THE U.S. HEALTH WORKFORCE CHARTBOOK

Part III: Technologists & Technicians and Aides & Assistants

U.S. Department of Health and Human Services Health Resources and Services Administration National Center for Health Workforce Analysis





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Suggested citation:

U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. The U.S. Health Workforce Chartbook, Rockville, Maryland; 2013.

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GENERAL LIST OF ACRONYMS

Acronym	Definition
AAPA	American Academy of Physician Assistants
ACNM	American College of Nurse-Midwives
ACS	American Community Survey
APRN	Advanced Practice Registered Nurse
ARF	Area Resource File
BHPr	Bureau of Health Professions
BLS	Bureau of Labor Statistics
BSN	Bachelor of Science in Nursing
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare & Medicaid Services
EMT	Emergency Medical Technician
HHS	U.S. Department of Health and Human Services
HRSA	Health Resources and Services Administration
IPEDS	Integrated Postsecondary Education Data System
LPN	Licensed Practical and Licensed Vocational Nurse
NAICS	North American Industry Classification System
NCHWA	National Center for Health Workforce Analysis
NCLEX-PN®	National Counsel Licensure Examination for Practical Nurses
NCLEX-RN®	National Counsel Licensure Examination for Registered Nurses
NP	Nurse Practitioner
NPI	National Provider Identification
OT	Occupational therapy
PA	Physician Assistant
PA-C	Certified Physician Assistant
PUMS	Public Use Microdata Sample
RN	Registered Nurse
RSE	Relative standard error
SOC	Standard Occupational Classification

INTRODUCTION

The U.S. Health Workforce Chartbook provides extensive data on 35 health occupations and is part of the Health Resources and Services Administration's (HRSA's) effort to assist states, policymakers, local workforce planners, researchers, and the public in understanding the U.S. health workforce. The Chartbook may also be used as a baseline to track changes in the health workforce. While this Chartbook includes extensive data on supply, including comparative data by state, it does not include data on demand and, as such, does not address the adequacy of the supply.

The 35 occupations included in this Chartbook are classified based on the U.S. government's Standard Occupational Classification (SOC) system and included more than 14 million individuals in 2010. These individuals represent approximately 10 percent of the nation's workforce. The occupations included in this Chartbook also represent those with the largest current employment and those that are expected to grow substantially in the future.

The vast majority of workers are employed in what the U.S. Office of Management and Budget defines as the "health sector," which includes health settings such as hospitals, clinics, physician offices, and nursing homes. The health sector also includes many workers in occupations that are not considered health occupations. For example, workers such as accountants or food service workers employed in hospitals are working *in* the health sector, even though they are not working in a health occupation. Individuals in health occupations may also work outside the health sector in settings such as local governments, schools, or insurance companies. The information provided in this Chartbook includes individuals in health occupations that are both within and outside the health sector.

For most occupations, the Chartbook relies on the U.S. Census Bureau's ACS to estimate the total number of individuals in each occupation, their geographic distribution, the settings in which they work, and their demographic characteristics. The ACS, which uses self-reported data, is the most comprehensive source available for the broad range of occupations included in this report.³ This report also draws from the U.S. Department of Education's Integrated Postsecondary Education System (IPEDS) to include information on the number of graduates from educational programs leading to entry into specific occupations. No graduate data are presented for occupations in which formal educational requirements are completed in institutions not reporting to IPEDS or vary substantially by state.

Some important components of the health workforce are not included or fully represented in the Chartbook because of data limitations. These components include occupations for which data are not collected or reported separately by the U.S. Census Bureau. For example, data from public health nurses are not collected separately from other types of nurses. The report also does

¹HRSA analysis of the U.S. Census Bureau, American Community Survey (ACS) Public Use Microdata Sample (PUMS), 2008-2010.

²HRSA analysis of the U.S. Bureau of Labor Statistics (BLS), Employment Projections, 2010-2020. Note: The "workforce" is defined as individuals employed in the occupation and individuals whose last job was in the occupation and who are still seeking employment.

³Note: Self-reported data have limitations. Some individuals may report the occupation for which they are trained or licensed even when they are not currently working the majority of their time in that occupation. For example, a physician who is spending a majority of his/her time as an administrator may self-report as either a physician or an administrator. The ACS does not collect data on licensure or professional certification. See the Technical Documentation for additional details on ACS reporting and limitations.

not include important health occupations, because of the small size of the occupation, such as epidemiologists and other public-health oriented disciplines like laboratorians and environmental health professionals. In addition, some occupations in the Chartbook are limited by ACS occupational groupings because of the methods by which the ACS collects and reports SOC data. For example, although the SOC has two separate groupings for "medical and clinical laboratory technologists" and "medical and clinical laboratory technicians," the ACS only reports on "medical and clinical laboratory technologists and technicians" as a single occupational grouping and does not report the two occupations separately.

The Chartbook is divided into four main parts for ease of reporting. Part I comprises clinicians. Part II presents additional clinician categories and occupations concerned with health care administration duties. Part III discusses health-related technologists and technicians as well as aides and assistants. Part IV describes behavioral and allied health occupations.

DATA SOURCES

Data for this Chartbook come primarily from two federal agencies: the U.S. Census Bureau and the U.S. Department of Education.

The U.S. Census Bureau's American Community Survey (ACS): The ACS, a household survey, provides detailed self-reported data including demographic information (e.g., age, race, and sex data) on individuals working in the health occupations and is the major source of data for this report.

The U.S. Department of Education's Integrated Postsecondary Education System (IPEDS): IPEDS data are used to measure the educational pipeline into the health occupations. IPEDS provides enrollment and graduation data on an annual basis for all institutions that receive or apply for federal funds. The number of graduates, by degree type, is presented for occupations for which there is a specific educational pathway into the occupation. No data are reported for those occupations without a distinct educational pathway.

Descriptions of the educational and training requirements for the various occupations have been obtained from the BLS, *Occupational Outlook Handbook*, 2012-13 Edition.

Also, data from *HRSA's Area Resource File (ARF)* are included in this Chartbook. The ARF is a comprehensive, county-level source of health workforce and other health resources data. Included in the ARF are data from the American College of Nurse-Midwives (ACNM) and the Centers for Medicare & Medicaid Services' National Provider Identification (NPI) file. The NPI file contains data on health professionals that require unique identification for federal billing (e.g., Medicare and Medicaid), private insurance, and other purposes. In this report, NPI data in the ARF have been used for cases in which ACS data were not available (i.e., nurse practitioners and nurse anesthetists).

Details on the data sources, definitions and analysis, and other information provided in the Chartbook are available in the *The U.S. Health Workforce Chartbook: Technical Documentation*, which can be found at http://bhpr.hrsa.gov/healthworkforce/index.html. Also, more detailed information on the work settings used in this report can be found on the U.S. Census Bureau website at www.census.gov/eos/www/naics.

The following table lists each of the selected occupations in Part III of *The U.S. Health Workforce Chartbook* along with the associated total workforce estimates from the ACS.

Part III: Technologists & Technicians and Aides & Assistants

	<u>Occupation</u>	<u>Total</u> <u>Workforce</u> ⁴
1.0	Technologists and Technicians	
1.1	Medical and Clinical Laboratory Technologists and Technicians	354,652
1.2	Diagnostic Related Technologists and Technicians	314,113
1.3	Emergency Medical Technicians and Paramedics	187,686
1.4	Health Diagnosing and Treating Practitioner Support Technologists and Technicians	527,657
1.5	Medical Records and Health Information Technicians	111,297
2.0	Aides and Assistants	
2.1	Medical Assistants and Other Healthcare Support Occupations	845,117
2.2	Personal Care Aides	1,022,998
2.3	Nursing, Psychiatric, and Home Health Aides	2,328,702

⁴Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

1.0 TECHNOLOGISTS AND TECHNICIANS

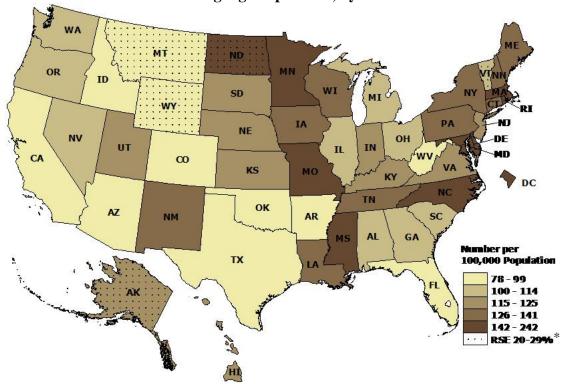
Technologist and Technician occupations described in this section include:

- 1.1 Medical and Clinical Laboratory Technologists and Technicians;
- 1.2 Diagnostic Related Technologists and Technicians;
- 1.3 Emergency Medical Technicians and Paramedics;
- 1.4 Health Diagnosing and Treating Practitioner Support Technologists and Technicians; and
- 1.5 Medical Record and Health Information Technicians.

1.1 Medical and Clinical Laboratory Technologists and Technicians

- An estimated 354,652 individuals in the U.S. workforce reported their occupation as medical and clinical laboratory technologist or technician.⁵
- The typical entry-level education required for medical and clinical laboratory technologists is a bachelor's degree and for technicians it is an associate's degree. 6

Figure 1: Medical and Clinical Laboratory Technologists and Technicians per 100,000 Working-Age Population, by State



^{*}Note: Estimated ratios in states with a relative standard error (RSE) > 20% should be used with caution because of large sampling error.

⁵Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

⁶BLS, Occupational Outlook Handbook, 2012-13 Edition.

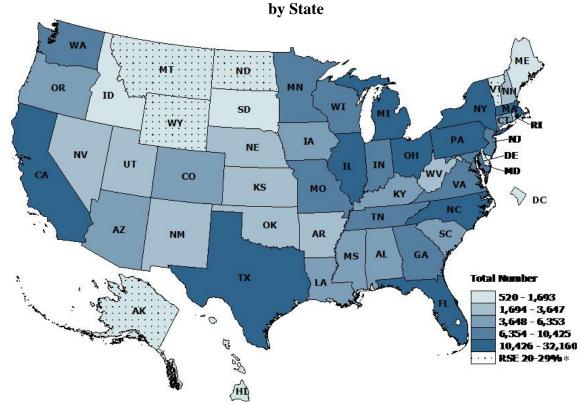


Figure 2: Number of Medical and Clinical Laboratory Technologists and Technicians, by State

*Note: Estimates in states with an RSE > 20% should be used with caution because of large sampling error.

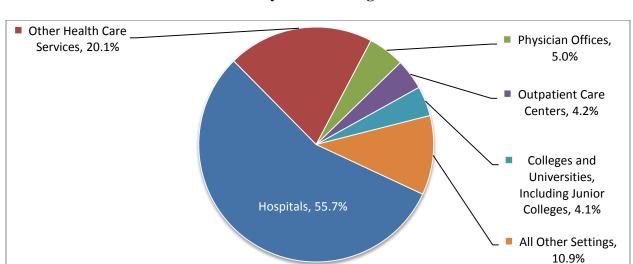
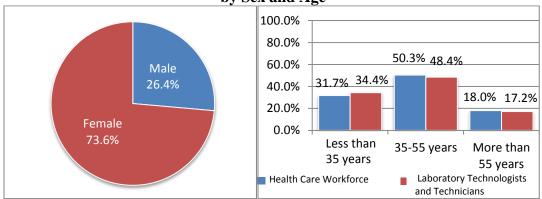


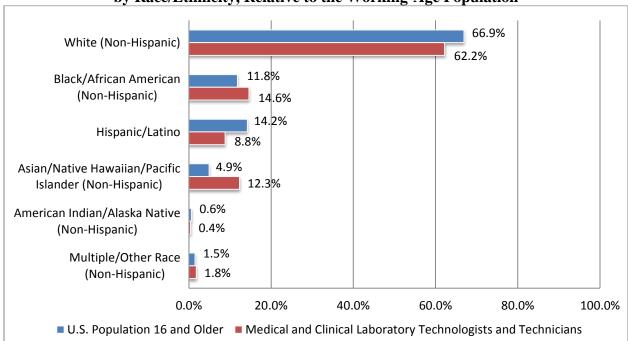
Figure 3: Distribution of Medical and Clinical Laboratory Technologists and Technicians, by Work Setting

Figure 4: Distribution of Medical and Clinical Laboratory Technologists and Technicians, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Figure 5: Distribution of Medical and Clinical Laboratory Technologists and Technicians, by Race/Ethnicity, Relative to the Working-Age Population



Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

Graduates

The total number of post-secondary medical and clinical laboratory technologist and technician graduates at the associate's and bachelor's levels in the 2009 to 2010 academic year was 5,687. Of these, 50.2 percent of graduates received a bachelor's degree, and 49.8 percent of graduates received an associate's degree.⁷

⁷HRSA analysis of the National Center for Education Statistics IPEDS, 2009-2010.

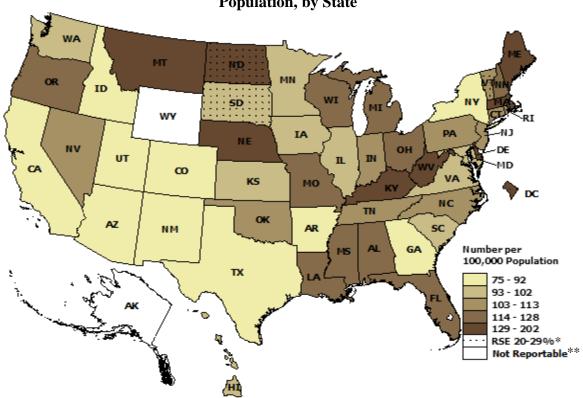
1.2 Diagnostic Related Technologists and Technicians

The information presented below for "diagnostic related technologists and technicians" combines data for the following individual occupations:

- Cardiovascular technologists and technicians;
- Diagnostic medical sonographers;
- Nuclear medicine technologists;
- Radiologic technologists; and
- Magnetic resonance imaging technologists.
- An estimated 314,113 individuals in the U.S. workforce reported their occupation as diagnostic related technologist or technician in the U.S. workforce.⁹
- The typical entry-level education for diagnostic related technologists and technicians is an associate's degree. 10

Current Distribution

Figure 6: Diagnostic Related Technologists and Technicians per 100,000 Working-Age Population, by State



^{*}Note: Estimated ratios in states with an RSE > 20% should be used with caution because of large sampling error.

^{**}Data are not reported at the state level because the RSE ≥ 30%; estimate does not meet standards of reliability.

⁸BLS, Occupational Outlook Handbook, 2012-13 Edition.

⁹Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

¹⁰BLS, Occupational Outlook Handbook, 2012-13 Edition.

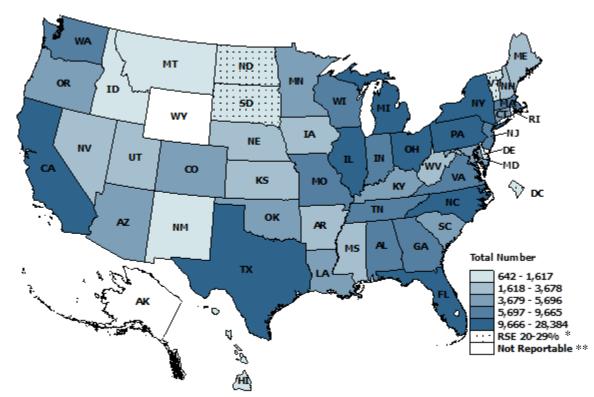


Figure 7: Number of Diagnostic Related Technologists and Technicians, by State

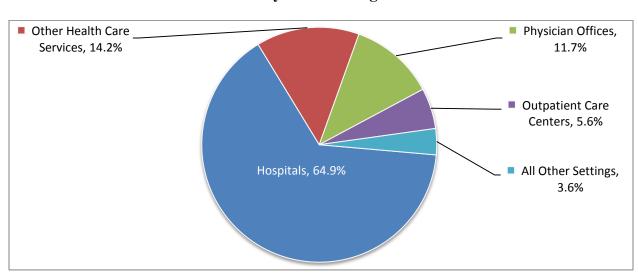
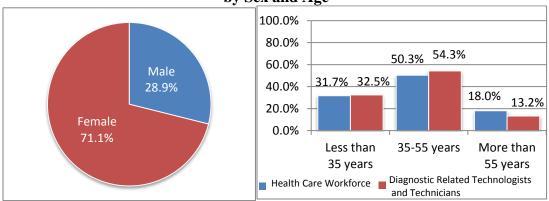


Figure 8: Distribution of Diagnostic Related Technologists and Technicians, by Work Setting

^{*}Note: Estimates in states with an RSE > 20% should be used with caution because of large sampling error.

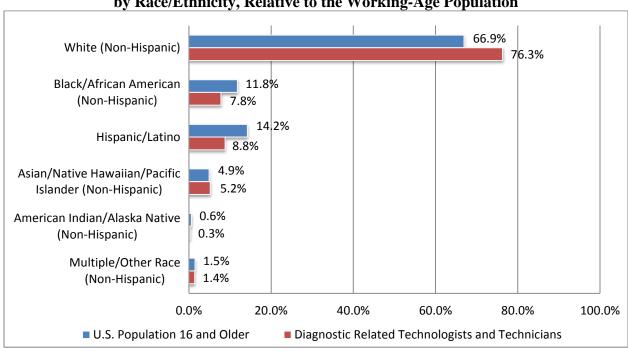
^{**}Data are not reported at the state level, because the RSE ≥ 30%; estimate does not meet standards of reliability.

Figure 9: Distribution of Diagnostic Related Technologists and Technicians, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Figure 10: Distribution of Diagnostic Related Technologists and Technicians, by Race/Ethnicity, Relative to the Working-Age Population



Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

Graduates

The total number of post-secondary diagnostic related technologist and technician graduates at the associate's and bachelor's levels in the 2009 to 2010 year was 16,066. Of these, 81.6 percent of graduates received an associate's degree, and 18.4 percent of graduates received a bachelor's degree. 11

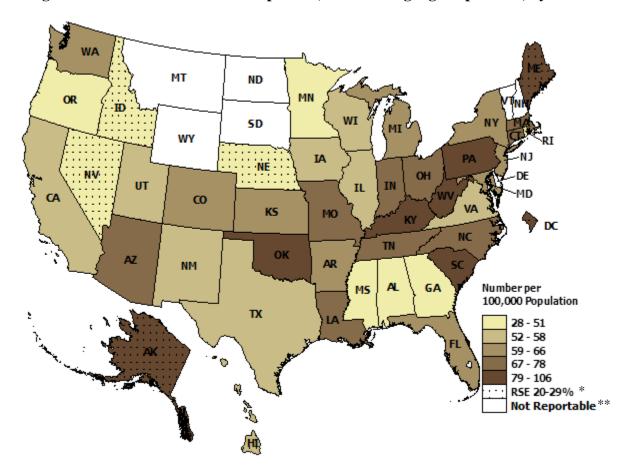
¹¹HRSA analysis of the National Center for Education Statistics IPEDS, 2009-2010.

1.3 Emergency Medical Technicians and Paramedics

- An estimated 187,686 individuals in the U.S. workforce reported their occupation as emergency medical technician (EMT) or paramedic.¹²
- The required education for EMTs and paramedics is a post-secondary non-degree award. 13

Current Distribution

Figure 11: EMTs and Paramedics per 100,000 Working-Age Population, by State



^{*}Note: Estimated ratios in states with an RSE > 20% should be used with caution because of large sampling error.

^{**}Data are not reported at the state level, because the RSE ≥ 30%; estimate does not meet standards of reliability.

¹²Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

¹³BLS, Occupational Outlook Handbook, 2012-13 Edition.

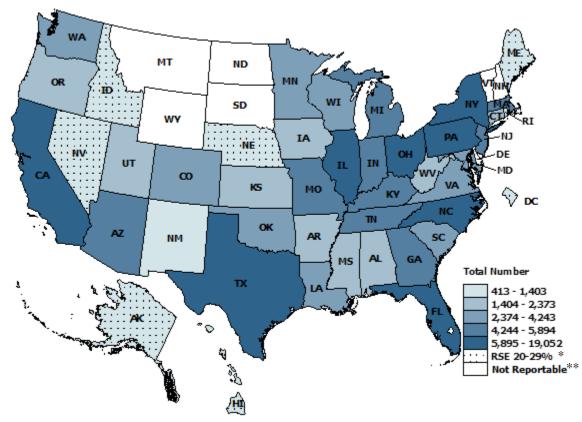


Figure 12: Number of EMTs and Paramedics, by State

^{**}Data are not reported at the state level, because the RSE ≥ 30%; estimate does not meet standards of reliability.

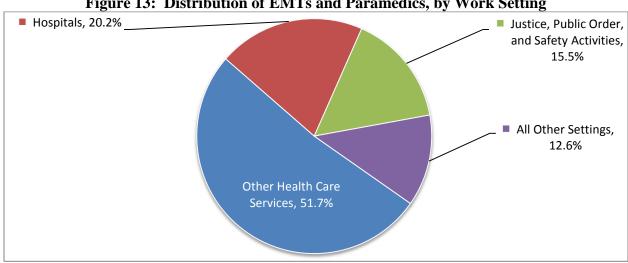
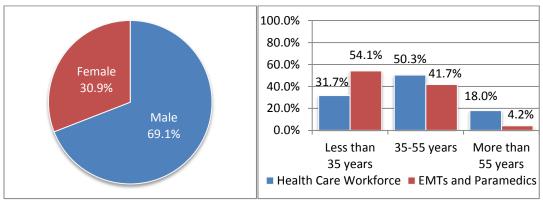


Figure 13: Distribution of EMTs and Paramedics, by Work Setting

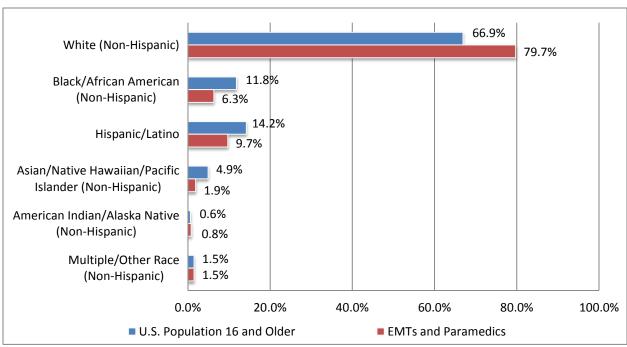
^{*}Estimates in states with an RSE > 20% should be used with caution because of large sampling error.

Figure 14: Distribution of EMTs and Paramedics, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Figure 15: Distribution of EMTs and Paramedics, by Race/Ethnicity, Relative to the Working-Age Population



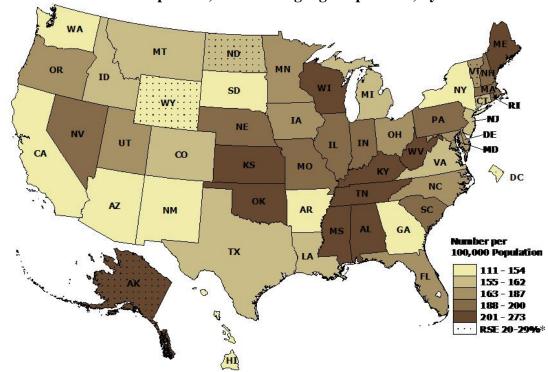
Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

1.4 Health Diagnosing and Treating Practitioner Support Technologists and Technicians

The information presented below for "health diagnosing and treating practitioner support technologists and technicians" combines data for the following individual occupations:

- Dietetic technicians:
- Pharmacy technicians;
- Psychiatric technicians;
- Respiratory therapy technicians;
- Surgical technologists; and
- Veterinary technologists and technicians.
- An estimated 527,657 individuals in the U.S. workforce reported their occupation as health diagnosing and treating practitioner support technologist or technician. ¹⁴
- The education entry levels for health diagnosing and treating practitioner support technologists and technicians are a high school diploma or equivalent, post-secondary non-degree award, or an associate's degree.¹⁵

Figure 16: Health Diagnosing and Treating Practitioner Support Technologists and Technicians per 100,000 Working-Age Population, by State



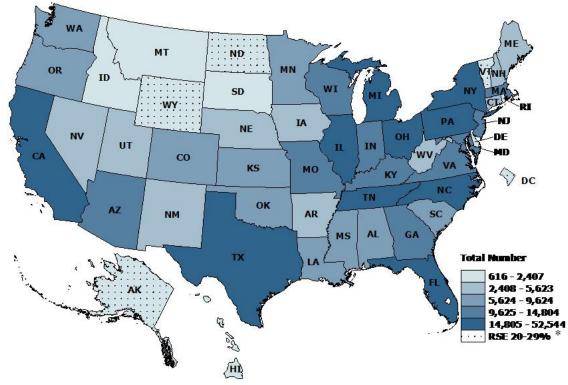
Data Source: HRSA analysis of the ACS PUMS, 2008-2010.

*Note: Estimated ratios in states with an RSE > 20% should be used with caution because of large sampling error.

¹⁴Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

¹⁵BLS, Occupational Outlook Handbook, 2012-13 Edition.

Figure 17: Number of Health Diagnosing and Treating Practitioner Support Technologists and Technicians, by State



*Note: Estimated ratios in states with an RSE > 20% should be used with caution because of large sampling error.

Figure 18: Distribution of Health Diagnosing and Treating Practitioner Support Technologists and Technicians, by Work Setting

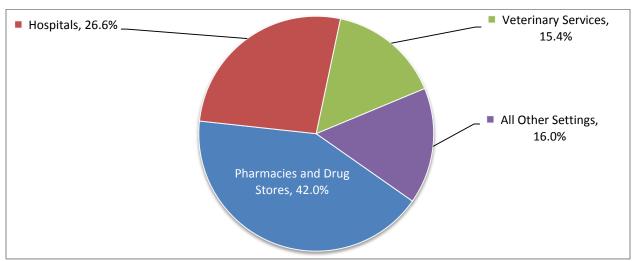
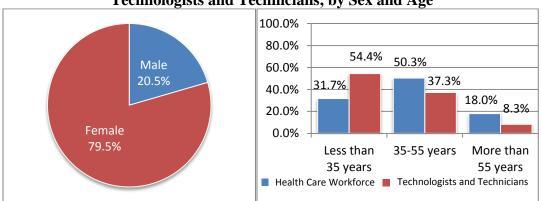
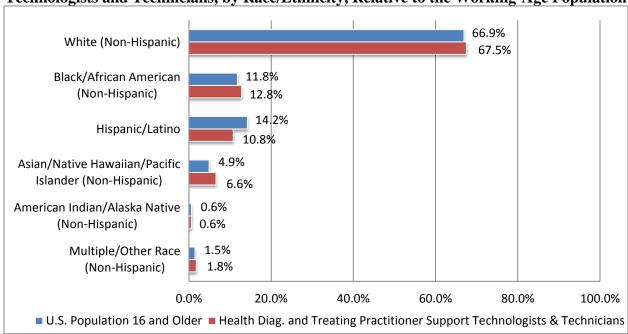


Figure 19: Distribution of Health Diagnosing and Treating Practitioner Support Technologists and Technicians, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Figure 20: Distribution of Health Diagnosing and Treating Practitioner Support Technologists and Technicians, by Race/Ethnicity, Relative to the Working-Age Population



Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

Graduates

The total number of post-secondary health diagnosing and treating practitioner support technologist and technician degrees in the 2009 to 2010 year was 17,514. Of these, 68.6 percent of graduates received an associate's degree, 25.0 percent of graduates received a bachelor's degree, and 6.4 percent of graduates received a master's degree. ¹⁷

¹⁶The total number of degrees represents only a subset because IPEDS provides post-secondary education data only and does not include data on high school diplomas or the equivalent.

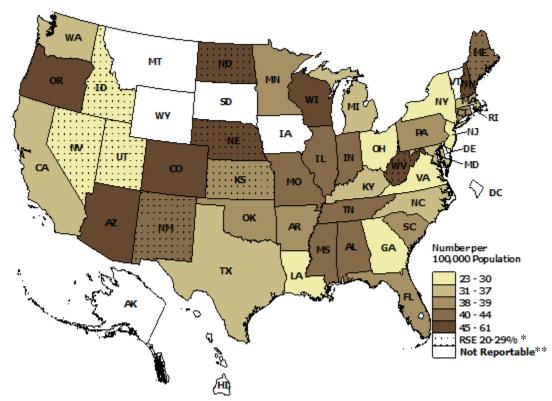
¹⁷HRSA analysis of the National Center for Education Statistics IPEDS, 2009-2010.

1.5 Medical Records and Health Information Technicians

- An estimated 111,297 individuals in the U.S. workforce reported their occupation as medical records and health information technician.¹⁸
- The typical entry-level education for medical records and health information technicians is a post-secondary non-degree award. 19

Current Distribution

Figure 21: Medical Records and Health Information Technician Jobs per 100,000 Working-Age Population, by State



^{*}Note: Estimated ratios in states with an RSE > 20% should be used with caution because of large sampling error.

^{**}Data are not reported at the state level, because the RSE ≥ 30%; estimate does not meet standards of reliability.

¹⁸Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

¹⁹BLS, Occupational Outlook Handbook, 2012-13 Edition.

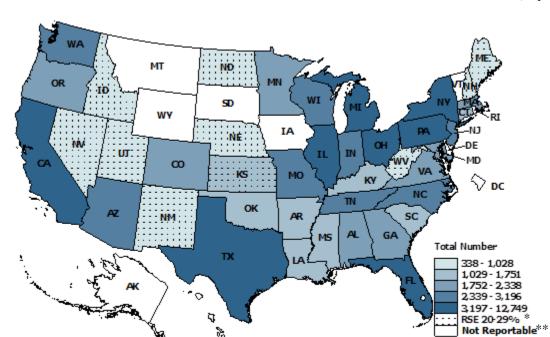


Figure 22: Number of Medical Records and Health Information Technician Jobs, by State

*Note: Estimates in states with an RSE > 20% should be used with caution because of large sampling error.

Physician Offices,

18.0%

Other Health Care
Services, 8.7%

Outpatient Care
Centers, 8.4%

Nursing Care
Facilities, 6.5%

Hospitals, 42.4%

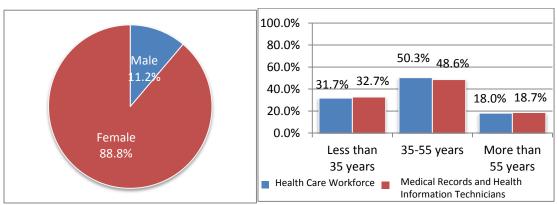
All Other Settings,
16.1%

Figure 23: Distribution of Medical Records and Health Information Technicians, by Work Setting

Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

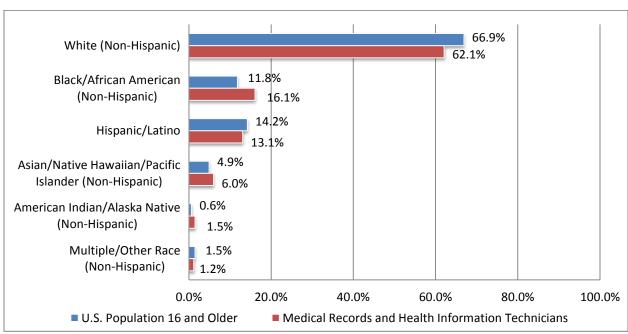
^{**}Data are not reported at the state level, because the RSE \geq 30%; estimate does not meet standards of reliability.

Figure 24: Distribution of Medical Records and Health Information Technicians, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Figure 25: Distribution of Medical Records and Health Information Technicians, by Race/Ethnicity, Relative to the Working-Age Population



Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

Graduates

The total number of post-secondary medical records and health information technician graduates at the "one year and less than two years" and associate's levels in the 2009 to 2010 academic year was 7,028. Of these, 30.6 percent of graduates received at least one but less than two years of post-secondary education, and 69.4 percent of graduates received an associate's degree. ²⁰

²⁰HRSA analysis of the National Center for Education Statistics IPEDS, 2009-2010.

2.0 AIDES AND ASSISTANTS

Auxiliary health occupations and professional groups described in this section include:

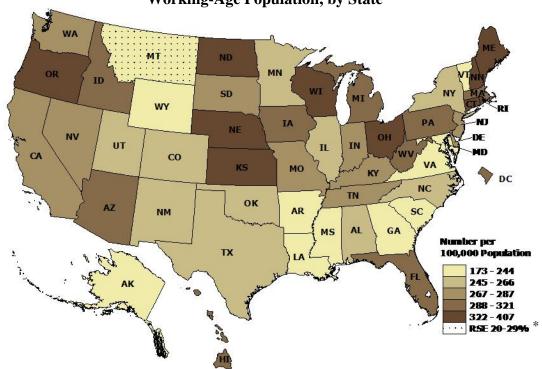
- 2.1 Medical Assistants and Other Healthcare Support Occupations;
- 2.2 Personal Care Aides; and
- 2.3 Nursing, Psychiatric, and Home Health Aides.

2.1 Medical Assistants and Other Healthcare Support Occupations

- An estimated 845,117 individuals in the U.S. workforce reported their occupation as medical assistant or other healthcare support occupation.²¹
- The required education for medical assistants and other healthcare support occupations is a high school diploma or equivalent. 22

Current Distribution

Figure 26: Medical Assistants and Other Healthcare Support Occupations per 100,000 Working-Age Population, by State



Data Source: HRSA analysis of the ACS PUMS, 2008-2010.

*Note: Estimated ratios in states with an RSE > 20% should be used with caution because of large sampling error.

²¹Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

²²BLS, Occupational Outlook Handbook, 2012-13 Edition.

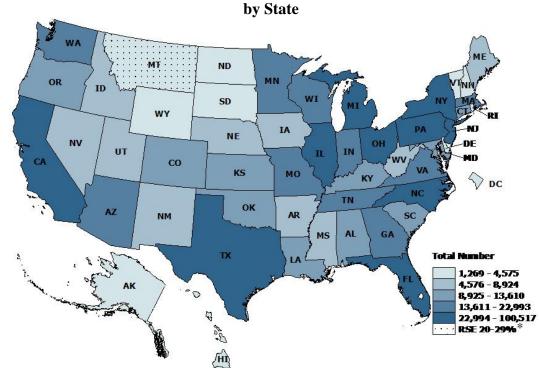


Figure 27: Number of Medical Assistants and Other Healthcare Support Occupations,

*Note: Estimates in states with an RSE > 20% should be used with caution because of large sampling error.

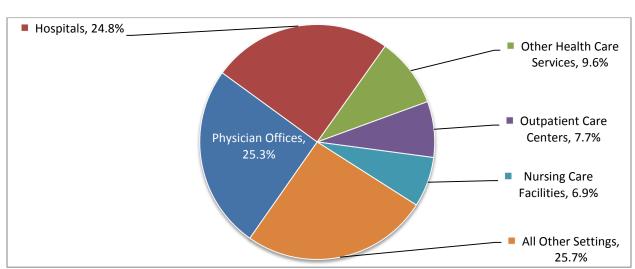
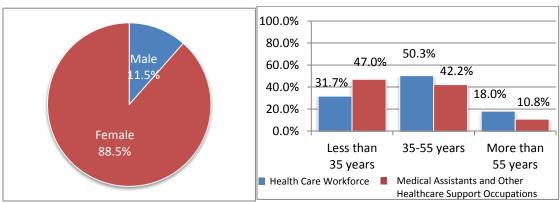


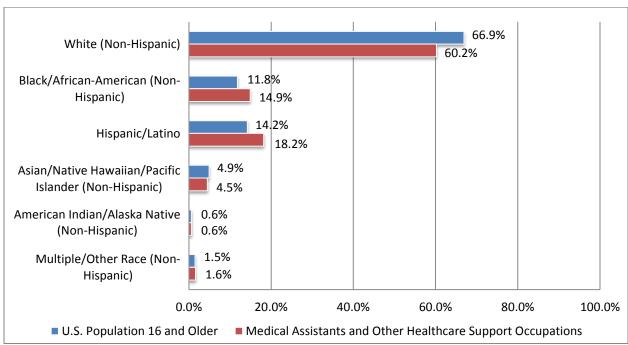
Figure 28: Distribution of Medical Assistants and Other Healthcare Support Occupations, by Work Setting

Figure 29: Distribution of Medical Assistants and Other Healthcare Support Occupations, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Figure 30: Distribution of Medical Assistants and Other Healthcare Support Occupations, by Race/Ethnicity, Relative to the Working-Age Population



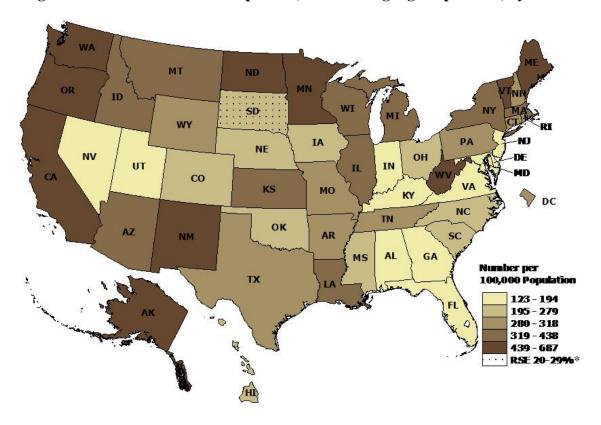
Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

2.2 Personal Care Aides

- An estimated 1,022,998 individuals in the U.S. workforce reported their occupation as personal care aide. ²³
- The required education for personal care aides is less than high school.²⁴

Current Distribution

Figure 31: Personal Care Aides per 100,000 Working-Age Population, by State



Data Source: HRSA analysis of the ACS PUMs, 2008-2010.

*Note: Estimated ratios in states with an RSE > 20% should be used with caution because of large sampling error.

²³Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

²⁴BLS, Occupational Outlook Handbook, 2012-13 Edition.

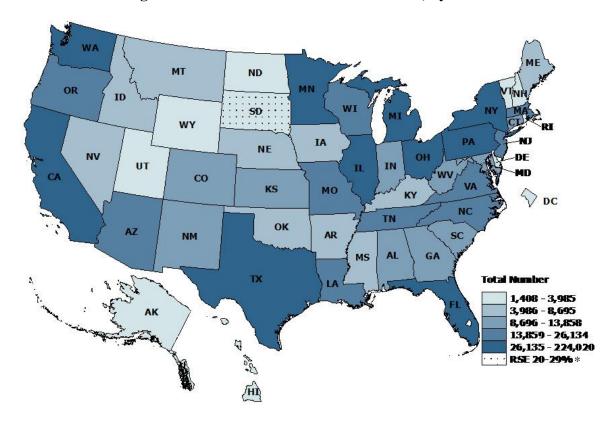


Figure 32: Number of Personal Care Aides, by State

*Note: Estimates in states with an RSE > 20% should be used with caution because of large sampling error.

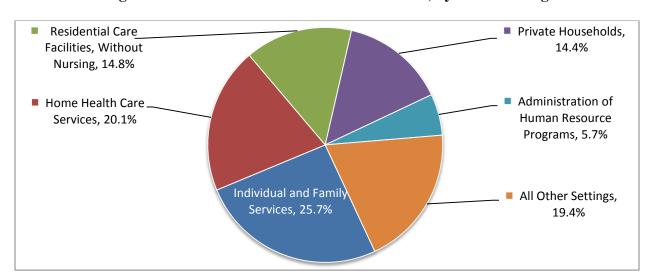
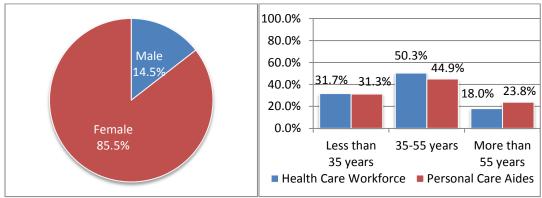


Figure 33: Distribution of Personal Care Aides, by Work Setting

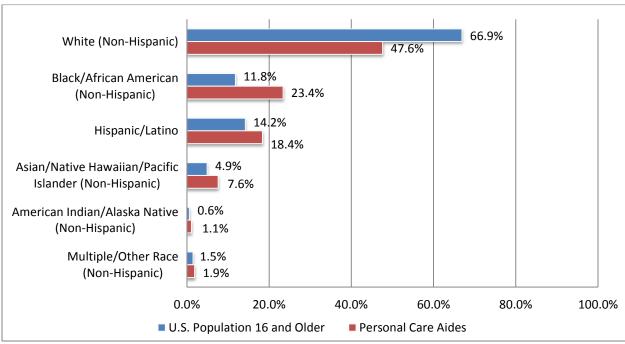
Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

Figure 34: Distribution of Personal Care Aides, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Figure 35: Distribution of Personal Care Aides, by Race/Ethnicity, Relative to the Working-Age Population



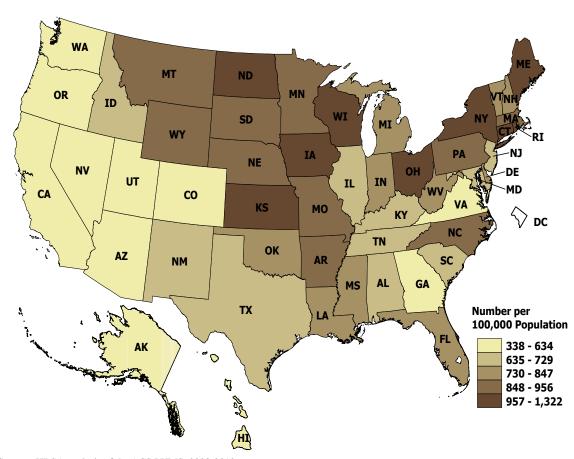
Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.

2.3 Nursing, Psychiatric, and Home Health Aides

- An estimated 2,328,702 individuals in the U.S. workforce reported their occupation as nursing, psychiatric, or home health aide. ²⁵
- The required education for nursing, psychiatric, and home health aides is less than high school, a high school diploma or equivalent, or a post-secondary non-degree award. ²⁶

Current Distribution

Figure 36: Nursing, Psychiatric, and Home Health Aides per 100,000 Working-Age Population, by State



²⁵Total workforce from HRSA analysis of the ACS PUMS, 2008-2010.

²⁶BLS, Occupational Outlook Handbook, 2012-13 Edition.

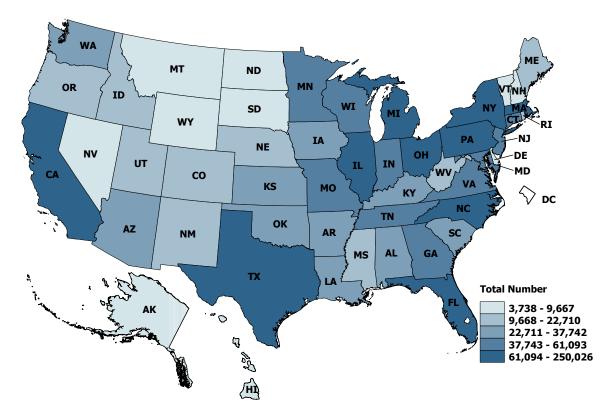


Figure 37: Number of Nursing, Psychiatric, and Home Health Aides, by State

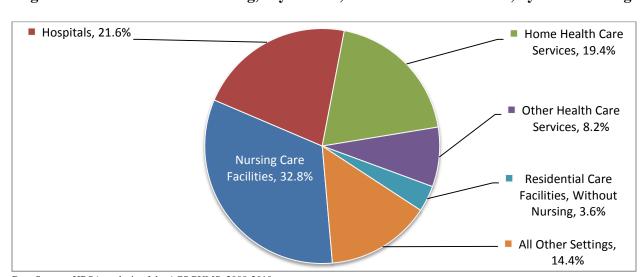
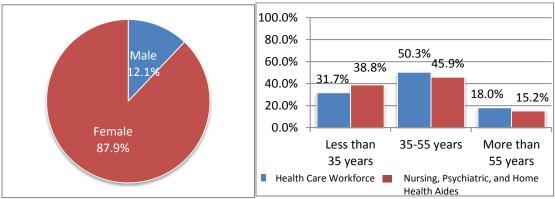


Figure 38: Distribution of Nursing, Psychiatric, and Home Health Aides, by Work Setting

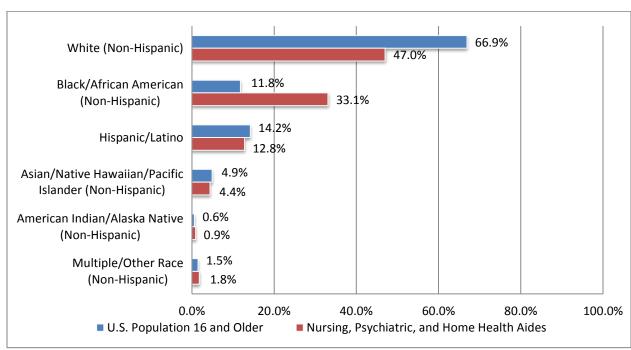
Figure 39: Distribution of Nursing, Psychiatric, and Home Health Aides, by Sex and Age



Note: The "Health Care Workforce" in this figure refers to the health occupations covered in this report.

Note: Percentages may not total 100, because of rounding.

Figure 40: Distribution of Nursing, Psychiatric, and Home Health Aides, by Race/Ethnicity, Relative to the Working-Age Population



Data Source: HRSA analysis of the ACS PUMS, 2008-2010. Note: Percentages may not total 100, because of rounding.