

# Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources

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## KEY FINDINGS

This study compared national estimates of the supply and characteristics of nine types of allied health workers drawn from four publicly available national data sources: the American Community Survey (ACS), the Current Population Survey (CPS), the Occupational Employment Statistics (OES), and the National Provider Identifier (NPI) Registry. The nine occupations (or occupation groups) examined were occupational therapists, physical therapists, respiratory therapists, speech-language pathologists, clinical laboratory technologists/technicians, dental hygienists, diagnostic related technologists/technicians, medical assistants and social workers. Key findings include:

- National workforce supply estimates from the ACS, CPS and OES data sources for the nine selected occupations were generally comparable. Estimates based on NPI Registry data were smaller and not available for some occupations.
- Social workers and medical assistants were the largest groups among the occupations studied. Occupational therapists and respiratory therapists were the smallest.
- Speech-language pathologists and dental hygienists were predominantly female (>96%) and respiratory therapists had the highest percentage of males (34-35%).
- Clinical laboratory technicians/technologists and medical assistants were the most racially diverse of the occupations studied (roughly half of those who were not Hispanic were of races other than White) and clinical laboratory technicians/technologists, medical assistants, and social workers had the highest proportions of Hispanic individuals (10-28%).
- Medical assistants had the lowest annual earnings (\$29,000-\$32,000) and physical therapists had the highest (\$60,000-\$86,000) among the nine occupations. Earnings are challenging to compare across data sources because the definitions of earnings differed.
- In general, higher educational attainment was associated with higher earnings. The exception was social workers, with more than a third having attained master's degrees or higher, but who had annual earnings (\$41,000-\$50,000) similar to clinical laboratory technologists/technicians (\$45,000- \$52,000), among whom only 9% held a master's degree or higher.

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# Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources

## INTRODUCTION

Effective health workforce planning requires accurate and timely information about the existing supply of healthcare providers. This information supports studies to assess whether the workforce meets current patient needs and demands as well as to project the adequacy of future supply. Partners in health workforce development who make use of this information include education leaders who must determine whether more or different training and educational opportunities are needed; credentialing entities that assess how professional licensing or other credentialing processes affect supply; and employers in the healthcare industry that must anticipate the extent to which the pool of workers will meet their needs, as well as to develop appropriate recruitment, retention and training strategies.

A major challenge to monitoring the healthcare workforce is securing up-to-date and valid data on the number and characteristics of the entire spectrum of the healthcare workforce. The majority of national and regional estimates of the size, distribution, characteristics, and future supply/demand of healthcare occupations tend to address occupations with the largest numbers in the workforce and with the most available data, such as physicians and registered nurses.<sup>1-3</sup> The Health Resources and Services Administration (HRSA) provided 2007-2010 estimates of the national supply of 35 healthcare occupations in *The US Health Workforce Chartbook*.<sup>4</sup> HRSA also produced projections of supply and demand for many healthcare practitioners and healthcare support occupations.<sup>5</sup> These resources are valuable to help understand trends in a wide selection of occupations, but these workforce estimates are carried out relatively infrequently because considerable resources are needed to study each occupation, few datasets exist to support these studies, and funding to collect new data is limited. These factors especially limit the availability of data for allied health occupations (generally considered to encompass healthcare occupations other than physicians, nurses, dentists and pharmacists) because of the relatively small size and the limited availability of resources and advocates to promote efforts to enumerate and describe these occupations.

Most estimates of the size and distribution of the health workforce are drawn from either surveys (direct contact with the healthcare worker or employer to obtain information about worker demographic, employment and other characteristics) or from administrative records (e.g., healthcare claims, licensure and other registration data). While survey data about healthcare occupations gathered at regular intervals, just once, or as funding is available can provide some of the best data for health workforce assessment (e.g., HRSA's National Sample Survey of Registered Nurses and National Sample Survey of Nurse Practitioners),<sup>6</sup> the costs of collecting and analyzing these data can be prohibitive and surveys conducted to describe allied health occupations are rare. Administrative records at the national level (e.g., the federal National Plan and Provider Enumeration System, Medicare claims), or at the state level (e.g., state professional licensure records, state Medicaid claims) are additional sources of data for health workforce analysis. Given that these data sources are generally collected on an ongoing basis to serve the administrative functions for which they are being assembled, often these sources do not capture enough detail about an occupation or otherwise are not able to address the questions asked by health workforce planners.

Because different data sources are developed for different purposes, they frequently provide varying estimates when used to describe the health workforce. Ideally, the ranges of the estimates overlap, but because each data source reveals different parts of the full picture, multiple data sources may be needed to make useful workforce estimates. A clear understanding of the differences among these data sources is needed for healthcare workforce planners and policymakers to effectively develop and implement

workforce policies and practices. Although a variety of recent reports have described data sources available for workforce planning, none compare estimates across data sources. This report expands on these prior works to compare estimates for select allied health occupations, and describes the extent to which four publicly available data sources frequently used in healthcare workforce studies support analyses of these occupations, as well as where more resources are needed.

## DATA AND METHODS

This report examines nine allied health occupations (or occupation groups): occupational therapists, physical therapists, respiratory therapists, speech-language pathologists, clinical laboratory technologists and technicians, dental hygienists, diagnostic related technologists and technicians (i.e., cardiovascular technologists/technicians, diagnostic medical sonographers, nuclear medicine technologists, radiologic technologists/technicians and magnetic resonance imaging technologists), medical assistants and social workers. Data were extracted from the most recent year available across four national data sources: the American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES) and the National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) Registry records. U.S. population data for per capita estimates of workforce supplied came from a custom-prepared 2014 data file from Claritas.<sup>7</sup>

For each of the datasets from the ACS, OES, CPS and NPI Registry, we compared the estimated workforce size and characteristics of these occupations. Descriptive statistics were used to portray the demographic and socioeconomic characteristics, to the extent the data were available, of individuals in these occupations. This report compares results across these national data sources and describes their uses and limitations for health workforce planning.

### DATA SOURCES

**American Community Survey (ACS):** The ACS is an annual survey administered to a nationally representative sample of approximately three million U.S. households by the U.S. Census Bureau.<sup>8</sup> ACS essentially replaced, in 2010, the long form of the Decennial U.S. Census (ongoing since 1850). ACS includes data on occupation, industry, employment status, geography, and demographics such as race, sex, and age of respondents. We extracted data from the Public Use Microdata Sample (PUMS) files provided by the Integrated Public Use Microdata Series (IPUMS).<sup>9,10</sup> Alternatively, data could have been extracted directly from the Census website, but the advantage of using IPUMS is that they harmonize the data across years and with another national survey, the Current Population Survey, which allows for easier comparisons between datasets. IPUMS ACS data are accessible from the <https://usa.ipums.org/usa/> website.

We compared estimates from a three-year pooled sample of the ACS with estimates from single-year ACS data. The three-year data reflect pooled estimates over multiple years for areas and subgroups with smaller populations. Only about 25% of U.S. counties are captured in the single-year data, while the three-year datasets cover about 59%.<sup>11</sup> The three-year pooled sample, compared to single-year files, is statistically more reliable due to increased sample size. The tradeoff is that the three-year data are less current than the single-year data. Although there are advantages for small area estimation using the three-year data, we decided to present data from the most recent single-year file, 2014, because the Census will not be providing multi-year pooled data in future releases.<sup>12</sup> The three-year pooled sample data will remain available to users for 2015 and prior.

For this study, we restricted the ACS sample to the non-institutionalized, civilian population living in the 50 states and the District of Columbia. Our analyses included respondents who were in the labor force at the time of the survey, where labor force participation was defined as working or seeking work (excluding, for example, those in school, retired, or living in institutions). Pre-defined person-level replicate weights were used to make the data nationally representative. In the ACS, each PUMS housing unit and person record contains 80 PUMS replicate weights. Replicate weights allow researchers to obtain precise variance estimation or direct standard errors, which translates to better precision in statistical testing, by amplifying one sample to simulate multiple samples.

**Current Population Survey (CPS):** The CPS is a nationally representative survey of approximately 60,000 households administered monthly by the U.S. Census Bureau and U.S. Bureau of Labor Statistics (BLS).<sup>13</sup> CPS has been ongoing since 1962. Like the ACS, CPS includes data on occupation, industry, employment status, geography, and demographics such as race, sex, and age on individuals age 16 and older. Many social scientists interested in detailed employment-related information focus on the Annual Social and Economic Supplement (ASEC) conducted in March of each year (also referred to as the “March Supplement”). Although CPS data are available directly from the U.S. Census website, we extracted the March Supplement of the CPS data from the PUMS files as described above for the ACS. IPUMS CPS data are accessible from the <https://cps.ipums.org/cps/> website. For CPS, our analysis relied on data from 2015, which was the most recent data available.

Like the ACS, we restricted the CPS sample to the non-institutionalized, civilian population living in the 50 states and the District of Columbia, and in the labor force at the time of the survey. CPS has a complex sampling frame with individuals interviewed for four consecutive months, then not interviewed for the next eight months, and then interviewed again for four months. Pre-defined person-level replicate weights were used to account for this complex sampling frame, and made the data nationally representative. In the CPS, there are 160 replicate weights for each record, which is a greater number than ACS because CPS has a smaller sample size and requires more simulations to obtain precise standard errors.

**Occupational Employment Statistics (OES):** The Bureau of Labor Statistics’ OES program collects employment and earnings data from multiple, non-farm industries (800 occupations) across the U.S.<sup>14</sup> No other individual employee-level characteristics are collected. The survey is administered semi-annually on approximately 200,000 non-farm businesses, but a sampling process combines the current sample with the immediate five prior samples to obtain a combined sample of about 1.2 million businesses. OES data on industry-specific occupations are consistently available from 1997 forward on an annual basis. For this analysis, we used OES data from May 2015, which can be directly downloaded from the <http://www.bls.gov/oes/> website.

Data on employment and earnings are collected in six semiannual panels for three consecutive years, with a new panel of data added every six months and the oldest panel dropped. For example, the May 2015 estimates were based on responses from six semiannual panels collected over a three-year period: May 2015, November 2014, May 2014, November 2013, May 2013 and November 2012. OES methodology that relies on the use of six data waves assumes that employment and earning patterns change slowly; any sudden changes in labor market only show up gradually in the OES estimates. Older wage data are adjusted by the Employment Cost Index. The total employment reported is technically a pooled average of the three years of employment data. Despite the complex sampling frame, the employment estimates are assumed to be May 2015 estimates.

**National Plan and Provider Enumeration System National Provider Identifier (NPI) Registry:** The NPI is an identifier associated with healthcare providers and health plans participating in the NPI Registry managed by the Centers for Medicare and Medicaid Services (CMS).<sup>15</sup> The NPI, a 10-digit number, is a record within the NPDES that covers both individuals and institutional providers. The individual provider NPI is a single unique identifier that identifies a healthcare provider in standard transactions, such as healthcare claims. NPIs may also be used to identify healthcare providers on prescriptions, in coordination of benefits between health plans, in patient medical record systems, and in program integrity files.

The NPI Registry is updated monthly and contains individual-level data for all providers who obtain a NPI number. The NPI Registry is updated voluntarily by individuals when a change occurs in their status (e.g., to facilitate billing from a new employer or because they have retired). No characteristics of the individual provider other than sex is collected in the NPI. Some NPIs may be inactive if the individual does not have an incentive to update their records. Compared to the ACS, CPS and OES, the NPI Registry is fairly new -- CMS started issuing NPIs in 2006. We used NPI Registry data from July 2016, the most recent version at the time of the analysis, accessible from the CMS NPI Registry website.

## COMPARISONS OF NATIONAL DATA SOURCES

Key features of the four national data sources are described below and a summarized comparison is provided in Table 1.

**Costs/Availability:** All four data sources are publicly available and can be obtained for free.

**Sampling Frame/Time Lag:** Estimates derived from the data sources we studied may vary in part due to the way data are collected and the population sampled (also known as the sampling frame). The ACS, CPS and OES aim to be nationally representative samples reflecting the U.S. population. Both the ACS and CPS are household surveys that provide data from responses of individuals, while the OES, a survey of businesses, provides data about workers from the perspective of the employer. The NPI Registry derives data from the individual worker and because it does not rely on a sampling frame represents the total population of individuals with NPI numbers.

The ACS, conducted annually, has about a two-year time lag between when the data are collected and when the data become publicly available. The OES is published semi-annually with a complex sampling frame of using the prior three years of data to produce a one-year estimate on employment and earnings. There is about a 1.5 year time lag between the last data collection point and when the data become publicly available. The CPS is conducted monthly and is published with about a three- to four-month time lag between when the data were last collected and when they are made public. The NPI Registry is continually updated.

The ACS, CPS and OES aim to capture population-level changes, with the CPS and OES specifically aiming to capture changes in the labor market. Both the CPS and OES have complex sampling frames to smooth trends in estimates, which also means that any changes over time are slowly revealed. The NPI Registry captures real-time changes.

**Sample Size/Margin of Error:** Margins of error are important to report along with point estimates from survey data because surveys extrapolate population trends based on a sample of that population and there may be some room for error due to the sampling framework. ACS has the largest sample size, followed by OES, and then CPS with the smallest sample size. Generally, the larger

**Table 1:**  
Comparison of health workforce-related data available from four national data sources

	ACS 2014	CPS 2015	OES 2015	NPI 2016
<b>Costs/availability</b>	Public, free	Public, free	Public, free	Public, free
<b>Sample and frequency</b>	Annual household survey	Monthly household survey	Bi-annual employer survey	Ongoing registry
<b>Time lag for data release after each data collection cycle</b>	Approx. 2 years	Approx. 3-4 months	Approx. 1.5 years	Continually updated
<b>Sample size</b>	3.5 million	60,000 per month	1.2 million	Registry of all providers and organizations with NPIs
<b>Geographic coverage</b>	National, state and regional*	National, state and regional*	National, state, and regional*	National, regional, state, sub-state
<b>Occupations and industry classifications used</b>	Census occupation and industry codes that crosswalk to SOC** and NAICS***	Census occupation and industry codes that crosswalk to SOC and NAICS	SOC; NAICS	Health Care Provider Taxonomy code set; no industry codes
<b>Wage and salary earnings data collected</b>	Annual	Annual, weekly and hourly wage	Annual and hourly wage	---
<b>Demographic and socioeconomic characteristics</b>	Includes, but not limited to, age, sex, race, ethnicity, marital status, and education	Includes, but not limited to, age, sex, race, ethnicity, marital status, and education	---	Sex

\*depending on the variables of interest

\*\*SOC: Standard Occupation Classification

\*\*\*NAICS: North American Industry Classification System

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES), National Provider Identifier Registry (NPI)

the sample size, the smaller the margin of error. Estimates obtained from the CPS had the largest margins of error. Estimates from the OES survey had the smallest margins of errors mainly because of the OES's large sample size and a statistically robust sampling process. Because the NPI is a registry, and therefore includes the universe of all records of interest, there are no margins of errors to report.

**Geographic Coverage:** All four data sources allow for analyses at the national level. Regional and state-level analyses are also possible across all four data sources, though the accuracy of the sample estimates are dependent on factors such as the sample size. The multi-year pooled estimates of the ACS provide more geographic detail than the single-year pooled estimate of the ACS as described above. But even the single-year estimate of the ACS provides more reliable geographic detail than a single year of the CPS because its sample size is larger. Through IPUMS, Public Use Microdata Areas (PUMAs) are the smallest geographic regions available in the ACS and CPS. PUMAs consist of about 100,000 individuals within states, and reflect parts or groups of counties. PUMAs are designed so as not to disclose identifiable respondent information. The OES produces estimates of supply and earnings (but does not capture individual provider demographic or socioeconomic information) by occupation at the national, state, metropolitan and non-metropolitan geographic levels. Because the NPI Registry is a census of all providers with NPIs, these data can be used for national, state and sub-state analyses. The NPI Registry includes detailed information on providers' work locations (but not coded by facility type), including ZIP codes.

**Occupation Definitions:** All four data sources provide numbers (headcounts, not full-time equivalencies [FTEs]), of individuals in an occupation. The ACS and CPS use Census occupation codes, which crosswalk to the Standard Occupational Classification System (SOC) codes used by the OES. The ACS and CPS collapse some categories of occupations such as nursing, psychiatric, and home health aides, due to concerns about sample size and assumptions about which occupations are of greatest interest to the public using the data. The level of detail provided on occupations evolves over time: updates are made to the SOC every decade. Because of the longer time between data collection and public release, the ACS tends to be most delayed in applying updates to national changes in occupation codes.

SOC codes do not directly correspond to the NPI taxonomy of healthcare-related occupations. The NPI Registry provides greater detail about the specialty of a given occupation (such as the 28 types of respiratory therapists) than the ACS, CPS or OES. There were no NPI taxonomy codes, however, for three of the selected allied health occupations/occupation groups in this study - clinical laboratory technologists and technicians, diagnostic related technologists and technicians, and medical assistants - most likely because these occupations are not providers who bill insurers directly for their services.

**Industry Setting:** The ACS and CPS provide information on the setting in which individuals work using four-digit Census industry codes, which correspond to the North American Industry Classification System (NAICS) codes through a crosswalk. Similar to occupation codes, the ACS and CPS collapse several industry codes into higher-level categories such as for hospitals. Similar to SOC codes, these industry codes are updated every ten years. The OES also provides settings in which individuals work using the NAICS codes. The NPI Registry captures the names and addresses of providers' employers, but that information is not coded to employer or healthcare facility type.

**Wage and Salary Earnings:** The ACS, CPS and OES all capture wage and salary earnings information for individual workers. The NPI Registry does not capture any earnings-related information. Individuals in ACS and CPS are asked to report annual wage and salary earnings (excluding taxes and benefits, but including overtime, bonuses, commission and tips) received in the prior calendar year. ACS only reports annual earnings, while CPS also collects data on weekly earnings, as well as hourly wage rate for those paid hourly. Incorporated self-employed individuals are included in ACS earnings calculations, while incorporated and unincorporated self-employed are excluded from earnings calculations in CPS.

The OES survey collects wage earnings data on all full-time and part-time workers in nonfarm industries, and excludes the self-employed, owners and partners in unincorporated firms and household/unpaid family workers. The OES collects pre-tax base rate earnings that include cost-of-living allowances, guaranteed pay, hazardous duty pay, incentive pay such as commissions and

bonuses, and tips. The OES does not include overtime pay, severance pay, shift differentials, nonproduction bonuses, and tuition reimbursements, among other premium pay. Annual earnings data for individuals in the OES are calculated, depending on the variable, by dividing total wages for an occupation group by the total number of employees, or by multiplying hourly wage rates by the number of work hours in a year. Further details on OES wage earnings data can be found in the OES documentation.

There are some key differences between the OES and CPS earnings data. CPS collects earnings data based on an individual's main job. Even individuals that have multiple jobs report their earnings on their main job only, and these earnings are not adjusted for hours worked. The CPS collects wage data in exact dollars and cents. On the other hand, OES, which is employer-reported, collects wage data in 12 discrete wage intervals, and assumes 2,080 hours of work. Employers report the number of employees in an occupation per each wage range. More details on wage intervals are available at the OES website.<sup>16</sup> Additionally, CPS does not record earnings from the self-employed, while the OES collects wages and earnings from incorporated self-employed establishments.<sup>17</sup> Earnings data from the ACS are also employee-reported and are based on all of an individual's jobs.

### Demographic and Socioeconomic

**Characteristics:** Demographic and socioeconomic characteristics including age, sex, race/ethnicity, marital status, and general education attainment of individuals are available in the ACS and CPS only. The NPI registry provides data only on the sex of the provider. The ACS and CPS collect information on the usual hours of work.

## COMPARISON OF NATIONAL SUPPLY ESTIMATES OF NINE ALLIED HEALTH OCCUPATIONS

Estimates of national supply of nine allied health occupations derived from the four data sources examined by this study are shown in Table 2.

For each of the nine allied health occupations, estimates of supply size from the ACS, CPS and OES data sources were generally in the same range: for any occupation, the lower point estimate of supply being 72% of the largest point estimate. The estimates for clinical laboratory technologists/technicians supply from the ACS, CPS and OES data were the most similar, with the lowest point estimate (from CPS) being 97.3% of the highest point estimate (from the ACS).

**Table 2:**  
National supply estimates for nine allied health occupations across four data sources

	ACS 2014	CPS 2015	OES 2015	NPI 2016
	N of individuals (MoE*)	N of individuals (MoE)	N of individuals (MoE)	N of individuals **
Occupational therapists	102,576 (±7,371)	119,434 (±31,363)	114,660 (±2,945)	78,734
Physical therapists	228,876 (±11,782)	289,807 (±52,271)	209,690 (±4,143)	161,414
Respiratory therapists	113,322 (±8,695)	100,720 (±31,535)	120,330 (±2,377)	3,721
Speech-language pathologists	145,750 (±9,072)	182,004 (±44,495)	131,450 (±3,116)	99,407
Clinical laboratory technologists and technicians	314,202 (±14,176)	322,863 (±58,363)	320,550 (±7,600)	not available
Dental hygienists	162,553 (±8,757)	208,413 (±41,774)	200,550 (±4,755)	7,437
Diagnostic related technologists and technicians	337,032 (±13,420)	315,255 (±51,537)	361,430 (±4,999)	not available
Medical assistants	512,531 (±17,956)	504,735 (±58,708)	601,240 (±9,504)	not available
Social workers	814,744 (±21,422)	726,353 (±80,222)	619,300 (±8,566)	221,308

\* Margin of Error

\*\*Because the NPI Registry represents the entire population of providers in the registry, margins of error are not relevant.

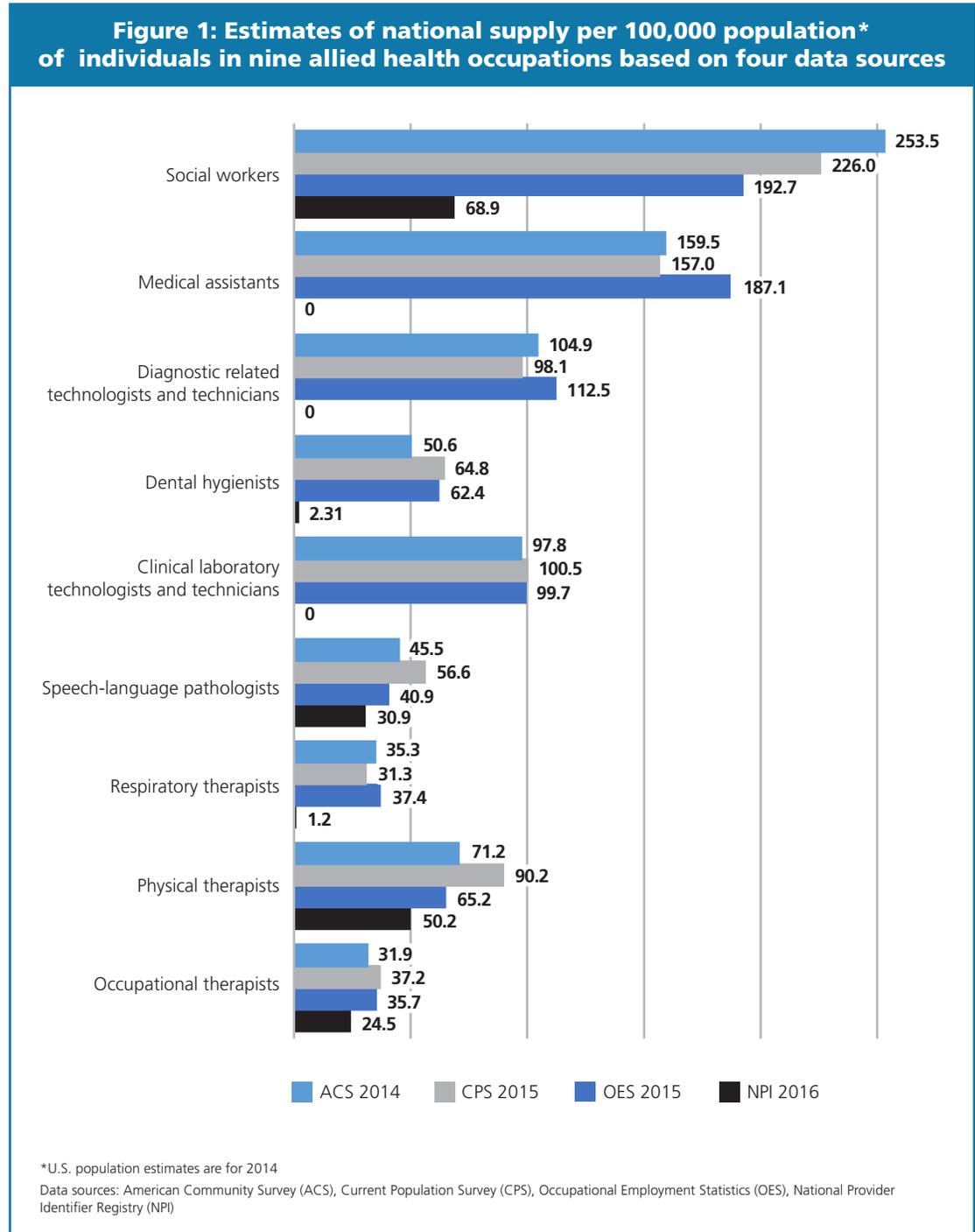
Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES), National Provider Identifier Registry (NPI)

Supply estimates of the selected allied health occupations from NPI Registry data were consistently smaller, if available at all, compared with estimates from the other data sources. Among occupations in the NPI Registry, the NPI estimates for occupational therapists, physical therapists and speech-language pathologists were between half to three quarters as large as estimates from the other data sources. For social workers, NPI-derived estimates were only 36% of the estimate from the OES data, which was the next largest. Three occupations (or occupation groups) did not appear at all in the NPI data: 1) clinical laboratory technologists/technicians, 2) diagnostic related technologists/technicians and 3) medical assistants.

Figure 1 compares the occupations' supply estimates across the data sources when used in calculations of per capita rates. The NPI Registry captured a majority of the occupational therapists, physical therapists and speech-language pathologists, but the NPI Registry supply estimates for the other six occupations examined in this study were much lower than from the other data sources.

Among these nine allied health occupations, social workers comprised the largest workforce, followed by medical assistants and diagnostic related technologists/technicians. Because social workers include those in clinical as well as social service settings, their involvement in healthcare jobs is likely lower than represented in these numbers. Respiratory therapists and occupational therapists had the smallest workforces among the list.

Using data from these four national sources, we produced Data Snapshots for each of the nine allied health occupations described in this report (see Appendix). Each Data Snapshot provides details about the overall supply estimates derived from



each of the four data sources, as well as available demographic and socioeconomic characteristics (e.g., age, sex, race/ethnicity, marital status), educational attainment, and employment information (e.g., annual earnings, hours/FTE) for the occupation.

As described in the Data Snapshots, most of these occupations had similar mean ages, between 40 and 43 years. The exception was individuals working as medical assistants who had a younger mean age range of 37 to 38 years. Speech-language pathologist and dental hygienists were predominantly female (96% or higher). Respiratory therapists had the highest percentage of males (between 34 and 35%). Clinical laboratory technicians/technologists and medical assistants had the most racially and ethnically diverse individuals; roughly half of those who were not Hispanic were of races other than White (estimates ranged between 39 and 54%). These two occupations, along with social workers, had the highest proportions of Hispanic members (ranging from 10 to 28%). Annual earnings ranged across datasets and across occupations: medical assistants had the lowest annual earnings, with estimates ranging from \$29,000 to \$32,000 across the data sources. Physical therapists had the highest annual earnings, with estimates ranging from \$60,000 to \$86,000. In general the higher the educational attainment of workers in an occupation the higher the annual earnings, with some exceptions. For example, with annual earnings of approximately \$41,000 to \$50,000, social workers were more in line with clinical laboratory technologists/technicians at \$45,000 to \$52,000, in spite of the fact that more than a third of social workers had master's degrees or higher compared with 9% or less of the clinical laboratory group.

## CONCLUSIONS AND IMPLICATIONS

### STRENGTHS AND WEAKNESSES OF DATA SOURCES

National workforce supply estimates among the ACS, CPS and OES data sources were generally comparable, as shown in Table 2 and Figure 1, although the margins of error in the CPS estimates were larger compared to other data sources mostly because of the survey's small sample size. The variations in the estimates likely occurred because each data source uses different inclusion criteria, sample selection, and/or survey frequency.

Each data source has strengths and weaknesses for use in estimating the size and characteristics of health workforce supply. A common challenge across the ACS, CPS and OES data sources is that periodic changes in industry and occupation classification systems complicate efforts to compare estimates across data sources and different time periods. Advantages of the ACS include the large sample size that allows detailed geographic analyses and the availability of demographic and employment information. The main disadvantage of the ACS is its data are the least current because of the standard delays in release of the data. A strength of the CPS is the availability of detailed income and other financial data. A weakness of the CPS is that the sample is smaller compared to ACS, and therefore, statistical reliability decreases when analyses are conducted on small geographic regions. The strength of the OES dataset is its large sample size that leads to significant reductions in sampling error and improves the reliability of estimates for detailed occupations in small geographical regions. A weakness of the OES, for purposes of health workforce planning, is its lack of information on worker demographic characteristics.

As seen in the Data Snapshots, earnings are a challenge to compare across datasets. The OES earnings estimates are almost always higher than earnings estimates from the CPS and ACS. A study by Abraham and Spletzer found that the hourly wage in the OES is 20.6% higher than the CPS hourly wage for healthcare practitioners.<sup>18</sup> Workforce planners comparing earnings should take care to understand how earnings are defined across datasets. In some cases, hourly rates will best illustrate wage differences where workers are not likely to work full-time or work multiple jobs. In other cases, describing annual salaries may be more useful for understanding the impact of part-time work versus full-time work on financial stability, or to compare across settings.

Because of their use in billing and records transfer, data from the NPI Registry are likely more representative of the portion of each workforce providing direct patient care, and especially care that can be billed for Medicare and Medicaid reimbursement. As a

result, it is not surprising that the supply estimates derived from the NPI Registry are smaller than those from the other data sources, and not available for occupations that cannot or seldom bill directly for their services. An NPI is a permanent identifier associated with a specific provider, regardless of changes in the provider's practice location or specialty. How well the registry keeps up-to-date with providers as they make changes to their practice, however, is likely influenced by their incentives to edit their records: if an up-to-date record is not required by an employer or to receive payment, it is unlikely to happen. Nonetheless, the NPI Registry is a public data source that is available for free, and over time could prove to be increasingly useful for health workforce planning. Additionally, to the extent the NPI Registry can be used to identify and link providers across federal and private datasets, the value of this registry increases as a tool to assemble a more complete picture of the supply and distribution of the health workforce, and the impact of the health workforce on healthcare costs and outcomes.

## CONCLUSIONS

The goal of this study was to describe the major data resources for estimating health workforce supply size and characteristics, and to compare how these resources may be used to describe the supply of allied health workers. All four data sources described in this report provide some level of useful information that can be used for health workforce planning: to identify and make decisions about the development, allocation and distribution of various healthcare occupations. These data sources are not able to capture some of the emerging or less defined occupations, however, given their use of structured national classification systems such as the Standard Occupational Classification (SOC) and Health Care Provider Taxonomy Code Set. For example, the SOC does not currently have codes for community health workers, patient navigators, or care coordinators. Also, there are no taxonomy codes identifying medical assistants in the NPI Registry.

As this report shows, a single data source that provides all of the desired information for health workforce planning does not exist. Choosing which data source to use involves more than simply considering the population or sample size. One must consider and weigh the balance between factors such as: having the most up-to-date data; the size of the sample; the dataset's statistical reliability and precision; and the availability of details about the workforce's demographic and socioeconomic characteristics. It may be important to rely on several data sources to estimate the size and distribution of the workforce of any single occupation. Assessing these data sources is a crucial step in understanding their usefulness in describing the supply and characteristics of allied health occupations, including their size, distribution, demographic and socioeconomic characteristics. This basic information about the health workforce is needed to assess the adequacy of the supply to meet industry and population needs.

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## APPENDIX

# NATIONAL SUPPLY ESTIMATES OF SPECIFIC ALLIED HEALTH OCCUPATIONS USING DIFFERENT DATA SOURCES

### DATA SNAPSHOTS:

Occupational therapists

Physical therapists

Respiratory therapists

Speech-language pathologists

Clinical laboratory technologists and technicians

Dental hygienists

Diagnostic related technologists and technicians

Medical assistants

Social workers

## DATA SNAPSHOT: Occupational Therapists

Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for occupational therapists.

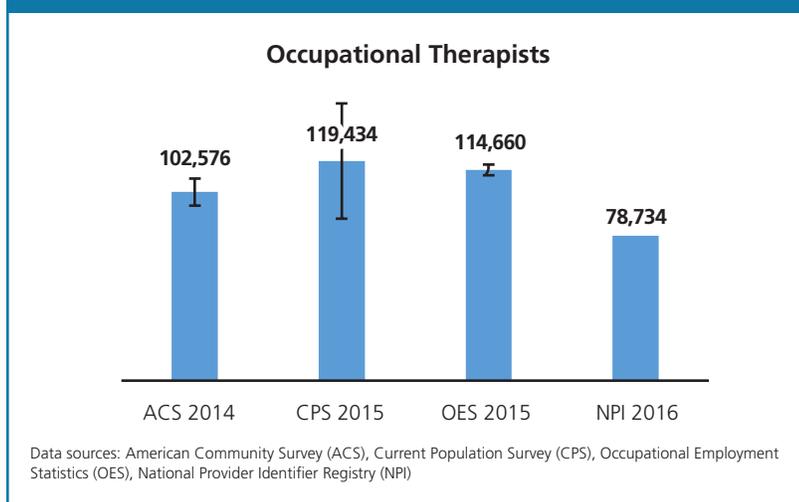
**Who are occupational therapists?** Occupational therapists work with ill, injured, disabled individuals using therapeutic means to restore individuals' maximum possible levels of independence to carry out day-to-day activities and more. Most occupational therapists work in offices of occupational therapy or in hospitals. Occupational therapists also work in schools, nursing homes, and home health services. Occupational therapists are required to be licensed by states.<sup>2</sup>

**How are occupational therapists identified across data sources?** Occupational therapists, in the ACS and CPS surveys, are identified by the four-digit SOC code, 3150, and in the OES dataset by the occupation code 29-1122, or could be pulled directly from the OES website, data section. In the

NPI Registry, occupational therapists are identified using the following taxonomy codes: Occupational Therapist - 225X00000X, Driving and Community Mobility - 225XR0403X, Environmental Modification - 225XE0001X, Ergonomics - 225XE1200X, Feeding, Eating & Swallowing - 225XF0002X, Gerontology - 225XG0600X, Hand - 225XH1200X, Human Factors - 225XH1300X, Low Vision - 225XL0004X, Mental Health - 225XM0800X, Neurorehabilitation - 225XN1300X, Pediatrics - 225XP0200X, Physical Rehabilitation - 225XP0019X.

**National estimates of occupational therapists across data sources:** Data to estimate the supply of occupational therapists were available in the ACS, CPS, OES, and NPPES NPI Registry. Demographic and socioeconomic data were available in the ACS and CPS data, and the OES had salary data. The NPI Registry had information only on the sex of the providers. The figure provides information on the estimated supply of occupational therapists as derived from these four data sources. The supply estimate of occupational therapists from the the CPS was 119,434 ( $\pm 31,363$ ), from the OES was 114,660 ( $\pm 2,945$ ), and from the ACS was 102,576 ( $\pm 7,371$ ), and from the NPI Registry was 78,734. Because the NPI Registry represents the entire population of providers in the Registry, margins of error are not relevant. As described in the background report, lower supply estimates from the NPI Registry are to be expected because they represent the providers who obtain NPIs for billing or information exchange purposes.

**Estimated national supply of occupational therapists from the ACS, OES, CPS, and NPI data sources**



**Demographic and socioeconomic characteristics:** The table below provides information on demographic and socioeconomic characteristics of occupational therapists as estimated from the ACS, CPS and OES data sources. The mean age of occupational therapists ranged from 41.2 to 42.6 years, with a slightly older population captured in the CPS. The majority of this workforce were women, between 88.4 to 89.0%. A similar proportion, about 90%, of occupational therapists were female when estimated from the NPI Registry (results not shown). Among non-White racial groups, Blacks were the second largest racial group among occupational therapists identified in the CPS (6.1%), while “other” race formed the second-largest group identified in the ACS data. Marital status was also comparable between the datasets. Between 66.1 to 66.7% of occupational therapists were married; between 11.6 to 12.1% were divorced or separated or widowed, and between 21.2 to 22.3% were single. In terms of educational attainment, a high proportion (more than 90%) of occupational therapists had either a bachelor’s degree or a master’s degree or more. The mean annual earnings, adjusted to 2015 U.S. dollars, was lowest in the CPS (\$52,819) and highest in OES (\$81,690) estimates. The mean hours worked per week were similar in the CPS and ACS data, 36.9 to 38.0 hours, respectively. Both the ACS and CPS reported similar percentages (78.5% and 78.0%) of full-time workers.

Demographic and socioeconomic characteristics of occupational therapists

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	41.2	42.6	--
Female	89.0%	88.4%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	84.1%	84.5%	--
Black, not Hispanic	4.4%	6.1%	--
Other, not Hispanic	7.0%	4.4%	--
Hispanic	4.5%	5.0%	--
<b>Marital Status</b>			
Married	66.1%	66.7%	--
Divorce/Separated/Widowed	11.6%	12.1%	--
Single	22.3%	21.2%	--
<b>Educational Attainment</b>			
High school or less	1.0%	0.0%	--
Some college	6.0%	9.4%	--
Bachelor’s degree	41.9%	42.4%	--
Master’s degree or more	51.1%	48.2%	--
<b>Employment</b>			
Annual earning (mean)*	\$57,729	\$52,819	\$81,690
Usual hours worked per week (mean)	38.0	36.9	--
Full-time workers**	78.5%	78.0%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition, Physical Therapists*. <http://www.bls.gov/ooh/healthcare/physical-therapists.htm> Accessed October 31, 2016.

## FUNDING

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## DATA SNAPSHOT: Physical Therapists

Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for physical therapists.

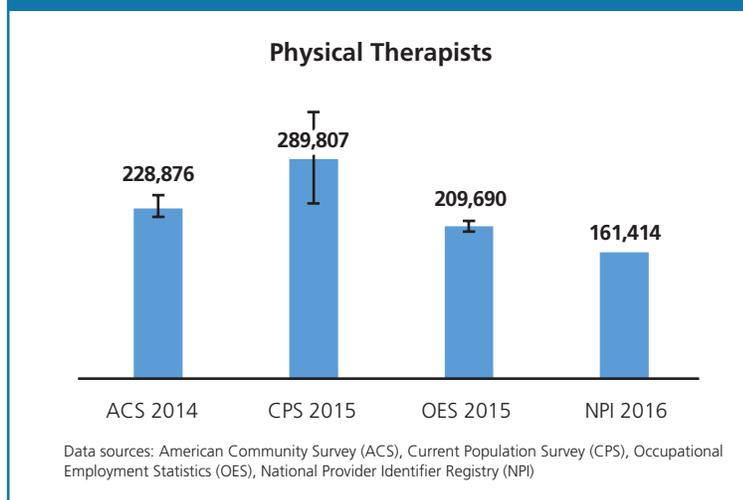
**Who are physical therapists?** Physical therapists work with ill and injured individuals to help improve movement and manage pain. Most physical therapists work in private offices and clinics, hospitals, and nursing homes. Physical therapists are required to be licensed by states.<sup>2</sup>

**How are physical therapists identified across data sources?** Physical therapists, in the ACS and CPS datasets, are identified by the four digit SOC code, 3160, and in the OES dataset by the occupation code 29-1123, or could be pulled directly from the OES website, data section. In the NPI Registry, physical therapists are identified using the following taxonomy codes: Physical Therapist - 22510000X, Cardiopulmonary - 2251C2600X, Electrophysiology, Clinical - 2251E1300X, Ergonomics - 2251E1200X, Geriatrics - 2251G0304X, Hand - 2251H1200X, Human Factors - 2251H1300X, Neurology - 2251N0400X, Orthopedic - 2251X0800X, Pediatrics - 2251P0200X, Sports - 2251S0007X.

**National estimates of physical therapists across data sources:** Data to estimate the supply of physical therapists were available in the ACS, CPS, OES, and NPPES NPI Registry. Demographic and socioeconomic data were available in the ACS and CPS data, and the OES had salary data. The NPI Registry had information only on the sex of the providers. The figure provides information on the supply of physical therapists from these four data sources. As shown in the Figure, the supply estimate of physical therapists from the CPS was 289,807 ( $\pm 52,271$ ), from the ACS was 228,876 ( $\pm 11,782$ ), and from the OES was 209,690 ( $\pm 4,143$ ), and from the NPI Registry was 161,414. Because the NPI Registry represents the entire population of providers in the Registry, margins of error are not relevant. As described in the background report, lower supply estimates from the NPI Registry are to be expected because they represent the providers who obtain NPIs for billing or information exchange purposes.

**Demographic and socioeconomic characteristics:** The table below provides information on the demographic and socioeconomic characteristics of physical therapists in the ACS, CPS and OES data sources. The mean age of physical therapists was in the range 41.3 to 42.8 years, with a slightly older estimate from the CPS. The proportions of the women working as physical therapists were between 68.5 to 80.3%, almost 12 percentage points higher in CPS compared to ACS. Similar to ACS, about 67% of physical

**Estimated national supply of physical therapists from the ACS, OES, CPS, and NPI data sources**



therapist were female in the NPI Registry (results not shown in the table). After non-White, not Hispanic, “other, not Hispanic” race was the largest racial/ethnic group among physical therapists estimated at 14.0% in the ACS and 7.5% in the CPS. Marital status was also similar as reported in the ACS and CPS data sources, with between 69.0 to 73.7% of physical therapists being married; between 9.9 to 10.3% divorced or separated or widowed, and between 16.3 to 20.6% single. In terms of educational attainment, the largest proportion of physical therapists had a master’s or higher degree: between 54.9 to 57.2%. The mean annual earnings, adjusted to 2015 U.S. dollars, was lowest in the CPS (\$60,318) and highest in the OES (\$85,790) estimates. The mean hours worked per week was about 38 hours in both the ACS and CPS. Between 77.7 to 80.0% of individuals reported working full-time between the two datasets.

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition, Physical Therapists*. <http://www.bls.gov/ooh/healthcare/physical-therapists.htm> Accessed October 31, 2016.

## Demographic and socioeconomic characteristics of physical therapists

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	41.3	42.8	--
Female	68.5%	80.3%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	75.8%	83.7%	--
Black, not Hispanic	5.1%	4.0%	--
Other, not Hispanic	14.0%	7.5%	--
Hispanic	5.1%	4.7%	--
<b>Marital Status</b>			
Married	69.0%	73.7%	--
Divorce/Separated/Widowed	10.3%	9.9%	--
Single	20.6%	16.3%	--
<b>Educational Attainment</b>			
High school or less	1.6%	4.0%	--
Some college	4.6%	9.7%	--
Bachelor’s degree	36.6%	31.5%	--
Master’s degree or more	57.2%	54.9%	--
<b>Employment</b>			
Annual earning (mean)*	\$64,318	\$60,313	\$85,790
Usual hours worked per week (mean)	38.4	37.8	--
Full-time workers**	80.0%	77.7%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## FUNDING

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## DATA SNAPSHOT: Respiratory Therapists

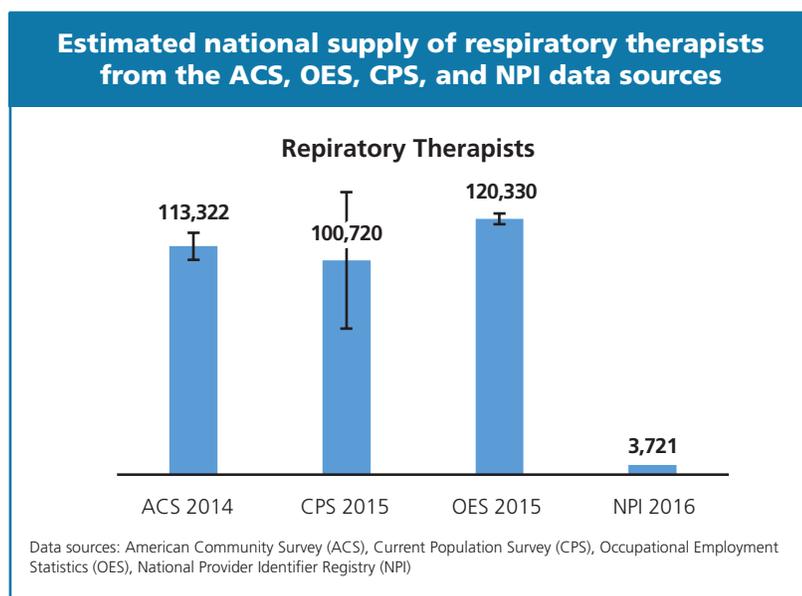
Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for respiratory therapists.

**Who are respiratory therapists?** Respiratory therapists work with individuals that have breathing problems that may be associated with chronic respiratory diseases such as asthma, chronic obstructive pulmonary disease (COPD), or pneumonia. Respiratory therapists also provide emergency care and services to individuals undergoing heart attack or shock. States except Alaska require respiratory therapists to be licensed.<sup>2</sup>

**How are respiratory therapists identified across data sources?** Respiratory therapists, in the ACS and CPS datasets, are identified by the four-digit SOC code, 3220, and in the OES dataset by the occupation code 29-1126, or could be pulled directly from the OES website, data section. In the NPI

Registry, respiratory therapists are identified using the following taxonomy codes: Respiratory Therapist, Certified - 227800000X, Critical Care - 2278C0205X, Educational - 2278E1000X, Emergency Care - 2278E0002X, General Care - 2278G1100X, Geriatric Care - 2278G0305X, Home Health - 2278H0200X, Neonatal/Pediatrics - 2278P3900X, Palliative/Hospice - 2278P3800X, Patient Transport - 2278P4000X, Pulmonary Diagnostics - 2278P1004X, Pulmonary Function Technologist - 2278P1006X, Pulmonary Rehabilitation - 2278P1005X, SNF/Subacute Care - 2278S1500X, Respiratory Therapist, Registered - 227900000X, Critical Care - 2279C0205X, Educational - 2279E1000X, Emergency Care - 2279E0002X, General Care - 2279G1100X, Geriatric Care - 2279G0305X, Home Health - 2279H0200X, Neonatal/Pediatrics - 2279P3900X, Palliative/Hospice - 2279P3800X, Patient Transport - 2279P4000X, Pulmonary Diagnostics - 2279P1004X, Pulmonary Function Technologist - 2279P1006X, Pulmonary Rehabilitation - 2279P1005X, SNF/Subacute Care - 2279S1500X.

**National estimates of respiratory therapists across data sources:** Data to estimate the supply of respiratory therapists were available in the ACS, CPS, OES, and NPPES NPI Registry. Demographic and socioeconomic data were available in ACS and CPS data, and the OES had salary data. The NPI Registry had information only on the sex of the providers. The figure shows the supply estimate of respiratory therapists from the OES was 120,330 ( $\pm 2,377$ ), from the ACS was 113,322 ( $\pm 8,695$ ), and from the CPS was 100,720 ( $\pm 31,535$ ), and from the NPI Registry was only 3,721. Because the NPI Registry represents the entire population of providers in the Registry, margins of error are not relevant. As described in the background report, lower supply estimates from the NPI Registry are to



be expected because they represent the providers who obtain NPIs for billing or information exchange purposes.

**Demographic and socioeconomic characteristics:** The table provides information on the demographic and socioeconomic characteristics of respiratory therapists from the ACS, CPS and OES data sources. The mean age of respiratory therapists was in the range 43.1 to 46.0 years, with a slightly older estimate from the CPS. The proportions of respiratory therapists who were women were similar in the ACS (64.0%) and the CPS (65.0%) data sources. About 56% of respiratory therapists were female in the NPI Registry (results not shown in the table). Among racial/ethnic groups, about two thirds of respiratory therapists were White, not-Hispanic (62.5 to 67.3%), and 12.5% (ACS) to 19.5% (CPS) were Black, not Hispanic. The majority of respiratory therapists were reported to be married compared, although the estimates from the ACS were higher compared to those from the CPS. About a quarter of respiratory therapists reported attaining a bachelor's degree, while about two thirds (64.5% to 66.0%) reported having attended but not completed college. The estimate for mean annual earnings, adjusted to 2015 U.S. dollars, was lowest in ACS (\$58,108) and highest in CPS (\$60,322). The mean hours worked per week was similar between the ACS and the CPS: 36.7 and 37.9 hours, respectively. Similar proportions of respiratory therapists reported working full-time in both data sources (90.1% in ACS and 90.8% in CPS).

## Demographic and socioeconomic characteristics of respiratory therapists

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	43.1	46.0	--
Female	64.0%	65.0%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	67.3%	62.5%	--
Black, not Hispanic	12.5%	19.5%	--
Other, not Hispanic	11.7%	9.3%	--
Hispanic	8.5%	8.7%	--
<b>Marital Status</b>			
Married	65.1%	59.0%	--
Divorce/Separated/Widowed	15.7%	28.5%	--
Single	19.2%	12.5%	--
<b>Educational Attainment</b>			
High school or less	2.8%	5.9%	--
Some college	64.5%	66.0%	--
Bachelor's degree	26.7%	25.1%	--
Master's degree or more	6.0%	3.1%	--
<b>Employment</b>			
Annual earning (mean)*	\$58,108	\$60,322	\$59,640
Usual hours worked per week (mean)	36.7	37.9	--
Full-time workers**	90.1%	90.8%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition, Respiratory Therapists*. <http://www.bls.gov/ooh/healthcare/respiratory-therapists.htm> Accessed October 31, 2016.

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## DATA SNAPSHOT: Speech-Language Pathologists

Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for speech-language pathologists.

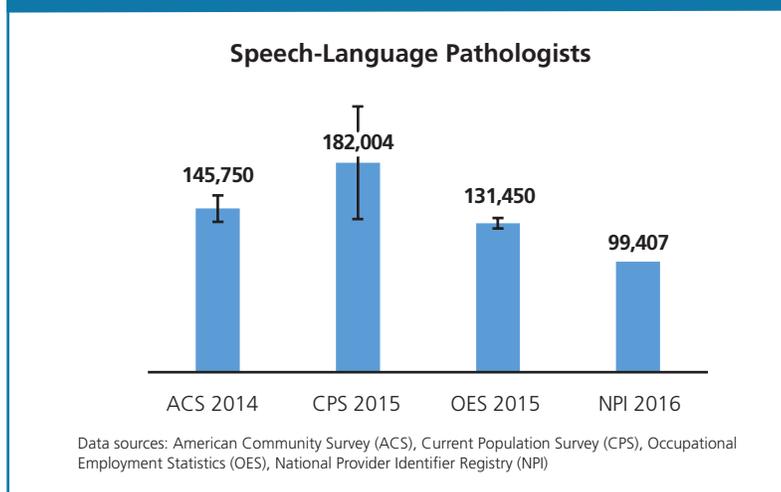
**Who are speech-language pathologists?** Speech-language pathologists or speech therapists specialize in diagnosis and treatment of communication and swallowing disorders, which are associated with illnesses such as stroke, brain injury, hearing loss, autism, and developmental delay, among others. Most states require that speech-language pathologists be licensed to practice.<sup>2</sup>

**How are speech-language pathologists identified across data sources?** Speech-language pathologists, in the ACS and CPS datasets, were identified by the four-digit SOC code, 3230, and in the OES dataset by the occupation code 29-1127, or could be pulled directly from the OES website, data section. In the NPI Registry, speech-language pathologists were identified using the following taxonomy codes: Speech-Language Pathologist - 235Z00000X.

**National estimates of speech-language pathologists across data sources:** Data to estimate the supply of speech-language pathologists were available in the ACS, CPS, OES, and NPPES NPI Registry. Demographic and socioeconomic data were available in the ACS and CPS data, and the OES had salary data. The NPI Registry had information only on the sex of the providers. As shown in the figure, the supply estimate of speech-language pathologists from the CPS was 182,004 ( $\pm 44,495$ ), from the ACS was 145,750 ( $\pm 9,072$ ), from the OES was 131,450 ( $\pm 3,116$ ), and from the NPI Registry was 99,407. Because the NPI Registry represents the entire population of providers in the Registry, margins of error are not relevant. As described in the background report, lower supply estimates from the NPI Registry are to be expected because they represent the providers who obtain NPIs for billing or information exchange purposes.

**Demographic and socioeconomic characteristics:** The table below provides information on the demographic and socioeconomic characteristics of speech-language pathologists in the ACS, CPS and OES data sources. The mean age of speech-language pathologists was similar in the ACS and CPS: approximately 42 years. The percentage of speech-language pathologists who were reported to be women was very high in both datasets, between 96.6 to 99.1%. Likewise, about 96% of speech-language pathologists were female in NPI Registry (results not shown in the table). The majority of speech-language pathologists were White,

**Estimated national supply of speech-language pathologists from the ACS, OES, CPS, and NPI data sources**



not Hispanic (between 85.0 to 91.1%), and about 5% were Hispanic (5.6% in the ACS and 5.3% in the CPS). The marital status of speech-language pathologists as reported in the ACS and CPS was similar: CPS showed a slightly lower percentage being married (65.8% compared with 67.2%) and a slightly higher percentage being single (23.3% compared with 21.2%). The majority (84.0% in the ACS and 93.1% in the CPS) of speech-language pathologists had a master's or higher degree. The mean annual earnings, adjusted to 2015 U.S. dollars, was lowest as estimated in the CPS (\$53,495) and highest in the OES (\$76,900) data sources. The mean hours worked per week was about 39 hours in both ACS and CPS. The percent of speech-language pathologists working full-time as estimated in the ACS was 76.6%, and 82.5% in the CPS.

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition, Speech-Language Pathologists*. <http://www.bls.gov/ooh/healthcare/speech-language-pathologists.htm> Accessed November 09, 2016.

## Demographic and socioeconomic characteristics of speech-language pathologists

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	41.5	42.1	--
Female	96.6%	99.1%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	85.0%	91.1%	--
Black, not Hispanic	4.8%	2.1%	--
Other, not Hispanic	4.7%	1.4%	--
Hispanic	5.6%	5.3%	--
<b>Marital Status</b>			
Married	67.2%	65.8%	--
Divorce/Separated/Widowed	11.6%	11.0%	--
Single	21.2%	23.3%	--
<b>Educational Attainment</b>			
High school or less	0.8%	1.0%	--
Some college	2.1%	1.2%	--
Bachelor's degree	13.1%	4.8%	--
Master's degree or more	84.0%	93.1%	--
<b>Employment</b>			
Annual earning (mean)*	\$54,618	\$53,495	\$76,900
Usual hours worked per week (mean)	38.6	39.3	--
Full-time workers**	76.6%	82.5%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## FUNDING

This study was supported by the National Center for Health Workforce Analysis (NCHWA), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under cooperative agreement # U81HP27844. The information, conclusions and opinions expressed in this presentation are those of the authors and no endorsement by NCHWA, HRSA or HHS is intended or should be inferred.

## SUGGESTED CITATION

Skillman SM, Dahal A, Frogner BK, Stubbs BA. *National Supply Estimates of Specific Allied Health Occupations Using Different Data Sources: Data Snapshot – Speech-Language Pathologists*. Center for Health Workforce Studies, University of Washington, Dec 2016.

## DATA SNAPSHOT: Clinical Laboratory Technologists and Technicians

Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for clinical laboratory technologists and technicians.

**Who are Clinical Laboratory Technologists and Technicians (CLTTs)?** CLTTs examine body fluid and tissue to find signs of illnesses. They manage labs for private offices and clinics, and hospitals.<sup>2</sup>

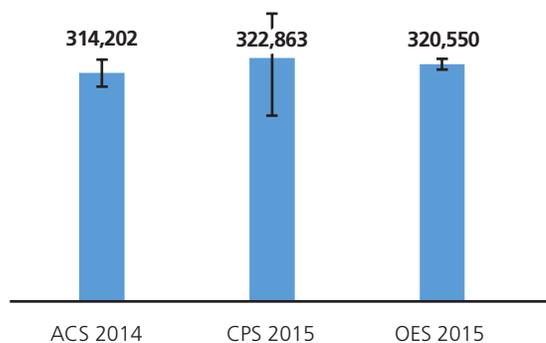
**How are CLTTs identified across data sources?** CLTTs, in the ACS and CPS datasets, were identified by the four-digit SOC code, 3300, and in the OES dataset by the occupation code 29-2010, or could be pulled directly from the OES website, data section. In the NPI Registry, it was not possible to identify CLTTs due to lack of specific taxonomy code(s).

**National estimates of CLTTs across data sources:** Data to estimate the supply of CLTTs were available in the ACS, CPS, and OES datasets. The NPI Registry had no information on CLTTs. Demographic and socioeconomic data were available in the ACS and CPS data, and the OES had salary data. As shown in the figure, the supply estimate of clinical laboratory technologists and technicians from the CPS was 322,863 ( $\pm 58,363$ ), from the OES was 320,550 ( $\pm 7,600$ ), and from the ACS was 314,202 ( $\pm 14,176$ ).

**Demographic and socioeconomic characteristics:** The table below provides information on the demographic and socioeconomic characteristics of CLTTs from the ACS, CPS and OES data sources. The mean age of CLTTs was estimated at about 41-42 years. Estimates from both data sources showed nearly three quarters of CLTTs to be women (72.4% in ACS and 76.1% in CPS). In terms of racial/ethnic diversity, the CPS estimated less than half the CLTT workforce as White, not Hispanic while the ACS data put that estimate at 61.8%. Ten percent or more of CLTTs were estimated to be Hispanic by both the ACS (9.7%) and the CPS (13.8%). Married CLTTs comprised 52.4% (ACS) to 58.5% (CPS) of the workforce. Both datasets showed relatively high percentages of CLTTs having some college (40.4% in both the ACS and CPS data) or a bachelor's degree (38.2% in the ACS and 41.4% in the CPS data). The mean annual earnings, adjusted to 2015 U.S. dollars, was lowest in the ACS (\$45,217) and highest in the OES (\$51,810). The

### Estimated national supply of clinical laboratory technologists and technicians from the ACS, OES, and CPS data sources

#### Clinical Laboratory Technologists and Technicians



Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES), National Provider Identifier Registry (NPI)

average hours worked per week was estimated at about 32 hours in both ACS and CPS. The percent of CLTTs estimated to be working full-time in the ACS was 87.0%, and 90.4% in the CPS data sources.

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition, Medical and Clinical Laboratory Technologists and Technicians*. <http://www.bls.gov/ooh/healthcare/medical-and-clinical-laboratory-technologists-and-technicians.htm> Accessed November 09, 2016.

## Demographic and socioeconomic characteristics of clinical laboratory technologists and technicians

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	42.3	41.1	--
Female	72.4%	76.1%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	61.8%	46.2%	--
Black, not Hispanic	13.8%	21.9%	--
Other, not Hispanic	14.6%	18.1%	--
Hispanic	9.7%	13.8%	--
<b>Marital Status</b>			
Married	52.4%	58.5%	--
Divorce/Separated/Widowed	17.2%	14.3%	--
Single	30.4%	27.2%	--
<b>Educational Attainment</b>			
High school or less	12.4%	9.4%	--
Some college	40.4%	40.4%	--
Bachelor's degree	38.2%	41.4%	--
Master's degree or more	9.0%	8.8%	--
<b>Employment</b>			
Annual earning (mean)*	\$45,217	\$46,352	\$51,810
Usual hours worked per week (mean)	31.7	31.7	--
Full-time workers**	87.0%	90.4%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## FUNDING

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## SUGGESTED CITATION

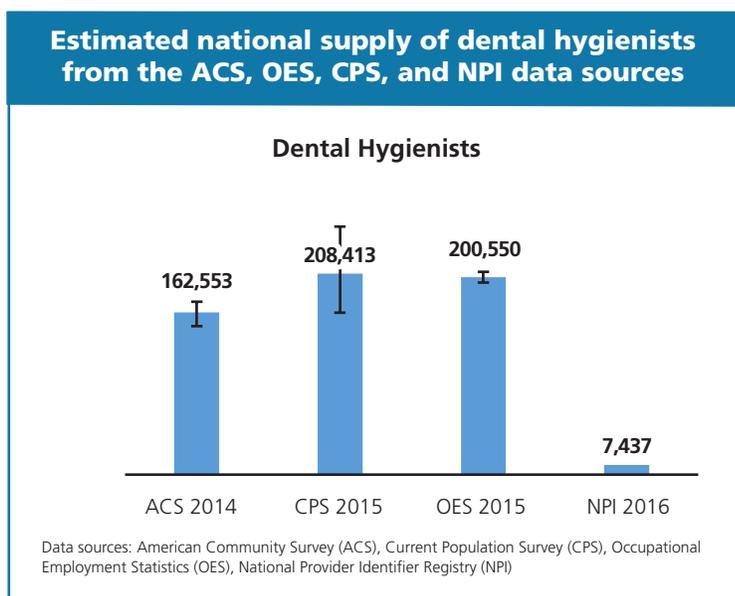
Skillman SM, Dahal A, Frogner BK, Stubbs BA. *National Supply Estimates of Specific Allied Health Occupations Using Different Data Sources: Data Snapshot – Clinical Laboratory Technologists and Technicians*. Center for Health Workforce Studies, University of Washington, Dec 2016.

## DATA SNAPSHOT: Dental Hygienists

Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for dental hygienists.

**Who are dental hygienists?** Dental hygienists provide preventative dental care, clean teeth, educate patients about good oral health, and examine for signs of oral diseases. Dental hygienists usually work in dentists' office and in 2014, more than 50% worked only part-time. States require dental hygienists to be licensed to practice.<sup>2</sup>

**How are dental hygienists identified across data sources?** Dental hygienists, in the ACS and CPS datasets, are identified by the four-digit SOC code, 3310, and in the OES dataset by the occupation code 29-2021, or could be pulled directly from the OES website, data section. In the NPI Registry, dental hygienists are identified using the following taxonomy code: 124Q00000X.



**National estimates of dental hygienists across data sources:** Data to estimate the supply of dental hygienists were available in the ACS, CPS, OES and NPPES NPI Registry data sources. Demographic and socioeconomic data were available in the ACS and CPS data, and the OES provided salary information. The NPI Registry had information only on the sex of the providers. The figure shows the supply estimate of dental hygienists from the CPS was 208,413 ( $\pm 41,774$ ), from the OES was 200,550 ( $\pm 4,755$ ), from the ACS was 162,553 ( $\pm 8,757$ ), and from the NPI Registry, was only 7,437. Because the NPI Registry represents the entire population of providers in the Registry, margins of error are not relevant. As described in the background report, lower supply estimates from the NPI Registry are to be expected because they represent the providers who obtain NPIs for billing or information exchange purposes.

**Demographic and socioeconomic characteristics:** The table below provides information on the demographic and socioeconomic characteristics of dental hygienists from the ACS, CPS and OES data sources. The mean age of dental hygienists was in the range of 40.8 to 42.5 years, with a slightly younger dental hygienists reflected in the CPS data. A very high proportion of dental hygienists were women, between 94.9 to 96.9%. In terms of racial composition, most were White, not Hispanic (79.1 to 82.7%). Approximately 8% were identified as Hispanic in both the ACS and CPS data. About two thirds of dental hygienists were reported to be married in the ACS and CPS data (67.6 and 65.3%, respectively). Both ACS and CPS data sources indicated that most dental hygienists had some college (59.1 and 55.5%, respectively) or a bachelor's degree (30.8 and 33.7%, respectively). Dental hygienists'

mean annual earnings, adjusted to 2015 U.S. dollars, showed a wide range depending on the data source. It was lowest in the CPS (\$38,238), \$48,613 in the ACS, and much higher, \$72,720, as reported in the OES data. The mean hours worked per week was estimated at about 38 hours in both ACS and CPS. The percent of dental hygienists estimated to be working full-time in the ACS was 61.2%, and 63.9% in the CPS.

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition, Dental Hygienists*. dental-hygienists.htm Accessed November 09, 2016.

## Demographic and socioeconomic characteristics of dental hygienists

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	42.5	40.8	--
Female	94.9%	96.9%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	82.7%	79.1%	--
Black, not Hispanic	3.0%	3.8%	--
Other, not Hispanic	6.4%	8.4%	--
Hispanic	7.9%	8.0%	--
<b>Marital Status</b>			
Married	67.6%	65.3%	--
Divorce/Separated/Widowed	14.0%	12.6%	--
Single	18.4%	22.1%	--
<b>Educational Attainment</b>			
High school or less	3.9%	5.8%	--
Some college	59.1%	55.5%	--
Bachelor's degree	30.8%	33.7%	--
Master's degree or more	6.2%	4.9%	--
<b>Employment</b>			
Annual earning (mean)*	\$48,613	\$38,238	\$72,720
Usual hours worked per week (mean)	37.7	37.7	--
Full-time workers**	61.2%	63.9%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## FUNDING

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## SUGGESTED CITATION

Skillman SM, Dahal A, Frogner BK, Stubbs BA. *National Supply Estimates of Specific Allied Health Occupations Using Different Data Sources: Data Snapshot – Dental Hygienists*. Center for Health Workforce Studies, University of Washington, Dec 2016.

## DATA SNAPSHOT: Diagnostic Related Technologists and Technicians

Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for diagnostic related technologists and technicians.

**Who are diagnostic related technologists and technicians (DRTTs)?** This category of allied health occupations includes the following five detailed occupations: cardiovascular technologists/technicians, diagnostic medical sonographers, nuclear medicine technologists, radiologic technologists, and magnetic resonance imaging technologists. DRTTs perform a wide range of activities that involve conducting tests for diagnostic purposes, assisting in electrocardiograms, performing diagnostic imaging examinations on patients, among others. More than 50% of DRTTs work in hospital settings.<sup>2</sup>

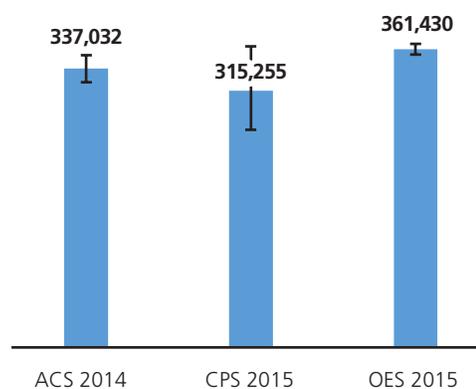
**How are DRTTs identified across data sources?** DRTTs, in the ACS and CPS datasets, are identified by the four-digit SOC code, 3320, and in the OES dataset by the occupation code 29-2030, or could be pulled directly from the OES website, data section. In the NPI Registry, there was no specific taxonomy code to identify DRTTs.

**National estimates of DRTTs across data sources:** Data to estimate the supply of DRTTs are available in the ACS, CPS, and OES, while the demography and socio-economic data were available only in the ACS and CPS. The NPI Registry has no information on the supply of DRTTs. As shown in the figure, the supply estimate of DRTTs from the OES was 361,430 ( $\pm 4,999$ ), from the ACS was 337,031 ( $\pm 13,420$ ), and from the CPS was 315,255 ( $\pm 51,537$ ).

**Demographic and socioeconomic characteristics:** The table below provides information on the demographic and socioeconomic characteristics of DRTTs from the ACS, CPS and OES data sources. The mean age of DRTTs was 42 years in both the ACS and CPS. About three quarters of DRTTs were women, 71.7% in the ACS and 75.6% in the CPS. Approximately three quarters reported being White, not Hispanic (77.4% in both the ACS and CPS data), and between 9 and 10% reported being Hispanic. Figures on marital

### Estimated national supply of diagnostic related technologists and technicians from the ACS, OES, and CPS data sources

#### Diagnostic Related Technologists and Technicians



Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES), National Provider Identifier Registry (NPI)

status were also comparable between the two data sources that included that information, with just under two-thirds reporting being married (60.3% in the ACS and 65.7% in the CPS). Estimates from both data sources indicated that about two thirds of DRTTs had some college education but had not completed a bachelor's degree, while another quarter of the workforce had a bachelor's degree. The mean annual earnings of DRTTs, adjusted to 2015 U.S. dollars, was lowest as estimated from the CPS (\$49,889) and highest from the OES (\$62,080). The mean hours worked per week by DRTTs was about 38 hours as estimated from both the ACS and CPS. The majority of DRTTs were estimated to work full-time, 83.7% from the ACS data and 86.1% from the CPS.

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition*, Diagnostic Related Technologists and Technicians. <https://www.bls.gov/soc/2010/soc292030.htm> Accessed November 09, 2016.

## Demographic and socioeconomic characteristics of DRTTs

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	42.3	42.3	--
Female	71.7%	75.6%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	77.4%	77.4%	--
Black, not Hispanic	6.5%	6.7%	--
Other, not Hispanic	6.9%	6.0%	--
Hispanic	9.3%	9.9%	--
<b>Marital Status</b>			
Married	60.3%	65.7%	--
Divorce/Separated/Widowed	15.9%	15.1%	--
Single	23.8%	19.2%	--
<b>Educational Attainment</b>			
High school or less	6.8%	5.4%	--
Some college	65.5%	63.8%	--
Bachelor's degree	23.0%	26.4%	--
Master's degree or more	4.7%	4.4%	--
<b>Employment</b>			
Annual earning (mean)*	\$52,480	\$49,889	\$62,080
Usual hours worked per week (mean)	38.0	37.7	--
Full-time workers**	83.7%	86.1%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## FUNDING

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## SUGGESTED CITATION

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## DATA SNAPSHOT: Medical Assistants

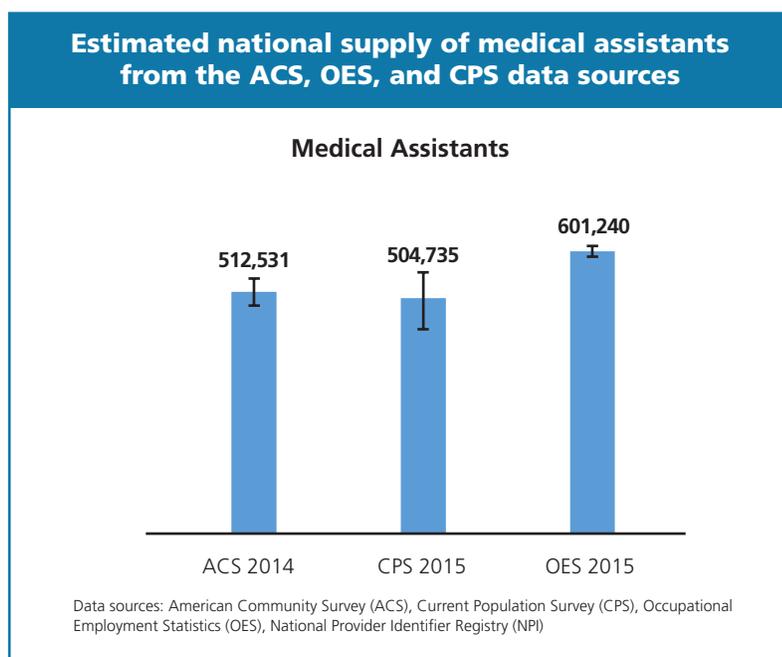
Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for medical assistants.

**Who are medical assistants?** Medical assistants provide help with administrative and clinical jobs in physicians' offices, hospitals, or other medical facilities. Their tasks may vary from site to site, depending on the specialty and size of the practice.<sup>2</sup>

**How are medical assistants identified across data sources?** Medical assistants, in the ACS and CPS, are identified by the four-digit SOC code, 3645, and in the OES dataset by the occupation code 31-9092, or could be pulled directly from the OES website, data section. In the NPI Registry, there was no specific taxonomy code to identify medical assistants.

**National estimates of medical assistants across data sources:** Data to estimate the supply of medical assistants were available only in the ACS and CPS data sources. As shown in the figure, the supply estimate of medical assistants from the OES was 601,240 ( $\pm 9,504$ ), from the ACS was 512,531 ( $\pm 17,956$ ), and from the CPS was 504,735 ( $\pm 58,708$ ).

**Demographic and socioeconomic characteristics:** The table below provides information on the demographic and socioeconomic characteristics of medical assistants from the ACS, CPS and OES data sources. The mean age of medical assistants was similar in the ACS and CPS: 37.1 to 38.4 years. The vast majority, between 90.8 to 94.4% were women. In terms of racial and ethnic composition, slightly over 50% were White, not Hispanic as reported in both datasets. From 13.2 to 14.3% reported being Black, not Hispanic, and about a quarter (27.9% in ACS and 23.0% in CPS) reported being Hispanic. Half or fewer medical assistants reported being married (46.6% in ACS and 49.3% in CPS). Both the ACS and CPS data indicated that about two-thirds of medical assistants had some level of college, but not a bachelor's degree. Medical assistants' mean annual earnings, adjusted to 2015 U.S. dollars, was lowest as estimated from the ACS (\$28,500) and highest from the OES (\$31,910). Their mean hours worked per week was 38.1 and 39.6 hours in the CPS and ACS, respectively. The percent of medical assistants working full-time estimated from ACS data was 86.0%, and 85.2% from CPS.



## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition*, Medical Assistants. <http://www.bls.gov/ooh/healthcare/medical-assistants.htm> Accessed November 04, 2016.

## Demographic and socioeconomic characteristics of medical assistants

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	37.1	38.4	--
Female	90.8%	94.4%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	52.6%	52.9%	--
Black, not Hispanic	13.2%	14.3%	--
Other, not Hispanic	6.3%	8.5%	--
Hispanic	27.9%	23.0%	--
<b>Marital Status</b>			
Married	46.6%	49.3%	--
Divorce/Separated/Widowed	18.3%	22.1%	--
Single	35.1%	28.6%	--
<b>Educational Attainment</b>			
High school or less	23.1%	19.5%	--
Some college	65.1%	65.7%	--
Bachelor's degree	9.5%	11.1%	--
Master's degree or more	2.3%	3.7%	--
<b>Employment</b>			
Annual earning (mean)*	\$28,500	\$30,781	\$31,910
Usual hours worked per week (mean)	39.6	38.1	--
Full-time workers**	86.0%	85.2%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

## FUNDING

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## SUGGESTED CITATION

Skillman SM, Dahal A, Frogner BK, Stubbs BA. *National Supply Estimates of Specific Allied Health Occupations Using Different Data Sources: Data Snapshot – Medical Assistants*. Center for Health Workforce Studies, University of Washington, Dec 2016.

## DATA SNAPSHOT: Social Workers

Identifying and analyzing available data resources is a crucial step in assessing the supply and distribution of allied health occupations, their demographic and socioeconomic characteristics, and the adequacy of the supply to meet industry and population needs. The report *Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources*<sup>1</sup> (the background report for this Data Snapshot) compared national estimates of the supply and characteristics of nine allied health occupations using four national data sources: the American Community Survey (ACS) and the Current Population Survey (CPS), both data from the U.S. Census Bureau; the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics, and the National Provider Identifier (NPI) Registry from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System. Using the most recent comparable data available from these sources, this Data Snapshot summarizes the national supply size and demographic, educational attainment, and employment information for social workers.

**Who are social workers?** Social workers provide help to individuals to solve or cope with day-to-day issues.<sup>2</sup> Social workers' roles may vary widely depending on education, credentials, specialty, and the configuration of the integrated behavioral health/primary care practice. Some social workers who are licensed to provide clinical counseling may work directly with patients to provide therapy while others might work with patients and families and coordinate treatment between patients, psychiatrists or psychologists, and primary care providers. While clinical social workers are most frequently mentioned as providing these services, other master's trained social workers might work under the consultation of a licensed clinical social worker, and bachelor's level social workers may provide care coordination or referral support.

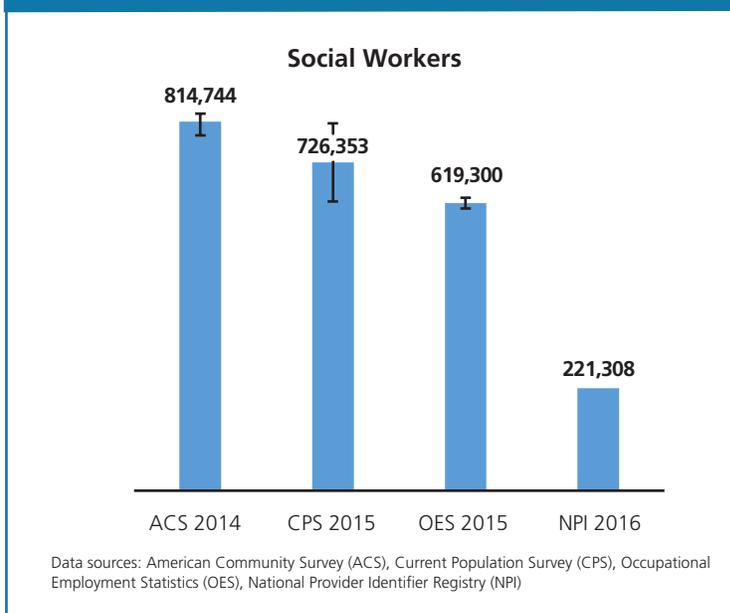
### How are social workers identified across data sources?

Social workers, in the ACS and CPS data sources, were identified by the four-digit SOC code, 2010, and in the OES dataset by the occupation code 21-1020, or could be pulled directly from the OES website, data section.

In the NPI Registry, social workers were identified using the following taxonomy code: Social Worker - 104100000X, Clinical - 1041C0700X, School - 1041S0200X.

**National estimates of social workers across data sources:** Data to estimate the supply of social workers were available in the ACS, CPS, and NPI Registry. Demographic and socioeconomic data are available only in ACS and CPS. The NPI Registry has information only on the sex of the providers. The figure shows the supply estimate of social workers from the ACS was 814,744 ( $\pm 21,422$ ), from the CPS was 726,353 ( $\pm 80,222$ ), from the OES was 619,300 ( $\pm 8,566$ ), and from the NPI Registry was 221,308. Because the NPI Registry represents the entire population of providers in the Registry, margins of error are not relevant. As described in the background report, lower supply estimates from the NPI Registry are to be expected because they represent the providers who obtain NPIs for billing or information exchange purposes.

**Estimated national supply of social workers from the ACS, OES, CPS, and NPI data sources**



**Demographic and socioeconomic characteristics:** The table below provides information on the demographic and socioeconomic characteristics of social workers from the ACS, CPS and OES data sources. The mean age of social workers was in the range 42.7 to 44.1 years, with a slightly older mean age reported from the CPS. High proportions of social workers were women, between 79.9 to 84.5%. In terms of racial and ethnic composition, 61.0 to 61.7% of social workers were White, not Hispanic, and 20.3 to 20.9% were Black, not Hispanic (in the ACS and CPS, respectively). Both ACS and CPS data sources showed approximately 13% of social workers to be Hispanic. Slightly over half of social workers were married. Similar proportions of social workers held bachelor's degrees (41.2% in the ACS and 42.2% in the CPS) and master's degrees or higher (36.9% in the ACS and 34.0% in the CPS). The mean annual earnings, adjusted to 2015 U.S. dollars, was lowest as estimated from the CPS (\$40,575) and highest from the OES (\$49,670). The estimated mean hours worked per week was about 36 hours in both ACS and CPS. The percent of social workers working full-time as estimated from the ACS was 89.8%, and was 83.9% from the CPS.

## REFERENCES:

1. Skillman SM, Dahal A, Frogner BK, Stubbs BA. Leveraging Data to Monitor the Allied Health Workforce: National Supply Estimates Using Different Data Sources. Center for Health Workforce Studies, University of Washington, Dec 2016.
2. Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition, Social Workers*. <http://www.bls.gov/ooh/community-and-social-service/social-workers.htm> Accessed November 04, 2016.

## Demographic and socioeconomic characteristics of social workers

	ACS 2014	CPS 2015	OES 2015
Age (mean years)	42.7	44.1	--
Female	79.9%	84.5%	--
<b>Race/Ethnicity</b>			
White, not Hispanic	61.0%	61.7%	--
Black, not Hispanic	20.3%	20.9%	--
Other, not Hispanic	5.8%	3.8%	--
Hispanic	12.9%	13.4%	--
<b>Marital Status</b>			
Married	52.1%	53.4%	--
Divorce/Separated/Widowed	18.9%	18.1%	--
Single	29.1%	28.5%	--
<b>Educational Attainment</b>			
High school or less	6.6%	7.7%	--
Some college	15.3%	16.1%	--
Bachelor's degree	41.2%	42.2%	--
Master's degree or more	36.9%	34.0%	--
<b>Employment</b>			
Annual earning (mean)*	\$42,674	\$40,575	\$49,670
Usual hours worked per week (mean)	36.4	36.1	--
Full-time workers**	89.8%	83.9%	--

\* ACS 2014 earnings were adjusted to 2015 real dollar values based on the Consumer Price Index. ACS and CPS wage and salary earnings include reported income from all sources. OES wage earnings are annualized to represent a full-time average wage.

\*\*Full-time indicates 32 or more weekly work hours.

Data sources: American Community Survey (ACS), Current Population Survey (CPS), Occupational Employment Statistics (OES)

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