of residential telephone numbers; for the remaining 40 percent, a 39 percent initial cooperation rate was applied. These calculations resulted in a total of 29,190 expected completed screeners for stratum 1.

Once the enumeration of the appropriate household members was completed in the screener, the sampling of household members for the extended interviews was done by computer. The PFI interviews were conducted with the parents or guardians of sampled children and youth in kindergarten through 12th grade with a maximum age of 20. Following the enumeration of children, if the household had at least one preschooler, then exactly one was randomly sampled for the SR survey. If the household had at least one child ages 3 through 20 enrolled in kindergarten through 12th grade, then exactly one was randomly sampled for the PFI survey. For each survey, pre-assigned random numbers were used to sample from among all eligible children in the household. In households in which an adult was sampled, adult education participants had twice the probability of selection of nonparticipants.

2005 NHES surveys—ECPP-NHES:2005, ASPA-NHES:2005, and AE-NHES:2005. To limit respondent burden, a within-household sampling scheme was developed to control the number of persons sampled for extended interviews in each household. In all households with children age 15 or younger, children were enumerated. To determine whether adults would be enumerated, the sample of telephone numbers was randomly divided into three groups. The first group (80,850 telephone numbers, or approximately one-third of the sample) was designated for adult enumeration. The second group (40,070 telephone numbers, or about one-sixth of the sample) was designated for adult enumeration only if there were no eligible children in the household. The third group (120,080 telephone numbers, or about one-half of the sample) was designated for no adult enumeration.

Once the enumeration of the appropriate household members was completed in the screener, the sampling of household members for the extended interviews was done by computer. The ECPP and ASPA interviews were conducted with the parents or guardians of sampled children from birth through age 15 who were in grade 8 or below. In households with one or more preschoolers (children age 3 through 6 and not yet in kindergarten), one child in this age/grade range was sampled. In households with

middle school students (6th through 8th grade), one child in this age/grade range was also sampled. The sampling of infants (newborn through age 2), elementary school children (kindergarten through 5th grade), and adults was conducted using an algorithm designed to attain the sampling rates required to meet the target sample sizes while minimizing the number of interviews per household. The within-household sample size was limited to three eligible children (if no adults were to be selected) or to two eligible children and one eligible adult. No more than one child from any given domain (i.e., infants, preschoolers, elementary students, middle school students) was sampled in any given household. This sampling algorithm was designed to limit the amount of time required to conduct interviews with parents in households with a large number of eligible children. If no children were selected and there were multiple adults with less than a high school diploma or the equivalent, up to two adults could be selected.

2003 NHES surveys—PFI-NHES:2003 and AEWR-NHES:2003. Sampling within households for NHES:2003 followed a similar methodology as in 2005. In all households with children and youth age 20 or younger, children and youth were enumerated. To determine whether adults would be enumerated, the sample of telephone numbers was randomly divided into three groups. The first group (63,620 telephone numbers, or approximately 44 percent of the sample) was designated for adult enumeration. The second group (63,730 telephone numbers, or about 44 percent of the sample) was designated for adult enumeration only if there were no eligible children or youth in the household. The third group (16,950 telephone numbers, or about 12 percent of the sample) was designated for no adult enumeration.

Once the enumeration of the appropriate household members was completed in the screener, the sampling of household members for the extended interviews was done by computer. The PFI interviews were conducted with the parents or guardians of the sampled children and youth in kindergarten through 12th grade (with a maximum age of 20). If there were one or two eligible children or youth, all were selected with certainty. In households with more than two eligible children or youth, two were selected with equal probability. The sampling of adults was conducted using an algorithm designed to attain the sampling rates required to meet the target sample sizes while minimizing the number of interviews per household. The within-household sample size was limited to two eligible children and one eligible adult. This sampling algorithm was designed to limit the amount of time required to conduct interviews with

parents in households with a large number of eligible children.

2001 NHES surveys—AELL-NHES:2001, ASPA-NHES:2001, and ECPP-NHES:2001. A within-household sample scheme was developed to control the number of persons sampled for extended interviews in each household. The sample of telephone numbers was randomly divided into three groups. The first group (89,600 telephone numbers, or approximately 50 percent of the sample) was designated for adult enumeration. The second group (44,990 telephone numbers, or about 25 percent of the sample) was designated for adult enumeration only if there were no eligible children in the household. The third group (44,630 telephone numbers, or about 25 percent of the sample) was designated for no adult enumeration. Once the enumeration of the appropriate household members was completed in the screener, the sample of household members for the extended interviews was done by computer. The ECPP and ASPA interviews were conducted with the parents or guardians of sampled children from birth through age 15 who were in 8th grade or below. In households with one or more preschoolers (children age 3 through 6 and not yet in kindergarten), one child in this age/grade range was sampled. In households with middle school students (6th through 8th grades), one child in this age/grade range was also sampled. The sampling of infants (newborn through age 2), elementary school children (kindergarten through grade 5), and adults was conducted using an algorithm designed to attain the sample rates required to meet the target sample sizes while minimizing the number of interviews per household. The within-household sample size was limited to three eligible children (if no adults were to be selected) or to two eligible children and one eligible adult. No more than one child from any given domain (i.e., infants, preschoolers, elementary students, middle school students) was sampled in any given household. This sampling algorithm was designed to limit the amount of time required to conduct interviews with parents in households with a large number of eligible children.

1999 NHES surveys—AE-NHES:1999, Parent-NHES:1999, and Youth-NHES:1999. The overall screening sample was largely determined by the need to produce precise estimates of indicators for young children, particularly preschoolers. Since sample requirements were most stringent for preschoolers (children ages 3 through 6 not yet in kindergarten), it was decided to sample one preschooler in every household with preschoolers. Another goal was that no more than three persons per household be sampled, with a maximum of four extended interviews per

household. To accomplish this, several flags were set prior to screening. The first specified whether adults in the household were to be enumerated, as well as the conditions under which an adult was to be sampled. This flag was set such that households without eligible children or youth were sampled for an Adult Education Survey at approximately twice the rate of households with eligible children or youth (about 26 percent vs. 13 percent). Additionally, this flag enabled one- and two-adult households with no adult education participants to be further subsampled at a fixed, prespecified rate (25 percent for one-adult households and 75 percent for two-adult households). The second flag designated whether an infant was to be sampled, if the household had two other sampled children or youth. A third flag designated whether a younger child or an older child was to be sampled; if the household had children in both groups, only one was to be selected. In households in which an adult was to be sampled, each adult education participant was given a probability of selection 2.5 times as large as the probability of selection assigned to nonparticipants.

1996 NHES surveys—ACI-NHES:1996, HHL-NHES:1996, PFI/CI-NHES:1996, and YCI-NHES:1996. The number of interviews for which household members could be selected was limited by creating two separate samples—parent/youth and adult. A sample of 161,450 telephone numbers was selected and randomly divided into two groups. The first group (153,370 telephone numbers, or 95 percent of the sample) was allocated to the parent/youth sample. A screening interview was conducted in these households, and eligible children and youth were sampled, respectively, for PFI/CI-NHES:1996 or for both PFI/CI-NHES:1996 and YCI-NHES:1996. For PFI/CI-NHES:1996, if there were one or more children from age 3 through 5th grade (younger children), one child in this age range in the household was sampled for the survey. If the household included one or more children in 6th through 12th grades (older children), one child in this grade range in the household was sampled for the survey. If an older child was sampled as the subject of a PFI/CINHES:1996 interview, the child was also asked to complete YCI-NHES:1996. Because households may have had up to two parent PFI/CI interviews (one for a younger child and one for an older child), the maximum number of interviews per sampled household was three. The other group (8,070 telephone numbers, or 5 percent of the sample) contained those telephone numbers allocated to ACI-NHES:1996. For households in this group, a screening interview was conducted ACI-NHES:1996 was administered to one eligible adult.

1995 NHES surveys—AE-NHES:1995 and ECPP-NHES:1995. Interviews for ECPP-NHES:1995 were conducted with the parents or guardians who were the most knowledgeable about the education of the sampled children aged 0 to 10 and in the 3rd grade or below. The within-household sample size was limited to two eligible children. Children in kindergarten were sampled at 1.5 times the rate for other children to improve the precision of single-year estimates for kindergartners. Any adult aged 16 years or older not currently enrolled in secondary school was eligible for sampling for AE-NHES:1995. Sampled adults who said they were on active duty in the U.S. Armed Forces were classified as ineligible for the interview.

1993 NHES surveys—SR-NHES:1993 and SS&D-NHES:1993. For the 1993 NHES surveys, children within households were subsampled. For SR-NHES:1993, interviews were conducted with the parents or guardians who were the most knowledgeable about the education of the sampled children aged 3 through 7 (as well as children aged 8 or 9 who had not completed 2nd grade. If there were one or two eligible children in a household, all were sampled. If there were more than two eligible children in a household, two were randomly sampled. Any child enrolled in grades 3 through 12 and below the age of 21 was eligible for sampling for the SS&D-NHES:1993 interview with the parent. Sampling was limited to one child in 3rd through 5th grades and no more than two children in any household. No more than one youth was subsampled per household for the youth interview. If a child was enrolled in the 6th through 12th grades but did not live with a parent or guardian, he or she was considered an emancipated youth. A special emancipated youth interview was conducted, including some questions usually asked only of parents.

1991 NHES surveys—AE-NHES:1991 and ECE-NHES:1991. All 3- to 8-year-olds in sampled households were included in ECE-NHES:1991, as were 9-year-olds who had not completed 2nd grade. This ensured that nearly all children eligible for the extended interviews were identified, even if a rounding error was made in reporting the children's ages. The respondent for the interview was the parent or guardian of the sampled child reported to be the most knowledgeable about the child's care and education. Only a subset of households was screened for AE-NHES:1991. In the screened households, all adults identified as participating in adult education activities were sampled, half of the full-time degree-seeking students were sampled, and about 7 percent of the nonparticipants in adult education activities were sampled. After a few weeks of data collection, the number of sampled households screened for AE-

NHES:1991 was reduced because the required number of interviews had been completed; thus, additional households did not need to be contacted. Altogether, 18,460 households out of 60,300 completed screeners (31 percent) were sampled for AE-NHES:1991. In addition, the sampling rate for nonparticipants was increased from 7 to 12 percent.

Data Collection and Processing
NHES program surveys are conducted using computer-assisted telephone interviewing (CATI). Westat has been the contractor on all surveys to date.

Reference dates. Most data items refer to the time of data collection or to the interval of time between the data collection and September of the current school year. Other items are asked retrospectively for different time frames. For example, in the 1996 NHES surveys, respondents were asked about family involvement with children outside of school (e.g., reading with a child, visiting a library) in the past week and past month; civic involvement (reading about or watching national news) in the past week; political activities in the past 12 months; voting activities in the past 5 years; working for pay during the past week and the past 12 months; job hunting in the past 4 weeks; child's communications with the noncustodial parent in a typical month and in the past year; youth's discussion of future educational plans with parents in the past month; books read in the past 6 months; home visits by professionals during the past 12 months; and religious service participation in the past year. The adult education information is based on participation in the past 12 months.

Data collection. Data collection for the NHES surveys takes place over a 3- to 4-month period beginning in January of each survey year. The data are collected using CATI. The NHES screeners are completed with an adult household member in households selected using RDD techniques. (See "Sample Design" in section 4 above.)

Over a period of about 3 weeks just prior to data collection, more than 300 interviewers undergo intensive training in general interviewing techniques, use of the CATI system, and the conduct of the survey.

Most responses to survey items are coded at the time of the interview. Most of the items are close ended, meaning respondents are given a short list of response options. Interviewers simply record the response as a one- or two-digit code that is entered directly into the data file as the interview progresses. However, most close-ended items do have "other, specify" options that allow interviewers to record responses that do not fit the precoded response categories. The interviewer types in these open-ended responses as one or more sentences. "Other, specify" responses to close-ended items are rare.

A small number of items in some of the surveys are designed to be open ended. That is, precoded categories do not exist and interviewers type in verbatim responses from respondents. Once the survey is completed, data preparation staff and survey managers review these open-ended responses to determine how they can be coded into a limited set of response categories. Coding of additional open-ended items was required for the Adult Education Surveys administered in 1991 and 1995. These items were for adult education courses, major fields of study for college and vocational programs, industry, and occupation. A double-blind coding procedure was used, in which two coders independently assigned a code to the response. When the coding was discrepant, an "adjudication" coder reviewed the case and assigned an appropriate final code.

Editing. Intensive data editing is a feature of both the data collection and file preparation phases of the NHES collections. Range checks for allowable values and logic checks for consistency between items are included in the online CATI interview so that many unlikely values or inconsistent responses can be resolved while the interviewer is speaking with the respondent.

Postinterview editing is conducted throughout data collection and after data collection is completed. In addition to range and logic edits, the postinterview editing process includes checks for the structural integrity of the hierarchical CATI database and integrity edits for complex skip patterns. It also includes a review of comments provided by interviewers and problem sheets completed by interviewers. Following the resolution of any problems, data preparation staff review frequency distributions and cross-tabulations of the datasets in order to identify any remaining skip pattern inconsistencies. Editing is repeated following completion of imputation.

Estimation Methods
The NHES surveys use weighting to adjust for the fact that the sampling method used is not simple random sampling. It is also used to adjust for potential undercoverage bias and potential unit nonresponse bias. Imputation is performed to compensate for item nonresponse.

Weighting. The objective of the NHES surveys is to make inferences about the entire noninstitutionalized, U.S. civilian population and about subgroups of

interest. Although only telephone households are sampled, the estimates are adjusted to totals of persons living in both telephone and nontelephone households derived from the Current Population Survey (CPS) to achieve this goal. (CPS is an annual household survey conducted by the U.S. Bureau of the Census for the U.S. Bureau of Labor Statistics.) As a result, any undercoverage in CPS for special populations, such as the homeless, is also reflected in NHES estimates. The potential for bias due to sampling only telephone households has been examined for virtually all the population groups sampled in NHES. Generally, the bias in the estimates due to excluding nontelephone households is small. (See "Coverage error" in section 5 below for further discussion.) The weighting procedures across NHES surveys are very similar. Weighting consists of two stages: household-level weighting and person-level weighting, as described below.

Household weights. The household weights take into account all factors that might have resulted in adjustments due to the telephone numbers being sampled at different rates. Two factors common to all NHES years are (1) the adjustment to account for the differential sampling rates by Black or Hispanic concentration; and (2) the adjustment to account for households that have more than one telephone number and, hence, have a greater chance of being sampled. In 1991 and 1993, an adjustment was also made to account for the modified Mitofsky-Waksberg method of RDD sampling. (See "Sample Design" in section 4 above.) The 1996 NHES included an adjustment for the oversampling in 18 states to bring the minimum expected number of completed screeners up to 500.

In NHES 2007, the primary purpose of the screener was to provide the information required to assess the eligibility of household members for an extended interview. Household-level information that is of analytic interest was also collected during the extended interview. Since no data intended for analyses were collected at the household level only, household-level weights were calculated solely for use as a basis for computing person-level weights for the analysis of the extended interview data. The household-level weight was the product of five factors:

1. The weight associated with the differential sampling of telephone numbers based on the Black or Hispanic stratum of the exchange and the mailable status of the telephone number;

2. An adjustment for subsampling of cases for nonresponse follow-up;

3. An adjustment for the subsampling of screener nonresponse cases;

4. An adjustment for the number of telephone numbers in a household; and

5. A poststratification adjustment to compensate for the fact that only landline telephone households were eligible for the NHES:2007 surveys.

The calculation of the household weight, taking into account these five factors, is discussed below.

The first step was to assign the weight associated with the differential sampling of telephone numbers based on the Black or Hispanic concentration stratum of the exchange and the mailable status of the telephone number. The RDD sampling method used in NHES:2007 was a list-assisted method (the same basic method as was used in NHES:1995, NHES:1996, NHES:1999, NHES:2001, NHES:2003, and NHES:2005). In NHES:2007, as in NHES:2001, NHES:2003, and NHES:2005, a two-phase approach was used. In the first phase, a single-stage sample of telephone numbers was selected from strata defined by the Black or Hispanic concentration status of the exchange. Telephone numbers in high-Black or Hispanic exchanges were sampled at a rate approximately twice that of those in low-Black or Hispanic exchanges. An attempt was made to match each telephone number selected in the first phase to an address listing. In the second phase, telephone numbers were subsampled differentially within each Black or Hispanic concentration stratum based on the mailable status (i.e., whether a mailing address was obtained for the telephone number).

The second step in creating the household weight was to adjust for the subsampling of screener nonresponse cases.

The third weighting factor adjusted for households that did not respond to the NHES:2007 screener.

The fourth step in adjusting the household weight was to adjust for the number of telephone numbers in a household. A weighting factor of one was assigned to households reporting one telephone number in the household. An adjustment factor of one-half was assigned to households with exactly two residential telephone numbers, and an adjustment factor of one-third was assigned to households with three or more residential telephone numbers. Technically, if the other telephone numbers of households with multiple residential telephone numbers are in the zero-listed

stratum, the household should get a weight adjustment of one. However, looking up the other numbers to determine whether each is in the zero-listed stratum is impractical, and the percentage of such numbers in the zero-listed stratum is small.

The final step in computing the household weight was to account for household-level undercoverage due to sampling only landline telephone households. Poststratification was used to accomplish this task.

Person weights. The second stage of weighting forms person weights for each extended interview. The household-level weight was used to compute the base weight for each of the person-level (SR and PFI interview) weights in NHES:2007. The person-level weight for sampled person k in household j, PW_{jk}, is the product of the household weight and four weight adjustment factors:

1. The weight associated with sampling the person's domain in the given household;

2. The weight associated with sampling the person from among all eligible persons in the given domain in the household;

3. The weight associated with extended interview (SR or PFI) unit nonresponse; and

4. An adjustment associated with raking the person-level weights to Census Bureau estimates of the number of persons in the target population.

The development of the person-level weights, taking into account these four factors, is discussed below.

The first step was to account for the probability of sampling the person's domain in the given household. For both the SR and PFI interviews, if there was an eligible child in the household, then at least one child was selected; however, only one child was sampled for each survey in households with eligible children. Thus, the factor for sampling in both the SR and PFI domain was always equal to 1.

The second adjustment accounted for the probability of sampling the person from among all eligible persons in the given domain in the household. For each sampled person, the unadjusted person-level weight can be written as the product of the household-level weight and the adjustments for within-household sampling.
The third step was to adjust for persons who did not respond to the extended interview (i.e., the most knowledgeable parents or guardians in the case of the

SR and PFI interviews). Each extended interview case was classified as either a respondent or a nonrespondent, depending on whether or not the extended interview was completed for the sampled person. The unadjusted person-level weights of the nonrespondents were distributed to the unadjusted person-level weights of the respondents within a nonresponse adjustment cell. For the SR and PFI Surveys, the nonresponse adjustment cells were created using combinations of home tenure (owned or rented), the four census regions, and age/grade combinations: unenrolled children age 3 through 6, preschoolers, kindergarteners, and children enrolled in each single grade for grade 1 through grade 12. (Enrolled children with no grade equivalent were included in the cell containing the modal grade for their age; that is, they were assigned to the grade in which most children their age are enrolled.) For PFI, whether the child attended regular school or was home schooled was also used. These variables were used because they are available for all sampled children (both respondents and nonrespondents) and are associated with SR/PFI interview response propensity.

The final stage of person-level weighting involved raking the nonresponse-adjusted person-level weights to national control totals. The raking procedure is carried out in a sequence of adjustments: first, the base weights are adjusted to one marginal distribution (or dimension) and then the second marginal distribution, and so on. One sequence of adjustments to the marginal distributions is known as a cycle or iteration. The procedure is repeated until convergence of weighted totals to all sets of marginal distributions is achieved. This additional raking adjustment, following the household-level poststratification adjustment, is required because the extended interviews involve new eligibility criteria and a new level of sampling. That is, although the household-level poststratification adjustment aligned the weighted totals of the household weights with the household-level control totals, the raking of the person-level weights is required in order to align the person-level weights with the person-level control totals and adjust for differential coverage rates at the person level.

The raking procedure for the SR and PFI weights involved raking the nonresponse-adjusted person-level weights to national totals obtained using the percentage distributions from the October 2005 CPS and the total number of children from the March 2006 CPS.

Imputation. Item response rates for most data items collected in NHES surveys are very high. Nevertheless, virtually all items with missing data (including "don't know" and "refused" responses) are imputed in NHES

surveys. In the two NHES surveys administered in 1991, only variables that were used for the development of weights or derived variables were fully imputed. Text responses (for example, in Youth-NHES:1999, type of service activity, or, in AE-NHES:1999, name of company) were not imputed in any year. Occasionally, "don't know" and "refused" responses are of analytic interest, so they are not imputed. For example, in the Youth-NHES:1999 survey, "don't know" and "refused to answer" responses to the knowledge about government items were not imputed.

In NHES:2007, for the SR and PFI Surveys, the median item response rates were 99.28 percent and 99.04 percent, respectively, and the median total response rates (the product of the item response rate and overall unit response rate) were 40.41 percent and 38.72 percent, respectively. Numeric and categorical data items with missing data in the file were imputed. (In general, character string variables, such as countries of origin, languages, or "other/specify" responses, were not imputed. School characteristics merged to the PFI data file from the NCES Common Core of Data [CCD] and Private School Universe Survey [PSS] files also were not imputed.)

Imputations are done in the NHES program for three reasons. First, complete responses are needed for the variables used in developing the sampling weights. Second, data users compute estimates employing a variety of methods, and complete responses should aid their analysis. Third, imputation may reduce bias due to item nonresponse, by obtaining imputed values from donors that are similar to the recipients. The procedures for imputing missing data are discussed below.

A standard (random within-class) hot-deck procedure has been used to impute missing responses in every NHES data collection. The methodology used for imputation in NHES:2007 was very similar to that used in previous NHES survey administrations. (The NHES:2007 procedures were based on those used in NHES:1996, NHES:1999, NHES:2001, NHES:2003, and NHES:2005.) In the hot-deck approach, the entire file is sorted into cells defined by characteristics of the respondents. The variables used in the sorting are general descriptors of the interview and include any variables involved in the skip pattern for the items. All of the observations are sorted into cells defined by the responses to the sort variables, and then divided into two classes within the cell depending on whether or not the item being imputed is missing. For an observation with a missing value, a value from a randomly selected donor (with the item completed) is used to replace the missing value. After the imputation is completed, edit

programs are run to ensure that the imputed responses do not violate edit rules.

For some items, the missing values are imputed manually rather than using the hot-deck procedure. In NHES:2007, manual imputation was done (1) to impute certain person-level demographic characteristics; (2) to impute whether a child is homeschooled, whether the child attends regular school for some classes, and the number of hours the child attends regular school; (3) to correct for a small number of inconsistent imputed values; and (4) to impute for a few cases when no donors with matching sort variable values could be found.

Some person-level characteristics from the screener as well as from several sections of the SR and PFI interviews (age confirmation, household relationships, and child and parent language) were imputed manually because they typically involve complex relationships and/or constraints that would have required extensive programming in order to impute using a hot-deck procedure. The same is true of the items indicating whether a child is homeschooled, whether the child attends regular school for some classes, and the number of hours the child attends regular school. Furthermore, the reasonableness of imputed values for these person-level characteristics can often be assessed by examining the values of these variables for other members of the household. The use of the manual imputation approach in this situation permits the review of the characteristics of household members when imputing the missing values for the person-level variables.

After values have been imputed for all observations with missing values, the distribution of the item prior to imputation (i.e., the respondent's distribution) is compared to the post-imputation distribution of the imputed values alone and of the imputed values together with the observed values. This comparison is an important step in assessing the potential impact of item nonresponse bias and ensuring that the imputation procedure reduces this bias, particularly for items with relatively low response rates (less than 90 percent).

For each data item for which any values are imputed, an imputation flag variable is created so that users can identify imputed values. Users can employ the imputation flag to delete the imputed values, use alternative imputation procedures, or account for the imputation in computation of the reliability of the estimates produced from the dataset.

Recent Changes

A two-phase sample design was used in the NHES surveys administered in 2001, and the NHES program adopted a new procedure for replication variance estimation for two-phase samples.

Future Plans

NHES is currently undergoing a major redesign to address falling response rates and potential coverage issues in the landline list assisted RDD design. The proposed new design utilizes an Address Based Sample (ABS) and will primarily collect data using a self administered paper questionnaire that will be mailed to sampled households. The first full scale data collection under the new design in anticipated to take place January 2012.

5. DATA QUALITY AND COMPARABILITY

In addition to the data quality activities inherent in the NHES design and survey procedures, activities designed specifically to assess data quality are undertaken for each collection. Reinterviews and analysis of telephone coverage bias are two activities conducted during many survey administrations. Other data quality activities address specific concerns related to a topical survey. Issues of data quality and comparability are discussed below.

Sampling Error

The two major methods of producing approximate standard errors for complex samples are replication methods and Taylor Series approximations. Special software is available for both methods, and the NHES data support either type of analysis. (Further information on the use of replication and Taylor Series methods is provided in *A Guide to Using Data From the National Household Education Survey* [Collins and Chandler 1997].)

Since the 2001 NHES surveys used a two-phase sample design, a new procedure for replication variance estimation was used thereafter. The replicate base weights under two-phase sampling are calculated using a two-step procedure. First, the initial replicate base weights of the first-phase units are calculated using the standard jackknife procedure. In the second step, the final replicate base weights for the second-phase sample are computed by redistributing the initial replicate weights of first-phase units not selected in the second phase to the initial replicate weights of the second-phase units within the same second-phase stratum.

Note that the sum of the final replicate base weights of the second-phase units is the same as the sum of the initial replicate base weights of the first-phase units within the same second-phase stratum. The procedure involves only the calculation of the telephone number-level replicate base weights. All full-sample weighting and all subsequent adjustments to the replicate weights are done using the same methodology used for a single-phase sample.

The replication method used in the NHES surveys for single-phase samples involves splitting the entire sample into a set of groups, or replicates, based on the actual sample design of the survey. The survey estimates can then be estimated for each of the replicates by creating replicate weights that mimic the actual sample design and estimation procedures used in the full sample. The variation in the estimates computed from the replicate weights can then be used to estimate the sampling errors of the estimates from the full sample. The procedures used to develop the full weights are used to produce each replicate weight. Replicate weights have been included in all of the NHES data files to make this application relatively simple. Various software packages, such as WesVar and SUDAAN, can properly apply replicate weights.

Nonsampling Error

Sample estimates also are subject to bias from nonsampling errors; however, it is more difficult to measure the magnitude of these errors. They can arise for a variety of reasons: nonresponse; undercoverage; differences in respondents' interpretations of the meaning of questions; memory effects; misrecording of responses; incorrect editing, coding, and data entry; time effects; or errors in data processing.

Coverage error. Every household survey is subject to some undercoverage bias—the result of some members of the target population being either deliberately or inadvertently missed in the survey. Telephone surveys like those in the NHES program are subject to an additional source of bias because not all households in the United States have telephones. Even more problematic is the fact that the percentage of households without telephones varies from one subgroup of the population to another. Differential rates among population subgroups, such as those defined by region, age, race/ethnicity, and household composition, are of concern to telephone survey methodologists because they can introduce bias in the estimates. Coverage bias in the telephone survey is probably due to the prevalence of nontelephone households (nontelephone households include cellular phone-only households, in addition to households with

no telephone service) and the differences between such households and those with telephones.

Based on recent findings (Blumberg and Luke, 2010) 24.5 percent of households had only a wireless telephone in 2009. Tucker et al. (2002) and Blumberg et al. (2006) examined differences in characteristics among persons and households having no telephone service, cellular service only, and landline service (including both landline only, and landline and cellular). Although there are differences in landline coverage (e.g., young adults, adults in 1-person households, renters, and Hispanics have lower landline coverage rates than other groups), raking is used in NHES to statistically adjust for and reduce undercoverage bias.

Special analyses of the bias associated with telephone coverage and its potential impact on estimates from the NHES surveys are conducted for each cycle of the survey. CPS data are used to evaluate the differences between estimates for telephone households and estimates for the entire population. The results of these analyses show that, for most estimates, the bias due to sampling only telephone households is small. However, for subgroups with characteristics highly correlated with not having a telephone (e.g., the poor, high school dropouts), coverage bias may be large. Recent studies suggest that between 5-20 percent of the population may be missed by using list assisted RDD methods (Boyle et al. and Fahimi et al.). Raking adjustments can reduce such coverage bias, though no adjustments have been found to adequately reduce the amount of bias across all measures that might be affected by coverage issues. Additionally, as the coverage bias increases, it becomes more difficult for raking to adequately adjust (See, for example, Montaquilla, Brick, and Brock [1997].)

Additional undercoverage results when some telephone households are excluded from the sampling frame. This was a disadvantage of the list-assisted method of RDD sampling used in earlier administrations of NHES surveys. (See section 4. "Survey Design,"above.) Households in the zero-listed stratum had no chance of being included in the sample. Empirical findings that address questions of coverage bias show that the percentage of telephone numbers in the zero-listed stratum that are residential is very small (about 1.4 percent) and that about 3 to 4 percent of all telephone households are in the zero-listed stratum. The findings also show that the bias resulting from excluding the zero-listed stratum is generally small. (See Brick et al. [1995].)

Nonresponse error. Nonresponse in NHES surveys is handled in ways designed to minimize the impact on data quality—through weighting adjustments for unit nonresponse and through imputation for item nonresponse.

Unit nonresponse. Household members are identified for extended interviews in a two-stage process. First, screener interviews are conducted to enumerate and sample households for the extended interviews. The failure to complete the first-stage screener means that it is not possible to enumerate and interview members of the household. The completion rate for the first stage is the percentage of screeners completed by households. The completion rate for the second stage is the percentage of sampled and eligible persons with completed interviews. The survey response rate is the product of the first- and second-stage completion rates (screener completion rate x interview completion rate = survey response rate). All of the rates are weighted by the inverse of the units' probability of selection (see table 19).

Item nonresponse. For most of the items collected in the NHES surveys, the item response rate is high. The median item response rate for items with any missing values for the surveys administered in 1995, 1996, and 1999 ranged from 98.4 to 99.5 percent, except for HHL-NHES:1996, where the median response rates for imputed items was 95.0 percent for household-level characteristics and 99.5 percent for person-level characteristics. For SR-NHES:1993, three items had response rates of less than 95 percent; for SS&D-NHES:1993, there were two such items. None of the ECE-NHES:1991 items had response rates of less than 94 percent, while most of the AE-NHES:1991 items had response rates of more than 99 percent; however, there was one item from the 1991 screen that had a response rate of 92 percent. For SR-NHES:2007 and PFI-NHES:2007, the median item response rates were 99.28 percent and 99.04 percent, respectively, and the median total response rates (the product of the item response rates and overall unit response rates) were 40.41 percent and 38.72 percent, respectively.

Measurement error. In order to assess item reliability and inform future NHES surveys, most administrations also include a subsample of respondents for a reinterview. Reinterviews were conducted for ECE-NHES:1991; both SR-NHES:1993 and SS&D-NHES:1993; AE-NHES:1995; both PFI-NHES:1996 and YCI-NHES:1996; and ASPA-NHES:2001, AEWR-NHES:2003, and AE-NHES:2005.

In a reinterview, the respondent is asked to respond to the same items on different occasions. In order to limit

the response burden of the reinterview program, only selected items are included in the reinterview. The item selection criteria focus on the inclusion of key survey statistics (e.g., frequency of reading to children), items that are expected to have a potential for measurement error based on cognitive laboratory or field-test findings, and items required to control the question skip patterns for the reinterview. The results of the reinterviews are used to modify subsequent NHES surveys and to give some guidance to users about the reliability of responses for specific items in the data files. (See *Use of Cognitive Laboratories and Recorded Interviews in the National Household Education Survey* [Nolin 1997].) However, the reinterview procedure does not account for all measurement errors in the interviewing process, such as systematic errors that would be made in both the original interview and the reinterview.

The major emphasis of the 1991, 1993, and 1995 reinterview studies was to measure response variability. Overall, the results were positive. For example, within the AE-NHES:1995 reinterview study, only three items in one subject area had high response variability. The reinterview responses were consistent for most items; only minor modifications were suggested. (See *Measurement Error Studies at the National Center for Education Statistics* [Salvucci et al. 1997].)

Bias study. As part of the 2007 NHES administration a comprehensive bias study was conducted to look at the impact of non response and coverage issues on the NHES. The bias study utilized a separately drawn area probability sample and compared results to the RDD study. The study did not identify systematic patterns of bias in the key NHES statistics. However, some potential for bias was found in five estimates and concern over the ability of a landline frame to maintain adequate coverage in the future was raised. (See *An Evaluation of Bias in the 2007 National Household Education Surveys Program Results from a Special Data Collection Effort* [Van de Kerckhove et. al. 2009]).

Data Comparability
The NHES data can be compared with estimates from several other large-scale data collections, as described below.

Comparisons of methodology. For analysts wanting to compare the NHES surveys with another household survey, the Survey of Income and Program Participation (SIPP)—a longitudinal household survey conducted by the U.S. Bureau of the Census—provides an appropriate comparison. The first wave of data

collection in SIPP is always done by personal visit to the household. Subsequent data collection is conducted primarily by telephone but may also be done in person. The response rates for SIPP are much higher than those that could be expected using an RDD screening sample, as in the NHES program. With personal interviews, there are more opportunities to obtain participation (including activities such as speaking with neighbors), and it is easier to demonstrate the importance of the sampled person's cooperation. It should be noted that, while the difference in response rates is largely the result of the different modes of sampling and data collection, the Census Bureau's response rates are generally higher than those achieved by other collection organizations.

Comparisons of topical data. Specific data from NHES surveys can be compared with data from several other surveys, as described below.

Early childhood education. Over the years, several NHES surveys have collected similar information on early childhood education: SR-NHES:2007, ECPP-NHES:2005, ECPP-NHES:2001, ECPP-NHES: 1995, ECE-NHES:1991, and SR-NHES:1993. These data can be compared with data from three other surveys. The CPS October Education Supplement collects information on nursery school enrollment. (See chapter 27.) CPS estimates of participation in early childhood programs and estimates of retention in early grades can be compared with NHES estimates. In addition, the 1990 CPS October Education Supplement replicated several NHES items on home activities that parents engage in with their children. NHES data can also be compared with data from the National Health Interview Survey Child Health Supplement of 1988 (conducted by the National Center for Health Statistics), which collected information on participation in child care and early childhood education programs and on the health status of children. Finally, SIPP (described above) periodically includes a supplement that collects information on the child care and early childhood program participation of children of mothers who are employed or enrolled in school or job training which is comparable with NHES data.

Before- and after-school programs and activities. PFI-NHES:2007 collected information on topics such as participation in literacy-related activities with family members, school size, contacts from the school, parent involvement with the school, disabling conditions, and parent and household characteristics. ASPA-NHES:2005 and ASPA-NHES:2001 covered some topics addressed in previous years by other NHES surveys. Parent-NHES:1999 and PFI/CI-NHES:1996 both collected information on school contacts with

households about children. Parent-NHES:1999 also collected information on type of care and basic statistics on after-school program participation. Basic enrollment totals and demographic characteristics, as well as public and private school enrollment data, from these NHES surveys, can be compared with CPS estimates.

Table 19. Weighted response rates for selected NHES surveys: 1991–2007

Questionnaire	Screener/1st stage	Interview/2nd stage	Overall
ECE-NHES:1991	81.0	94.5	76.5
AE-NHES:1991	81.0	84.7	68.6
SR-NHES:1993	82.1	89.6	73.6
SS&D-NHES:1993 – Parents, 3rd–5th	82.1	89.4	73.4
SS&D-NHES:1993 – Parents, 6th–12th	82.1	89.6	73.6
SS&D-NHES:1993 – Students, 6th–12th	82.1	83.0	68.1
ECPP-NHES:1995	73.3	90.4	66.3
AE-NHES:1995	73.3	80.0	58.6
PFI/CI-NHES:1996	69.9	89.4	62.5
YCI-NHES:1996	69.9	76.4	53.4
ACI-NHES:1996	69.9	84.1	58.9
Parent-NHES:1999	74.1	90.0	66.7
Youth-NHES:1999	74.1	78.1	57.9
AE-NHES:1999	74.1	84.1	62.3
AELL-NHES:2001	69.2	77.2	53.4
ECPP-NHES:2001	69.2	86.6	59.9
ASPA-NHES:2001	69.2	86.4	59.7
AEWR-NHES:2003	64.6	76.2	49.2
PFI-NHES:2003	64.6	83.3	53.8
AE-NHES:2005	66.9	71.2	47.6
ASPA-NHES:2005	66.9	84.1	56.3
ECPP-NHES:2005	66.9	84.4	56.4
AEWR-NHES:2007	52.8	62.4	33.0
PFI-NHES:2007	52.8	74.1	39.1
SR-NHES:2007	52.8	77.0	40.7

SOURCE: Brick, J.M., and Broene, P. (1997). *Unit and Item Response, Weighting, and Imputation Procedures in the 1995 National Household Education Survey (NHES:95)* (NCES Working Paper 97-06). National Center for Education Statistics, U.S. Department of Education. Washington, DC. Brick, J.M., Tubbs, E., Collins, M., and Nolin, M. (1997). *Unit and Item Response, Weighting, and Imputation Procedures in the 1993 National Household Education Survey (NHES:93)* (NCES Working Paper 97-05). National Center for Education Statistics, U.S. Department of Education. Washington, DC. Collins, M., Montaquila J., Nolin, M., Kim, K., Kleiner, B., and Waits, T. (2003). *National Household Education Surveys of 2001 Data File User's Manual, Volume I* (NCES 2003-079). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Montaquila, J., and Brick, J. M. (1997). *Unit and Item Response Rates, Weighting, and Imputation Procedures in the 1996 National Household Education Survey* (NCES Working Paper 97-40). National Center for Education Statistics, U.S. Department of Education. Washington, DC. Nolin, M., Montaquila, J., Nicchitta, P., Kim, K., Kleiner, B., Lennon, J., Chapman, C., Creighton, S., and Bielick, S. (2000). *NHES:1999 Methodology Report* (NCES 2000-078). National Center for Education Statistics, U.S. Department of Education. Washington, DC.

Adult education. Both NHES surveys (AEWR-NHES:2003, AELL-NHES:2001, AE-NHES:1999, AE-NHES:1995, and AE-NHES:1991) and CPS provide estimates of adult education participation. (See chapter adult education that replicated items used to estimate the adult education participation rate in AE-NHES:1991.

School safety and discipline. Estimates from SS&D-NHES:1993 can be compared with estimates from three other surveys. The Monitoring the Future Survey (conducted annually by the National Institute on Drug Abuse) gathers information on the prevalence and incidence of the illicit drug use of 12th-graders. In addition, it contains questions designed to describe and explain changes in many important values, behaviors, and lifestyle orientations of American youth. The School Crime Supplement of the 1989 and 1995 National Crime Victimization Survey (conducted by the U.S. Department of Justice, Bureau of Justice Statistics) provides detailed information on personal crimes of violence and theft that were committed inside a school building or on school property. Finally, the NCES National Education Longitudinal Study of 1988 (NELS:88) provides data on educational issues such as the school environment, school discipline, victimization at school, and drug and alcohol education. (See chapter 8.)

Parent involvement in education. Estimates from PFI/CI-NHES:1996 can be compared with data from NELS:88. Data analysts may wish to examine NELS:88 data in conjunction with the PFI estimates on school contacts with parents (by parent report) and the frequency of parents helping their child with his or her homework.

Civic involvement and other characteristics. Estimates from the NHES Adult and Youth Civic Involvement Surveys can be compared with estimates from seven other surveys. The 1995 CPS October Education Supplement included sets of items measuring the percentage distribution of the adult population, age and sex of the adult population, household income distributions, and race/ethnicity by highest level of education. (See chapter 27.) The 1992 National Adult Literacy Survey collected data on adults' activities in daily life that require English literacy skills. (See chapter 19). Areas common to the 1994 General Social Survey, sponsored by the National Science Foundation, and ACI-NHES:1996 include organizational membership, various political or civic activities, and attitudes about freedom of speech. The National Election Study collects data on voting, public opinion, and political participation and knowledge during election years. Several items addressing political

27.) CPS collected information on adult education participation every 3 years from 1969 through 1984 The 1992 CPS also included a brief set of questions on

knowledge in ACI-NHES:1996 were drawn from the National Election Study and can be used for direct comparisons. The Citizens' Political and Social Participation Survey measures the extent and variety of voluntary social and political activity among Americans and the causes of that engagement. The Washington Post/Kaiser Family Foundation/Harvard University Survey Project provides information on public knowledge, perceptions, and attitudes about the role of American government. Finally, the National Survey of High School Seniors, a part of the CPS, elicits detailed information on political and relevant nonpolitical matters so that parent-child similarities and differences can be assessed. ACI-NHES:1999 expanded on the 1996 Youth Civic Involvement Survey by including more questions about youth service activities.

6. CONTACT INFORMATION

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Chapter 27: Current Population Survey (CPS) – October Supplement

1. OVERVIEW

The Current Population Survey (CPS) is a monthly survey of 50,000–60,000 households conducted by the Bureau of the Census, part of the U.S. Department of Commerce, for the Bureau of Labor Statistics (BLS), U.S. Department of Labor. The basic monthly CPS collects data about the employment, unemployment, and other characteristics of the civilian noninstitutionalized population in the United States; it excludes military personnel and their families living on post, inmates of institutions, and residents of homes for the aged. Since the late 1960s, the National Center for Education Statistics (NCES) has sponsored the October Supplement to the CPS to capture additional information on school enrollment status and related topics for household members 3 years old and over, thus providing current estimates of school enrollment as well as of the social and economic characteristics of students.

Purpose

The October Supplement is designed to collect information on the school enrollment of household members in any type of public, parochial, or other private school in the regular school system. Such schools include nursery schools, kindergartens, elementary schools, high schools, colleges, universities, and professional schools. Additional supplementary questions are designed to collect information on various topics of interest.

Components

The October Supplement is an annual addition to the basic monthly CPS. The information collected is described below. A member of each household who is at least 15 years old provides information for all members of the household.

October Supplement. The October Supplement collects information on the school enrollment status and educational attainment of household members 3 years old and over, including highest grade completed, level and grade of current enrollment, attendance status, number and type of courses taken, degree or certificate objective, and type of organization offering instruction for each member of the household. A dozen core questions in the interview instrument for the October Supplement have remained unchanged since 1967. Since 1987, additional questions have been included on business, vocational, technical, secretarial, trade, and correspondence courses; on the grade the student was attending in the previous year; on the calendar year that the student received his or her most recent degree; on whether or not the student completed high school by means of an equivalency test (such as a General Educational Development [GED] credential); and on whether or not children ages 3 to 5 are enrolled in any kind of nursery school, kindergarten, or elementary school. From time to time, additional items address such topics as private school tuition, adult education,

SUPPLEMENTS TO THE CPS

September Supplement:

➢ Conducted only in 2001

➢ Collected data on the availability and use of computers and the Internet at school, home, and work.

October Supplement:

➢ Conducted annually

➢ Collects data on household members 3 years old and over on school enrollment status.

vocational education, computer and internet use, language proficiency library,use, disability status, and student mobility.

Basic CPS. The basic CPS collects monthly data on household membership, household characteristics, demographic characteristics, and labor force participation of the civilian noninstitutionalized population 15 years of age and over. However, published data focus on those ages 16 and over. The basic CPS is collected each month from a probability sample of approximately 50,000–60,000 occupied households.

Periodicity
The basic CPS is conducted monthly. The October Supplement to the CPS is an annual supplement.

2. USES OF DATA

The October Supplement provides important education data to policymakers and researchers on school enrollment and educational attainment. Data from the October Supplement, together with data from the basic CPS and the March Supplement (Annual Social and Economic Supplement), provide the basis for descriptive and analytic reports that portray the social and economic characteristics of students in relation to the specifics of their school enrollment. From these sources, it is possible to retention rates and completion rates for various levels of education, and high school dropout. In some years, the October Supplement also provides policy-relevant data on private school tuition, adult education, vocational education, early childhood education, and student mobility.

3. KEY CONCEPTS

Some of the key concepts in the CPS October Supplement are defined below. For additional terms relevant to the October Supplement, as well as to the basic CPS, refer to *School Enrollment—Social and Economic Characteristics of Students: October 1996 (Update). Detailed Tables and Documentation for P20-500* (U.S. Department of Commerce 1998).

Household. All persons who occupy a housing unit. A house, an apartment or other group of rooms, or a single room is regarded as a housing unit when it is occupied or intended for occupancy as separate living quarters; that is, when the occupants do not live and eat with any other persons in the structure and there is direct access from the outside or through a common hall. A household includes the related family members and all the unrelated persons, if any, such as lodgers, foster children, wards, or employees who share the housing unit. A person living alone in a housing unit, or a group of unrelated persons sharing a housing unit as partners, is also counted as a household.

School Enrollment. School enrollment includes anyone who has been enrolled at any time during the current term or school year in any type of public, parochial, or other private school in the regular school system. Such schools include nursery schools, kindergartens, elementary schools, high schools, colleges, universities, and professional schools. Attendance may be either full time or part time, during the day or night. Regular schooling is that which may advance a person toward an elementary or high school diploma, or a college, university, or professional school degree. Enrollment is excluded if in schools that are not in the regular school system or that do not advance students to regular school degrees (e.g., enrollment in trade schools, business colleges, and schools for the mentally handicapped).

Level of School. Nursery school, kindergarten, elementary school (1st through 8th grades), high school (9th through 12th grades), and college or professional school. The last level includes graduate students in colleges or universities. Persons enrolled in elementary school, middle school, intermediate school, or junior high school through the 8th grade are classified as in elementary school. All persons enrolled in the 9th through 12th grades are classified as in high school.

Nursery School. A group or class that is organized to provide educational experiences for children during the year or years preceding kindergarten. This includes Head Start programs or similar programs sponsored by local agencies to provide preschool education to young children.

Public or Private School. A public school is defined as any educational institution operated by publicly elected or appointed school officials and supported by public funds. Private schools include educational institutions established and operated by religious bodies, as well as those that are under other private control. In cases where enrollment is in a school or college that is both publicly and privately controlled or supported, enrollment is counted according to whether it is primarily public or private.

Modal Grade. For descriptive and analytic purposes, enrolled persons are classified according to their relative progress in school; that is, whether the grade or year in which they were enrolled was below, at, or above the modal (or typical) grade for persons of their age at the time of the survey. The modal grade is the year of school in which the largest proportion of students of a given age are enrolled.

Vocational School Enrollment. Vocational school enrollment includes enrollment in business, vocational, technical, secretarial, trade, and correspondence courses not counted as regular school enrollment and not for recreation or adult education classes.

Educational Attainment. Highest level of school a person has completed or highest degree a person has received.

4. SURVEY DESIGN

Target Population
All household members age 3 and older in the civilian noninstitutionalized population of the 50 states and the District of Columbia. Excludes military personnel and their families living on post, inmates of institutions, and residents of homes for the aged.

Sample Design
The CPS sample is a multistage stratified sample of approximately 72,000 assigned housing units from 824 sample areas designed to measure the demographic and labor force characteristics of the civilian noninstitutionalized population 15 years of age and older. Published data, however, focus on those ages 16 and over. Currently, the CPS samples housing units from lists of addresses obtained from the 2000 Decennial Census of Population and Housing. The sample is updated continuously for new housing built after the 2000 Census.

To improve the reliability of estimates of month-to-month and year-to-year change, eight panels of housing units are used to rotate the sample each month. A sample unit is interviewed for 4 consecutive months and then, after an 8-month rest period, for the same 4 months a year later. Every month, a new panel of housing units, or one-eighth of the total sample, is introduced. Thus, in a particular month, one panel is being interviewed for the first time, one panel for the second, and so on.

The first-stage sample selection is carried out in three major steps: definition of the primary sampling units (PSUs), stratification of the PSUs within each state, and selection of the sample PSUs in each state. There are currently (after the 2000 Decennial Census) 2,025 defined PSUs in the United States from which to draw the CPS sample. The CPS sample design calls for combining PSUs into strata within each state and selecting one PSU from each stratum. The CPS currently uses the Stratification Search Program (SSP), created by the Demographic Statistical Methods Division of the Census Bureau, to perform the PSU stratification. CPS strata in all states except Alaska are formed using the SSP. (A separate program performs the stratification for Alaska.) A total of 824 PSUs are selected for the sample. Using a procedure designed to maximize overlap, one PSU is selected per stratum with probability proportional to its 2000 population. This procedure uses mathematical programming techniques to maximize the probability of selecting PSUs that are already in sample while maintaining the correct overall probabilities of selection.

The second stage of the CPS sample design is the selection of sample housing units within PSUs. These ultimate sampling unit (USU) clusters consist of a geographically compact cluster of approximately four addresses, corresponding to four housing units at the time of the census. Each month, about 72,000 housing units are assigned for data collection, of which about 60,000 are occupied and thus eligible for interview. The remainder are units found to be destroyed, vacant, converted to nonresidential use, containing persons whose usual place of residence is elsewhere, or ineligible for other reasons. Of the 60,000 housing units, about 5 percent are not interviewed in a given month due to temporary absence (vacation, etc.), other failures to make contact after repeated attempts, the inability of persons contacted to respond, unavailability for other reasons, and refusals to cooperate (which make up about half of the noninterviews). Information is obtained each month on for approximately 110,000 persons 15 years of age or older and on approximately 30,000 persons under the age of 15.

Since 2005, the CPS sample has been selected based on 2000 census information. From 1995 to 2004, the sample was based on 1990 census information; samples prior to 1995 similarly used earlier censuses. The number of PSUs, housing units, and persons interviewed are also different in samples prior to 2005. Specifics on each given CPS sample can be found in the technical documentation report for the year's CPS.

Data Collection and Processing

The U.S. Bureau of the Census is the collection agent for the CPS and its supplements. Additional details on data collection and processing are provided in *The Current Population Survey: Design and Methodology* (Technical Paper 66) (U.S. Department of Commerce 2006).

Reference Dates. The reference period for the October Supplement is the current school year, which is assumed to be in progress in the interview month of October. The CPS labor force questions ask about labor market activities for 1 week each month. This week is referred to as the ''reference week.'' The reference week is defined as the 7-day period, Sunday through Saturday, which includes the 12th of the month.

Data Collection. Each month, Bureau of the Census field representatives attempt to collect data from the sample units during the week containing the 19th of the month. For the first month-in-sample interview, the interviewer visits the sample address to determine if the sample unit exists, if it is occupied, and if some responsible adult will provide the necessary information. If someone at the sample unit agrees to the interview, the interviewer uses a laptop computer to administer the interview. In most cases, the interviewer conducts subsequent interviews by telephone (use of telephone interviewing must be approved by the respondent) and does not actually visit the sample unit again until the fifth month-in-sample interview, the first interview after the 8-month resting period. Fifth-month households are more likely than any other household to be a replacement household; that is, a household in which all the previous month's residents have moved out and been replaced by an entirely different group of residents. However, any person can change his or her household status during the time in sample: a person who leaves the household is deleted from the roster; a person who moves into the household is added to the roster.

Most month-in-sample 2 through 4 and 6 through 8 interviews are conducted by telephone. (For instance, 78.8 percent of the interviews for the October 2004 Supplement were conducted by telephone, which is highly consistent with the usual monthly results for telephone interviews.) Interviewers continue to visit households without telephones, with poor English language skills, or that decline a telephone interview.

The interview begins with questions about the housing unit and the people who consider this address their usual residence. Basic demographic information is collected for each household member. Labor force information is collected for each civilian 15 years of age or older, although the data for 15-year-olds are not used in official BLS estimates. After the labor force information has been collected for all eligible household members, supplemental questions particular to that month's interview may be asked of specific family members or the entire household.

Editing. Completed interviews are electronically transmitted to a central processor where the responses are edited for consistency and various codes are added. The edits effectively blank out all entries in inappropriate questions and ensure that all appropriate questions have valid entries.

Estimation Methods

Weighting is used in the CPS to adjust for sampling and unit nonresponse, and imputation is used to adjust for item nonresponse.

Weighting. For the basic CPS, the estimation procedure involves weighting the data from each sample person by the inverse of the probability of the person's housing unit being in the sample. With some exceptions, sample persons within the same state have the same probability of selection. The CPS uses raking ratio estimation to derive the weights used to tabulate total U.S. and state estimates. The goal is to control the survey estimates of the population in specific subgroups to match independently obtained estimates of the civilian noninstitutionalized population in the 50 states and the District of Columbia. These population estimates are prepared monthly to agree with the most current set of population estimates that are released as part of the Census Bureau's population estimates and projections program. In addition, household and family weights provide a basis for household-level estimates and estimates for married couples living in the same household.

For all CPS data files, a final weight is prepared and used to compute the monthly labor force status estimates. The final weight, which is the product of several adjustments, including a nonresponse adjustment, is used to produce estimates for the various characteristics covered in the full monthly CPS. This weight is constructed from the basic weight for each person, which represents the probability of selection for the survey. For supplements, such as the October Supplement, separate data processing is required, not only to edit responses for consistency and impute for missing values, but also to incorporate special weighting procedures to account for the fact that the

supplement is targeting a special universe, such as school-age children, in contrast to the working-age labor force emphasis of the basic CPS.

Starting with the data collected in the October 1994 CPS, independent estimates have been based on civilian noninstitutionalized population controls for age, race, and sex established by the decennial census and adjusted to compensate for an undercount. These independent estimates are based on statistics from decennial censuses; statistics on births, deaths, immigration, and emigration; and statistics on the size of the Armed Forces.

Imputation. When a response is not obtained for a particular data item, or an inconsistency in reported items is detected, an imputed response is entered in the field. Before the edits are applied, the daily data files are merged and the combined file is sorted by state and PSU within state. This sort ensures that allocated values are from geographically related records; that is, missing values for records in Maryland will not receive values from records in California. This is an important distinction since many labor force and industry and occupation characteristics are geographically clustered. The edits are run in a deliberate and logical sequence. Demographic variables are edited first because several of these variables are used to allocate missing values in the other modules. The labor force module is edited next, since labor force status and related items are used to impute missing values for industry and occupation codes and so forth.

CPS edits use three imputation methods: relational imputation, longitudinal edits, and hot-deck imputation. Relational imputation infers the missing value from other characteristics in the person's record or within the household. Longitudinal edits are used primarily in the labor force edits. If a question is blank and the record is in the overlap sample, the edit looks at the previous month's data to determine whether the person had responded then for that item. If so, the previous month's entry is assigned; otherwise, the item is assigned a value using the appropriate hot deck. The hot-deck method assigns a value from a record with similar characteristics. Hot decks are always defined by age, race, and sex. Other characteristics used in hot decks vary depending on the nature of the question being referenced. The imputation procedure is performed one item at a time. In a typical month, the imputation rate for demographic items is less than 1 percent. The rates for labor force items are slightly over 1 percent. Over all earnings items, the imputation rate is near 10 percent, with some items

having much higher and others much lower nonresponse rates. In October 2005, the imputation rate for the basic school enrollment items ranged from 4 to 7 percent per item.

Future Plans
The October Supplement will always include the traditional school enrollment questions; questions on other topics will be added as occasion warrants. For example, over the last several decades NCES has funded additional items on education-related topics such as language proficiency, disabilities, computer use and access, student mobility, and private school tuition. Plans for additional questions in future years have yet to be determined.

5. DATA QUALITY AND COMPARABILITY

Sampling Error
Although the estimation methods used in the CPS do not produce unbiased estimates, biases for most estimates are believed to be small enough so that the confidence interval statements are approximately true. Standard error estimates are computed using replicate variance techniques and reflect contributions not only from sampling error but also from some types of nonsampling error, particularly response variability and intra-interviewer correlation. Because replicate variance techniques are somewhat cumbersome, simplified formulas called generalized variance functions (GVFs) have been developed for various types of labor force characteristics. The GVF can be used to approximate an estimate's standard error, but this only indicates the general magnitude of its standard error rather than a precise value. Standard error estimates computed using generalized variance functions are provided in *Employment and Earnings* and other BLS publications.

Nonsampling Error
Although the full extent of nonsampling error in the CPS is unknown, special studies have been conducted to quantify some of the possible sources. The effect of nonsampling error should be small on estimates of relative change, such as month-to-month change. Estimates of monthly levels would be more severely affected by nonsampling error.

Coverage Error. The concept of coverage in the survey sampling process is the extent to which the total population that could be selected for the sample "covers" the survey's target population. Undercoverage

in the CPS results from missed housing units and missed persons within sample households. Overall CPS undercoverage for households was estimated to be about 10 percent for October 2005 and about 11 percent for October 2006. It is known that the CPS undercoverage varies with age, sex, race, and Hispanic origin. Generally, undercoverage is larger for men than for women and larger for Blacks, Hispanics, and other races than for Whites. Ratio adjustment to independent age/sex/race/origin population controls, as described previously, partially corrects for the biases due to survey undercoverage. However, biases exist in the estimates to the extent that missed persons in missed households or missed persons in interviewed households have different characteristics than interviewed persons in the same age/sex/race/origin group.

The independent population estimates used in the estimation procedure may be a source of error although, on balance, their use substantially improves the statistical reliability of many of the figures. Errors may arise in the independent population estimates because of underenumeration of certain population groups or errors in age reporting in the decennial census (which serves as the base for the estimates) or similar problems in the components of population change (mortality, immigration, etc.).

Nonresponse Error.

Unit Nonresponse. Unit nonresponse may have a number of components. A respondent may refuse to participate in the survey, may not be capable of completing the interview, or may not be available to the interviewer during the specified survey period. If the entire household does not participate, this situation is referred to as a "Type A noninterview." There is also another type of (partial) unit nonresponse, namely, that one or more individual persons within the household refuse to be interviewed. This is not a major problem in the CPS since any responsible adult may be able to report information for other persons as a proxy reporter. There are other variations on unit nonresponse; detailed consideration of these may be found in *The Current Population Survey: Design and Methodology* (Technical Paper 66) (U.S. Department of Commerce 2006).

For the October 2005 basic CPS, the nonresponse rate was 7.4 percent, and the nonresponse rate for the October supplement was an additional 3.4 percent. These two nonresponse rates led to a combined nonresponse rate of 10.5 percent. For the October 2006 basic CPS, the household-level nonresponse rate was 8.1 percent, and the person-level nonresponse rate for the October supplement was an additional 3.9 percent. Since the basic CPS nonresponse rate was a household-level rate and the School Enrollment supplement nonresponse rate was a person-level rate, these rates couldn't be combined to derive an overall nonresponse rate. Since it is unlikely the nonresponding households to the basic CPS had the same number of persons as the households successfully interviewed, combining these rates would have resulted in an overestimate of the "true" person-level overall nonresponse rate for the October supplement (for more information, see *The Current Population Survey October 2006: School Enrollment Supplement Technical Documentation,* U.S. Department of Commerce 2006).

Item Nonresponse. Although an imputation procedure is implemented for item nonresponse in the CPS, there is no way of ensuring that the errors of item imputation will balance out and that any potential bias has been avoided.

Measurement Error. The main sources of nonsampling variability in the responses to the October Supplement are those inherent in the survey instrument. The question of current school enrollment may not be answered accurately for various reasons. Some respondents may not know current grade information for every student in the household, a problem especially prevalent for households with members in college or in nursery school. Confusion over college credits or hours taken by a student may make it difficult to determine the year in which the student is enrolled. Problems may occur with the definition of nursery school (a group or class organized to provide educational experiences for children), where respondents' interpretations of "educational experiences" vary.

Data Comparability

NCES collects preschool, elementary school, secondary school, and postsecondary education enrollment and completion data through a wide range of studies including the National Household Education Surveys Program (NHES, see chapter 26), the Common Core of Data (CCD, see chapter 2), the Private School Survey (PSS, see chapter 3), the Integrated Postsecondary Education Data System (IPEDS, see chapter 12), and the National Postsecondary Student Aid Study (NPSAS, see chapter 14). In addition, the Bureau of the Census collects the American Community Survey (ACS), which is another household survey that includes some school enrollment and educational attainment data.

Because of differences in data collection modes, respondent selection, interviewer training, collection and reference periods, and differing survey processes, data obtained from the CPS and other sources are not entirely comparable. This is an example of nonsampling variability that is not reflected in the standard errors. Therefore, caution should be used when comparing results from different sources.

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