THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC

Information Resources to Facilitate Middle Skills Workforce Development

Andrew Reamer, Research Professor

Prepared for National Academies Board on Science, Technology, and Economic Policy, Project on the Supply Chain for Middle-Skilled Jobs: Education. Training and Certification Pathways

August 21, 2015

I. Introduction

Economic growth and full employment require well-functioning labor markets—ones that enable workers to obtain talents in demand and employers to hire workers with such talents.

Well-functioning labor markets in turn require good information. Workers need to know which talents are sought by employers and how best to obtain and demonstrate competency in those talents. Employers need to know where to find workers with the desired talents and the steps required to hire and retain them.

To be well-functioning, labor markets need to clear. Employers and workers need to find what they're looking for; resource misallocations, say a training program for which there is no demand, are resolved through market feedback.

Due to technological advancement and increasing globalization, most workers require some set of specialized knowledge and skills to obtain a stable job with decent earnings. Workers need good information to intelligently make decisions about which sets of knowledge and skills to obtain, through what means, and represented by which credential. Compared to earlier eras, the personal economic costs of a poor career choices now are much higher.

In today's global economy, technologies, industries, markets, and firms are constantly being reshaped and restructured. Consequently, to stay afloat, workers and employers must have the capacity to quickly adapt to changes in their environment beyond their immediate control. To be successful, these adaptations require well-functioning labor markets and ready access to current, reliable information about the nature of those markets and options for successfully negotiating them.

As indicated by recent data and headlines on long-term unemployment, part-time work, student debt, and mismatches between worker qualifications and tasks, and as reiterated by the task statement of the Committee on the Supply Chain for Middle-Skill Jobs, U.S. labor markets are not working well. A good part of the reason for this condition is labor market participants' lack of access to current, reliable, useful quantitative and descriptive information they can use to intelligently make difficult-to-reverse decisions that have a reasonable probability of success.

The aim of this paper is to suggest improvements in information resources that would enable a well-functioning supply chain for middle-skill jobs, i.e., jobs that require some postsecondary education but not a four-year degree. The paper begins with a summary of the types of labor market participant decisions that require good information, follows with an overview and assessment of currently available information resources, and then offers recommendations for enhancing these information resources so that labor markets function well and participants have a reasonable likelihood that their decisions work as intended.

II. Middle Skills Workforce Development Decisions Requiring Good Information

Middle skills workforce development decisions that depend on access to good information include the following, organized by category of decision-maker:

- Students and workers without middle skills need to choose:
  - an occupation
  - the path to obtaining the skills to enter that occupation, which might include some combination of secondary vocational education, postsecondary education, training to obtain industry-recognized certification or occupational licensure, on-the-job training
  - the education and/or training institutions and programs to apply to and, if accepted, attend
- Guidance and career counselors need to craft advice on occupations and education and training programs to individuals without middle skills training
- Workers with middle skills need to determine how best to maintain their employability, pursue career advancement, and respond to unexpected changes in demand for their current set of skills
- Educators and trainers need to determine which programs to offer, the content of those programs, their size, and how many and which applicants to accept
- Employers need to determine:
  - in which regions to locate their businesses in light of the nature of the talent pipeline, the quality of supply relative to demand, and costs
  - worksites in those regions in light of where talent live
  - how best to attract, hire, and retain talent and encourage talent development
- Policy analysts and program managers in national, state, and local governments and nonprofit organizations need to make decisions about middle skills workforce development in terms of:
  - policy development
  - program design and implementation, including financial investments
  - program evaluation
  - occupational regulation and credentialing

- Researchers at universities and think tanks need access to good information to prepare findings on middle skills markets and policy dynamics that will guide labor market participant decisions

III. Information Required for Successful Middle Skills Workforce Development Decisions

The information needed by the decision-makers noted above can be organized in the following four categories:

1) Detailed occupational descriptions so:
   - decision-makers—particularly students, counselors, workers, educators, and trainers—are well-informed about the nature and requirements of various occupations
   - all data users have a common understanding of the occupational structure
   - elements of the information system prepared by different providers are compatible and comparable

2) Detailed descriptions of current and projected labor demand and supply, by occupation, at the local, state, and national levels

3) Employment outcomes of particular education and training programs and career pathways

4) Means to inform individuals about the nature of the match between their talents and particular occupational and career options

The types of required information within each of these categories are outlined below. In subsequent sections, the paper will assess the availability of data in each of these categories. Data use for decision-making depends both on availability (existence) and accessibility to users (in terms of format and price). Given limitations of scope, this paper primarily examines availability.

1) Occupational Descriptions
   - A taxonomy of occupational classifications that aligns well with current job titles and is of value to decision-makers
   - For each occupation, information about:
     - prerequisites for entry level positions, including knowledge, skills, abilities (KSAs), and educational credentials
     - career ladder or competency model, with requisite KSAs and credentials (occupational levels)
     - recent significant changes in occupational characteristics
   - A crosswalk between KSAs and occupations—so that individuals with particular KSAs can see the range of occupations for which they might have relevant qualifications

2) Characteristics of Labor Markets (Local, State, National)
   - General labor market characteristics, including:
     - general trends in labor force, employment, and unemployment
     - income and poverty trends
     - trends in demographic characteristics
     - relative cost of living
   - Occupational structure—the distribution of employment by occupation
   - Workforce characteristics by occupation, e.g., distribution by industry, age, sex, race, ethnicity, credential attainment, earnings, journey-to-work, labor force status
   - Near-term trends in supply and demand by occupation
     - flow analysis—job openings; job hires, separations, turnover; student school-to-job flows
     - stock analysis—numbers of jobs and persons
   - Backmapping—tracing talent flow
   - Long-term projections of demand and supply by occupation

3) Employment Outcomes and Career Pathways
   - Near-term employment outcomes—labor force status, nature of employment (wage and salary, self-employed), occupation if employed, earnings, hours, location, by:
     - type of degree or occupational credential
     - category of undergraduate major
     - education or training institution and program
   - Usual and possible long-term career pathways—in terms of:
     - the progression of credential and KSA acquisition and job advancement
     - the characteristics of successive jobs
     - the role of credential and KSA acquisition in enabling job advancement

4) Quantitative Assessments of One's KSAs and Personal Goals and Characteristics Relative to Occupational Characteristics and Career Pathways
   - Means to inform individuals about the nature of their match with particular occupational and career options

IV. The Landscape: Information Providers for Middle Skills Workforce Development Decisions

The U.S. has a highly decentralized system of workforce and labor market information (WLMI). Numerous federal and state government agencies generate and disseminate WLMI, as do various commercial and nonprofit data vendors.

This section offers a brief overview of the roles of the various public and private WLMI providers. In a following section, specific programs are discussed and assessed in terms of their ability to provide the information needed for middle skills workforce development decisions.

➢ Federal Government

Traditionally, the federal government has been the primary provider of WLMI. The federal government alone has the fiscal, technical, and intellectual capacities, the legal authority, the imperative for objectivity, and the public trust to scientifically gather, analyze, and disseminate reliable, useful data that are consistent over space and time.

For a variety of historical reasons, the federal statistical efforts have never resided in a single agency. Numerous federal agencies are actively involved in the collection, analysis, and dissemination of WLMI activities. The allocation of responsibilities and activities across agencies is highly idiosyncratic and without apparent logic. Over the last century, efforts have regularly been made to reorganize and centralize the federal statistical system—none has been implemented.

The two agencies with the most extensive WLMI responsibilities are the Bureau of Labor Statistics (BLS), in the U.S. Department of Labor, and the Census Bureau, in the U.S. Department of Commerce. Generally speaking, BLS has primary responsibility for data on jobs and labor markets and the Census Bureau covers data on workers. A significant part of BLS's WLMI is generated in cooperation with the state LMI agencies (each state's analog to BLS). The Census Bureau operates a narrower in-kind cooperative program with the state LMI agencies.

The Employment and Training Administration (ETA), the agency of U.S. Department of Labor responsible for workforce development, serves as an important complement to BLS. ETA provides workforce information grants to states, both on a formula and competitive basis. For instance, each state receives a formula grant to prepare occupational employment projections (which BLS does for the nation), analyze and otherwise add value to data generated through the federal-state cooperative system, and prepare additional useful datasets. ETA also offers a suite of national WLMI online information tools, including detailed occupational descriptions and occupational competency models.

As will be discussed in the next section, the recently passed Workforce Innovation and Opportunity Act (WIOA) indicates that the Secretary of Labor is to create and maintain a national Workforce and Labor Market Information System (WLMIS) with highly specified content and is to be supported in specific ways by BLS and ETA in this effort.

Under the predecessor Workforce Investment Act of 1998 (WIA), BLS created a Workforce Information Council (WIC) composed of BLS staff and ten state LMI directors to guide the management of BLS-State cooperative statistics programs. Through WIOA, ETA is organizing a new Workforce Information Advisory Council (WIAC), to be composed largely of representatives of various data-using interests, to advise the Labor Secretary on the development and maintenance of the WLMIS. At the same time, the WIC is continuing its work under a new name, the BLS LMI Oversight Committee (BLOC).

The National Center for Education Statistics (NCES), in the U.S. Department of Education's Institute of Education Sciences, is "the primary federal entity for collecting and analyzing data related to education."[1] NCES collects and disseminates substantial detailed information from each of the nation's postsecondary institutions on enrollments, program completions, faculty, staff, finances, and academic libraries. It operates a competitive program of grants to state education agencies to build longitudinal data systems that track student trajectories through secondary and postsecondary schools and into the labor market. NCES also will conduct a new household survey on adult training and education.

NCES sponsors a National Postsecondary Education Collaborative (NPEC) with the mission to "promote the quality, comparability and utility of postsecondary data and information that support **policy development** at the federal, state, and institution levels."[2] (Emphasis added) The NPEC is not charged with broadly looking at and responding to information needs of labor market participants.

A number of other federal agencies play a role in collecting, analyzing, and disseminating WLMI on defined segments of the U.S. workforce:

- Industries and Occupations
  - Agriculture – National Agricultural Statistics Service, U.S. Department of Agriculture (USDA)
  - Healthcare – National Center for Health Workforce Analysis, Health Resources and Services Administration, U.S. Department of Health and Human Services
  - Science and engineering – National Center for Science and Engineering Statistics, National Science Foundation
- Worker characteristics
  - Disabled and retired – Office of Research, Evaluation, and Statistics, Social Security Administration
  - Self-employed – Bureau of Economic Analysis (BEA), U.S. Department of Commerce, and Statistics of Income Division, Internal Revenue Service, U.S. Department of Treasury
  - Veterans – National Center for Veterans Analysis and Statistics, U.S. Department of Veterans Affairs

[1] Per the agency website, www.nces.gov.
[2] See https://nces.ed.gov/npec/.

- Rural – Economic Research Service, USDA

Federal agency efforts to provide WLMI are, or should be, guided by agency mission, mandate, goals, and strategy as set out in the U.S. Code, the Code of Federal Regulations, a five-year strategic plan, and the annual performance plan (required by the Government Performance and Results Act [GPRA]). These statements are useful resources in assessing the appropriateness and effectiveness of federal WLMI efforts; relevant guiding statements on each of the major WLMI providers are provided in Appendix A.

All agencies adhere to a rigorous set principles of practice in data collection, analysis, and dissemination.[3] The primary federal tool for gathering WLMI is the survey of a statistical sample of households, individuals, or businesses.

To a lesser degree, statistical agencies analyze data from administrative records created for other purposes, such as unemployment insurance and income tax records. Recent advances in information technology enable large volumes of administrative records (sometimes known as "Big Data") to be analyzed much more quickly and cheaply than was the case even a decade ago. As surveys are labor-intensive and costly in comparison, as survey response rates are falling, and as administrative records represent the full "universe" of the population of interest, not a sample, the Obama Administration and the various statistical agencies are actively seeking opportunities to increase the use of administrative records in statistical analysis.[4]

In some instances, existing administrative data can replace a survey question, such as using tax records in lieu of a question about income. On an experimental basis, Census and BLS are asking a small number of survey respondents to forward their records "as is," rather filling out a survey; each agency then "autocodes" those records. If these experiments work, the agencies could expand the survey sample size and so enhance the statistical accuracy and detail of the resulting estimates at relatively low added cost.

Increasingly, agencies are linking data from a relatively small national survey sample with a national set of administrative records or a larger sample on a related topic to model estimates at a level of geographic detail that would not be statistically possible using the original sample alone. Census does this now with poverty estimates.[5] BLS is developing methods to improve the quality of estimates of occupational employment.

One valuable benefit of administrative records is that they can be linked longitudinally, allowing analysts to study the nature of and reasons for changes over time in the characteristics and

---

[3] "Principles and Practices for a Federal Statistical Agency," Constance F. Citro and Miron L. Straf, Editors; Committee on National Statistics; Committee on National Statistics; Division on Behavioral and Social Sciences and Education; National Research Council; Fifth Edition, 2013.

[4] See "Building Evidence with Administrative Data," Chapter 7 of Analytical Perspectives, Budget of the United States Government, Fiscal Year 2016; also OMB Memorandum M-14-06, "Guidance for Providing and Using Administrative Data for Statistical Purposes," February 2014.

[5] Small Area Income and Poverty Estimates.

experiences of workers, students, establishments, and firms. Over the past decade, BLS, Census, and NCES have become active practitioners of longitudinal analysis and seek opportunities to expand their efforts.

BLS, ETA, and Census are exploring how they might enhance official statistics through "webscraping," the gathering of data directly from the universe of webpages. For instance, BLS wants to understand how it might make use of "real-time LMI," information on job openings scraped from the web, to inform its data on job openings and its classification and description of occupations. The agencies are grappling with if and how they can appropriately use web-sourced data that does not approach the same high quality as data collected through traditional means.

All federal statistical agency efforts to collect data from outside the federal government, whether through surveys or administrative data collection, must be reviewed and approved by the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB). Each existing collection must be reviewed and renewed every three years. The public is offered the opportunity to comment on each proposed data collection before OMB makes its decision.[6]

- WLMI Vendors

The advent of advanced IT has enabled the creation of a growing number of for-profit and nonprofit vendors offering access to large databases of WLMI not found in federal agencies. Database categories include:

- Job openings (full text)
- Personal profiles and resumes
- Student achievement (transcripts)
- Formal assessments of personal knowledge and skills
- Informal assessments of firms
- Industry-recognized certification programs

Vendor WLMI products are in various stages of development—some are on the market, some are in the development stage, some are in the exploratory stage, and some are latent.

Vendors collect and analyze large amounts of data through any of four processes:

- "Webscraping," e.g., "real-time LMI" firms such as Burning Glass, EMSI/Career Builder, Geographic Solutions, and WANTED Analytics capture job openings on a daily basis.

[6] OMB posts the contents of every Information Collection Request (ICR), and its decision, at http://www.reginfo.gov/public/do/PRAMain.

- Requests for data, e.g., a planned Credentialing Registry will seek detailed information from each credentialing program in the U.S.[7]
- Hosting a web-based data posting service and, as a secondary activity, analyzing the content to describe the characteristics and experiences of the workforce. Examples include:
  - LinkedIn, Glassdoor, and Payscale, which receive worker-determined data uploads;
  - the National Student Clearinghouse, which collects student records from postsecondary institutions for the purposes of transcript verification; and
  - the National Labor Exchange (NLx), a web-based repository of job openings and resumes co-managed by the National Association of State Workforce Agencies (NASWA) and Direct Employers on behalf of their members.
- Assessing individual knowledge and skills and, as a secondary activity, analyzing the results to describe the distribution of other workforce characteristics and experience. Examples include the testing organization ACT and predictive analytics firms (such as Knack and Evolv) that help clients assess the fit of job applicants.

Another class of vendors provide data aggregation services, which integrate multiple public and private datasets, usually with sophisticated visualizations. Vendor examples include Quandl and Statista.

Observations:

- The commercial WLMI-providing industry, broadly defined, is in a state of rapid flux and growth.
- Government statistical agencies are actively using these services or exploring the possibility. Most state LMI agencies have purchased licenses from real-time LMI vendors and BLS and ETA are exploring ways to productively use of real-time LMI.
- Methods for making effective use of vendor-provided data are in development.
- The federal government and other public purpose organizations have the opportunity to productively influence commercial and nonprofit vendor products.

Appendix B provides the Center for Regional Economic Competitiveness's brief profiles of 35 commercial WLMI vendors.

➢ Regional Employer-led Collaboratives

The U.S. Chamber of Commerce Foundation's Talent Pipeline Management (TPM) Initiative is creating regional employer-led collaboratives to manage the employers' skill needs through

[7] This effort is being organized by the George Washington Institute of Public Policy, George Washington University, in cooperation with American National Standards Institute's Workcred Program and with funding from the Lumina Foundation. See http://www.luminafoundation.org/grants-database/9383.

applying the principles of supply chain management.[8] With funding from USA Funds, the Chamber Foundation has selected seven regional collaboratives to test this process.[9]

TPM is encouraging its regional partners to pool WLMI data to:

- identify future talent needs for critical jobs through demand planning
- "back-map" where current workers come from (e.g. training provider, education institution, or previous employer) and ascertain partners that provide quality talent

These experimental efforts will provide understanding about the potential for creating shared regional WLMI that guides labor market participant decisions, including middle skills development.

Through a new Communities That Work Partnership, the U.S. Economic Development Administration is partnering with the Aspen Workforce Strategies Initiative to create six regional employer collaboratives similar to those sponsored by TPM.[10] However, it is unclear the extent to which this second group of collaboratives will explore WLMI database development.

V. Legal and Policy Framework for Middle Skills WLMI

In July 22, 2014, President Obama signed into law the Workforce Innovation and Opportunity Act (P.L. 113-128), which replaces the Workforce Investment Act of 1998 as the primary federal effort to promote workforce development. On the same day, the White House released Vice-President Biden's report on administrative reforms to the federal workforce development effort, "Ready to Work: Job-Driven Training and American Opportunity."[11]

WIOA and the Biden report share the theme of response to labor market demands as identified through WLMI analysis. This approach has significant implications for the availability of information resources for middle skills workforce development.

---

[8] "Talent Pipeline Management: A New Approach to Closing the Skills Gaps"

[9] Regional partners include Arizona Chamber Foundation, Vermilion Advantage (Illinois), Governor's Council of Economic Advisors (Kansas), Impact Northern Kentucky, Michigan Energy Workforce Development Consortium, Greater Houston Partnership, and Elevate Virginia. U.S. Chamber of Commerce Foundation, "7 Regions to Pilot-Test New Strategies to Close Skills Gap," press release, May 8, 2015.

[10] Communities That Work Partnership.

[11] President Obama's charge to Vice President Biden's was given by in the State of the Union address, January 28, 2014: ""[T]onight, I've asked Vice President Biden to lead an across-the-board reform of America's training programs to make sure they have one mission: train Americans with the skills employers need, and match them to good jobs that need to be filled right now. That means more on-the-job training, and more apprenticeships that set a young worker on an upward trajectory for life. It means connecting companies to community colleges that can help design training to fill their specific needs. And if Congress wants to help, you can concentrate funding on proven programs that connect more ready-to-work Americans with ready-to-be-filled jobs."

WIOA indicates that federally-funded workforce development investments are to focus on "in-demand industry sectors or occupations," defined on the basis of WLMI.[12] In parallel, the Biden report specifies that federal workforce development programs are "to help job seekers prepare for in-demand jobs and careers" on the basis of a seven-point "job-driven checklist" that includes these two principles:

- Make better use of data to drive accountability, inform what programs are offered and what is taught, and offer user-friendly information for job seekers to choose programs and pathways that work for them and are likely to result in jobs.
- Measure and evaluate employment and earnings outcomes.[13]

WIOA seeks to ensure that the Department of Labor provides the WLMI necessary to make the required determinations by requiring the Secretary of Labor to "oversee the development, maintenance, and continuous improvement of a workforce and labor market information system" to "enumerate, estimate, and project employment opportunities and conditions at national, State, and local levels in a timely manner." WIOA identifies the required elements of the WLMIS and then indicates that the Secretary is to "develop and maintain" these elements "[t]hrough the Bureau of Labor Statistics and the Employment and Training Administration, and in collaboration with States . . . ." [14]

Moreover, WIOA makes clear that a key purpose of the WLMIS, in addition to guiding federal workforce investments, is to meet the information needs of a full array of labor market participants, including jobseekers, students, employers, workforce investment boards, and state and local educational agencies.

ETA's proposed rules for WIOA implementation amplify this approach through its definitions of WLMI and WLMIS:

- "Workforce and Labor Market Information (WLMI) means that body of knowledge pertaining to the socioeconomic factors influencing the employment, training, and business decisions in national, State, sub-State, and local labor market areas. These factors, which affect labor demand-supply relationships, worker preparation, and

[12] "The term 'in-demand industry sector or occupation' means—(i) an industry sector that has a substantial current or potential impact (including through jobs that lead to economic self-sufficiency and opportunities for advancement) on the State, regional, or local economy, as appropriate, and that contributes to the growth or stability of other supporting businesses, or the growth of other industry sectors; or (ii) an occupation that currently has or is projected to have a number of positions (including positions that lead to economic self-sufficiency and opportunities for advancement) in an industry sector so as to have a significant impact on the State, regional, or local economy, as appropriate. The determination of whether an industry sector or occupation is in-demand under this paragraph shall be made by the State board or local board, as appropriate, **using State and regional business and labor market projections, including the use of labor market information.** (Emphasis added.) 29 U.S. Code § 3102

[13] White House, "Ready to Work: Job-Driven Training and American Opportunity," July 2014, pp. 8-9.

[14] 29 USC 49l-2.

educational program offerings, also define the content of the WLMI programs and system.

- Workforce and Labor Market Information System (WLMIS) means the system that collects, analyzes, interprets, and disseminates workforce characteristics and employment-related data, statistics, and information at national, State, and local labor market areas and makes that information available to the public, workforce development system, one-stop partner programs, and the education and economic development communities."[15]

WIOA gives the Labor Secretary specific directions with regard to the design and operation of the WLMIS. In particular, the Secretary is to:

- Actively seek the cooperation of heads of other Federal agencies to establish and maintain mechanisms for ensuring complementarity and nonduplication
- Solicit, receive, evaluate, and respond in writing to the recommendations from a 14-member, user-dominated Workforce Information Advisory Council (WIAC) concerning the evaluation and improvement of the WLMIS
- Eliminate gaps and duplication in statistical undertakings
- Prepare a 2-year plan for the WLMIS—acting through the Commissioner of BLS and the Assistant Secretary for ETA and in consultation with the WIAC and heads of other appropriate Federal agencies

WIOA, then, provides a substantial, detailed framework for providing the large majority of information resources needed by labor market participants, as outlined in Section III above.

It should be pointed out that the Workforce Investment Act of 1998 gave the Labor Secretary a similar mandate, to create and maintain a National Employment Statistics System, and directed BLS to support the Secretary in that effort. However, after the end of the Clinton Administration, succeeding Secretaries and BLS chose not to pursue this mandate. WIOA's inclusion of ETA as a responsible party has already led to the promulgation of the rule noted above.

BLS inattention to the WIA mandate can be explained in part by culture. Since the 1940s, BLS has viewed federal macroeconomic policymakers as the primary audience for its employment statistics. This orientation is reflected in the fact that BLS evaluates its performance only in terms of its dissemination of Principal Federal Economic Indicators (PFEIs)—such as the national employment and unemployment numbers and consumer and producer price indices.[16] As a

[15] Employment and Training Administration, "Workforce Innovation and Opportunity Act; Notice of Proposed Rulemaking," *Federal Register*, April 16, 2015, p. 20935.

[16] This approach is consistent with the view of Congress expressed in 1983 that the purpose of BLS grants to state LMI agencies was "to operate statistical programs which are essential for development of estimates of the gross national product and other national statistical series, including those related to employment and unemployment." (29 USC 49l-1)

corollary, BLS has historically viewed the primary purpose of its regional data as guiding the distribution of funds by federal assistance programs.[17] Thus, it did not show strong, consistent interest in fulfilling the broad purposes of the National Employment Statistics System mandate.[18]

WIOA's requirements for the WLMIS are summarized below and presented in full in Appendix A.

WORKFORCE AND LABOR MARKET INFORMATION SYSTEM (29 USC 49l-2)

WLMIS Content

The Secretary shall oversee the development, maintenance, and continuous improvement of a workforce and labor market information system that includes:

- statistical data from cooperative statistical survey and projection programs and data from administrative reporting systems that enumerate, estimate, and project employment opportunities and conditions at national, State, and local levels in a timely manner
- information on State and local employment opportunities, and other appropriate statistical data related to labor market dynamics

The WLMIS shall include the following elements:

- General statistics
  - employment and unemployment status of national, State, and local populations, including self-employed, part-time, and seasonal workers
  - industrial distribution of occupations
  - current and projected employment opportunities, wages, benefits (where data is available)
  - skill trends by occupation and industry, with particular attention paid to State and local conditions
  - the incidence of, industrial and geographical location of, and number of workers displaced by, permanent layoffs and plant closings
  - employment and earnings information maintained in a longitudinal manner to be used for research and program evaluation
- Information on job opportunities
  - job vacancy listings in local, regional, and national labor market areas
  - job skills necessary to obtain the available jobs
  - local occupations in demand and the earnings and skill requirements for such occupations
- Information sought by certain local data users:

[17] See, for example, "Administration Uses of Local Area Unemployment Statistics," November 2013.
[18] While BLS used its authority under WIA to establish the Workforce Information Council (WIC), that has functioned primarily as a vehicle for managing BLS-state cooperative programs rather than fulfilling the broader purposes of the National Employment Statistics System as laid out in 29 USC 49l-2.

- State and local employers, participants, and local workforce investment boards
- State educational agencies, local educational agencies, and secondary school and postsecondary school students

<u>WLMIS Governance, Management, and Operations</u>

The Secretary of Labor shall perform the following set of tasks:

- General
  - Oversee the development, maintenance, and continuous improvement of the WLMIS
  - Evaluate and improve the WLMIS in consultation with the Workforce Information Advisory Council (WIAC)
  - Develop and maintain the elements of the WLMIS through BLS and ETA and in collaboration with States, including the development of consistent procedures and definitions for use by the States in collecting the data and information
  - Carry out the provisions of this section in a timely manner
- Specific
  - Assign responsibilities within the Department of Labor for elements of the WLMIS to ensure that
    - the statistical and administrative data collected are consistent with appropriate BLS standards and definitions
    - the information is accessible and understandable to users of such data
  - Actively seek the cooperation of heads of other Federal agencies to establish and maintain mechanisms for ensuring complementarity and nonduplication
  - Solicit, receive, evaluate, and respond in writing to the recommendations from the WIAC concerning the evaluation and improvement of the WLMIS
  - Eliminate gaps and duplication in statistical undertakings
  - Establish procedures for the system to ensure that such data and information are timely and paperwork and reporting for the system are reduced to a minimum
  - Appoint 14 members of the WIAC, including:
    - 4 members who represent State workforce investment agencies
    - 4 members who represent State WLMI directors
    - 1 member who represents a provider of training services
    - 1 member who represents an economic development entity
    - 1 member who represents businesses
    - 1 member who represents labor organizations
    - 1 member who represents local workforce development boards
    - 1 member who represents a research entity that utilizes WLMI
  - Formally consult at least twice annually with the WIAC through the Commissioner of BLS and the Assistant Secretary for ETA regarding
    - the evaluation and improvement of the nationwide WLMIS and the statewide WLMIS that comprise the nationwide system and
    - how the Department of Labor and the States will cooperate in the management of such systems
  - Prepare a 2-year plan for the WLMIS—acting through the Commissioner of BLS and the Assistant Secretary for ETA and in consultation with the WIAC and heads of other appropriate Federal agencies—with the following elements:

- a description of how the Secretary will work with the States to manage the nationwide WLMIS and the statewide WLMIS that comprise the nationwide system
- the steps to be taken to fulfill the Secretary's duties regarding the WLMIS
- an evaluation of the performance of the WLMIS, with particular attention to the improvements needed at the State and local levels
- a description of the involvement of States in the development of the plan
- the written recommendations received from the WIAC and the extent to which those recommendations were incorporated into the plan

Congress has mandated the use of WLMI on behalf of middle skill labor market participants in two other ways. First, The Carl D. Perkins Career and Technical Education Act of 2006 requires state plans to describe how career and technical education programs will "prepare . . . for opportunities in postsecondary education or entry into high skill, high wage, or high demand occupations in current or emerging occupations, and how participating students will be made aware of such opportunities."[19] States publish statewide and regional "Demand Occupation Lists."[20] A WLMIS that fulfills the requirements of WIOA will better enable state plans to identify such occupations.

Also, states report a series of Perkins outcome indicators.[21] The U.S. Department of Education's Office of Career, Technical, and Adult Education manages the Data Quality Institute, "building state capacity for reporting Perkins data."[22]

Second, the Higher Education Act of 1965 (as amended) requires that most for-profit programs (regardless of credential level) and most non-degree programs at non-profit and public institutions (including community colleges) prepare students for "gainful employment in a recognized occupation." In October 2014, the Obama Administration released regulations that set the standards for "gainful employment" programs to remain eligible to accept federal student aid grants and loans. Standards are based on debt-to-earnings ratios, with earnings obtained by the Secretary of Education from the Social Security Administration. These regulations became effective July 1, 2015.[23]

VI. Assessment of Information Available for Good Middle Skills Workforce Development Decisions

[19] 20 USC 2342.
[20] See, for instance, lists for Florida and New Jersey.
[21] See http://cte.ed.gov/accountability/core-indicators.
[22] See http://cte.ed.gov/dqi/.
[23] See http://www2.ed.gov/policy/highered/reg/hearulemaking/2012/gainfulemployment.html.

Section III outlined the types of information needed by middle skills labor market participants to make good decisions. The aim of this section is to describe and assess the availability of this information.

In summary, the information required by middle skills labor market participants is not available for the most part. At the same time, relatively modest investments in the next few years could quickly lead to the widespread availability of the required information. Factors enabling such a quick improvement include radical advances in information technology, the low costs of IT-based improvements, current efforts by federal statistical agencies and WLMI vendors that provide the foundation for very productive next steps, and the Labor Secretary's legal mandate to provide much of the required information.

Detailed assessments by information category are provided below.[24]

- Occupational Descriptions
  - A taxonomy of occupational classifications that aligns well with current job titles and is of value to decision-makers
  - For each occupational classification, information about:
    - prerequisites for entry level positions, including knowledge, skills, abilities (KSAs), and educational credentials
    - career ladder or competency model, with requisite KSAs and credentials (occupational levels)
    - recent significant changes in occupational characteristics
  - A crosswalk between KSAs and occupations—so that individuals with particular KSAs can see the range of occupations for which they might have relevant qualifications

OMB issues the Standard Occupational Classification (SOC) System on which all agency-specific taxonomies are to be based. Last updated in 2010, the SOC is scheduled for revision in 2018 and every ten years after that. Recommendations for revisions to SOC are provided to OMB by an interagency SOC Policy Committee (SOCPC) led by BLS.[25] The SOCPC goes through several processes of soliciting public input. It expects to provide recommendations to OMB in 2015; OMB in turn expects to issue the final 2018 SOC structure in 2016.

The 2010 SOC contains 840 detailed occupations grouped successively into 461 broad occupations, 97 minor occupation groups, and 23 major occupation groups. Each detailed

[24] For reference, an overview of each of the primary sources of WLMI is available on the LMI Institute website at http://www.lmiontheweb.org/Resources/.

[25] Detailed information on SOC purpose, governance, structure, principles, coding guidelines, and revisions are provided in "Revising the Standard Occupational Classification," March 2014. One key principle: "The U.S. Bureau of Labor Statistics and the U.S. Census Bureau are charged with collecting and reporting data on total U.S. employment across the full spectrum of SOC major groups. Thus, for a detailed occupation to be included in the SOC, either the Bureau of Labor Statistics or the Census Bureau must be able to collect and report data on that occupation."

occupation has a code, title, and statement of duties. Text for a sample detailed middle-skill occupation looks like this:

> 29-2052 Pharmacy Technicians
>
> Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications according to prescription orders.
>
> Illustrative examples: Pharmacist Technician, Certified Pharmacy Technician
>
> Broad Occupation: 29-2050 Health Practitioner Support Technologists and Technicians
> Minor Group: 29-2000 Health Technologists and Technicians
> Major Group: 29-0000 Healthcare Practitioners and Technical Occupations

Through BLS and ETA, the Department of Labor offers three distinct occupational information products.

- Occupational Outlook Handbook (OOH) (BLS) – The OOH includes detailed information on 580 occupations in 334 OOH profiles. BLS indicates that the OOH is the most popular section of its website.[26]
- Occupational Information Network (O*NET) (ETA) – covers 1,110 occupations (that is, more detail than the SOC), including 974 with data. O*NET is the foundation of a substantial number of ETA-sponsored web-based tools for career exploration.[27]
- Competency Model Clearinghouse (ETA) – competency pyramids for 26 occupational groups, each covering middle skills and constructed in cooperation with industry.[28]

As can be seen from Appendix C, OOH and O*NET each offers substantial information on the example detailed occupation, pharmacy technician. O*NET offers great detail on KSAs while OOH emphasizes market trends. The Competency Model Clearinghouse provides an industry competency pyramid for a minor occupational group—health technologists and technicians—which includes pharmacy technician.[29] As can also be seen, the content of these three products are largely independent of one another. The lack of connection across these resources has the potential to be confusing to product users.

---

[26] BLS also regularly provides articles on specific occupations in Career Outlook.

[27] These include O*NET Career Exploration Tools, O*NET Skills Search, Career InfoNet, and My Skills My Future.

[28] See http://www.careeronestop.org/competencymodel/. "The Employment and Training Administration (ETA) is working with business leaders, educators, and others to create comprehensive and readily accessible industry competency models that document the foundational and technical skills and competencies required for workplace success in economically important industries. Industry competency models provide a resource for the development of curriculum, certifications, and the tests that assess work-related competencies. . . . The industry model frameworks are based on the competency model building blocks which are modified to meet the industry needs. "

[29] The O*NET description for pharmacy technician was updated in 2013 and the one for OOH in early 2014 (and every two years). The ETA competency model for allied health was prepared in 2011.

O*NET, then, is the government's primary resource for KSA detail for specific occupations. However, a low funding level ($4.5 million annually) has meant that O*NET has had difficulty remaining current—it can fully update only about 100 occupations annually.

As one consequence, ETA has asked Congress for a $5 million initiative to modernize O*NET.[30] Separately, ETA has initiated an Occupational Information Pilot "to determine the feasibility and validity of updating three key occupation-specific factors more frequently than is currently done with O*NET: 1) occupational codes and titles; 2) skills and tasks required; and 3) education and experience requirements."[31] This pilot is expected to start in the fall of 2015. It is being organized in conjunction with the White House-led Tech Innovations sub-group of the Skills Working Group, which grew out of the Vice President's job-driven training initiative.[32]

---

[30] Department of Labor, "FY2016 Congressional Budget Justification: State Unemployment Insurance and Employment Service Operations, Employment and Training Administration," p. 85-86. "O*NET Modernization ($5,000,000). The 2016 Budget includes a request for $5 million to conduct a feasibility study and pilot various approaches to modernize and potentially streamline the way data for O*NET are collected. O*NET currently relies on a two-stage survey design to collect occupational information from a random sample of businesses and workers within those businesses. This method meets Federal standards for representative sampling, response rate, objectivity, integrity, validity, and reliability. This investment would explore potential ways that data mined from online job boards could inform O*NET's current survey work, and evaluate any existing public and private sector job and skill taxonomies that could potentially be leveraged, while still maintaining comparable descriptors across occupations in order to facilitate identification and analysis of transferable skills. The Department would identify and test ways to achieve more complete and up-to-date coverage of occupations and skills, particularly for high-growth, changing industries, which could enable a greater share of the O*NET occupations to be updated annually—which is currently slightly more than 100 occupations per year out of over 900 O*NET occupations."

[31] According to an ETA memo ("Occupational Information Pilot, Revised Draft, May 5, 2015): "The Occupational Information Network (O*NET) is DOL's primary database of information about skills and other characteristics of occupations, providing a taxonomy used by many labor market information platforms for job seekers, employers, training providers, and others interested in skills training and occupational opportunities. Through this pilot, DOL will collaborate with interagency and external partners to test alternative approaches for updating occupational codes, skills, tasks, work activities, and education and experience requirements in selected clusters of high-growth occupations experiencing frequent changes (such as information technology). DOL will use the results of the pilot to identify if there is a cost effective process for updating occupational skills information more frequently while continuing to maintain high quality standards and historic comparability across occupations.

The Occupational Information Pilot will operate for 12 months beginning in the summer of 2015, and will consist of the following:

- Purpose. Explore at least two alternative labor market information platforms to determine the feasibility and validity of updating three key occupation-specific factors more frequently than is currently done with O*NET: 1) occupational codes and titles; 2) skills and tasks required; and 3) education and experience requirements..
- Pilot options. Two alternative platforms would be piloted: 1) a jobs data aggregation technology tool strategy that would examine one or more industry products, such as LinkedIn, Burning Glass, GlassDoor, CareerBuilder, Monster, etc; and 2) a crowdsourcing strategy that would collect data directly from employers, workers, or other stakeholders.
- Cross-agency collaboration. DOL will incorporate this project into the work stream of the Tech Innovations sub-group of the Skills Working Group, which has grown out of the Vice President's job-driven training initiative."

[32] White House, "Ready to Work: Job-Driven Training and American Opportunity," July 22, 2014.

In parallel, BLS has one existing and four new initiatives to gather and organize occupational information:

- National Compensation Survey (NCS) – For use in setting federal pay and prevailing wage, BLS conducts the NCS, a nationwide survey of employers that collects occupational wage data by competency level. BLS provides employers with a "leveling guide" to determine the proper level for each job.[33] The number and nature of levels are customized for each occupation group. Allied health technicians, for instance, have five levels. (See Appendix C.) In total, BLS publishes wage data for 15 work levels.
- Occupational Requirements Survey (ORS)—The Social Security Administration (SSA) has retained BLS to collect detailed information occupations across the SOC to enable SSA to more appropriately assess disability claims. SSA says that O*NET is insufficiently detailed for this work, as it needs more information on physical demands and environmental conditions, factors pertinent to disability claims. At present, SSA continues to rely on the Dictionary of Occupational Titles (DOT), which was last updated in 1991.[34] BLS is in the development phase of the ORS. "[T]he ORS will gather job-related information regarding physical demands, environmental conditions, and vocational preparation requirements." BLS has posted an ORS "preproduction collection report" that describes tests to date (deemed successful) and plans to commence full implementation in 2015.[35]
- Educational attainment—BLS is exploring methods for increasing understanding of the frequency distribution of educational attainment, including non-degree credentials, and the effect of educational attainment on earnings within individual occupations. Further, it will consider whether to identify education/training levels associated with prime age workers.
- Webscraping—BLS is in discussion with NASWA regarding webscraping online job postings to trace changes in occupational skills requirements and identify emerging occupations.
- Autocoding—In lieu of asking respondents to the Occupational Employment Statistics survey to code jobs according to the SOC, BLS will test asking respondents to report job title, which it then will autocode using the SOC. BLS indicates that one "advantage of occupation coding is that failures to code can help identify new and emerging occupations."[36]

---

[33] BLS, "National Compensation Survey: Guide for Evaluating Your Firm's Jobs and Pay," May 2013.

[34] Dictionary of Occupational Titles, Fourth Edition, 1991. The 1991 DOT provides 12,740 job descriptions. The DOT was first published in 1938.

[35] ORS website http://www.bls.gov/ors/. On June 22, 2015, BLS posted a notice in the *Federal Register* that it is requesting OMB permission to commence ORS operations.

[36] Mike Horrigan, BLS, presentation at C2ER - 55th Annual Conference and LMI Institute Annual Forum, June 12, 2015.

ETA funds the Analyst Resource Center, a collaborative effort of state LMI agencies led by Minnesota to provide "resources are designed to enhance information delivery to workforce customers in the employment, education and economic development sectors." Among these is the National Crosswalk Service Center, which provides crosswalks among the various federal occupational classification systems.[37]

The review of various federal efforts to create detailed, useful occupational descriptions suggests the federal government has a workable occupational taxonomy, a set process for updating it, a large number of popular occupational information resources, and the willingness to commit available resources to exploring improvements. That said, the following concerns arise:

- The SOC is not updated between the major once-a-decade overhaul.
- Due to insufficient funding, O*NET is not up-to-date. As a consequence, the efficacy of the various O*NET-based tools suffers. In light of the importance of O*NET to the Labor Department's occupational information enterprise, and in light of labor market problems faced by many Americans, the lack of appropriations for O*NET is a lost opportunity to have a large impact at very low cost.
- As reflected in Appendix C, BLS and ETA are pursuing their respective occupational information efforts independently of one another. Conversations with principals in each agency suggest they are not aware of the other agency's activities, a situation consistent with historical practice.
- A comprehensive evaluation does not exist of the impact of the government's various occupational information tools, particularly for middle skills development. In particular, it would be good to understand market penetration (the extent to which the target audience uses the available tools, whether directly from the federal government or through value-added vendors) and the value of the tools in guiding labor market participants to effective decisions.

➢ Characteristics of Labor Markets (Local, State, National)

- General labor market characteristics, including:
  - general trends in labor force, employment, and unemployment
  - income and poverty trends
  - trends in demographic characteristics
  - relative cost of living
- Occupational structure—the distribution of employment by occupation
- Workforce characteristics by occupation, e.g., distribution by industry, age, sex, race, ethnicity, credential attainment, earnings, journey-to-work, labor force status
- Near-term trends in supply and demand by occupation
  - flow analysis—job openings; job hires, separations, turnover; school-to-job flows

[37] See http://www.xwalkcenter.org/.

    - stock analysis—numbers of jobs and persons
- Backmapping—tracing talent flow
- Long-term projections of demand and supply by occupation

General labor market characteristics. The federal government provides a substantial amount of information on local, state, and national economic conditions. Such information is important context for labor market decisions. Resources include:

- American Community Survey (ACS), Census Bureau—provides estimates of population characteristics, including labor force status and income by age, sex, race, and ethnicity, for all levels of geography from the nation to neighborhoods[38]
- Local Area Unemployment Statistics (LAUS), BLS—provides monthly and annual estimates of labor force, employment, and unemployment, i.e., household economic conditions, for 7,500 geographic areas nationwide
- Small Area Income and Poverty Estimates (SAIPE), Census Bureau—models annual estimates of income and poverty for all school districts, counties, and states
- Current Employment Statistics (CES), BLS—provides monthly estimates of employment, hours, and earnings, by industry and geography, for the nation, states, and over 400 metropolitan areas
- Regional Price Parities (RPPs), BEA—measures differences in the price levels of goods and services across states and metropolitan areas for a given year. RPPs are expressed as an index of the overall national price level of 100. RPPs allow more meaningful comparisons of occupational wages by region

Generally speaking, the system for describing general regional economic conditions is a very good one. Model-based LAUS, RPPs, and SAIPE reflect initiative and innovation by the federal government. Five years ago, BLS moved the CES estimates process from the state LMI agencies to BLS—there initially were significant estimation anomalies as a result, but concerns have lessened as BLS learns how to better carry out the estimates. The ACS is the most vulnerable program among this set as a number of members of Congress—perceiving government intrusiveness—seek to terminate it or make responses voluntary, which would diminish data quality substantially.

Occupational structure. Data on the distribution of jobs by occupation is valuable to understand the relative importance and place of various types of jobs, such as middle skills ones, in the functioning of the national, state, and regional economies. The primary source of such data is the BLS Occupational Employment Statistics (OES) Program. OES annually produces employment and wage estimates for over 800 occupations for the nation, states, and metro

[38] The ACS provides one-year average estimates for geographic areas with populations of 60,000 and above and five-year average estimates for small geographies.

areas. Official occupational statistics by industry are available for the nation only. However, BLS makes available a research dataset of detailed occupation by industry by state.[39]

Due to limitations on sample size, annual OES estimates are based on data collected over a three-year period.[40] Consequently, according to BLS, an annual time series of OES estimates cannot be constructed to identify recent changes in occupational structure. For FY2011, BLS asked Congress for funding to increase the size of the OES sample; its request was denied.

BLS is exploring a number of adjustments to OES methods, all of which seem feasible. The most ambitious is adding occupation as a data element in the unemployment insurance (UI) wage record collected by states from employers on each employee. Adding occupation would obviate the need for a survey, as a job title would be available on each worker in the UI system nationwide. The BLOC is in the midst of a study on the desirability and feasibility of such a step.[41]

In the meantime, BLS is exploring two approaches to providing one-year OES estimates. The first is modeling estimates. Over the last few years, BLS researchers have successfully demonstrated that alternative approaches to modeling OES estimates surpass existing methods.[42]

Second, as mentioned above, BLS will be testing an approach to OES data collection in which respondents provide job title and wages and BLS autocodes each title to an SOC occupation. If this effort is successful, BLS can consider an expansion of the OES sample at very low cost; the larger sample would allow one-year estimates to be produced.

Detailed workforce characteristics by occupation (e.g., distribution by industry, age, sex, race, ethnicity, credential attainment, earnings, journey-to-work, and labor force status) are useful to students and workers in making career and location decisions, educators and trainers in understanding the nature of the market for their services, employers for determining where to locate operations to best access desired labor, and public purpose organizations seeking to

---

[39] See http://www.bls.gov/oes/2014/may/oes_research_estimates.htm.

[40] See http://www.bls.gov/oes/home.htm. The OES sample size is 1.2 million establishments over three years. The sample is divided into six panels (one every six months) of about 200,000 establishments. The sample is stratified by geography and industry. The survey does not cover the self-employed, owners and partners in unincorporated firms, household workers, or unpaid family workers. Estimates are made for a point in time (May or November). "Every six months, a new panel of data is added, and the oldest panel is dropped, resulting in a moving average staffing pattern. The three years of employment data are benchmarked to represent the total employment for the reference period. The wages of the older data are adjusted by the Employment Cost Index. This methodology assumes that industry staffing patterns change slowly and that detailed occupational wage rates in an area change at the same rate as the national change in the ECI wage component for the occupational group."

[41] See http://www.workforceinfocouncil.org/AdministrativeWageRecordEnhancementStudyasp.asp.

[42] Matt Dey, David Piccone, Stephen Miller, and Alan Dorfman, "Redesigning the OES Sample Design and Estimation Method," rough draft, April 2014. Also Matt Dey, Steve Miller, and Dave Piccone, "OES Time Series: Alternative designs and estimation methods," presentation to the BLS Technical Advisory Committee, November 21, 2014.

promote improved economic and workforce development. These data are available through the ACS and the Current Population Survey (CPS) jointly operated by Census and BLS. In light of its relatively small sample size, the CPS is best suited for analysis of the nation and larger states, while the ACS can provide estimates for much small levels of geography.

One important aspect of workforce characteristics is educational attainment. Traditionally, attainment has been measured in terms of degrees (e.g., high school diploma, some college, associate's, bachelor's, master's). Missing has been data on the attainment of postsecondary workforce credentials other than degrees, that is, industry-recognized certifications, state occupational licenses, and community college certificates. Such non-degree credentials are particularly germane to middle skills jobs. Consequently, decision-makers lack good information on the extent to which U.S. adults have non-degree credentials with value in the labor market. The absence of this information inhibits middle skills labor market participants of all types from making fully informed decisions.

In response, NCES has convened the Interagency Working Group on Expanded Measures of Enrollment and Attainment (GEMEnA) "to develop and validate national measures of the participation in and credentialing of education and training for work, and to build government-wide consensus for the adoption of these measures in key federal data collections."[43]

In January 2015, the CPS added a question on the attainment of certifications and licenses. Calendar year 2015 estimates will be available in early 2016. A more detailed NCES Adult Training and Education Survey (ATES) will be conducted in 2016 to gather data on nondegree credentials by subject and program length. The new CPS and ATES data should help middle skills labor market participants assess the value of nondegree credentials for employability, earnings, and career advancement.

Near-term trends in occupational demand and supply. Middle skills labor market participants regularly make decisions on the basis of perceptions about near-term occupational demand relative to supply. Measures of supply and demand are of two types—flow and stock.

[43] See https://nces.ed.gov/surveys/gemena/. "GEMEnA is engaged in a rigorous process of survey item development to validate core items on 1) the attainment of non-degree credentials, including industry-recognized certifications, occupational licenses, and educational certificates, and 2) enrollment in education and training that prepares people for work. GEMEnA has developed a core set of survey items to measure the prevalence and key characteristics of certifications and licenses, and efforts are underway to deploy these items within the federal statistical system. NCES is planning to field an in-depth survey of US adults, the Credentials for Work (CWS) survey, to provide detailed cross-sectional time series data beginning in 2016. NCES is also incorporating survey items on non-degree credentials into its post high school longitudinal studies. Other GEMEnA agencies have also begun deploying survey items on certifications and licenses in their own surveys of households and individuals including the redesigned Survey of Income and Program Participation (Census), the National Survey of College Graduates (NSF), and the Current Population Survey (BLS)."

- Flow analysis looks at measures of changes in the status of individual workers and jobs, such as job openings; job hires, separations, and turnover; school-to-job flows; and worker job-to-job flows.
- Stock analysis examines overall demand and supply, that is, the number of jobs in an occupation (filled and open) compared to the number of persons qualified to take those jobs. Changes in wage levels can be a corollary indicator, waxing and waning to some degree in response to changes in demand relative to supply.

At present, the U.S. does not have a system of readily available indicators of near-term occupational demand and supply. However, several components of such a system are available and others could be with proper investment.

Resources for flow analysis include the following:

- Job openings
  - Real-time LMI provides a count of the number of online job openings by occupation. Multiple vendors provide statistics of this sort for a subscription fee. As the data are not confidential, detail by occupation, industry, and geography are available. Changes in the number of job openings by occupation can serve as an indicator of changes in overall demand. [44] While real-time LMI is an exciting and useful new tool for getting a rough sense of the magnitude of occupation, it lacks complete coverage (as not all job listings are web accessible) and has data quality issues. The plethora of tools and vendors diminishes compatibility and comparability. That said, the opportunity exists for real-time LMI vendors to increase coverage by working with the NASWA-Direct Employer's National Labor

[44] For example, see the Conference Board's Help Wanted Online at https://www.conference-board.org/data/helpwantedonline.cfm. From a recent press release, summary figures for May 2015:

Table C: U.S. Top Ten Demand Occupations and Pay Levels, Seasonally Adjusted

SOC[1]	Occupation	Total Ads (Thousands) May-15	M-O-M Change (Thousands) May-Apr 15	Unemployed (Thousands) Apr-15	Supply/ Demand Rate[2] Apr-15	Average Hourly Wage[3]
43	Office and administrative support	612.3	0.5	972.9	1.59	$17.08
29	Healthcare practitioners and technical	601.5	19.7	205.6	0.35	$36.54
15	Computer and mathematical science	595.5	16.4	85.8	0.15	$40.37
41	Sales and related	579.3	-8.3	981.0	1.67	$18.59
11	Management	485.9	7.6	455.6	0.95	$54.08
53	Transportation and material moving	387.5	13.4	600.6	1.61	$16.57
13	Business and financial operations	338.0	4.8	194.1	0.58	$34.81
35	Food preparation and serving related	240.6	-6.7	765.1	3.09	$10.57
49	Installation, maintenance, and repair	232.8	4.8	301.8	1.32	$21.74
17	Architecture and engineering	167.5	0.7	86.0	0.52	$39.19

1. Standard Occupational Classification code (SOC)
2. Supply/Demand rate is the number of Unemployed persons divided by the number of total ads and reflects the latest month for which unemployment data is available.
3. BLS Occupational Employment Statistics - May 2014 estimates.

Exchange (NLx) and for Direct Employers to require employers to use a standard template that would increase the quality of information captured.

- The BLS Job Openings and Turnover Survey (JOLTS) provides estimates of job openings by industry—but for the nation only, and not for occupation. The president's FY2016 budget request seeks $6.5 million in additional funding in large part to expand "the sample to provide both greater industry detail and State level data, and add depth by allowing for a series of focused questions on labor market issues." Focused questions would gather information by occupation.[45] The proposal to expand JOLTS coverage to states, industries, and occupations, is a most welcome demonstration of BLS interest. In the near term it is unlikely to be approved by Congress, which has not approved a BLS budget initiative for some time.[46]
- State LMI agencies generate short-term projections of average annual openings for detailed occupations, based on estimated net new jobs and replacement rates.[47] Projection efforts are supported through the State Projections Consortium and the Projections Managing Partnership (PMP).[48]

---

[45] BLS indicates it wishes to "[a]dd depth by allowing for a series of focused questions on labor market issues to enhance the understanding of Openings, Hires, and Separations. Questions could cover topics such as:

- Duration of vacancies (a sign of labor shortages),
- Intensity of recruiting efforts (a sign of the strength of labor demand),
- Occupations and/or wages of hires (signs of labor demand), and
- Tenure, occupations, and/or demographics of workers involved in quits and layoffs."

[46] On June 16, 2015, the House Appropriations Committee released the draft fiscal year 2016 Labor, Health and Human Services (LHHS) funding bill, which proposes a $609 million appropriations for BLS, rather than the $633 million requested. The full House Appropriations Committee approved the bill on June 24.

[47] See https://www.projectionscentral.com/Projections/ShortTerm. "The projection period includes the short-term period up to 2016 for all participating states. Participating states may project from different quarters within the base and projected years. . . . Each State Employment Security Agency, in cooperation with the Bureau of Labor Statistics, uses the Occupational Employment Statistics (OES) report to gather occupational employment data. These OES data are the basis for the staffing patterns used in the projections . . . . Short-term employment projections are developed by each state and therefore are subject to work schedules and other related constraints of each state. . . . Average annual openings are the sum of average annual new jobs and replacements. Average annual new jobs are the numeric change in employment over the projection period divided by the number of years in the projection period. Replacements are an estimate of the number of jobs that will arise from the need to replace workers who will change occupations, retire, or otherwise permanently leave the occupation."

[48] See https://support.projectionscentral.com/. The State Projections Consortium is composed of state government analysts responsible for developing employment projections under contract with the U.S. Department of Labor, Employment and Training Administration. PMP is a "partnership is between (1) the U.S. Department of Labor, Employment and Training Administration (ETA); (2) the U.S. Department of Labor, Bureau of Labor Statistics (BLS); (3) the National Association of State Workforce Agencies (NASWA); and (4) the State Projections Consortium. . . . The PMP operates an integrated, nationwide program of state and local projections. This program is driven by our customers' need to make informed decisions based on the most reliable and relevant occupational and industry outlook information. The Partnership's goals include:

- Operating an integrated long and short-term projections program
- Gaining further understanding of customer needs
- Responding to customer needs in a demand driven system

- Job hires, separations, and turnover
  - The commercial vendor LinkedIn offers research access to its database to create indicators on occupational status, entry, and exit.
  - The Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Program ties together establishment and employee wage records from each state's UI system to produce Quarterly Workforce Indicators, such as rates of hires, separations, turnover, and wage change, by industry for states, metro areas, counties, and workforce investment areas. While LEHD cannot provide indicators by occupation, indicators by industry can be a useful proxy. If occupation were added to the wage record template, very useful flow indicators for small areas could be generated.
  - The BLS Employment Projections (EP) Program estimates average annual replacement rates by occupation.[49] The latest estimates are for 2012-2022. BLS is in the process of replacing its replacement rates method with a new methodology for estimating separations.[50]
  - As noted earlier, the U.S. Chamber of Commerce Foundation's TPM Initiative is creating an occupational demand planning toolkit for regional employer collaboratives.
- School-to-job flows
  - The NCES Integrated Postsecondary Data System (IPEDS) generates the number of students and degree and certificate recipients by field of study by year. IPEDS has several limitations—for instance, it focuses on full-time students and it generates aggregates numbers at a point in time, distinct from tracking the flow of students through an institution.[51]
  - The NCES Statewide Longitudinal Data System (SLDS) Program enables states to build longitudinal data systems that track students as they move through from

---

- Refining operating processes to improve product quality and time to market
- Deploying integrated staff training
- Improving projections analysis and presentation"

[49] See http://www.bls.gov/emp/ep_table_110.htm. "To project the magnitude of replacement needs, the Bureau of Labor Statistics (BLS) calculated an estimate of openings resulting from workers retiring or otherwise permanently leaving an occupation. Because workers entering an occupation often need training, these replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for the occupation. This estimate of replacement needs does not count workers who change jobs but remain in the same occupation." The methodology for estimating replacement rates is available at http://www.bls.gov/emp/ep_replacements.htm.

[50] See http://www.bls.gov/emp/ep_separations.htm. "The new method is designed to measure the same concept as the old methodology: workers who leave their occupation and need to be replaced by new entrants into the occupation. It is not a measure of all movement in and out of occupations, but instead an estimate of workers who permanently leave an occupation. The new method is different, however, from the current method in how it estimates workers who leave permanently."

[51] See http://www.lmiontheweb.org/Resources/briefs/Summary_Brief_-_IPEDS.pdf.

pre-kindergarten into K-12 and postsecondary and into the workforce.[52] According to the Data Quality Campaign, almost all states are aiming to have an SLDS that will allow them to identify the annual number of credential recipients by institution program and field.
    - The immediate workforce outcome of a credential completion can be identified through a worker's UI wage record. However, under current practice, a state's ability to identify workforce outcomes is largely limited to graduates who remain in state, as obtaining out-of-state wage records usually is cumbersome.
    - A number of federal, state, and nonprofit parties are exploring options for more easily tracking workforce outcomes of graduates regardless of location. A promising option is the use of the new LEHD Job-to-Job Flows (J2J) tool. BLS also is looking into obtaining access to a national set of UI wage records, perhaps through Census and perhaps independently.
  - The National Student Clearinghouse Research Center provides access to completion data by postsecondary institution.[53]
  - The Association for Career and Technical Education has created a new Certification Data Exchange Project "to expand and improve data exchange between industry certification organizations and state longitudinal data systems . . . that will allow states and educational institutions to gain access to data on industry-recognized certifications earned by students."[54]
  - Under TPM sponsorship, regional collaboratives will carry out talent flow analyses to identify the educational institutions that provide qualified and valued employees.

Resources for stock analysis include the following:

- The ACS provides estimates of employment for 526 detailed occupations and estimates of major occupational group (e.g., service occupations) of the employed workforce by major industry division (e.g., manufacturing) and class of worker (e.g., salaried, self-employed, private sector, public sector). One-year data are available for areas greater than 60,000 in population and five-year estimates for smaller areas of geography.
- OES provides point-in-time estimates of wage and salary employment, and associated wages, by occupation for the nation, states, and metro areas. National

[52] For a summary see, http://www.lmiontheweb.org/Resources/briefs/Summary_Brief_-_SLDS.pdf. Federal funding to state education agencies comes from the NCES SLDS Program and to state LMI agencies (to support linkage to wage records) from the ETA Workforce Data Quality Initiative.

[53] See StudentTracker http://www.studentclearinghouse.org/colleges/studenttracker/. According to the NSCRC, "StudentTracker℠ is the only nationwide source of college enrollment and degree data. More than 3,600 colleges and universities — enrolling 98% of all students in public and private U.S. institutions — regularly provide enrollment and graduation data to the Clearinghouse."

[54] See https://www.acteonline.org/certification_data/#.VYc2rvlViko.

estimates include detailed occupational breakouts by industry.[55] As noted earlier, occupation-by-industry-by-state research datasets were recently made available. Comparisons of estimates three years apart can provide indicators of change in jobs and wages by occupation, giving a sense of shifts in demand-supply equilibrium. The development of annual OES times series, as described earlier, would allow BLS to identify "in-demand ("hot") occupations based on pre-defined thresholds for employment increases and real wage increases. In a time series, these thresholds could be based on growth rates in employment and real wages over several years."[56]

- BLS is planning to publish a new data series that estimates average wage by occupation by competency level, for metro areas. The estimates are prepared through combined use of data from the three-year OES and NCS, described earlier.[57] If an annual OES time series were developed, the availability of OES-NCS modeled wage levels would further support identifying occupations in demand as annual wage growth could be measured by competency level, which is tied to education.
- Biennally, BLS publishes the Occupational Outlook Handbook (OOH) with occupational employment projections ten years hence. The 2014-15 OOH, with 2012-2022 projections, was issued in January 2014. The OOH includes a series of national occupational tables by industry for the base year (2012 being the latest). The coverage is broader than for the OES in that it includes agriculture, private household workers, unpaid family workers, and the self-employed.[58]
- State LMI agencies generate short-term employment projections for detailed occupations.[59]
- The Census Bureau's Nonemployer Statistics Program provides annual estimates of non-employers by industry for the nation, states, metro areas, and counties.[60]

---

[55] See http://www.bls.gov/oes/current/oessrci.htm. The latest estimates are for May 2014.

[56] Horrigan, *op.cit*.

[57] Michael K. Lettau and Dee A. Zamora, "Wage estimates by job characteristic: NCS and OES program data," *Monthly Labor Review*, August 2013.

[58] See http://www.bls.gov/emp/ep_faq_001.htm#compare, answering the question "Why are there differences between estimated employment in a particular occupation in the Employment Projections data and estimated employment in that same occupation from surveys such as the Occupational Employment Statistics (OES) survey or the Current Population Survey (CPS)?"

[59] See https://www.projectionscentral.com/Projections/ShortTerm. "The projection period includes the short-term period up to 2016 for all participating states. Participating states may project from different quarters within the base and projected years. . . . Each State Employment Security Agency, in cooperation with the Bureau of Labor Statistics, uses the Occupational Employment Statistics (OES) report to gather occupational employment data. These OES data are the basis for the staffing patterns used in the projections . . . . Short-term employment projections are developed by each state and therefore are subject to work schedules and other related constraints of each state."

[60] See http://www.census.gov/econ/nonemployer/. Nonemployer businesses "have no paid employees and are subject to federal income tax. The data consist of the number of businesses and total receipts by industry. Most nonemployers are self-employed individuals operating unincorporated businesses (known as sole proprietorships), which may or may not be the owner's principal source of income."

At present, there is no reliable set of estimates of the supply of persons qualified to work in various occupations. Perhaps the most sophisticated supply estimating efforts are being carried out by the National Center for Health Workforce Analysis in HHS.[61]

The development of reliable occupational demand-supply models is in its infancy. While several estimation tools exist,[62] models could be substantially improved to the extent that the building blocks on which they are based could be enhanced.

Backmapping. As discussed earlier, the TPM Initiative is providing its regional employer collaboratives with a guide to talent flow analysis—identifying and evaluating assessing the sources of current employees in key occupations, with sources including education and training programs and prior employers. The effort would look back ("backmap") from between one and five years.[63]

Long-term projections of demand and supply by occupation. BLS and the state LMI agencies independently produce ten-year employment projections by occupation:

- As noted above, BLS publishes the biennial OOH, the most recent of which contains 2012-2022 projections for 580 detailed occupations (about 84 percent of total employment in 2012).[64]
- The State Projections Consortium hosts the long-term occupational employment projections of each participating state, currently through 2022.[65] State projections are prepared after the BLS national projections are completed.

---

[61] See http://bhw.hrsa.gov/healthworkforce/supplydemand/index.html, particularly "Projecting Future Clinician Supply and Demand: Advances and Challenges," April 19, 2013.

[62] See, for example, the Economic Development and Employer Planning System and the Florida Occupational Supply-Demand System. Regional Prosperity Project, Raising the Bar on Skills Development: Findings from the Front, June 2013, p. 8: "It is still hard to get accurate, reliable, realtime information about what is happening in the labor market. There are now technologies available that can aggregate multiple large data sets to develop a comprehensive picture of what's happening in the labor market, analyze that information to gain new insights into labor market trends and patterns, develop sophisticated models of regional labor markets that can be used to forecast longer-term trends and run what-if scenarios to guide decisions about where to focus, track enrollment in skill development programs, and assess the quality of those programs by tracking what happens to participants upon completion. But the deployment of those technologies is still very limited. That's because nobody is responsible for playing this vital role, there is no dedicated funding stream to support it, and most skill development organizations lack the capacity to effectively perform these functions. There are also legal barriers in some states that block access to critical data due to privacy concerns. As a result, regional leaders too often end up relying on outdated BLS forecasts, some of which date back to before the recession, snapshots of current conditions that can often be misleading, the latest fad, political pressures, or the availability of grant funding to determine where to focus their skill-development efforts."

[63] "Analyzing Talent Flow: Identifying Opportunities for Improvement," Center for Education and Workforce, U.S. Chamber of Commerce Foundation.

[64] The OOH/EP methodology is available for review: http://www.bls.gov/emp/ep_projections_methods.htm.

[65] See https://www.projectionscentral.com/Projections/LongTerm.

BLS and the states emphasize that the projections are not forecasts.

> Projections focus on longer term underlying trends based on a set of assumptions, whereas forecasts focus more on predicting actual outcomes in the near term. The assumptions that underlie projections are usually designed to provide a neutral backdrop that allows a focused analysis of the long-term trends. . . . A projection . . . supplies the user with a plausible scenario in which to understand the ramifications of the longterm trends.[66]

Assumptions include full employment, continuation of broad social and demographic trends, and stability of existing laws and policies with significant impacts on economic trends. BLS projects labor force, labor force participation rates, aggregate economic growth, commodity final demand, input-output relationships, and a projected-year occupational staffing matrix by industry.[67]

In the late 1990s, 2003, and 2010, BLS evaluated prior projections, the most recent being 1996-2006.[68] Findings of regarding the accuracy of those occupational projections are:

- The occupations evaluated accounted for about half of all employment in both the base (1996) and projection (2006) years.
- BLS correctly projected the direction of change for about two-thirds of the occupations.
- BLS more accurately projected the employment of large-sized occupations than that of small-sized ones.
- BLS was off by only 4.2 percent in projecting the distribution of employment among occupations.
- Some errors in projecting occupational employment can be attributed to an imperfect OES–SOC crosswalk.

---

[66] BLS, "Chapter 13: Employment Projections," Handbook of Methods, p. 13-6.

[67] *Ibid*., pp. 13-5-6. "To derive projected-year staffing patterns, BLS economists place base-year staffing patterns under an iterative process of qualitative and quantitative analyses. Examining historical staffing pattern data, they conduct research on factors that may affect occupational utilization within given industries during the projection decade. Among such factors are shifts in product mix and changes in technology or business practices. Once these factors are identified, they are used to develop numerical change factors that give the proportional change in an occupation's share of industry employment over the 10-year projection period. These change factors are applied to the base year occupational staffing patterns to derive projected staffing patterns. An occupation's projected share of an industry may increase, decrease, or remain the same, depending on the change factors and underlying rationales.

For each industry, the projected-year employment is multiplied by the projected-year occupational ratio to yield the industry's projected-year wage and salary occupational employment. Occupational employment data on the self-employed and on unpaid family workers are projected separately. Total projected-year occupational employment is the sum of the projected employment figures for wage and salary workers, the self-employed, and unpaid family workers."

[68] http://www.bls.gov/emp/ep_pub_projections_eval.htm.

- Macroeconomic fluctuations that affected the accuracy of the industry projections also affected the occupational projections.[69]

Recently, BLS sought to make clear that its identification of the minimum educational requirements needed for entry into each occupation should not be used to project the number of jobs that require various levels of educational attainment.[70]

The utility of the long-term BLS projections are only as good as the validity of the assumptions on which they are based. There are no obvious easy fixes to improving projections, only a slow, steady focus on testing, and backcasting, various approaches.

➢ Employment Outcomes and Career Pathways

- Near-term employment outcomes—labor force status, nature of employment (wage and salary, self-employed), occupation if employed, earnings, location, by:
  - type of degree or occupational credential
  - category of undergraduate major
  - education or training institution and program
- Usual and possible long-term career pathways—in terms of:
  - the progression of credential and KSA acquisition and job advancement
  - the characteristics of successive jobs
  - the role of credential and KSA acquisition in enabling job advancement

Some middle skills labor market participants want to understand and compare the employment outcomes of various alternative education paths—particular degrees and programs. Some also want to understand the efficacy of various career paths that occupation holders take.

A primary aim of the NCES SLDS Program is to allow labor market participants to compare the employment outcomes of specific educational institutions and programs. Widespread availability of such data would also allow analysts to assess the efficacy of various types of credentials. Ideally, employment outcome measures would include labor force status; occupation, industry, and location of employment; and wage. As noted earlier, a majority of SLDS are working towards including employment outcomes. Three issues impede their efforts. One is the difficulty of obtaining workforce outcome information when a person moves out of state. The second is the absence of occupation on the wage record. The third is that SLDS do not cover credentials, such as industry-recognized certifications, that are granted outside educational institutions.

Also as noted, efforts are underway to address these issues.

- Options being explored to obtain employment outcomes of migrating workers include engaging the LEHD program, expanding and increasing the effectiveness of

[69] Ian D. Wyatt, "Evaluating the 1996–2006 employment projections," *Monthly Labor Review*, September 2010.
[70] Horrigan, *op.cit.*

the Wage Record Interchange System (WRIS2), and making use of the files of the National Directory of New Hires (NDNH) maintained by the Department of Health and Human Services.

- LEHD holds the wage records for all workers in state UI systems. It is open to exploring creating reimbursable arrangements in which it examines wage records to identify employment outcomes of particular postsecondary institutions and programs; to test the idea, it is in discussion with the University of Texas (UT) to create a reimbursable research project that identifies the employment outcomes of UT graduates. It should be understood that each state has veto over the use of its wage records and it is unclear how many states might not want their records shared. As an alternative, LEHD also is in discussions with the Internal Revenue Service regarding access to worker W-2 forms issued for income tax purposes.[71]
- WRIS2 is a voluntary program of sharing UI wage records among states and has 36 members. However several larger states are not members (e.g., California, New York, Georgia, and Michigan) and record-sharing among members has proved cumbersome.[72]
- The NDNH was created to help states track down "deadbeat dads," particularly those who move out of state. The NDNH contains data on newly hired individuals (obtained from W-4 forms), quarterly wages reported by employers to the UI system, and UI applications and benefits. While the NDNH database can be used for research purposes, its value is limited because records are supposed to be deleted after 24 months.[73]
- While there are issues to be addressed, there is strong interest in enabling SLDS to identify workforce outcomes. Further, Senators Wyden, Rubio, and Warner recently introduced the Student Right to Know Before You Go Act of 2015, which would require IPEDS to provide access to data on employment and earnings outcomes for each program of study, credential received, postsecondary institution, and state of employment.[74]

- As noted earlier, the BLOC is in the midst of examining the desirability and feasibility of adding occupation to the UI wage record. Federal and state agencies and nonprofit advocates all are supportive of this idea. Efforts are being made to identify and address any employer reluctance to provide such information, primarily due to the cost. Most major employers use automated payroll services that have the job

[71] The Census Bureau has legal permission to obtain IRS records.

[72] An overview of WRIS2 is available at http://www.doleta.gov/performance/wris_2.cfm. Also see Workforce Data Quality Campaign, "Employing WRIS2: Sharing Wage Records Across States to Track Program Outcomes," May 19, 2014.

[73] Christin Dunham and Laura Wheaton, "Investigating Alternative Sources Of Quarterly Wage Data: An Overview Of The NDNH, LEHD, WRIS, And ADARE," The Urban Institute, October 25, 2012.

[74] See http://www.wyden.senate.gov/news/press-releases/wyden-rubio-warner-introduce-the-student-right-to-know-before-you-go-act.

title information and that the federal Fair Labor Standards Act requires employers to record the occupation of non-exempt workers.[75] Also, it might be possible for state UI agencies to autocode employer records.
- As mentioned above, the Certification Data Exchange Project is seeking to develop a nationwide system that allows states and educational institutions to gain access to data on industry-recognized certifications earned by students and so add these credentials to SLDS.

The National Student Clearinghouse Research Center indicates it is working towards being able to provide information on the employment outcomes of education.[76]

Two types of IT advances potentially allow researchers to understand the nature and results of various career pathway patterns by occupation. Once organized, this information might be fruitfully used by the full range of middle skills labor market participants.

- LEHD is building a Job-to-Job Flows (J2J) Tool that let researchers trace worker trajectories across jobs and changes in labor force status, with information regarding industry, earnings, and location. At present, J2J offers public use microdata samples (PUMS), which allow researchers to examine career paths differentiated by educational attainment and industry.[77] Census plans to release a web-based research tool in the near future. As noted, however, UI wage records at present do not include occupation as a data element.
- IT advances make possible the text analysis of large volumes of personal career histories—on LinkedIn and in resume banks. For instance, the Georgetown University Center for Education and the Workforce is working with NASWA to machine read resumes. However, this type of research is in its infancy.

Overall, the possibilities for the emergence of highly useful information on employment outcomes and career pathways are quite substantial.

➢ Quantitative Assessments of One's KSAs and Personal Goals and Characteristics Relative to Occupational Characteristics and Career Pathways

- Means to inform individuals about the nature of their match with particular occupational and career options

IT advances offer the possibility of providing customized guidance to students, workers, educators, and employers regarding the fit, or lack thereof, between an individual's KSAs and those required for a particular occupation or job.

[75] See http://www.dol.gov/whd/regs/compliance/whdfs21.pdf.
[76] See http://nscresearchcenter.org/aboutus/.
[77] See http://lehd.ces.census.gov/data/j2j_beta.html.

A recent article indicates that nearly one-quarter of job applicants now take a skills test.[78] Often, these tests are administered by a predictive analytics firm. (A number of these firms are profiled in Appendix B). On the basis of the test results, the firm then provides guidance to the employer regarding the applicant's likely fit with the job.

It becomes possible, then, for researchers to analyze large volumes of test results to create career guides and offer customized career testing (not specific to a particular job opening). While it does not appear that the newer predictive analytics organizations intend to provide such services as yet, an older one is moving in that direction. The Aces Applied Research Network of the ACT Foundation is examining historical ACT test data to understand their relationship to education and employment outcomes.[79]

The value of such guidance would be enhanced to the extent that the federal government offers a current, reliable, detailed crosswalk between occupations and skills. O*NET has the potential to do this if it were adequately funded. On June 22, 2015, under the auspices of the WIC (now BLOC) Skills Initiative, the LMI Institute hosted a meeting of ETA, BLS, and state LMI staff to discuss desirability and feasibility of improvements in skills data.[80]

[78] "Last year 23% received a skills test, up from 16% five years ago." Josh Zumbrun, "Seen That Job Listing for a While? It's No Coincidence," *Wall Street Journal*, June 18, 2015.

[79] See http://actfdn.org/what-we-do/produce-evidence/aces-research-network/.

[80] For scope and members of the Skills Initiative, see http://www.workforceinfocouncil.org/Skills%20Initiative%20Study%20Group.asp. Project objectives include:

- Obtaining a baseline assessment of the efforts engaged in by state LMI agencies in providing skills data to a variety of customer groups
- Obtaining a baseline assessment of the views of state LMI Directors about the current and future importance of providing skills data to a variety of customer groups
- Beginning a national dialogue about best practices in the provision of skills data, to include states that can offer best practices as well as national policymakers
- Beginning to build consensus throughout the national LMI infrastructure as it relates to skills data, validating and/or differentiating from the work of myriad studies by nongovernmental entities
- Disseminating best practices and suggestions for next steps to the national LMI system through a report that documents lessons learned from a national survey and convening of national subject matter experts

VII. Findings and Recommendations: Governance

With regard to the availability of information resources to inform decision-making by middle skills labor market participants, the following findings are offered:

- The availability and accessibility of current, reliable, detailed information substantially increases the probability of successful labor market decisions.
- Advances in IT make possible significant increases in the volume of relevant statistics collected, analyzed, and disseminated.
- IT advances also make possible an increased role for non-government data providers.
- The federal government has critical roles in enabling the availability and accessibility of information for decision-making by labor market participants. Key roles include data provision and leadership.
- The return on federal investment in WLMI is extraordinarily high.
  - The federal WLMIS's annual cost is $800 million—just $2.49 per capita.[81]
  - Federal WLMI guide the labor market decisions of a $17.7 trillion economy, which includes $10.9 trillion in worker earnings. The WLMIS's cost as a percent of GDP is only 0.00005%.
  - U.S. employers over $450 billion on training in 2013. In FY2014, the federal government spent over $17 billion on employment and training programs.[82] Average training expenditures per worker is $3,300. Additional investment in federal WLMI of less than a dollar per worker could significantly increase return on these training investments.
- The effectiveness of the federal WLMIS is substantially far less than it might be. Factors include:
  - Insufficient funding for WLMIS. Departments and OMB tend to ask for too little funding for WLMIS. Congress provides too little of the president's requests and very rarely approves new budget initiatives, which typically are very low cost ($1 million-$5 million).[83] In general, congressional appropriators, OMB, and department budget offices fail to appreciate the high benefit-cost ratio of investments in WLMI and, in particular, the value of WLMI in guiding the intelligent use of over $17 billion in federal training investment. Throughout the Obama Administration, the Labor Secretary's Office has not allowed BLS to independently visit Capitol Hill to educate members and staff, latitude that the Commerce Secretary gives the Census Bureau.

[81] The figure is based on FY2015 funding of BLS workforce and compensation statistics at $310 million; Census Bureau funding of the ACS, CPS, and LEHD at approximately the same figure; ETA funding for workforce information at $60 million; NCES funding for postsecondary data at approximately $55 million; NCSES funding for workforce at approximately $25 million; and a "fudge factor" of $40 million for the remaining agencies.
[82] White House, *op.cit.*, p. 12.
[83] BLS appropriations peaked in FY2010 at $611.4 million and are $592.2 million in FY2015.

- In particular, lack of federal funding of state LMI agencies. Annual funding for BLS grants to state LMI agencies has been stuck at about $72 million for well over a decade. Similarly, ETA state workforce information grant funding has been flat at $32 million. Too little money to begin with, the utility of these grants has eroded with inflation. As a consequence, state LMI agencies have not been able to provide the level of information services needed by labor market participants.
- Lack of understanding of uses of WLMIS by labor market participants. Federal economic statistics agencies consider macroeconomists to be their primary customer group. They have relatively little understanding of how labor market participants rely on WLMI to make decisions of great personal and organizational import and tend to not have the relationships with data users that would provide that understanding.
- Lack of evaluation of WLMIS performance and impacts. The federal government does not adequately assess the performance and impacts of its investments in WLMI. For instance, as mentioned, BLS performance indicators are concerned solely with the production of Principal Federal Economic Indicators.
- A focus on programs, not policy and strategy. The federal WLMIS operates as a collection of disparate programs without coordination within the system (or even between BLS and ETA) or from the White House. At present, there is no vision regarding how the various pieces might be organized to most productively inform the decisions of labor market participants.
- Lack of coordination and communication between BLS and ETA. This situation, unfortunately, is long-standing. Reasons include substantial differences in mission and culture, inertia, and lack of leadership from the Secretary's Office. The result is duplication, gaps, and missed opportunities for positive impact.
- Legacy approaches to statistical products. Federal statistical agencies continue to rely on legacy methods for collecting and producing data, particularly surveys. To their credit, they are more actively exploring how they might better use advanced, low-cost IT to improve WLMI, for example, through greater use of federal administrative records and through commercial data vendors and service providers. The challenge is determining how, in the production of official statistics, to work with data and statistics that do not meet traditional, and appropriate, high standards of reliability as defined by OMB and the National Academy of Sciences.

WIOA's detailed, thoughtful specifications for the WLMIS provide the legal and organizational basis for addressing these factors. ETA's affirmation and enhancement of these specifications in its proposed WIOA rules is a positive first step in their implementation.

Going forward, recommendations regarding the governance and organization of the WLMIS are:

- The Secretary of Labor should fulfill his responsibilities for creating and maintaining the WLMIS. As part of this effort, the Secretary of Labor should:
  - see to the development and the regular updating of the two-year WLMIS plan required by WIOA that lays out a clear vision, roadmap, and rationale
  - take seriously WIOA's requirement to coordinate with other federal agency heads, and reduce duplication and address gaps in the WLMIS, through including the Census Bureau, NCES, NCSES, and state education agencies as participants in the governance of the WLMIS
  - direct his budget office to base WLMIS budget requests on expected return on investment in comparison to other forms of investment
  - direct BLS and ETA to:
    - coordinate and collaborate on WLMI activities
    - create relationships with WLMI customers to better understand WLMI uses, issues, and opportunities
    - for their respective annual performance reports, design indicators that measure the performance and impacts of their WLMI products and services
    - provide initial budget requests for state grants significantly above current levels
  - allow BLS, on its own initiative, to educate congressional members and staff on the value and uses of WLMI
- White House policy offices—including the Office of Management and Budget, the National Economic Council, the Domestic Policy Office, the Council of Economic Advisers, and the Office of Science and Technology Policy—should work together to ensure that the federal government has a coherent WLMIS strategy and requests congressional appropriations adequate to fulfill that strategy.
- NCES should expand the mission to the National Postsecondary Education Collaborative to support labor market participant decision-making in addition to policy development.
- The Federal Committee on Statistical Methodology should create a study committee charged with proposing principles and practices regarding statistical agency use of advanced IT data methods and third-party services.

VIII. Recommendations: Program Priorities

On the basis of the analyses in Section IV, it is suggested that the federal government pursue the following program priorities.

➢ Occupational Descriptions

- OMB should create a strategy for regularly updating detail occupational descriptions, including emerging and receding occupations, changes in KSAs, and changes in educational requirements. Such a strategy may rely on some combination

of methods such as greater funding of O*NET, webscraping, autocoding, crowdsourcing, and new surveys (such as the Occupational Requirements Survey).

- In light of the disparate array of occupational information products in Appendix C, BLS and ETA should work together to align and integrate the government's suite of occupational information tools in a way that meets the labor market participant needs.
- As part of this effort, they should regularly evaluate the value of the tools in guiding labor market participants to effective decisions. They also should incorporate indicators on the use of these tools in their annual performance reports.
- NASWA, Direct Employers, and national human resource and industry associations should adopt a standard template for on-line job postings that would allow for more productive text analysis for the purpose of understanding occupational KSAs and educational requirement.

➢ <u>Characteristics of Labor Markets</u> (Local, State, National)

- The White House, the Secretary of Labor, BLS, and ETA should collectively make priority improvements in occupational statistics.
  - In the short-run, these improvements should be based on implementation of new OES modeling to provide annual time series, integration of OES with NCS data to provide estimates of wages by occupational level by locality, the addition of new elements to the OES, and autocoding of OES responses (if that experiment proves successful).
  - At the same time, efforts to add occupation to the UI wage record should continue, with priority. If implemented, this addition could obviate the need for other modes of occupation data collection.
- Congress should actively support and fully fund a mandatory response American Community Survey.
- GEMEnA, led by NCES, should continue its important efforts to encourage collection of non-degree credential attainment data.
- As part of WIOA implementation, the Secretary of Labor should make a priority the development of useful occupational supply-demand models at all levels of geography. He should direct ETA to convene a public-private working group to explore alternative approaches and, if possible, develop a consensus vision and roadmap.
- The Secretary of Labor also should make a priority continued improvements in short-term and long-term national and state occupational projections.
- NCES should expand the Integrated Postsecondary Education Data System to include non-traditional students.
- The public-private effort to construct a national Credentialing Registry is highly valuable and should continue.

- Employment Outcomes and Career Pathways
  - To facilitate the understanding of employment outcomes of various education programs and career paths, the Secretary of Labor should make a priority the addition of occupation as a field in the UI wage record.
  - Efforts by Census, BLS, ETA, and the National Student Clearinghouse Research Center to develop technically and legally viable methods to track the employment outcomes of out-of-state movers should continue.
  - The Certification Data Exchange Project, led by ACTE, can add important information to SLDS on certification attainment and should be supported with priority.
  - Efforts by the Census Bureau and academic researchers to analyze job-to-job and career trajectories should be continued, with priority, as the results could do much to inform middle skills labor market participants. As part of this effort,
    - the Census Bureau should facilitate qualified researcher access to its network of Federal Statistical Research Data Centers and
    - NASWA and state LMI agencies should facilitate qualified researcher access to resumes.

- Quantitative Assessments of One's KSAs and Personal Goals and Characteristics Relative to Occupational Characteristics and Career Pathways
  - ETA should convene a national conference to explore the potential of analyzing the results of personal assessment tests to inform workforce development processes.

IX. Conclusion

The development of a robust, fully employed middle skills workforce requires that students, workers, employers, educators and trainers, and public purpose and policy organizations be able to make labor market decisions on the basis of current, reliable, detailed information.

At present, such information is not readily available to a sufficient degree. However, significant advances in information technology and strong, widespread interest by government agencies, advocates, researchers, and vendors suggest that the way and the will exist to address this situation. Remarkable opportunities are available to enhance the workings of U.S. labor markets through modest investments to improve workforce data resources. It is hoped that this paper fully describes the nature of the issues and opportunities and offers useful suggestions for addressing them.

Appendix A: Federal WLMI Mandates and Goals

Office of Management and Budget

- Statistical Policy Directive No. 1: Fundamental Responsibilities of Federal Statistical Agencies and Recognized Statistical Units; Notice; December 2, 2014[1]

Responsibilities: It is the responsibility of Federal statistical agencies and recognized statistical units to

- produce and disseminate relevant and timely information;
- conduct credible, accurate, and objective statistical activities; and
- protect the trust of information providers by ensuring confidentiality and exclusive statistical use of their responses

Responsibility 1: Produce and disseminate relevant and timely information.

The core mission of Federal statistical agencies and recognized statistical units is to produce relevant and timely statistical information to inform decision-makers in governments, businesses, institutions, and households. Federal statistical agencies and recognized statistical units must be knowledgeable about the issues and requirements of programs and policies relating to their subject domains. This requires communication and coordination among agencies and within and across Departments when planning information collection and dissemination activities.

In addition, Federal statistical agencies and recognized statistical units must seek input regularly from the broadest range of private- and public-sector data users, including analysts and policy makers within Federal, State, local, tribal, and territorial government agencies; academic researchers; private sector businesses and constituent groups; and non-profit organizations.

[1] *Federal Register*, Vol. 79, No. 231, December 2, 2014, pp. 71610-71616.

Secretary of Labor

- Legislative Mandate

29 USC 49l-2. WORKFORCE AND LABOR MARKET INFORMATION SYSTEM[2]

(a) SYSTEM CONTENT

(1) In general

The Secretary, in accordance with the provisions of this section, shall oversee the development, maintenance, and continuous improvement of a workforce and labor market information system that includes—

(A) statistical data from cooperative statistical survey and projection programs and data from administrative reporting systems that, taken together, enumerate, estimate, and project employment opportunities and conditions at national, State, and local levels in a timely manner, including statistics on—

(i) employment and unemployment status of national, State, and local populations, including self-employed, part-time, and seasonal workers;

(ii) industrial distribution of occupations, as well as current and projected employment opportunities, wages, benefits (where data is available), and skill trends by occupation and industry, with particular attention paid to State and local conditions;

(iii) the incidence of, industrial and geographical location of, and number of workers displaced by, permanent layoffs and plant closings; and

(iv) employment and earnings information maintained in a longitudinal manner to be used for research and program evaluation;

(B) information on State and local employment opportunities, and other appropriate statistical data related to labor market dynamics, which—

(i) shall be current and comprehensive;

(ii) shall meet the needs identified through the consultations described in subparagraphs (A) and (B) of subsection (e)(2) of this section; and

(iii) shall meet the needs for the information identified in section 134(d);[3]

---

[2] As amended by P.L. 113-128 (Workforce Innovation and Opportunity Act).

[3] Section 134(d) is codified as 29 USC 2864(d)(2):

Funds . . . shall be used to provide core services, which shall be available to individuals who are adults or dislocated workers through the one-stop delivery system and shall, at a minimum, include— . . .

(E) provision of employment statistics information, including the provision of accurate information relating to local, regional, and national labor market areas, including—

(i) job vacancy listings in such labor market areas;

(ii) information on job skills necessary to obtain the jobs described in clause (i); and

(iii) information relating to local occupations in demand and the earnings and skill requirements for such occupations;]

(C) technical standards (which the Secretary shall publish annually) for data and information described in subparagraphs (A) and (B) that, at a minimum, meet the criteria of chapter 35 of title 44;

(D) procedures to ensure compatibility and additivity of the data and information described in subparagraphs (A) and (B) from national, State, and local levels;

(E) procedures to support standardization and aggregation of data from administrative reporting systems described in subparagraph (A) of employment-related programs;

(F) analysis of data and information described in subparagraphs (A) and (B) for uses such as—

(i) national, State, and local policymaking;

(ii) implementation of Federal policies (including allocation formulas);

(iii) program planning and evaluation; and

(iv) researching labor market dynamics;

(G) wide dissemination of such data, information, and analysis in a user-friendly manner and voluntary technical standards for dissemination mechanisms; and

(H) programs of—

(i) training for effective data dissemination;

(ii) research and demonstration; and

(iii) programs and technical assistance. . . .

(b) SYSTEM RESPONSIBILITIES

(1) In General.—

(A) Structure.—The workforce and labor market information system described in subsection (a) shall be evaluated and improved by the Secretary, in consultation with the Workforce Information Advisory Council established in subsection (d).

(B) Grants and Responsibilities.—

(i) In General.—The Secretary shall carry out the provisions of this section in a timely manner, through grants to or agreements with States.

(ii) Distribution of Funds.—Using amounts appropriated under subsection (g), the Secretary shall provide funds through those grants and agreements. In distributing the funds (relating to workforce and labor market information funding) for fiscal years 2015 through 2020, the Secretary shall continue to distribute the funds to States in the manner in which the Secretary distributed funds to the States under this section for fiscal years 2004 through 2008.

(2) Duties.—The Secretary, with respect to data collection, analysis, and dissemination of workforce and labor market information for the system, shall carry out the following duties:

(A) Assign responsibilities within the Department of Labor for elements of the workforce and labor market information system described in subsection (a) to ensure that the statistical and administrative data collected is consistent with appropriate Bureau of Labor Statistics standards and definitions, and that the information is accessible and understandable to users of such data.

(B) Actively seek the cooperation of heads of other Federal agencies to establish and maintain mechanisms for ensuring complementarity and nonduplication in the development and operation of statistical and administrative data collection activities.
(C) Solicit, receive, and evaluate the recommendations from the Workforce Information Advisory Council established in subsection (d) concerning the evaluation and improvement of the workforce and labor market information system described in subsection (a) and respond in writing to the Council regarding the recommendations.
(D) Eliminate gaps and duplication in statistical undertakings.
(E) Through the Bureau of Labor Statistics and the Employment and Training Administration, and in collaboration with States, develop and maintain the elements of the workforce and labor market information system described in subsection (a), including the development of consistent procedures and definitions for use by the States in collecting the data and information described in subparagraphs (A) and (B) of subsection (a)(1).
(F) Establish procedures for the system to ensure that—
(i) such data and information are timely; and
(ii) paperwork and reporting for the system are reduced to a minimum. . . .

(c) TWO-YEAR PLAN.—The Secretary, acting through the Commissioner of Labor Statistics and the Assistant Secretary for Employment and Training, and in consultation with the Workforce Information Advisory Council described in subsection (d) and heads of other appropriate Federal agencies, shall prepare a 2-year plan for the workforce and labor market information system. The plan shall be developed and implemented in a manner that takes into account the activities described in State plans submitted by States under section 102 or 103 of the Workforce Innovation and Opportunity Act and shall be submitted to the Committee on Education and the Workforce of the House of Representatives and the Committee on Health, Education, Labor, and Pensions of the Senate. The plan shall include—
(1) a description of how the Secretary will work with the States to manage the nationwide workforce and labor market information system described in subsection (a) and the statewide workforce and labor market information systems that comprise the nationwide system;
(2) a description of the steps to be taken in the following 2 years to carry out the duties described in subsection (b)(2);
(3) an evaluation of the performance of the system, with particular attention to the improvements needed at the State and local levels;
(4) a description of the involvement of States in the development of the plan, through consultation by the Secretary with the Workforce Information Advisory Council in accordance with subsection (d); and
(5) a description of the written recommendations received from the Workforce Information Advisory Council established under subsection (d), and the extent to which those recommendations were incorporated into the plan.

(d) WORKFORCE INFORMATION ADVISORY COUNCIL.—

(1) In General.—The Secretary, through the Commissioner of Labor Statistics and the Assistant Secretary for Employment and Training, shall formally consult at least twice annually with the Workforce Information Advisory Council established in accordance with paragraph (2). Such consultations shall address the evaluation and improvement of the nationwide workforce and labor market information system described in subsection (a) and the statewide workforce and labor market information systems that comprise the nationwide system and how the Department of Labor and the States will cooperate in the management of such systems. The Council shall provide written recommendations to the Secretary concerning the evaluation and improvement of the nationwide system, including any recommendations regarding the 2-year plan described in subsection (c).

(2) Establishment of Council.—

(A) Establishment.—The Secretary shall establish an advisory council that shall be known as the Workforce Information Advisory Council (referred to in this section as the 'Council') to participate in the consultations and provide the recommendations described in paragraph (1).

(B) Membership.—The Secretary shall appoint the members of the Council, which shall consist of—

(i) 4 members who are representatives of lead State agencies with responsibility for workforce investment activities, or State agencies described in section 4, who have been nominated by such agencies or by a national organization that represents such agencies;

(ii) 4 members who are representatives of the State workforce and labor market information directors affiliated with the State agencies that perform the H. R. 803—206 duties described in subsection (e)(2), who have been nominated by the directors;

(iii) 1 member who is a representative of providers of training services under section 122 of the Workforce Innovation and Opportunity Act;

(iv) 1 member who is a representative of economic development entities;

(v) 1 member who is a representative of businesses, who has been nominated by national business organizations or trade associations;

(vi) 1 member who is a representative of labor organizations, who has been nominated by a national labor federation;

(vii) 1 member who is a representative of local workforce development boards, who has been nominated by a national organization representing such boards; and

(viii) 1 member who is a representative of research entities that utilize workforce and labor market information.

(C) Geographic Diversity.—The Secretary shall ensure that the membership of the Council is geographically diverse and that no 2 of the members appointed under clauses (i), (ii), and (vii) represent the same State.

(D) Period of Appointment; Vacancies.—

(i) In General.—Each member of the Council shall be appointed for a term of 3 years, except that the initial terms for members may be 1, 2, or 3 years in order to establish a

rotation in which one-third of the members are selected each year. Any such member may be appointed for not more than 2 consecutive terms.

(ii) Vacancies.—Any member appointed to fill a vacancy occurring before the expiration of the term for which the member's predecessor was appointed shall be appointed only for the remainder of that term. A member may serve after the expiration of that member's term until a successor has taken office.

(E) Travel Expenses.—The members of the Council shall not receive compensation for the performance of services for the Council, but shall be allowed travel expenses, including per diem in lieu of subsistence, at rates authorized for employees of agencies under subchapter I of chapter 57 of title 5, United States Code, while away from their homes or regular places of business in the performance of services for the Council. Notwithstanding section 1342 of title 31, United States Code, the Secretary may accept the voluntary and uncompensated services of members of the Council.

(F) Permanent Council.—Section 14 of the Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the Council.

(e) State responsibilities

(1) Designation of State agency

In order to receive Federal financial assistance under this section, the Governor of a State shall—

(A) designate a single State agency to be responsible for the management of the portions of the workforce and labor market information system described in subsection (a) of this section that comprise a statewide workforce and labor market information system and for the State's participation in the development of the plan described in subsection (c); and

(B) establish a process for the oversight of such system.

(2) Duties

In order to receive Federal financial assistance under this section, the State agency shall—

(A) consult with State and local employers, participants, and local workforce investment boards about the labor market relevance of the data to be collected and disseminated through the statewide workforce and labor market information system;

(B) consult with State educational agencies and local educational agencies concerning the provision of workforce and labor market information in order to meet the needs of secondary school and postsecondary school students who seek such information;

(C) collect and disseminate for the system, on behalf of the State and localities in the State, the information and data described in subparagraphs (A) and (B) of subsection (a)(1) of this section;

(D) maintain and continuously improve the statewide workforce and labor market information system in accordance with this section;

(E) perform contract and grant responsibilities for data collection, analysis, and dissemination for such system;

(F) conduct such other data collection, analysis, and dissemination activities as will ensure an effective statewide workforce and labor market information system;
(G) actively seek the participation of other State and local agencies in data collection, analysis, and dissemination activities in order to ensure complementarity, compatibility, and usefulness of data; and
(H) utilize the quarterly records described in section 116(i)(2) of the Workforce Innovation and Opportunity Act of 2014 [29 U.S.C. 2871(f)(2)] to assist the State and other States in measuring State progress on State performance measures.

Bureau of Labor Statistics

- Mission: Collect, analyze, and disseminate essential economic information to support public and private decision–making.[4]

- Legislative Mandates

29 USC 1 DESIGN AND DUTIES OF BUREAU GENERALLY

The general design and duties of the Bureau of Labor Statistics shall be to acquire and diffuse among the people of the United States useful information on subjects connected with labor, in the most general and comprehensive sense of that word, and especially upon its relation to capital, the hours of labor, the earnings of laboring men and women, and the means of promoting their material, social, intellectual, and moral prosperity. (1888)

29 USC 2. COLLECTION, COLLATION, AND REPORTS OF LABOR STATISTICS

The Bureau of Labor Statistics, under the direction of the Secretary of Labor, shall collect, collate, and report at least once each year, or oftener if necessary, full and complete statistics of the conditions of labor and the products and distribution of the products of the same, and to this end said Secretary shall have power to employ any or either of the bureaus provided for his department and to rearrange such statistical work, and to distribute or consolidate the same as may be deemed desirable in the public interests; and said Secretary shall also have authority to call upon other departments of the Government for statistical data and results obtained by them; and said Secretary of Labor may collate, arrange, and publish such statistical information so obtained in such manner as to him may seem wise. (1913)

The Bureau of Labor Statistics shall also collect, collate, report, and publish at least once each month full and complete statistics of the volume of and changes in employment, as indicated by the number of persons employed, the total wages paid, and the total hours of employment, in the service of the Federal Government, the States and political subdivisions thereof, and in the following industries and their principal branches: (1) Manufacturing; (2) mining, quarrying, and crude petroleum production; (3) building construction; (4) agriculture and lumbering; (5) transportation, communication, and other public utilities; (6) the retail and wholesale trades; and such other industries as the Secretary of Labor may deem it in the public interest to include. Such statistics shall be reported for all such industries and their principal branches throughout the United States and also by States and/or Federal reserve districts and by such smaller geographical subdivisions as the said Secretary may from time to time prescribe. The said Secretary is authorized to arrange with any Federal, State, or municipal bureau or other governmental agency for the collection of such statistics in such manner as he may deem satisfactory, and may assign special agents of the Department of Labor to any such bureau or agency to assist in such collection. (1930)

[4] Drawn from http://www.bls.gov/bls/blsmissn.htm, June 17, 2015.

➢ Department of Labor Strategy Relevant to BLS[5]

Strategic Goal 5 is to ***produce timely and accurate data on the economic conditions of workers and their families***. The Bureau of Labor Statistics (BLS) helps realize the Department's vision of *promoting and protecting opportunity* by providing sound and impartial information on labor market activity, working conditions, and price changes in the economy. These data guide and inform policy and investment decisions that lead to the creation of jobs and economic growth. One Strategic Objective supports this goal:

• Strategic Objective 5.1 is to *provide sound and impartial information on labor market activity, working conditions, and price changes in the economy for decision making, including support for the formulation of economic and social policy affecting virtually all Americans*. BLS strives to meet the information needs of a rapidly changing U.S. and global economy by continuously improving its products and services, maintaining rigorous quality and timeliness standards, investing in its workforce, and modernizing its business processes.

➢ BLS Strategies[6]

The BLS has identified six high-level strategies to achieve its Strategic Goal, Strategic Objective, and Performance Goal. The following ongoing strategies also help fulfill the need for economic information to support decision-making:

- Continue to produce objective data and analyses that are timely, accurate, and relevant;
- Improve the timeliness, accuracy, and relevance of its products and processes, and develop new products that reflect economic changes and meet the needs of its broad customer base;
- Inform current and potential customers about the availability and uses of its information products; reach out to current and potential customers to understand their needs for economic information; and ensure that the content, presentation, and delivery of BLS information products match its customers' needs;
- Improve data collection processes, maintain high response rates, and optimize the balance between quality, cost, and respondent burden in its data collection programs;
- Ensure that BLS data, products, and services on the BLS website are easy to find, understand, and use; and
- Recruit, train, and retain a talented, innovative, and diverse group of individuals who are experts in the production and continuous improvement of its products and services, including employees who will support those functions, and who are well prepared to represent the agency and become its future leaders.

[5] Department of Labor, "U.S. Department of Labor Strategic Plan Fiscal Years 2014-2018," p. 14.
[6] Bureau of Labor Statistics, "FY 2016 Congressional Budget Justification," p. 11.

Strategy 2 (Product and Process Improvement): BLS will improve the timeliness, accuracy, and relevance of our products and processes. New products will be developed that meet the needs of our broad customer base.

As economic trends and issues change, BLS is committed to updating our product lines to meet the needs of our data users. In addition, BLS strives to improve the usefulness of our existing products by making them available more quickly, improving the accuracy of our data, communicating the strengths and limitations of the data to our customers, and expanding the products and analyses available from our existing programs. BLS will conduct periodic, comprehensive reviews of our programs and support processes, the scope of which will include strategic vision, methodologies, products, and customer interactions. We will use these reviews to improve the efficiency and effectiveness of our programs and processes.

Goal 2.1 – Improve the timeliness of BLS data and analyses
Objective 2.1.1 - Reduce lag between reference date and release of data.
Objective 2.1.2 - Publish data on a more frequent basis.

Goal 2.2 – Improve the accuracy of BLS data and analyses
Objective 2.2.1 - Update population controls.
Objective 2.2.2 - Reduce sampling and non-sampling errors.
Objective 2.2.3 - Provide variance and other data quality measures.
Objective 2.2.4 - Conduct research on long-standing data quality issues.

Goal 2.3 – Improve the relevance of BLS data and analyses
Objective 2.3.1 - Develop and introduce new data products.
Objective 2.3.2 - Expand industry coverage and increase the number of series published at the industry level.
Objective 2.3.3 - Improve and expand occupational data.
Objective 2.3.4 - Update classification systems.
Objective 2.3.5 - Expand economic data by geography.[7]

[7] Drawn from Bureau of Labor Statistics, "Strategic Plan FY2013-2018," 2012.

Performance Goal BLS 5.1 – Improve the timeliness, accuracy, and relevance of information on labor market activity, working conditions, and price changes in the economy.								
Performance Measure	**2011 Result**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018 Target**
Percentage of timeliness targets achieved for the Principal Federal Economic Indicators (PFEIs) 1/	100%	100%	100%	100%	100%	100%	100%	100%
Percentage of accuracy targets achieved for the PFEIs 1/	100%	100%	100%	100%	100%	100%	100%	100%
Percentage of relevance targets achieved for the PFEIs 1/	100%	90%	100%	100%	100%	100%	100%	100%
Average number of Internet site user sessions each month (Dissemination)	7,213,823	8,149,686	8,765,143	8,700,000	8,700,000	8,700,000	8,700,000	8,700,000
Customer satisfaction with the BLS website through the American Customer Satisfaction Index (Mission Achievement)	75	77	77	77	77	77	77	77

1/ Measure is new beginning in FY 2014. The FY 2011 – 2013 results are shown for comparative purposes.

- BLS Principal Federal Economic Indicators

DEPARTMENT OF LABOR / BUREAU OF LABOR STATISTICS
The Employment Situation *(Data are for previous month)*
Producer Price Indexes *(Data are for previous month)*
Consumer Price Index *(Data are for previous month)*
Real Earnings *(Data are for previous month)*
Productivity and Costs *(Preliminary and revised estimates are issued for each quarter)*
Employment Cost Index *(Data are for previous month)*
U.S. Import and Export Price Indexes *(Data are for previous month)*

Employment and Training Administration

- ETA Mission Statement[8]

The mission of the Employment and Training Administration is to contribute to the more efficient functioning of the U.S. labor market by providing high quality job training, employment, labor market information, and income maintenance services primarily through state and local workforce development systems.

- ETA Vision

Our vision is to promote pathways to economic liberty for individuals and families working to achieve the American Dream. On behalf of American taxpayers, the Employment and Training Administration will administer effective programs that have at their core the goals of enhanced employment opportunities and business prosperity.

- Guiding Principles

1. We will be faithful to the American taxpayer and support programs that are outcome-focused and results-oriented.
2. We will encourage business growth through the creation of an agile workforce-one that can respond quickly and effectively to the changing needs of business and the new economy.
3. We will strive to turn individuals into career entrepreneurs by equipping them with the information they need to develop the knowledge, skills and abilities sought after in the new economy.
4. We will bolster opportunities for those less fortunate so they can gain the freedom to make sound economic decisions for themselves and their families.
5. We will uphold the principles of federalism and understand that states and local communities are the most competent administrators of our domestic concerns.
6. We will administer a workforce system that partners and connects with public and higher education systems to prepare the workforce of the 21st Century with career opportunities and skills in high job growth sectors.
7. We will ensure that our youth workforce training programs have a strong educational component, since it is clear that income and opportunities increase exponentially with education credentials.
8. We will support strong families and vibrant communities by working with community and faith-based organizations.

[8] http://www.doleta.gov/etainfo/mission.cfm, obtained June 17, 2015

- Workforce Information-Electronic Tools-System Building[9]

U.S. Department of Labor programs funded through the Workforce Information/E-Tools/System Building line item assist working-age individuals, employers, government entities, and non-profit organizations. The resources supported through this line item are foundational to creating innovative workforce strategies to ensure a skilled workforce for high demand and emerging industries and occupations providing good jobs for workers.

Program strategies that support the goal of providing advice, tools and knowledge about careers, skills and employment include: 1) collecting, producing, and analyzing workforce information through activities such as State and local employment projections for occupations and industries; 2) collecting information on the skills necessary to perform work in occupations; and 3) disseminating information through Web-based guidance on how to search for work; where to obtain employment counseling; how to identify related education, training, credentials or licenses to qualify for careers; where to find relevant course offerings; and how to locate and benefit from government-financed employment programs and other assistance.

- ETA Goals and Objectives in DOL Strategic Plan

Strategic Objective 1.1 – Advance employment opportunities for US workers in 21st century demand sectors and occupations using proven training models and through increased employer engagement and partnerships.

Strategic Objective 1.1 is a cornerstone of the Secretary's vision of *promoting and protecting opportunity*. The Labor Department can only successfully provide opportunities for workers and job seekers to gain the skills they need by utilizing proven training models, funding rigorous evaluation to test the effectiveness of various programs, and increasing employer engagement and partnership in the development and execution of training curricula. In today's knowledge-based, global economy, the input of businesses and employers is critical to ensure that training programs are up-to-date, that they are tailored so graduates learn relevant skills and attain useful credentials, and that training efforts are closely intertwined with regional economic development strategies.

Through ETA and VETS, the Labor Department will equip working and middle class families with the skills needed to succeed in 21st century careers. ETA and VETS will continue – and where possible, expand – their collaborative work with businesses and associations, training providers, and other stakeholders to increase employment in growth industries, and support rising wages through skill attainment. Requiring the engagement of local businesses and associations in training development ensures that programs are aligned with regional needs, and can move low-wage workers into pathways to middle class careers – and help employers secure the skilled workforce they need.

ETA-funded employment and training services include labor market information, employment assistance, job training, and income support through the administration of the following

[9] Department of Labor, "FY 2016 Budget in Brief," p.28.

programs: Adults, Dislocated Workers, Youth, Indian and Native American, and National Farmworkers Jobs Programs and National Emergency Grants authorized by the Workforce Investment Act of 1998 (WIA); the Employment Service authorized by the Wagner-Peyser Act; Trade Adjustment Assistance Community College and Career Training Grant Program authorized by the Trade Act of 1974, as amended; Foreign Labor Certification activities authorized by the Immigration and Nationality Act; Job Corps; Community Service Employment for Older Americans (also known as the Senior Community Service Employment Program) authorized by the Older Americans Act; apprenticeship programs, registered under the National Apprenticeship Act; and competitive grants such as YouthBuild, Reintegration of Ex-Offenders, and Face Forward Grants for Juvenile Offenders.

ETA's strategies to advance the economic recovery, put Americans back to work, and help American businesses compete in the global economy, include:

- A stronger, more comprehensive American Job Center network delivery system;
- A focus on both workers and employers as customers;
- Progressive levels of education and job training to provide those most in need with a pathway to the middle class;
- Regional partnerships and collaboration; and
- Strategies for high-demand, growing industry sectors.

Strategic Objective 1.2 – Provide marketable skills and knowledge to increase workers' incomes and help them overcome barriers to the middle class through partnerships among business, education, labor, community organizations, and the workforce system.

The demand for skilled labor is projected to grow significantly over the next decade. According to the Bureau of Labor Statistics (BLS), between 2010 and 2020, 17 of the 30 fastest growing occupations will require a postsecondary certificate or degree. By 2018, 30 million new and replacement jobs will require some postsecondary education. These jobs pay family-sustaining wages and can be found in every sector of the economy, from manufacturing to customer service to health care. Data from BLS indicate that occupations requiring some type of post-secondary degree or education will account for nearly 37 percent of all new jobs from 2010 to 2020, and 31 percent of total job openings. Among the education and training categories, the fastest growth will occur in occupations requiring a master's degree. Workers ability to fill and succeed in these jobs will be dependent on their access to high-quality workforce training programs being available in their area.

While the projected job growth over the next decade is concentrated in occupations that require some postsecondary education or training, the cost of postsecondary education is rising and completion rates are falling. According to a 2009 Organization for Economic Co-operation and Development study, if current trends in postsecondary credential attainment continue, the next generation of American workers will be less educated than the previous generation for the first time in the country's history. Declining rates of postsecondary credential attainment threaten America's global competitiveness and ability to generate broadly-shared prosperity at home.

Department of Commerce

- Department of Commerce Strategic Plan FY2014-2018

STRATEGIC OBJECTIVE 2.4: Accelerate the development of industry-led skills strategies that result in a productive workforce for employers and high-quality jobs for workers (EDA, ESA, NIST)

A skilled and adaptable workforce is critical to U.S. global competitiveness and sustainable economic growth. A demand-driven, comprehensive approach to skills development is essential to helping businesses across all sectors better access skilled workers to grow, innovate, and be more productive. A skills strategy focused on industry-driven solutions helps address the difficulties many industries, particularly manufacturing, have in filling jobs requiring specific technical skills—even with many Americans still looking for work.

The Department is an honest broker for business and possesses the convening power, regional economic development expertise, and supply-chain analytical capability needed to highlight and address the workforce demands of growing industries. In addition to supporting a Presidential effort to align federal agency initiatives to industry workforce needs, the Department's programs will support the development of a strong pipeline of workers with in-demand skills.

KEY STRATEGIES

Implement industry-driven initiatives that provide U.S. workers with in-demand skills (EDA, NIST). Many unemployed or underemployed workers lack the skills that businesses need to fill the millions of open jobs across the Nation. The Department will capitalize on its relationships with businesses and state and local governments to champion and support employer-aligned skills programs. By funding infrastructure grants that encourage demand-driven skill training, EDA will build regional and community capacity for workforce training relevant to the local business community. Through MEP's national system of centers, NIST will support and promote programs that identify the future hiring needs of small manufacturers and expose young people to science, technology, engineering, and mathematics (STEM) fields.

Engage businesses to identify and facilitate industry-driven training best practices (EDA, OS). A fragmented approach to skills training often ignores the immediate and long-term needs of the business community. The Department will directly engage business and the economic development community to identify and articulate workforce skills needed and help create a pipeline of well-trained 21st century workers. Moreover, by partnering and sharing information with the Department of Labor (DOL) and the Department of Education (Ed) to inform policy and grant opportunities, the Department will enable a comprehensive approach to skills training that results in careers.

Capture, coordinate, and analyze U.S. workforce data (ESA, OS). Current federal data on workforce dynamics is not used in a comprehensive, coordinated fashion. This undermines the ability of communities and regions to build the capacity to train professionals for high demand

fields. By developing partnerships within government and with the private sector to release this data, the Department will help communities develop more customized skills and economic development strategies. Specifically, ESA will convene private and public sector stakeholders (in partnership with DOL and Ed) to develop new data dissemination tools. The Department will also obtain and share qualitative data on businesses' perceived skills gaps, challenges to hiring, and the value of industry-driven workforce partnerships.

STRATEGIC OBJECTIVE 2.4 PERFORMANCE INDICATORS

- Future Indicators (the outcomes that we will strive to measure in the future)
- Number of businesses receiving MEP assistance with workforce programs (NIST)
- Key Indicators (the outcomes that we can measure now)
- Number of MEP centers partnering with skills training providers (e.g., community colleges) to link manufacturing firms with skills training resources (NIST)
- Recipient-estimated number of jobs and dollar amount of private investment generated as a result of infrastructure for industry-driven skills training (EDA)
- Supporting Indicators (other measures that have an impact on our target outcomes)
- Number of industry-driven workforce partnerships supported (OS)
- Implementation progress on Presidential Memorandum for job-driven training (OS)
- Number of data dissemination tools and improvements fueled by Department data on the U.S. workforce (ESA)

Strategic Goal 4: Improve government, business, and community decisions and knowledge by transforming Department data capabilities and supporting a data-enabled economy

STRATEGIC OBJECTIVE 4.1: Deliver increasing amounts of data to governments, businesses, and the public in formats that are easier to access and use (OS, All Bureaus)

The Department collects, stores, and analyzes a treasure trove of data, including data on the Nation's economy, population, and environment. This data is fundamental to the Department's mission and is used for the protection of life and property and to enhance economic growth. However, the capacity to analyze and disseminate this magnitude of data is significantly constrained.

Barriers to accessing and using data must be minimized in order to realize the potential value of the data. There are differing data types, standards, methodologies, websites, architecture, platforms, and formats that make it difficult to access and combine datasets.

Partnering with the private sector will increase the capacity of the Department to release raw scientific and climate data that cannot be cost-effectively disseminated by the federal government. Public-private partnerships developing and disseminating data in common standards and architectures could also produce a powerful data platform and more access to public data in usable forms.

The Chief Data Officer will lead the Department's efforts to make more Commerce data available to its customers. Additionally, the Commerce Data Advisory Council will provide

invaluable insights for the Department to consider as it leads the effort to make sure the data the government holds is accessible in ways that enable businesses to be more competitive, governments smarter, and citizens more informed.

KEY STRATEGIES

Increase capacity to make data accessible, discoverable, and usable by the public (OS, All Bureaus). The Department's Big Data vision will not be realized by making data available through conventional means. Through public-private partnerships, scientific and geospatial data can be intelligently positioned in the cloud. The cloud will provide easy, affordable access to computing, storage, and advanced analytical capabilities. Public-private partnerships have the ability to scale and surge at the pace of U.S. innovation, enabling new value-added services and unimaginable integration into the daily lives of the public. For example, the National Institute of Standards and Technology (NIST) will seek public input on how it can partner with the private sector to structure time server operations to provide time information over the Internet in different formats. Just as making Global Positioning System (GPS) data publicly available in the early 1980s led to an explosion of GPS-related innovations, access to precision network timing could lead to another innovation surge. Success of public-private partnerships for scientific data will position the Department to lead similar partnership efforts for other data segments. The Department will leverage the core capabilities of the National Technical Information Service (NTIS) in public-private partnerships and the delivery of information and data, such as providing access to controlled datasets with stringent privacy and security requirements.

Empower entrepreneurs and innovators with Commerce data (OS, ESA). Entrepreneurs and innovators are constantly discovering new ways to use Commerce data. The Department wants to accelerate this trend. Since Commerce data reflects the wide array of Department activities, the Department cannot take a homogenous approach to empowering innovation and entrepreneurship. Instead, the Department will build on the existing relationships its bureaus have with their customers, sharing successes, exchanging best practices, and learning from their failures. When the Department finds techniques and collaborative endeavors that might work at the Department level, it will experiment with them in concert with its customers. The Department—predominantly the Chief Data Officer—will serve as a convener and a facilitator, integrating processes and standards across the Department only when it makes sense to do so. In a similar vein, instead of developing its own tools, the Department will take full advantage of available commercial and open-source tools to manage the entire life cycle of Commerce data. The Department will listen to its customers, exchange information, and work with them at all levels of the Department to help them use Commerce data to power the economy.

STRATEGIC OBJECTIVE 4.2: Position the Department of Commerce to meet society's future data needs (ESA)

Commerce-held data go back to the first census conducted in 1790. Since then, the Department (in its current or predecessor organizations) has collected information about the Nation's people, its weather, its climate, its economy, and its trade. The Department has a rich history of

data to explore and to share. The world is changing and data is an increasingly important driver of that change. The Department's approach to data services must change accordingly.

Consumers of Commerce data want data that is timelier, more accurate, and more specific to their needs. Society is becoming more mobile and demands information tailored to a particular region or local area. Consumers are increasingly technologically savvy and want data they can combine with other sources, in real time. The Department must do its part to be more responsive and meet these changing demands.

Adapting to new expectations will be challenging. The Department must figure out what it does well and what is best left to state and local governments, nongovernmental organizations, and businesses. It must refine existing datasets and develop new ones. The Department must reconsider its techniques and methodologies. And all the while, it must constantly reevaluate and adapt to emerging needs and technologies.

To begin, the Department will commission a blue-ribbon panel to study the future of economic data. Visionaries and experts will examine existing Commerce economic data offerings, suggest changes or the creation of new economic data products that need less revisions, identify methods to close the time gap between collection and dissemination, and recommend new ways of being responsive to future needs of customers. The panel will assist the Department in formulating a path forward over the short, medium, and long term.

KEY STRATEGIES

Drive the development of new Commerce economic datasets that can be combined with other data (federal and non-federal) to enhance entrepreneurial activities, regional, state, and local decision-making, and personal and family decisions (ESA). As the federal government's central data agency, the Department is in a unique position to collect, store, and disseminate certain types of information. Commerce economic data is widely recognized as objective, authoritative, comprehensive and consistent over time. The Department will transform its current economic data products to meet future demands, recognizing that these datasets will be combined with data from other sources to meet the changing needs of society. To determine what is needed, the Economic and Statistics Administration (ESA) will hold conversations with businesses, governments, and the public and will consider the recommendations of the Department's blue-ribbon panel.

Explore alternative means, methods, and techniques for collecting economic information (ESA). Much of the information the Department collects to produce its economic datasets is obtained through extensive surveys. These are expensive and time-consuming. Using surveys also creates a lag between collection and dissemination, impeding the timely delivery of data to individuals and organizations that need it. In order to meet the real-time demands of its customers, the Department must explore alternative ways to collect the information needed for current and future economic datasets.

Raw economic information is now available from a host of sources and these sources will only increase in the future. Private-sector data providers use a number of techniques and sources of

information for their products: Web-scraping, electronic payment systems, inventory and logistics management systems, electronic point of sale information, and many others.

The Department will explore these techniques and sources to determine which might be appropriate for obtaining raw economic information. The Department will also consider making better use of existing administrative data held by other federal agencies. In exploring these possibilities, the Department will be mindful of the relative value and costs of obtaining information from new sources. It will also ensure any new information-gathering techniques protect personal privacy and the confidentiality of business information.

STRATEGIC OBJECTIVE 4.3: Create a data-driven government (EDA, ESA, ITA, MBDA)

The federal government collects vast amounts of data every day to support, protect, and defend the U.S. public. Data can and should be used to drive program excellence and sound decision-making within the federal government. Data can be used more widely to help measure the efficacy of government assistance programs, allowing policymakers to make better and wiser choices on how to spend limited resources. Data from different agencies can be better shared or combined to make government programs more informed and more efficient. Achieving this strategic objective will require re-evaluating the data the Department collects and determining how that data might be used to inform decisions both within the Department and in other federal agencies.

KEY STRATEGIES

Increase the use of existing federal databases to help analyze business assistance and economic growth programs throughout the government (EDA, ESA, ITA, MBDA). The federal government provides billions of dollars of business assistance each year. The Department has several programs that provide information and technical advice to businesses. Analyzing the effectiveness of this assistance and identifying key drivers of success can be difficult and time-consuming.

If the Department employs the federal government's economic, demographic, geospatial, and scientific data in its decision-making, this could result in better and perhaps faster assessments. The Department is conducting pilot tests to determine the best way to incorporate information and analyses gleaned from existing datasets into business-assistance program decisions. Once a methodology is developed, the Department will provide the data and expertise needed for programs to operate more effectively and increase their return on investment.

Execute high profile statistical programs well (ESA). The Department is committed to conducting the 2020 Census at lower costs per housing unit than the 2010 Census. The Department will do this by focusing on cost-effective ways to collect, process, and disseminate information. This also requires increased sharing of administrative data collected by other federal agencies. The Economic and Statistics Administration's (ESA) Census Bureau recognizes that these innovations must be flexible enough to respond to social and technological changes, while ensuring there is no degradation in data quality.

Increase data sharing among federal agencies (ESA). Many federal agencies face legislative, regulatory, or policy limitations on sharing administrative record data with other agencies. Addressing these limitations will drive down costs and reduce the public burden of redundant data collections. The International Trade Data System (ITDS) is an example of early government efforts to share data. The Department will identify and champion other potential avenues that will continue this success. However, current law prohibits sharing data among ESA's Census Bureau and Bureau of Economic Analysis (BEA), and the Department of Labor's Bureau of Labor Statistics (BLS). Enactment of a simple, proposed legislative amendment to Title 26 of the U.S. Code allowing more data sharing would reduce cost and enhance data quality without sacrificing the confidentiality of the data.

Census Bureau

- Strategic Plan

Objective 1.2: Produce up-to-date economic and social measures to advance informed decision-making in business and society.

The Census Bureau conducts multiple surveys on a monthly, quarterly, and annual basis to help entrepreneurs and businesses identify market opportunities and to inform decision-makers and policymakers across sectors and at all levels of government. The information from these surveys and administrative record data collections are a critical part of the Nation's economic indicators, GDP calculations, National Income and Product Accounts, unemployment rate, and other widely disseminated information released regularly by the Census Bureau and other federal statistical agencies. Ongoing household surveys provide current information on a wide variety of topics such as income, poverty, health insurance coverage, housing, and other characteristics of our society.

Outcome: Data product consumers continue to rely on Census Bureau statistical products because these products are widely recognized as being accurate, consistent across geographic areas, timely, and providing important longitudinal and cross cutting views. Research to continually improve and create new data products is supported and encouraged.

The five tactics below will help us achieve this outcome.

Tactic 1.2.1: Deliver up-to-date monthly, quarterly and annual statistical products to inform the nation of changes in society and the economy.

Tactic 1.2.2: Release effective information products that enable communities, particularly those that are economically distressed, to build their capacity to attract businesses and sustain economic growth.

Tactic 1.2.3: Release information products (e.g., small area poverty estimates) that enable policymakers, non-profit organizations, all levels of government, and the public to assess opportunities, needs, and challenges and to make effective decisions, for example, about emergency management, planning, and delivery of services.

Tactic 1.2.4: Integrate data from existing sources, including administrative records, to produce new information products that provide deeper insights into our people and economy by combining data sets that had not previously been linked.

Tactic 1.2.5: Explore enhancing our data products to provide businesses, especially small and minority-owned businesses, with the information they need to compete in a global economy.

Tactic 1.2.6: Produce and disseminate population estimates for governmental units including states, counties and cities on an annual basis.

Implementing Programs:

American Community Survey
Demographic Current Surveys
Small Area Income and Poverty Estimates
Small Area Health Insurance Estimates
Economic Current Surveys
Center for Economic Studies Analyses

Objective 1.3: Provide measures of labor market dynamics to inform decisions that foster economic growth.

Timely, relevant, and accurate measures showing the dynamics of local job markets and identifying the changing structure of the U.S. economy and its effect on jobs are critical for decision makers and policy makers to determine the health of local economies and track the geographic dimensions of the economy.

Outcome: Consumers of Census labor market-related statistical products express increased satisfaction with relevant products.

Tactic 1.3.1: Release timely and comprehensive data on local labor market dynamics to permit users to track job creation and elimination and other critical measures at the county-level to evaluate the progress of economic recovery.

Implementing Program:

Local Employment Dynamics

Department of Education

- FY2016 Performance Plan

Postsecondary Education, Career and Technical Education, and Adult Education Indicators of Success	Baseline	Actuals			Targets		
		2012	2013	2014	2014	2015	2016
Objective 1.3: Completion. Increase degree and certificate completion and job placement in high-need and high-skill areas, particularly among underrepresented and/or underprepared populations.							
1.3.A. Degree attainment among 25–34-year-old age cohort[7]	Year: 2012 44.0%	Year: 2011 43.1%	Year: 2012 44.0%	Year: 2013 44.8%	44.7% *MET*	45.6%	46.8%
1.3.B. Retention rate of first-time degree-seeking undergraduates: Full-time[8]	Year: 2011 71.9%	Year: 2010 72.1%	Year: 2011 71.9%	Year: 2012 71.8%	71.9% *NOT MET*	72.1%	72.1%
1.3.C. Retention rate of first-time degree-seeking undergraduates: Part-time[9]	Year: 2011 41.7%	Year: 2010 42.1%	Year: 2011 41.7%	Year: 2012 42.2%	41.9% *MET*	42.6%	42.9%

Objective 1.3: Completion

Explanation and Analysis of Progress:

In addition to the actions described below, the Department incorporated a competitive priority in the GEAR-UP State and Partnership grant competitions to encourage applicants to propose postsecondary success strategies, including those that support attention to remedial education needs prior to enrollment in college.

The Department developed a new project for FY 2015 that will involve more states in the development and implementation of career pathways, and a new project on employability skills by (1) upgrading the Department's interactive employability skills model and (2) aligning the Department's employability skill standards with "demand side standards" set by the National Association of Business and Industry Associations. The Department also published a Career Pathways Request for Information to inform the Department about models that are improving the college and career readiness of youths and adults.

The Department coordinated with the Department of Veterans Affairs to increase the number of institutions of higher education from 400 to over 1,000 that have committed to implementing the 8 Keys to Veterans Success, which provides specific strategies to support veterans and their successful program completion.

The Department achieved its FY 2014 target for metric 1.3.A with an attainment rate of 44.8 percent. However, the targets in future years are set to grow at increasingly accelerated rates in order to reach the President's goal of 60 percent degree attainment. While increases in high school graduation rates (one of the factors that feed into the attainment rate) are growing,

recent data from the Bureau of Labor Statistics show that fewer high school graduates are opting for college—65.9 percent in 2013 compared to a high point of 70.1 percent in 2009. (Bureau of Labor Statistics, College Enrollment and Work Activity of High School Graduates News Release, April 22, 2014: http://www.bls.gov/news.release/hsgec.htm.) These data may be attributable to the natural cycle of higher enrollment rates during economic downturns followed by lower rates as the economy improves, but the declining enrollment rate may impact the ability to achieve the targeted growth in the attainment rate. Equity gaps in the attainment rate based on race, ethnicity, and disability status have not improved.

With regard to metrics 1.3.B and 1.3.C, the Department did not achieve the retention target for full-time students, but did achieve the retention target for part-time students. These rates tend to fluctuate slightly each year, with the overall trend showing incremental growth over the past five years, so the Department does not consider whether or not this year's targets were met to be indicative of overall performance. Although the Department funds a number of grant programs that support activities which influence retention, the number of students directly served by these programs is not large enough to significantly affect retention across the board. Nonetheless, the Department is hopeful that efforts through programs such as First in the World, Minority-Serving Institution grants under Titles III and V, and TRIO Student Support Services, along with initiatives to improve remedial education in community colleges, will have an impact in future years.

Challenges and Next Steps:

The White House and the Department jointly held a second College Opportunity Summit on December 4, 2014, which focused on completion and affordability, as well as partnerships between K-12 and higher education, to promote educational quality and seamless transitions from high school to college. The Department is also planning to convene minority-serving community colleges in FY 2015 in an effort to scale up successful practices in remedial education that lead to completion.

The WIOA aligns federal investments to support job seekers and employers and promotes transitions from adult education to postsecondary education and training through career pathways. The act includes many changes that are designed to strengthen and improve employment for individuals with disabilities. In early 2015, the Department will collaborate with the Departments of Labor and Health and Human Services to publish a Notice of Proposed Rulemaking to implement WIOA, with the intent to publish final rules in early 2016.

The administration proposed a State Higher Education Performance Fund that would incentivize states to base institutional funding on performance and reward states that have a strong record of investment in, and show a commitment to, increasing funding support for higher education. The Department included this new grant program in the FY 2015 budget.

Goal 5. Continuous Improvement of the U.S. Education System: Enhance the education system's ability to continuously improve through better and more widespread use of data, research and evaluation, evidence, transparency, innovation, and technology.

Public Benefit

The foundation for improving systemic capacity is an infrastructure that supports data-driven decision-making. Stakeholders must have access to relevant, useful data in a timely fashion, and they need the skills to better understand and make use of the data. With relevant and actionable data and the ability to use it, policymakers and educators will be able to appraise how states, districts, schools, and students are currently performing; measure progress; pinpoint gaps; improve practice; better address student needs; and make sound decisions. States are developing systems that will yield the valid, reliable data that are essential to achieving these purposes, but there is much more work to do. The Department will continue ongoing efforts to develop effective statewide longitudinal data systems, design voluntary common data standards to increase interoperability, and develop the capacity of institutions and staff to utilize data to improve teaching and learning. These activities will help to ensure that education agencies across the nation have timely access to the data necessary in order to generate an accurate picture of student performance and other critical elements, from early learning programs through postsecondary institutions and the workforce.

The collection, storage, maintenance, and use of data must be responsible and must appropriately protect student privacy. The necessity of achieving responsible data management is highlighted by the passage in the past year of student privacy legislation in 35 different states. Stewards and users of data must remember that these data describe real people and ensure that systems protect the rights of those people. The Department will help practitioners in the field ensure they are properly protecting privacy and communicating with parents and students about the proper use and management of student data.

Systemic improvement also requires research and evaluation so that decision makers at the national, state, and local levels have reliable evidence to inform their actions. The Department aims to support evidence-building so that states, districts, and schools have the information they need to identify effective practices and so they can build evidence about emerging practices and issues. Using evidence to direct funds will ensure scarce dollars are more likely to have the intended impact and empowers states and districts to become more dynamic learning organizations.

The Department's vision for 21st-century learning also requires that schools have a 21st-century technology infrastructure anchored around high-speed Internet to allow for innovation and personalization in the classroom. States, districts, and schools must have such infrastructure to incorporate cutting-edge methods for strengthening curriculum quality and delivery to meet more rigorous college- and career-ready standards; improving student access and engagement; developing comprehensive, formative, and summative assessment systems; and enhancing data management systems.

Continuous Improvement of the U.S. Education System Indicators of Success	Baseline	Actuals			Targets		
		2012	2013	2014	2014	2015	2016
Objective 5.1: Data Systems and Transparency. Facilitate the development of interoperable longitudinal data systems for early learning through employment to enable data-driven, transparent decision-making by increasing access to timely, reliable, and high-value data.							
5.1.A. Number of public data sets included in ED Data Inventory and thus linked to Data.gov or ED.gov websites[1]	Year: 2013 55	NA	55	66	66 *MET*	79	94
5.1.B. Number of states linking K–12 and postsecondary data with workforce data[2]	Year: 2013 12	5	12	20	14 *MET*	22	25
5.1.C. Number of states linking K–12 with early childhood data[2]	Year: 2013 19	8	19	26	23 *MET*	27	29

Appendix B: Matrix of Private and Nonprofit Data Sources for Workforce Development

Company	Contact	Key Products	Data Content	Value to Public ED/WF system	Required job skills	Held job skills	Job postings	Compensation
Data Analytics Product and Market in Place								
Burning Glass Technologies	Steve Lynch	• Labor/Insight™ • Real-Time Jobs Feed • Applied Research	• Job postings • Skills and qualifications • Locations	Source for aggregated real-time LMI, including job postings.	x		x	
EMSI / Career Builder	Rob Sikritz	• Analyst: • Career Coach: • Professional Services:	• Job postings • LMI	Analytics targeted towards workforce, economic development, and higher education.	x		x	
Geographic Solutions	Paul Toomey	• Virtual OneStop • Virtual LMI • Reemployment Exchange (REX) • Geographic Solutions Unemployment System (GUS) • America's Labor Market Analyzer (ALMA) • America's Virtual OneStop (AVOS) • Labor Market Survey (VOSurvey) • Job Aggregation (VOSJobs)	• Job postings • Unemployment data • LMI	Provides job postings and regional labor market information.	x		x	
National Student Clearinghouse	Don Hossler	• Signature Reports • Snapshot Reports • Current Term Enrollment Estimates	• Enrollment data • Degree records • Demographic data	Provides student data.	x			
TORQWorks		Career transition tools • Online tool for One-Stops to guide workers to new jobs • Maps non-military occupations to civilians and suggests alternative occupations • Evaluates occupational transferability through the TORQ algorithm. Based on O*NET, state LMI data, and other sources.	• Occupation data • Real time job availability • Training programs • Knowledge, skills, and abilities gaps	Analysis of related occupations and on similar skill requirements.	x			

Wanted Analytics/Help Wanted OnLine	Bob Plumber/Carol Courter	• Hiring Scale • Global Data • Historical Hiring • Posting Period • Search Criteria • Hiring Demand Dashboard • Candidate Rolodex • Heat Map • Market Salary • Skills & Certifications • Graduates Programs • Job Listing • Candidates Supply	• Job postings • Skills and qualifications • Locations • Job seekers • Salaries	Source for job postings, skills, competencies, and salaries.	x	x	x	x
Product in place; seeking new market								
ACT		Workforce assessments • National Career Readiness Certificate • Job Analysis Tools • Workplace Assessments • Skill Gap Training • Evidence-based Credentials • Certificate Reporting & Management System	• Skills • Occupation data • Knowledge, skills, and abilities gaps	Source for data about skills gaps, occupations, competencies, and credentials.	x			
CareerBuilder		• Careerbuilder1 • Broadbean • Workforce Data	• Job postings • Resume postings	Source for job postings and resume data.	x	x	x	
Economic Research Institute		Compensation comparisons • Salary assessor • Executive compensation assessor • Geographic assessor • Relocation assessor • Nonprofit executive position compensation assessor • Occupational assessor	• Salary survey data for 6,000 positions in more than 1,000 industries and over 8,000 locations • Compensation data for over 500 top management positions. • Create geographic salary differentials for more than 8,000 locations in the US, Canada and Europe. • Compare cost of living in over 10,000 locations in more than 200 countries • Determine competitive pay for 90 nonprofit executive positions. Historic data for over 200,000 organizations. • Perform disability determination analyses and overtime exemption testing of over 19,000 position titles using FLSA and 9 state level resources.	Cross-regional salary comparisons.				x

Indeed	Tara Sinclair	• Post a job • Find Resumes • Search Jobs • Analyses • Resume database • Queries trends • Job trends	• Job postings • Resume postings • Queries trends • Job trends	Queries trends data would be useful in finding the most common job searches. Source for job postings and resumes.	x	x	x	
National Labor Exchange		• Post Jobs • Search Resumes • CareerOneStop • America's Career InfoNet • Downloads and Uploads of Job Openings • Indexing (a No Cost Customizable Spider) • Jobs Microsites • Hosted Sites • Analytics	• Employment trends • Job postings • Skills and certifications • Salaries	Source for employment trends, job postings, skills, and salaries.	x		x	x
Interest in market; in process of developing data / analytics product								
Glassdoor	Andrew Chamberlain, Chief Economist	Company and job resource • Job postings User generated data on: • Company reviews • Interview reviews • Salary information	• Job postings • Company reviews • Interview questions • Salaries	Data from interviews could show skills in demand.	x		x	x
LinkedIn		• LinkedIn Job Postings • Recruiter • Manage pipeline of talent	• Job postings • Resumes	Source of skills, online badges, certifications, groups or other signalers people will add to their profiles. Source of job history and professional connections. Source of job postings.	x		x	
Sociometric Solutions		Electronic wearable sensing devices to measure social behavior and generate feedback to assist individuals and teams improve behavior and communication.	Sociometric Badges: • Capture face-to-face interactions • Extract social signals from speech and body movement • Measure proximity and location of users	Source for identifying competencies and evaluating team performance. Source for insights on the categorization of soft skills.				
Extent of data product or market involvement is unclear								
Certification Registry	Bob Sheets/Steve Crawford	• Certification language standardization • Certification organization catalogue • Certification Registry - Online database	• Credentials • Certifying organizations • Credential transfer value	Provides a new source of data on a burgeoning field of certifications	x	x		

ConnectCubed	Michael Tanenbaum, Co-founder / CEO	• Candidate assessment games • Employee performance benchmarking	Results from assessments: • Personality traits • Reaction times, focus, and mental bandwidth from memory games • Subject matter knowledge • Spatial reasoning skills Data from benchmarking • Performance reviews • Job descriptions • Interview scores	Source for competencies / skills	x	x		
Cornerstone OnDemand	Michael Housman, Chief Analytics Officer	Software to organize recruitment, onboarding, connecting employees, training, performance, compensation, and succession planning.	• Applicant information • Employee training completion, certifications, and goals • Employee performance information (skills and competencies, feedback from team and supervisor) • Assessments of employee potential for succession planning	Source for competencies / skills, learning about training needs and compensation		x		
getTalent	acquired by Dice.com in 2013. Unclear about status of getTalent functions.	Talent database with resume component • Creates pipeline of future potential applicants • People can submit resumes when there is not a job open • Parses resumes to create searchable database • Mobile talent acquisition: App for taking pictures of resumes and entering them into searchable database • Parses resumes to create searchable database	Resume data	Source to see who is applying for jobs and more about their skills and competencies		x		
Gild	Jonathan Foley, VP of Science	Recruitment resources for tech companies seeking computer programmers • Assessment of computer programmer's technical ability through open data sources • Assessment of computer programmer's demand in job market	Information about computer programmers: • Coding skills • Education • Work history • Location • Social site profiles • Contact information	Potential profiles of resumes and competencies specific to computer programmers.		x		

IBM Smarter Workforce		Talent management software • Software to for hiring, onboarding, training, virtual employee sharing, feedback and recognition • Candidate assessments • Retention analytics • Retention analytics	• Applicant information • Employee training completion • Employee performance information (skills and competencies, feedback from team and supervisor)	Source for job skills and competencies.		x		
Infor Talent Science		Talent management software • Cloud-based predictive analytics software to improve employee selection, retention, and training. • Employee performance profiles • Candidate management workflow • Candidate assessments • Employee development module	• Applicant information • Employee training completion, certifications, and goals • Employee performance information (skills and competencies, feedback from team and supervisor)	Source for job skills and competencies.		x		x
Knack	Guy Halfteck, Founder/CEO	Candidate assessment games	Personality traits resulting from candidate assessments	Source for job skills and competencies.		x		
PayScale		Salary and compensation resource • Salary assessments, career planning, and cost of living research for individuals • Employer research • Cloud compensation software w/salary dataset and analytics to help businesses set compensation rates	• User-generated salary, employment, education, and location information	Free salary calculators, pay and career charts, and data visualizations. A variety of data licensing and partnership opportunities to republic Pascale data. Alumni analytics to assess how college alumni are faring in the job market.				x
Simply Hired		• Local Jobs • Company Directory • Browse Jobs • Salary Estimator • Post a Job	• Job postings • Company data • Salaries	Source for job postings, skills in demand, types of jobs in demand, salaries.			x	x
Taleo		Cloud based solution for: • Talent management (recruiting, onboarding, career development, performance management, and succession management) • HR • Payroll Compensation	• Performance of employees • Education and work history of employees and candidates • Salary information	Source for skills and salaries.		x		x

The Vault		Rankings and job board • Company, internship program, and school rankings • Job board • Company reviews	• Job postings • User-generated company reviews	Source for company reviews and job postings.			x	
Ultimate Software: UltiPro Human Capital Management		Cloud-based solution for: • Talent management (recruiting, onboarding, career development, performance management, and succession management) • HR • Payroll	• Performance of employees • Education and work history of employees and candidates • Salary information	Source for skills and salaries.		x		x
Public data aggregators								
Amazon web services Public Data Set		Data aggregator	Different data sets about wide ranges of topics	Public data with unique user interface, not specific to workforce and education.				
Google Public Data		Data aggregator	Different data sets about wide ranges of topics	Public data with unique user interface, not specific to workforce and education.				
IBM ManyEyes		Data aggregator	Different data sets about wide ranges of topics	Public data with unique user interface, not specific to workforce and education.				
NORC at the University of Chicago		Confidential microdata management	Different data sets about wide ranges of topics	Portal to private data for vetted researchers.				
Open Science Data Cloud		Science data aggregator	Science data	Source for science data.				
Quandl	Abraham Thomas, Founder/CEO/Chief Data Officer	Data aggregator	Different data sets about wide ranges of topics	Public data with unique user interface, not specific to workforce and education.				
Statista		• Data aggregator • Research and analysis • Infographics and visualization	Different data sets about wide ranges of topics	Public data with unique user interface, not specific to workforce and education.				

Prepared by the Center for Regional Economic Competitiveness, March 2015

Heading
Job Board
Resume Posting
Crowd Sourced Job Data or User-Generated Data
Analytics
Predictive Analysis

Definition
Employers may post open positions on the website
Job seekiers may post their resumes to the website for employers to see
Employees and job applicants self-report information, such as salary, job satisfaction, and job interview questions.
The company analyzes data to determine trends in demographics and labor supply and demand.
The company analyzes data to predict an applicant's skills and/or ability to fulfill the requirements of a position.

Appendix C: U.S. Department of Labor Occupational Profiles for Pharmacy Technician

U.S. Bureau of Labor Statistics

Pharmacy Technicians

Summary

Pharmacy technicians work under the supervision of pharmacists.

Quick Facts: Pharmacy Technicians	
2012 Median Pay	$29,320 per year $14.10 per hour
Entry-Level Education	High school diploma or equivalent
Work Experience in a Related Occupation	None
On-the-job Training	Moderate-term on-the-job training
Number of Jobs, 2012	355,300
Job Outlook, 2012-22	20% (Faster than average)
Employment Change, 2012-22	70,700

What Pharmacy Technicians Do

Pharmacy technicians help licensed pharmacists dispense prescription medication to customers or health professionals.

Work Environment

Pharmacy technicians work in pharmacies, including those found in grocery and drug stores, and in hospitals. Most work full time, but many work part time.

How to Become a Pharmacy Technician

Becoming a pharmacy technician usually requires earning a high school diploma or the equivalent. Pharmacy technicians typically learn through on-the-job training, or they may complete a postsecondary education program. Most states regulate pharmacy technicians, which

is a process that may require passing an exam or completing a formal education or training program.

Pay

The median annual wage for pharmacy technicians was $29,320 in May 2012.

Job Outlook

Employment of pharmacy technicians is projected to grow 20 percent from 2012 to 2022, faster than the average for all occupations. Several factors will lead to increased demand for prescription medications.

Similar Occupations

Compare the job duties, education, job growth, and pay of pharmacy technicians with similar occupations.

More Information, Including Links to O*NET

Learn more about pharmacy technicians by visiting additional resources, including O*NET, a source on key characteristics of workers and occupations.

What Pharmacy Technicians Do

Pharmacy technicians fill prescriptions and check inventory.

Pharmacy technicians help licensed pharmacists dispense prescription medication to customers or health professionals. They work in retail pharmacies and hospitals.

Duties

Pharmacy technicians typically do the following:

- Take the information needed to fill a prescription from customers or health professionals
- Measure amounts of medication for prescriptions
- Package and label prescriptions

- Organize inventory and alert pharmacists to any shortages of medications or supplies
- Accept payment for prescriptions and process insurance claims
- Enter customer or patient information, including any prescriptions taken, into a computer system
- Answer phone calls from customers
- Arrange for customers to speak with pharmacists if customers have questions about medications or health matters

Pharmacy technicians work under the supervision of pharmacists, who must review prescriptions before they are given to patients. In most states, technicians can compound or mix some medications and call physicians for prescription refill authorizations. Technicians also may need to operate automated dispensing equipment when filling prescription orders.

Pharmacy technicians working in hospitals and other medical facilities prepare a greater variety of medications, such as intravenous medications. They may make rounds in the hospital, giving medications to patients.

Work Environment

Pharmacy technicians work primarily in pharmacies, including those found in grocery and drug stores, and in hospitals.

Pharmacy technicians held about 355,300 jobs in 2012. They worked primarily in pharmacies, including those found in grocery and drug stores. Some technicians work in hospitals or clinics. Pharmacy technicians spend most of the workday on their feet.

The industries that employed the most pharmacy technicians in 2012 were as follows:

Pharmacies and drug stores	53%
Hospitals; state, local, and private	17
General merchandise stores	12
Grocery stores	7
Ambulatory health care services	3

Work Schedules

Most pharmacy technicians work full time. Pharmacies may be open at all hours. Therefore, pharmacy technicians may have to work nights or weekends.

How to Become a Pharmacy Technician

Pharmacy technicians spend much of their time interacting with customers.

Becoming a pharmacy technician usually requires earning a high school diploma or the equivalent. Pharmacy technicians typically learn through on-the-job training, or they may complete a postsecondary education program. Most states regulate pharmacy technicians, which is a process that may require passing an exam or completing a formal education or training program.

Education and Training

Many pharmacy technicians learn how to perform their duties through on-the-job training. These programs vary in length and subject matter according to the employer's requirements.

Other pharmacy technicians enter the occupation after completing postsecondary education programs in pharmacy technology. These programs are usually offered by vocational schools or community colleges. Most programs award a certificate after 1 year or less, although some programs last longer and lead to an associate's degree. They cover a variety of subjects, such as arithmetic used in pharmacies, recordkeeping, ways of dispensing medications, and pharmacy law and ethics. Technicians also learn the names, uses, and doses of medications. Most programs

also include clinical experience opportunities, in which students gain hands-on experience in a pharmacy.

The American Society of Health System Pharmacists (ASHP) accredits pharmacy technician programs that include at least 600 hours of instruction over a minimum of 15 weeks. In 2012, there were 213 fully accredited programs, including a few in retail drugstore chains.

Licenses, Certifications, and Registrations

Most states regulate pharmacy technicians in some way. Consult your state's Board of Pharmacy for its particular regulations. Requirements for pharmacy technicians in the states that regulate them typically include some or all of the following:

- High school diploma or GED
- Criminal background check
- Formal education or training program
- Exam
- Fees
- Continuing education

Some states and employers require pharmacy technicians to be certified. Even where it is not required, certification may make it easier to get a job. Many employers will pay for their pharmacy technicians to take the certification exam.

Two organizations offer certification. The Pharmacy Technician Certification Board (PTCB) certification requires a high school diploma and the passing of an exam. Applicants for the National Healthcareer Association (NHA) certification must be at least 18 years old, have a high school diploma, and have completed a training program or have 1 year of work experience. Technicians must recertify every 2 years by completing 20 hours of continuing education courses.

Important Qualities

Customer-service skills. Pharmacy technicians spend much of their time interacting with customers, so being helpful and polite are required of pharmacy technicians in a retail setting.

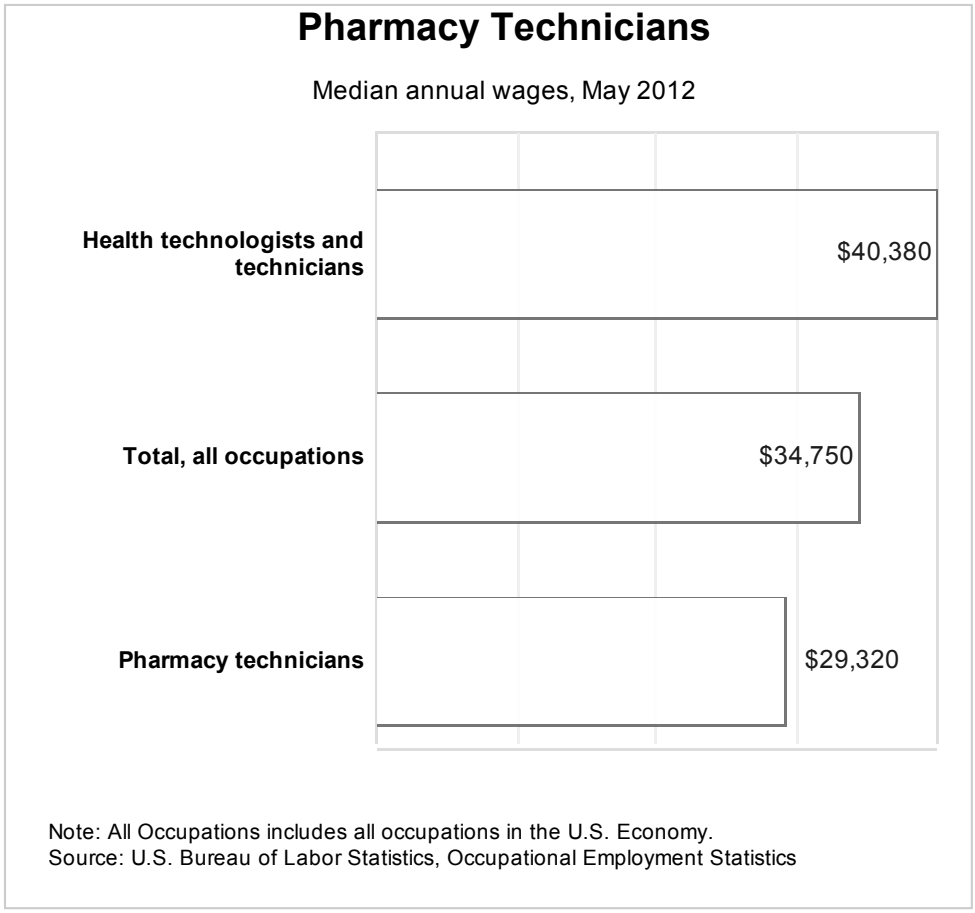
Detail oriented. Serious health problems can result from mistakes in filling prescriptions. Although the pharmacist is responsible for ensuring the safety of all medications dispensed, pharmacy technicians should be detail oriented so that complications are avoided.

Listening skills. Pharmacy technicians must communicate clearly with pharmacists and doctors when taking prescription orders. When speaking with customers, technicians must listen carefully to understand customers' needs and determine if they need to speak with a pharmacist.

Math skills. Pharmacy technicians need to have an understanding of the math concepts used in pharmacies when counting pills and compounding medications.

Organizational skills. Working as a pharmacy technician involves balancing a variety of responsibilities. Pharmacy technicians need good organizational skills to complete the work delegated by pharmacists while at the same time providing service to customers or patients.

Pay



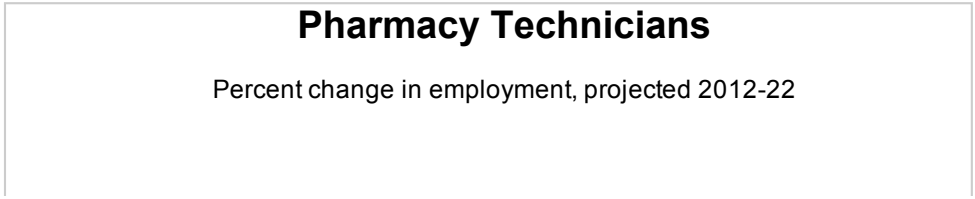
The median annual wage for pharmacy technicians was $29,320 in May 2012. The median wage is the wage at which half the workers in an occupation earned more than that amount and half earned less. The lowest 10 percent earned less than $20,580, and the top 10 percent earned more than $42,400.

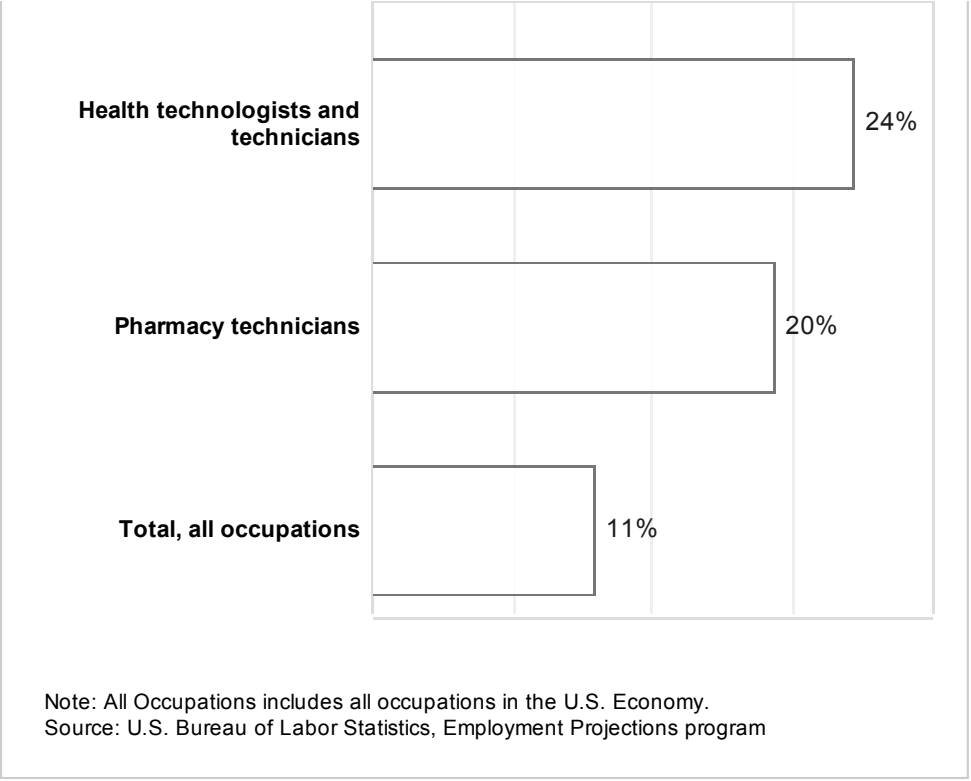
In May 2012, the median annual wages for pharmacy technicians in the top five industries in which these technicians worked were as follows:

Ambulatory health care services	$35,470
Hospitals; state, local, and private	33,550
Grocery stores	28,760
Pharmacies and drug stores	28,030
General merchandise stores	27,450

Most pharmacy technicians work full time. Pharmacies may be open at all hours. Therefore, pharmacy technicians may have to work nights or weekends.

Job Outlook





Note: All Occupations includes all occupations in the U.S. Economy.
Source: U.S. Bureau of Labor Statistics, Employment Projections program

Employment of pharmacy technicians is projected to grow 20 percent from 2012 to 2022, faster than the average for all occupations. Several factors will lead to increased demand for prescription medications.

The population is aging, and older people typically use more prescription medicines than younger people. Higher rates of chronic diseases such as diabetes among all age groups also will lead to increased demand for prescription medications. Advances in pharmaceutical research will allow for more prescription medications to be used to fight diseases.

The number of individuals who have health insurance will increase due to federal health insurance reform legislation. As more people have access to insurance coverage, more pharmacy technicians will be needed to handle their prescriptions.

In addition, pharmacy technicians may be needed to take on a greater role in pharmacy operations because pharmacists are increasingly performing more patient care activities such as giving flu shots. Technicians will need to perform tasks such as collecting patient information, preparing more types of medications, and verifying the work of other technicians, tasks formerly done by pharmacists.

Job Prospects

Job prospects should be good for pharmacy technicians, particularly those with formal training, certification, and those with experience in retail settings.

Employment projections data for Pharmacy Technicians, 2012-22

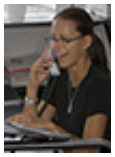
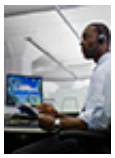
Occupational Title	SOC Code	Employment, 2012	Projected Employment, 2022	Change, 2012-22		Employment by Industry
				Percent	Numeric	
Pharmacy technicians	29-2052	355,300	426,100	20	70,700	[XLS]

SOURCE: U.S. Bureau of Labor Statistics, Employment Projections program

Similar Occupations

This table shows a list of occupations with job duties that are similar to those of pharmacy technicians.

	OCCUPATION	JOB DUTIES	ENTRY-LEVEL EDUCATION	2012 MEDIAN PAY
	Dental Assistants	Dental assistants have many tasks, ranging from providing patient care and taking x rays to recordkeeping and scheduling appointments. Their duties vary by state and by the dentists' offices where they work.	Postsecondary non-degree award	$34,500
	Medical Assistants	Medical assistants complete administrative and clinical tasks in the offices of physicians, podiatrists, chiropractors, and other health practitioners. Their duties vary with the location, specialty, and size of the practice.	Postsecondary non-degree award	$29,370
		Medical records and health information technicians, commonly referred to as health information technicians, organize and		

	**Medical Records and Health Information Technicians**	manage health information data. They ensure its quality, accuracy, accessibility, and security in both paper and electronic systems. They use various classification systems to code and categorize patient information for insurance reimbursement purposes, for databases and registries, and to maintain patients' medical and treatment histories.	Postsecondary non-degree award	$34,160
	**Medical Transcriptionists**	Medical transcriptionists listen to voice recordings that physicians and other healthcare professionals make and convert them into written reports. They may also review and edit medical documents created using speech recognition technology. Transcriptionists interpret medical terminology and abbreviations in preparing patients' medical histories, discharge summaries, and other	Postsecondary non-degree award	$34,020

		documents.		
	**Pharmacists**	Pharmacists dispense prescription medications to patients and offer expertise in the safe use of prescriptions. They also may provide advice on how to lead a healthy lifestyle, conduct health and wellness screenings, provide immunizations, and oversee the medications given to patients.	Doctoral or professional degree	$116,670

Contacts for More Information

For information on becoming a pharmacy technician, visit

National Pharmacy Technician Association

For information about accredited pharmacy technician programs, visit

American Society of Health System Pharmacists

For information about state licensure laws, contact individual state Boards of Pharmacy, or visit

National Association of Boards of Pharmacy

For more information about certification, visit

Pharmacy Technician Certification Board

National Healthcareer Association

O*NET

Pharmacy Technicians

Suggested citation:

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2014-15 Edition*, Pharmacy Technicians,
on the Internet at http://www.bls.gov/ooh/healthcare/pharmacy-technicians.htm (visited *June 15, 2015*).

Publish Date: Wednesday, January 8, 2014

U.S. Bureau of Labor Statistics | Office of Occupational Statistics and Employment Projections, PSB Suite 2135, 2 Massachusetts Avenue, NE Washington, DC 20212-0001

www.bls.gov/ooh | Telephone: 1-202-691-5700 | Contact OOH

Occupational Employment Statistics

BROWSE OES
OES HOME
OES OVERVIEW
OES NEWS RELEASES
OES DATA
OES CHARTS
OES MAPS
OES PUBLICATIONS
OES DATABASES
OES FAQS
CONTACT OES

SEARCH OES
Go

OES TOPICS
RESPONDENTS
DOCUMENTATION
SPECIAL NOTICES
RELATED LINKS

Occupational Employment and Wages, May 2014

29-2052 Pharmacy Technicians

Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications according to prescription orders.

National estimates for this occupation
Industry profile for this occupation
Geographic profile for this occupation

National estimates for this occupation: Top

Employment estimate and mean wage estimates for this occupation:

Employment (1)	Employment RSE (3)	Mean hourly wage	Mean annual wage (2)	Wage RSE (3)
368,760	0.8 %	$14.95	$31,090	0.3 %

Percentile wage estimates for this occupation:

Percentile	10%	25%	50% (Median)	75%	90%
Hourly Wage	$9.97	$11.76	$14.33	$17.60	$21.10
Annual Wage (2)	$20,730	$24,470	$29,810	$36,600	$43,900

Industry profile for this occupation: Top

Industries with the highest published employment and wages for this occupation are provided. For a list of all industries with employment in this occupation, see the Create Customized Tables function.

Industries with the highest levels of employment in this occupation:

Industry	Employment (1)	Percent of industry employment	Hourly mean wage	Annual mean wage (2)
Health and Personal Care Stores	192,290	18.84	$14.04	$29,200
General Medical and Surgical Hospitals	58,090	1.11	$17.22	$35,820
Other General Merchandise Stores	27,910	1.56	$14.23	$29,610
Grocery Stores	26,540	1.02	$13.97	$29,060
Department Stores	15,060	1.07	$13.84	$28,780

Industries with the highest concentration of employment in this occupation:

Industry	Employment (1)	Percent of industry employment	Hourly mean wage	Annual mean wage (2)
Health and Personal Care Stores	192,290	18.84	$14.04	$29,200
Drugs and Druggists' Sundries Merchant Wholesalers	8,430	4.39	$15.79	$32,850
Electronic Shopping and Mail-Order Houses	5,490	1.71	$14.97	$31,150
Other General Merchandise Stores	27,910	1.56	$14.23	$29,610
General Medical and Surgical Hospitals	58,090	1.11	$17.22	$35,820

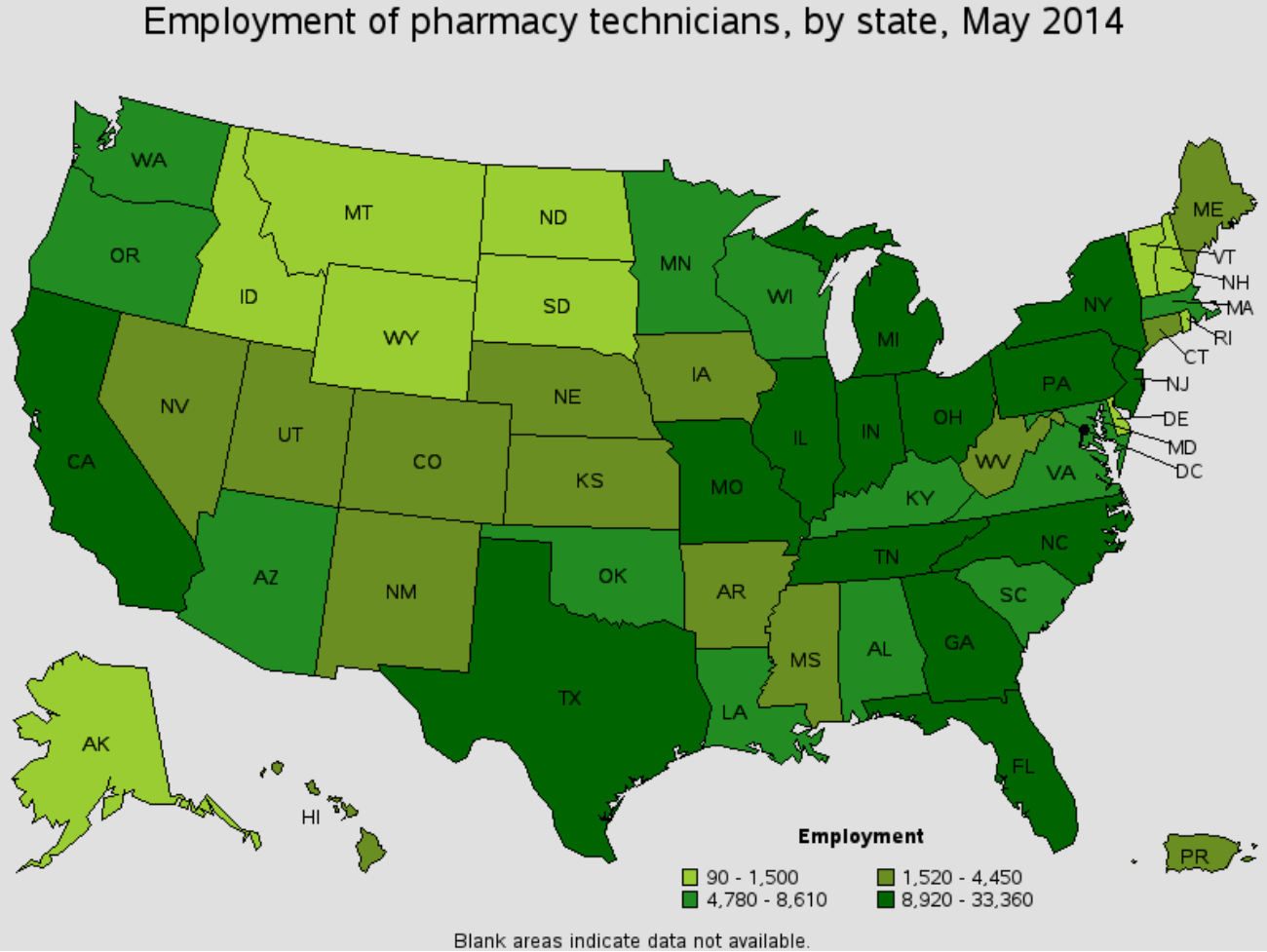
Top paying industries for this occupation:

		Percent of		

Industry	Employment (1)	industry employment	Hourly mean wage	Annual mean wage (2)
Federal Executive Branch (OES Designation)	5,920	0.30	$19.94	$41,480
Outpatient Care Centers	3,850	0.55	$19.11	$39,750
Scientific Research and Development Services	70	0.01	$18.98	$39,480
Offices of Physicians	5,790	0.24	$18.39	$38,250
Computer Systems Design and Related Services	(8)	(8)	$18.33	$38,120

Geographic profile for this occupation: Top

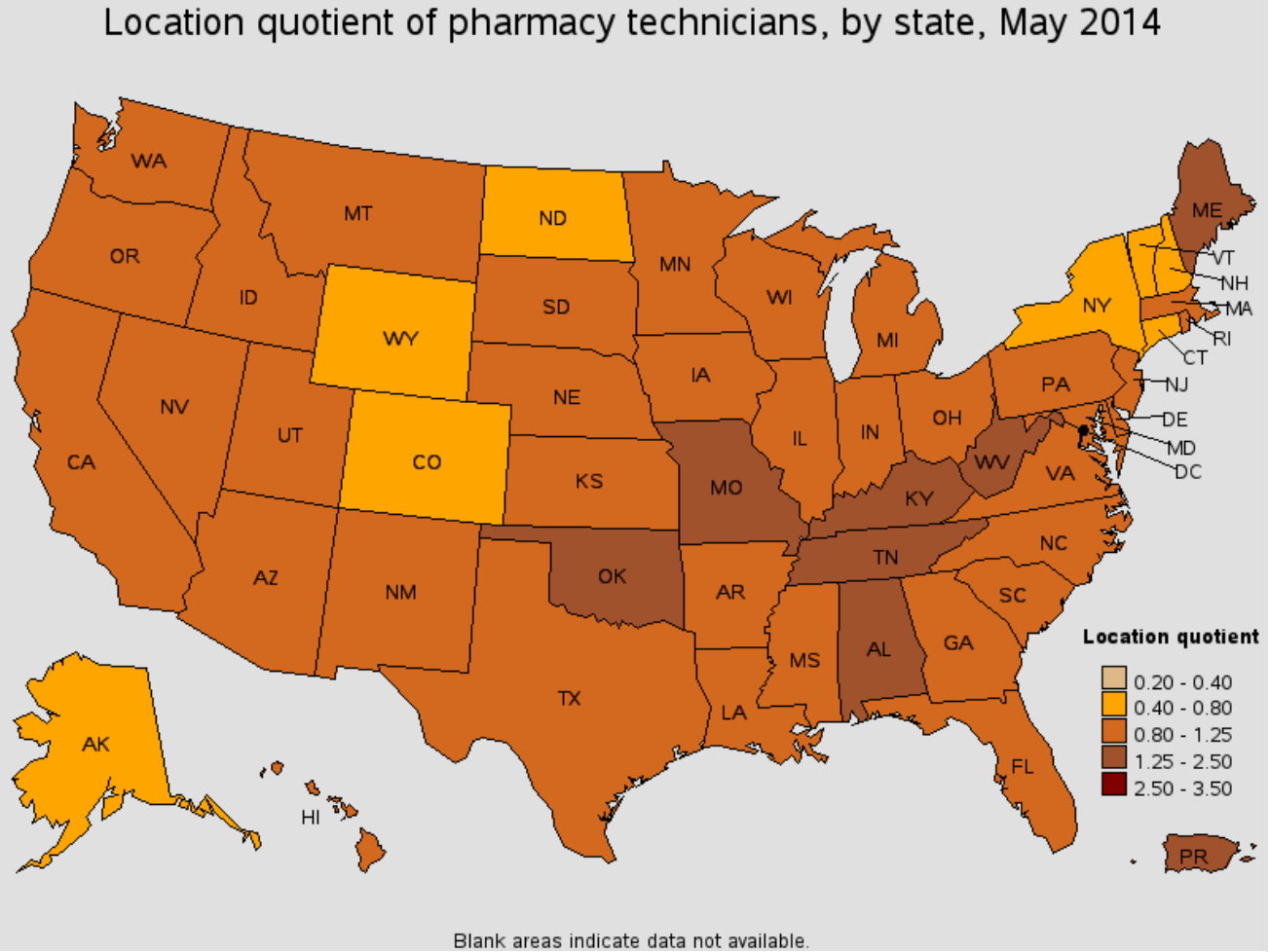
States and areas with the highest published employment, location quotients, and wages for this occupation are provided. For a list of all areas with employment in this occupation, see the Create Customized Tables function.



States with the highest employment level in this occupation:

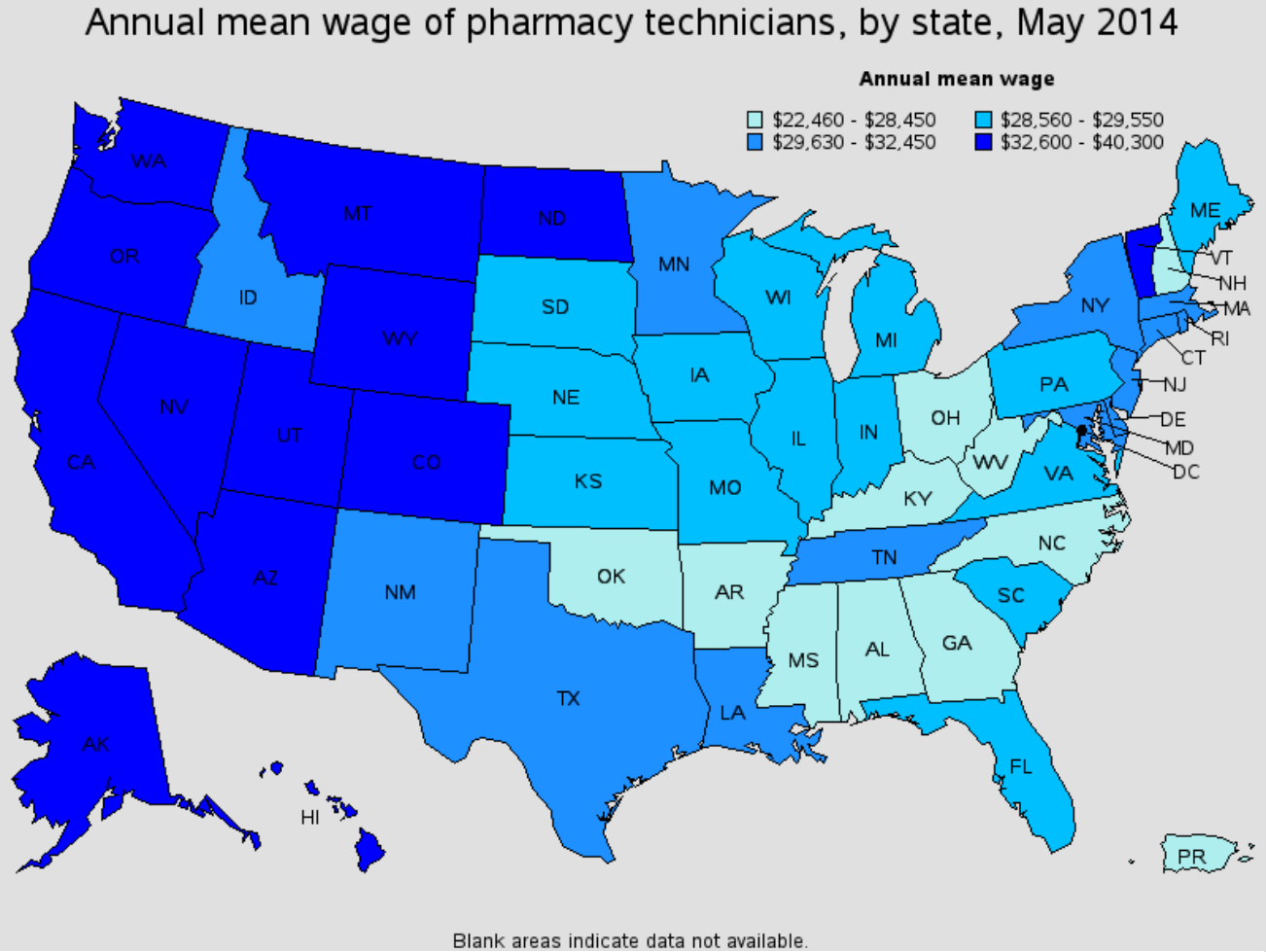
State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
California	33,360	2.21	0.81	$19.09	$39,710

Texas	30,080	2.68	0.98	$15.30	$31,830
Florida	25,310	3.30	1.21	$13.90	$28,900
Illinois	18,020	3.13	1.15	$13.95	$29,020
New York	16,580	1.88	0.69	$15.40	$32,030



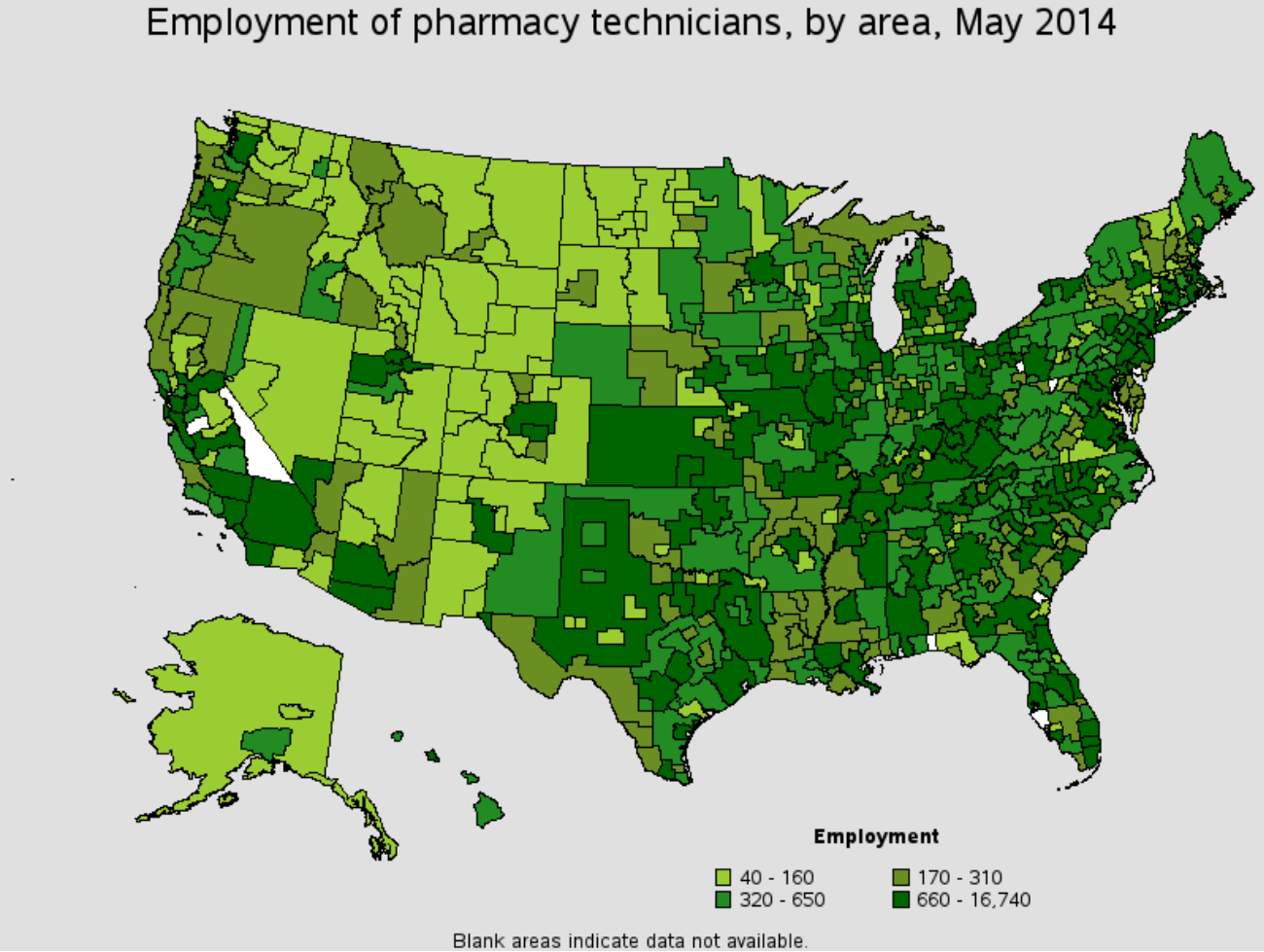
States with the highest concentration of jobs and location quotients in this occupation:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Tennessee	12,030	4.38	1.60	$14.24	$29,630
West Virginia	3,080	4.35	1.59	$12.75	$26,510
Alabama	7,260	3.91	1.43	$12.94	$26,920
Kentucky	6,920	3.83	1.40	$13.06	$27,170
Oklahoma	5,600	3.55	1.30	$13.68	$28,450



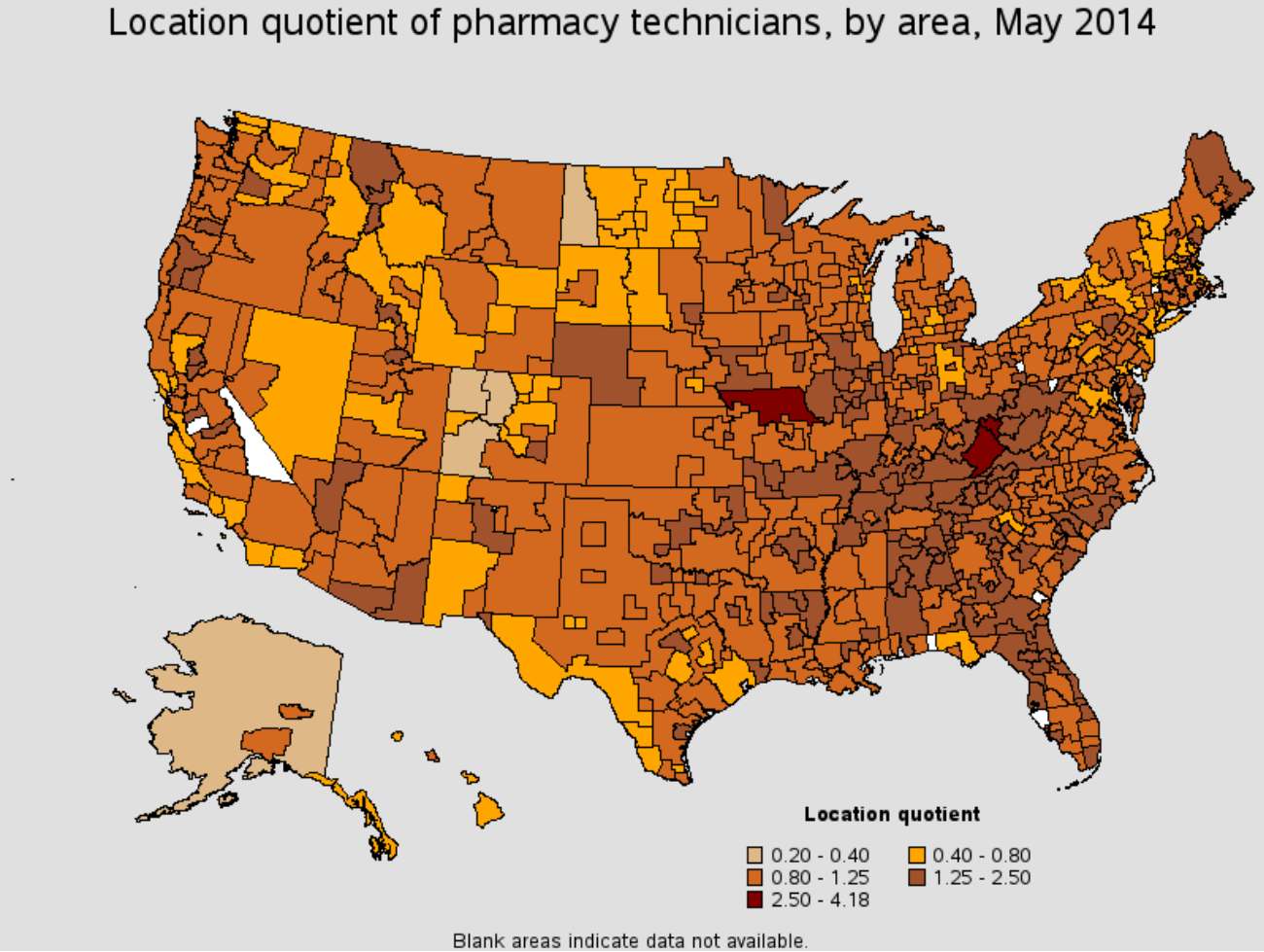
Top paying States for this occupation:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Washington	7,180	2.48	0.91	$19.38	$40,300
Alaska	660	2.04	0.75	$19.22	$39,980
California	33,360	2.21	0.81	$19.09	$39,710
Hawaii	1,520	2.49	0.91	$17.50	$36,400
Oregon	4,780	2.84	1.04	$17.44	$36,270



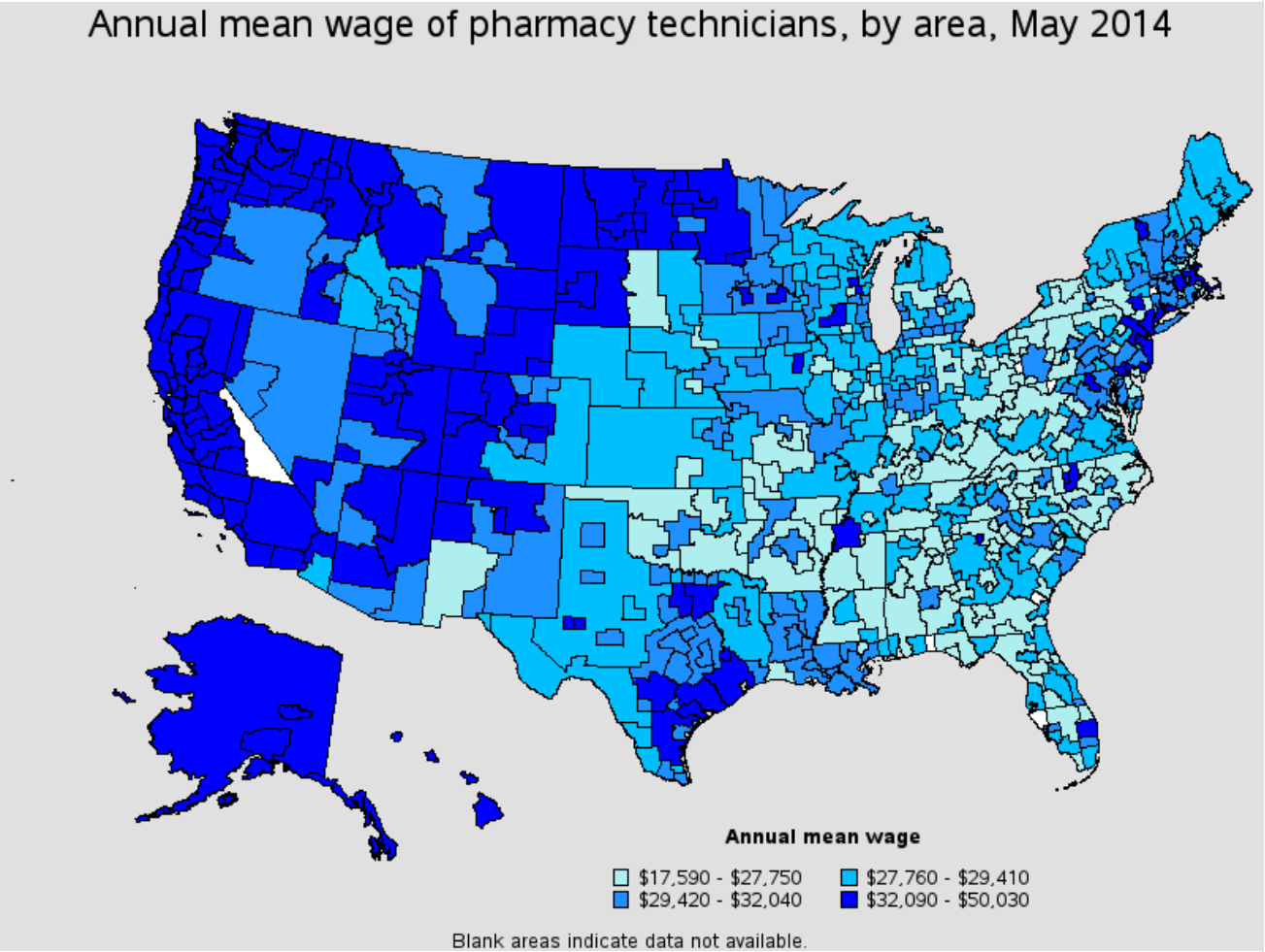
Metropolitan areas with the highest employment level in this occupation:

Metropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Chicago-Joliet-Naperville, IL Metropolitan Division	10,510	2.80	1.03	$13.94	$28,990
New York-White Plains-Wayne, NY-NJ Metropolitan Division	9,340	1.73	0.63	$16.49	$34,290
Los Angeles-Long Beach-Glendale, CA Metropolitan Division	8,120	2.00	0.73	$18.10	$37,640
Atlanta-Sandy Springs-Marietta, GA	6,640	2.78	1.02	$13.66	$28,410
Houston-Sugar Land-Baytown, TX	6,160	2.17	0.79	$15.88	$33,030
Phoenix-Mesa-Glendale, AZ	6,100	3.34	1.22	$16.32	$33,940
Dallas-Plano-Irving, TX Metropolitan Division	5,650	2.52	0.92	$15.73	$32,720
Philadelphia, PA Metropolitan Division	4,790	2.57	0.94	$15.05	$31,300
Tampa-St. Petersburg-Clearwater, FL	4,570	3.87	1.42	$13.68	$28,460
St. Louis, MO-IL	4,300	3.29	1.21	$14.67	$30,510



Metropolitan areas with the highest concentration of jobs and location quotients in this occupation:

Metropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Huntington-Ashland, WV-KY-OH	790	7.40	2.71	$13.43	$27,940
Muncie, IN	270	6.13	2.25	$12.52	$26,030
Florence-Muscle Shoals, AL	300	5.78	2.12	$12.13	$25,230
Kingsport-Bristol-Bristol, TN-VA	660	5.68	2.08	$12.96	$26,960
Johnson City, TN	410	5.42	1.99	$13.33	$27,720
Danville, IL	140	5.27	1.93	$13.05	$27,140
Springfield, MO	970	4.97	1.82	$11.96	$24,880
Springfield, IL	540	4.93	1.81	$14.68	$30,530
Morristown, TN	220	4.91	1.80	$13.66	$28,420
Kankakee-Bradley, IL	200	4.90	1.80	$12.98	$27,010



Top paying metropolitan areas for this occupation:

Metropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Oakland-Fremont-Hayward, CA Metropolitan Division	2,360	2.30	0.84	$24.05	$50,030
San Francisco-San Mateo-Redwood City, CA Metropolitan Division	1,700	1.57	0.57	$22.29	$46,350
San Jose-Sunnyvale-Santa Clara, CA	1,750	1.80	0.66	$21.76	$45,260
Napa, CA	100	1.41	0.52	$21.72	$45,190
Santa Rosa-Petaluma, CA	370	2.01	0.74	$21.67	$45,070
Santa Cruz-Watsonville, CA	260	3.00	1.10	$21.51	$44,740
Vallejo-Fairfield, CA	340	2.85	1.05	$21.14	$43,960
Kennewick-Pasco-Richland, WA	190	1.95	0.71	$21.00	$43,670
Seattle-Bellevue-Everett, WA Metropolitan Division	3,500	2.34	0.86	$19.99	$41,570
Tacoma, WA Metropolitan Division	630	2.32	0.85	$19.79	$41,170

Nonmetropolitan areas with the highest employment in this occupation:

Nonmetropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Other North Carolina nonmetropolitan area	1,340	4.50	1.65	$11.99	$24,940
Kansas nonmetropolitan area	1,070	2.75	1.01	$13.49	$28,070
Balance of Lower Peninsula of Michigan nonmetropolitan area	940	3.18	1.17	$12.57	$26,140

South Central Kentucky nonmetropolitan area	930	5.50	2.02	$12.18	$25,330
East Kentucky nonmetropolitan area	930	8.61	3.15	$12.65	$26,310

Nonmetropolitan areas with the highest concentration of jobs and location quotients in this occupation:

Nonmetropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
East Kentucky nonmetropolitan area	930	8.61	3.15	$12.65	$26,310
North Missouri nonmetropolitan area	680	7.81	2.86	$14.19	$29,510
Western Tennessee nonmetropolitan area	760	6.01	2.20	$13.67	$28,440
South Central Kentucky nonmetropolitan area	930	5.50	2.02	$12.18	$25,330
Eastern Tennessee nonmetropolitan area	780	5.45	2.00	$13.66	$28,420

Top paying nonmetropolitan areas for this occupation:

Nonmetropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Far Western North Dakota nonmetropolitan area	70	0.84	0.31	$20.21	$42,040
Southeast Alaska nonmetropolitan area	60	1.77	0.65	$19.45	$40,460
Northern Mountains Region of California nonmetropolitan area	170	2.70	0.99	$19.32	$40,190
Mother Lode Region of California nonmetropolitan area	90	2.43	0.89	$19.29	$40,130
North Coast Region of California nonmetropolitan area	310	3.29	1.21	$18.81	$39,130

About May 2014 National, State, Metropolitan, and Nonmetropolitan Area Occupational Employment and Wage Estimates

These estimates are calculated with data collected from employers in all industry sectors, all metropolitan and nonmetropolitan areas, and all states and the District of Columbia. The top employment and wage figures are provided above. The complete list is available in the downloadable XLS files.

The percentile wage estimate is the value of a wage below which a certain percent of workers fall. The median wage is the 50th percentile wage estimate--50 percent of workers earn less than the median and 50 percent of workers earn more than the median. More about percentile wages.

(1) Estimates for detailed occupations do not sum to the totals because the totals include occupations not shown separately. Estimates do not include self-employed workers.

(2) Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where there is not an hourly mean wage published, the annual wage has been directly calculated from the reported survey data.

(3) The relative standard error (RSE) is a measure of the reliability of a survey statistic. The smaller the relative standard error, the more precise the estimate.

(8) Estimate not released.

(9) The location quotient is the ratio of the area concentration of occupational employment to the national average concentration. A location quotient greater than one indicates the occupation has a higher share of employment than average, and a location quotient less than one indicates the occupation is less prevalent in the area than average.

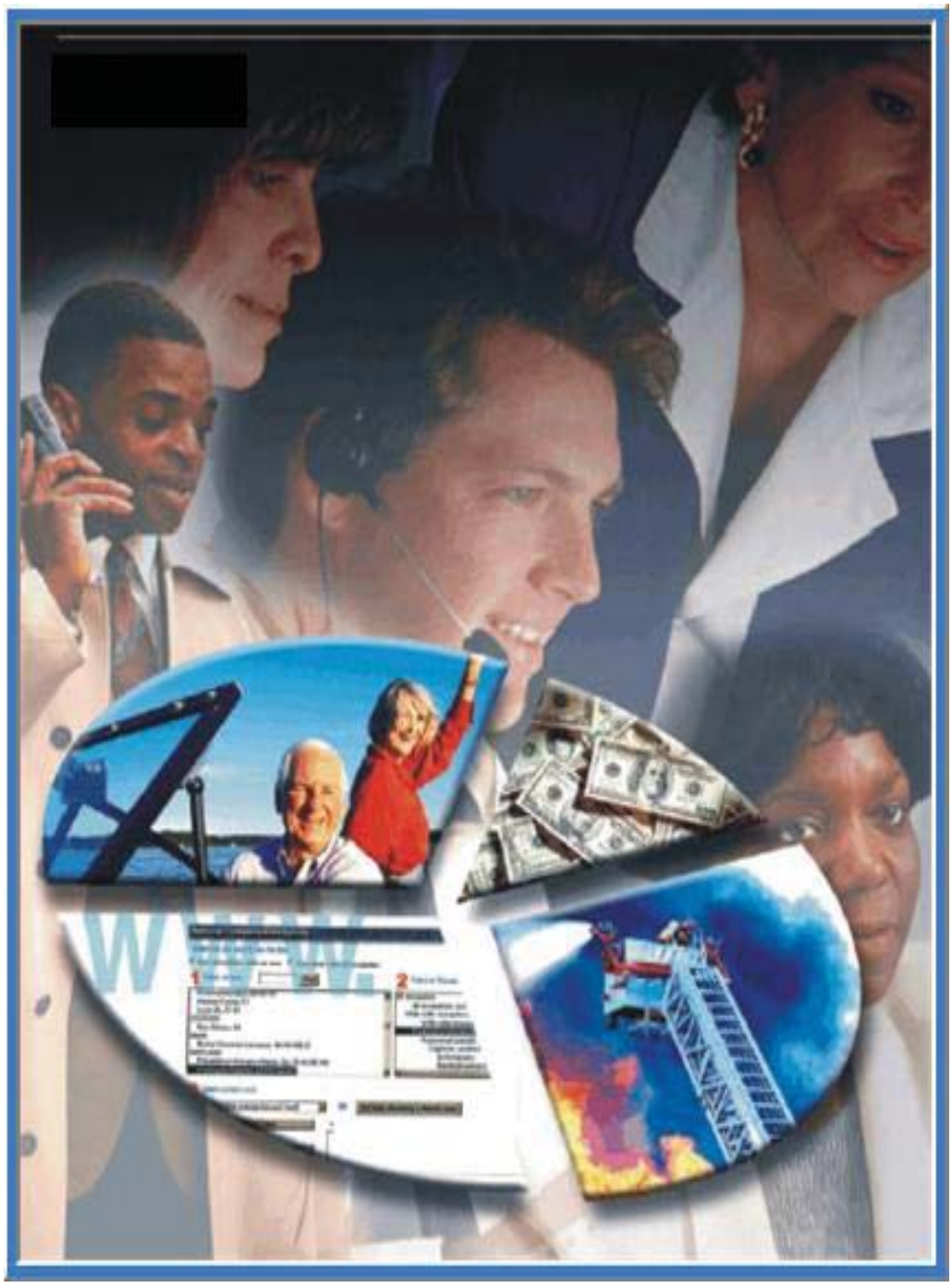
Other OES estimates and related information:

May 2014 National Occupational Employment and Wage Estimates

May 2014 State Occupational Employment and Wage Estimates

National Compensation Survey:
Guide for Evaluating Your Firm's Jobs and Pay

U.S. Bureau of Labor Statistics
May 2013 (Revised)



National Compensation Survey:
Guide for Evaluating Your Firm's Jobs and Pay

U.S. Department of Labor
Seth D. Harris, Acting Secretary

U. S. Bureau of Labor Statistics
Erica L. Groshen, Commissioner

May 2013 (Revised)

Contents

Introduction

This publication is designed to familiarize data users with how the Bureau of Labor Statistics (BLS) determines the work level of an occupation in the National Compensation Survey (NCS). This information can help data users replicate the process.

Before wage data can be collected, four steps must be completed by the field economist (BLS employee) visiting an establishment. First, is the selection of which jobs in the establishment are to be surveyed. The number of jobs selected is based on the total employment of the establishment. A complete list of employees is used to randomly select up to eight workers, with each selected worker representing a selected job within the establishment. Sampling is done using a technique that results in those jobs with the greatest number of workers having the greatest chance of selection.

In the second step, certain characteristics—union vs. nonunion status, full-time vs. part-time status, time-based pay vs. incentive pay—are identified for each selected job.

In the third step, selected jobs are classified into occupations based on job duties and responsibilities. The 2010 Standard Occupational Classification (SOC) system manual is used to classify each job into one of approximately 800 detailed classifications based on the highest skill level and primary duties of the occupation.

During the final step before collection of wage rates and hours worked, each sampled job is evaluated to determine the work level of its duties and responsibilities. This process is known as *Point factor leveling,* because it categorizes certain aspects of a job to specific levels of work with assigned point values. The duties and responsibilities of the job, along with consideration given to work performed and the skills, education, and training required for the job are evaluated. Points for each factor are then totaled to determine the overall work level for the job.

Leveling

Point Factor Leveling

In point factor leveling, an occupation is matched to a level within each of four factors. The factors are as follows:

- Knowledge
- Job controls and complexity
- Contacts (nature and purpose)
- Physical environment

Each factor consists of several levels, each with an associated description and assigned points. The description within each factor best matching the job is chosen. Points for the four factors are recorded and totaled. The point total determines the overall work level of the occupation. BLS publishes data for 15 work levels; the point range for each level is shown later in the publication.

Most of this publication consists of descriptions for the leveling knowledge factor. The knowledge factor is described separately for broad categories of occupations. Each description contains short definitions of the point levels of knowledge expected for the occupations and relevant examples. The Standard Occupational Classification codes related to each knowledge category are listed below the description.

The other three factors use identical descriptions for all occupational categories and contain a definition of each point level within each factor.

The point levels within each factor are designed to describe the thresholds of distinct levels of work. When a job does not meet the full description of a point level, the next lowest point level is used. Only the stated point values are used. The last pages contain leveling examples and worksheets that can be used to determine the level of any job.

BLS work level

NCS determines the work level for each major occupation group, which is a combination of similar occupations. Here is a list of the 22 major occupational groups:

- Management
- Business and financial operations
- Computer and mathematical
- Architecture and engineering
- Life, physical, and social science
- Community and social services
- Legal
- Education, training, and library

Knowledge Guide for Medical, Hospital, Dental, Public Health, and Veterinary Technician Jobs

200 Points Knowledge of, and skill in performing, basic commonly-used health care methods. Knowledge permits the employee to carry out a limited variety of simple health or personal care assignments.	**Examples of How Knowledge Is Used** (1) Provides nursing support by taking and recording vital signs (e.g., temperature, blood pressure, and pulse rate). Administers commonly prescribed oral medication. Changes sterile dressings. (2) Provides basic elder care. Dresses, feeds, and bathes charges as needed. (3) Prepares trays of instruments. Cleans glassware and slides. Sterilizes equipment.
350 Points Knowledge of common practices of a health care area. Knowledge permits the employee to complete a few routine medical and healthcare procedures and operate basic equipment and instruments.	(1) Administers prescribed oral, topical, and intramuscular medication and observes for emotional and physical contraindications. Sets up and gives treatments requiring the assembly and operation of equipment such as oxygen, suction, and respirator. Responds to emergency situations such as cardiopulmonary arrest. (2) Performs simple laboratory tests such as checking urine for sugar and stool for blood. Prepares, fixes, and stains tissue smears for microscopic examination by others. (3) Prepares patients for treatment or diagnostic examinations. Conducts chest x-ray and pulmonary tests. (4) Inserts hypodermic needle in vein of blood donor. Instructs donor on correct behavior during and following blood donation. Ensures that the vital signs of donor remain stable throughout the donating process. Follows prescribed procedures for labeling, segregating, and storing donated blood. (5) Operates dental x-ray equipment and develops x-rays. Prepares amalgams and adhesives for use by the dentist. Constructs base plates, bite rims and impressions trays. Inspects dental casts and model impressions for deficiencies. Fabricates casts. (6) Cares for laboratory animals. Takes stool and blood samples. Runs simple diagnostic laboratory tests. Maintains records of gross observations and test results.
550 Points Knowledge of principles and procedures associated with providing a limited range of tasks in a health care area. Knowledge permits the employee to carry out a variety of interrelated tasks and recurring assignments.	(1) Freezes, slices, and stains tissue samples to enable physicians to detect, diagnose, and treat abnormal cellular growth. (2) Cares for and monitors a group of critically ill patients assessing deviations in patient conditions. (3) Administers and monitors procedures such as radiographic procedures, gastro-intestinal series and choloangiograms. (4) Administers oxygen and therapeutic gas mixtures using nasal cannulas, masks, or other appliances. (5) Operates dialysis systems, electroencephalograms and ultrasound equipment. (6) Produces ultrasonic recording of internal organs, embryos, and fetuses for use by physicians. (7) Reviews orders for intravenous additive medications and solutions. Determines kind, strength, and dosage of drugs prescribed. Performs bulk com-pounding. (8) Fabricates custom orthotics and/or prosthetics using a diversity of materials such as metal and plastic. (9) Performs preventative oral treatment by cleaning, scaling, and polishing teeth.

750 Points Knowledge of the detailed processes, methods, and techniques, as well as practical knowledge of a specific health-care area. Knowledge permits the employee to schedule and carry out the steps of a treatment or examination or to complete important steps of a procedure.	(1) Administers occupational therapy and physical therapy to patients suffering from pulmonary disease and recovering from surgery. (2) Performs laboratory tests where standardized procedures do not exist or where results are not conclusive, and, therefore, require multiple approaches such as in testing for Anthrax. (3) Uses bronchography, mammography, and magnetic resonance imaging equipment. Reviews results for clarity. (4) Administers controlled ventilation, and adjusts delivery after assessing respiratory status of patients. (5) Performs procedures to control and maintain artificial airways by such methods as tracheal intubations and extubations, tracheal lavage, and tracheotomy. (6) Constructs fixed or removable partial dentures or complete dentures. Fabricates orthodontic appliances, dental splints and obturators.
950 Points Knowledge of specific medical hospital, dental, or allied health principles and practices, as well as skill in using specialized techniques and equipment. Knowledge permits the employee to plan, coordinate and carry out precedent procedures.	(1) Carries out treatment for severely disabled patients such as physical therapy for tubercular patients, chest-surgery patients, and neuro/psychiatric patients. (2) Fabricates a variety of nuclear medicine implants for inoperable tumors and as alternatives to radical cancer treatments. (3) Works with pharmaceutical researchers by infecting laboratory animals, subsequently obtaining material from them, and using the material to test new processes to develop vaccines and serums to prevent or treat diseases.

Covered SOC Codes

292011	Medical and Clinical Laboratory Technologists
292012	Medical and Clinical Laboratory Technicians
292021	Dental Hygienists
292031	Cardiovascular Technologists and Technicians
292032	Diagnostic Medical Sonographers
292033	Nuclear Medicine Technologists
292034	Radiologic Technologists and Technicians
292035	**Magnetic Resonance Imaging Technologists**
292051	Dietetic Technicians
292052	Pharmacy Technicians
292053	Psychiatric Technicians
292054	Respiratory Therapy Technicians
292055	Surgical Technologists
292056	Veterinary Technologists and Technicians
292057	**Ophthalmic Medical Technicians**
292061	Licensed Practical and Licensed Vocational Nurses
292081	Opticians, Dispensing
292091	Orthotists and Prosthetists
292092	**Hearing Aid Specialists**
292099	Health Technologists and Technicians, All Other
299091	Athletic Trainers

311011	Home Health Aides
311013	Psychiatric Aides
311014	**Nursing Assistants**
311015	**Orderlies**
312011	**Occupational Therapy Assistants**
312012	**Occupational Therapy Aides**
312021	Physical Therapist Assistants
312022	Physical Therapist Aides
319011	Massage Therapists
319091	Dental Assistants
319092	Medical Assistants
319093	Medical Equipment Preparers
319095	Pharmacy Aides
319096	Veterinary Assistants and Laboratory Animal Caretakers
319097	**Phlebotomists**
319099	Healthcare Support Workers, All Other
319011	Massage Therapists
319091	Dental Assistants
319092	Medical Assistants
319093	Medical Equipment Preparers
319099	Healthcare Support Workers, All Other
394011	Embalmers
394031	**Morticians, Undertakers, and Funeral Directors**
399021	**Personal Care Aides**
519081	Dental Laboratory Technicians
519082	Medical Appliance Technicians
519083	Ophthalmic Laboratory Technicians

O*NET OnLine

Updated 2013

Bright Outlook

Summary Report for:
29-2052.00 - Pharmacy Technicians

Prepare medications under the direction of a pharmacist. May measure, mix, count out, label, and record amounts and dosages of medications according to prescription orders.

Sample of reported job titles: Accredited Pharmacy Technician; Billing and Quality Technician; Certified Pharmacy Technician (CPhT); Compounding Technician; Lead Pharmacy Tech, Certified Pharmacy Technician (Lead Pharmacy Tech, CPhT); Lead Pharmacy Technician (Lead Pharmacy Tech); Pharmacy Technician (Pharmacy Tech); Senior Pharmacy Technician; Technician; Technician, Inventory Specialist

View report: Summary | Details | Custom

Tasks | Tools & Technology | Knowledge | Skills | Abilities | Work Activities | Detailed Work Activities | Work Context | Job Zone | Education | Credentials | Interests | Work Styles | Work Values | Related Occupations | Wages & Employment | Job Openings | Additional Information

Tasks

All 20 displayed

- Receive written prescription or refill requests and verify that information is complete and accurate.
- Prepack bulk medicines, fill bottles with prescribed medications, and type and affix labels.
- Answer telephones, responding to questions or requests.
- Maintain proper storage and security conditions for drugs.
- Assist customers by answering simple questions, locating items, or referring them to the pharmacist for medication information.
- Price and file prescriptions that have been filled.
- Establish or maintain patient profiles, including lists of medications taken by individual patients.
- Order, label, and count stock of medications, chemicals, or supplies and enter inventory data into computer.

- Receive and store incoming supplies, verify quantities against invoices, check for outdated medications in current inventory, and inform supervisors of stock needs and shortages.
- Mix pharmaceutical preparations, according to written prescriptions.
- Operate cash registers to accept payment from customers.
- Clean and help maintain equipment or work areas and sterilize glassware, according to prescribed methods.
- Prepare and process medical insurance claim forms and records.
- Transfer medication from vials to the appropriate number of sterile, disposable syringes, using aseptic techniques.
- Supply and monitor robotic machines that dispense medicine into containers and label the containers.
- Restock intravenous (IV) supplies and add measured drugs or nutrients to IV solutions under sterile conditions to prepare IV packs for various uses, such as chemotherapy medication.
- Compute charges for medication or equipment dispensed to hospital patients and enter data in computer.
- Deliver medications or pharmaceutical supplies to patients, nursing stations, or surgery.
- Price stock and mark items for sale.
- Maintain and merchandise home healthcare products or services.

Find occupations related to multiple tasks

back to top

Tools & Technology

All 40 displayed

Tools used in this occupation:

- **Benchtop centrifuges —** Centrifuges
- **Bi distillation units —** Water distillation equipment
- **Cash registers**
- **Compact disc CD or labeling printers —** Label printers
- **Desktop computers**
- **Dry heat or hot air sterilizers —** Sterilizing equipment
- **Filling or sealing auger dose machines —** Automatic unit dose strip packaging machines; Tube filling and crimping machines

- **Forced air or mechanical convection general purpose incubators** — Incubators
- **Fume hoods or cupboards** — Horizontal and vertical flow hoods
- **Gas burners** — Bunsen burners
- **Hydrometers** — Specific gravity testing equipment
- **Intravenous tubing with catheter administration kits** — Intravenous IV supplies
- **Laboratory balances** — Equal-arm balances; Single-beam balances; Torsion balances; Unequal-arm balances (see all 5 examples)
- **Laboratory blenders or emulsifiers** — Blending/agitating machines; Total Parenteral Nutrition TPN compounders
- **Laboratory graduated cylinders** — Graduated cylinders
- **Laboratory mills** — Benchtop colloid mills; Colloid mills; Grinding and shearing colloid mills
- **Laboratory vacuum pumps**
- **Laboratory washing machines** — Flask washers
- **Laminar flow cabinets or stations** — Laminar flow hoods
- **Laser printers** — Computer laser printers
- **Medical syringe without needle** — Syringes
- **Medication or pill dispensers or accessories** — Robotic dispensing systems
- **Microscope slides** — Agar slides
- **Multipurpose or general test tubes** — Test tubes
- **Notebook computers**
- **Personal computers**
- **Petri plates or dishes** — Petri dishes
- **Pharmaceutical filters or ultra filters** — Filtering devices
- **Point of sale POS terminal** — Point of sale POS computer terminals
- **Steam autoclaves or sterilizers** — Autoclaves
- **Sterile or aseptic processing or filling machines** — Automatic bottle filling machines; Computer-based dispensing equipment; Semiautomatic sterile solution transferring devices
- **Tablet counters** — Tablet counting machines
- **Vacuum blood collection tubes or containers** — Evacuated blood collection containers

Technology used in this occupation:

- **Accounting software —** Billing and reimbursement software
- **Data base user interface and query software —** Database software; Drug compatibility software
- **Enterprise resource planning ERP software —** Pharmacy management software
- **Inventory management software —** Cardinal Health Pyxis CII Safe
- **Label making software —** Label-making software
- **Medical software —** Compounder software; Patient record maintenance software; Pharmaceutical software; Prescription processing software
- **Point of sale POS software**

back to top

Knowledge

All 5 displayed

- **Customer and Personal Service —** Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
- **English Language —** Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
- **Mathematics —** Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
- **Medicine and Dentistry —** Knowledge of the information and techniques needed to diagnose and treat human injuries, diseases, and deformities. This includes symptoms, treatment alternatives, drug properties and interactions, and preventive health-care measures.
- **Clerical —** Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.

back to top

Skills

5 of 12 displayed

- **Active Listening —** Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and

not interrupting at inappropriate times.

- **Reading Comprehension —** Understanding written sentences and paragraphs in work related documents.
- **Speaking —** Talking to others to convey information effectively.
- **Critical Thinking —** Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
- **Monitoring —** Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

back to top

Abilities

All 20 displayed

- **Near Vision —** The ability to see details at close range (within a few feet of the observer).
- **Oral Comprehension —** The ability to listen to and understand information and ideas presented through spoken words and sentences.
- **Oral Expression —** The ability to communicate information and ideas in speaking so others will understand.
- **Written Comprehension —** The ability to read and understand information and ideas presented in writing.
- **Speech Recognition —** The ability to identify and understand the speech of another person.
- **Information Ordering —** The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
- **Problem Sensitivity —** The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
- **Category Flexibility —** The ability to generate or use different sets of rules for combining or grouping things in different ways.
- **Deductive Reasoning —** The ability to apply general rules to specific problems to produce answers that make sense.
- **Speech Clarity —** The ability to speak clearly so others can understand you.
- **Finger Dexterity —** The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.
- **Manual Dexterity —** The ability to quickly move your hand, your hand together

with your arm, or your two hands to grasp, manipulate, or assemble objects.

- **Mathematical Reasoning —** The ability to choose the right mathematical methods or formulas to solve a problem.
- **Number Facility —** The ability to add, subtract, multiply, or divide quickly and correctly.
- **Perceptual Speed —** The ability to quickly and accurately compare similarities and differences among sets of letters, numbers, objects, pictures, or patterns. The things to be compared may be presented at the same time or one after the other. This ability also includes comparing a presented object with a remembered object.
- **Arm-Hand Steadiness —** The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.
- **Far Vision —** The ability to see details at a distance.
- **Inductive Reasoning —** The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).
- **Selective Attention —** The ability to concentrate on a task over a period of time without being distracted.
- **Visual Color Discrimination —** The ability to match or detect differences between colors, including shades of color and brightness.

back to top

Work Activities

All 24 displayed

- **Getting Information —** Observing, receiving, and otherwise obtaining information from all relevant sources.
- **Interacting With Computers —** Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- **Performing for or Working Directly with the Public —** Performing for people or dealing directly with the public. This includes serving customers in restaurants and stores, and receiving clients or guests.
- **Identifying Objects, Actions, and Events —** Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- **Processing Information —** Compiling, coding, categorizing, calculating, tabulating, auditing, or verifying information or data.

- **Communicating with Supervisors, Peers, or Subordinates —** Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- **Organizing, Planning, and Prioritizing Work —** Developing specific goals and plans to prioritize, organize, and accomplish your work.
- **Assisting and Caring for Others —** Providing personal assistance, medical attention, emotional support, or other personal care to others such as coworkers, customers, or patients.
- **Documenting/Recording Information —** Entering, transcribing, recording, storing, or maintaining information in written or electronic/magnetic form.
- **Monitor Processes, Materials, or Surroundings —** Monitoring and reviewing information from materials, events, or the environment, to detect or assess problems.
- **Handling and Moving Objects —** Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- **Updating and Using Relevant Knowledge —** Keeping up-to-date technically and applying new knowledge to your job.
- **Making Decisions and Solving Problems —** Analyzing information and evaluating results to choose the best solution and solve problems.
- **Establishing and Maintaining Interpersonal Relationships —** Developing constructive and cooperative working relationships with others, and maintaining them over time.
- **Evaluating Information to Determine Compliance with Standards —** Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.
- **Interpreting the Meaning of Information for Others —** Translating or explaining what information means and how it can be used.
- **Communicating with Persons Outside Organization —** Communicating with people outside the organization, representing the organization to customers, the public, government, and other external sources. This information can be exchanged in person, in writing, or by telephone or e-mail.
- **Resolving Conflicts and Negotiating with Others —** Handling complaints, settling disputes, and resolving grievances and conflicts, or otherwise negotiating with others.
- **Analyzing Data or Information —** Identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts.
- **Coordinating the Work and Activities of Others —** Getting members of a group to work together to accomplish tasks.
- **Inspecting Equipment, Structures, or Material —** Inspecting equipment,

structures, or materials to identify the cause of errors or other problems or defects.

- **Developing and Building Teams —** Encouraging and building mutual trust, respect, and cooperation among team members.
- **Training and Teaching Others —** Identifying the educational needs of others, developing formal educational or training programs or classes, and teaching or instructing others.
- **Performing General Physical Activities —** Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

back to top

Detailed Work Activities

All 11 displayed

- Record patient medical histories.
- Verify accuracy of patient information.
- Perform clerical work in medical settings.
- Maintain inventory of medical supplies or equipment.
- Maintain medical equipment or instruments.
- Prepare medications or medical solutions.
- Enter patient or treatment data into computers.
- Sterilize medical equipment or instruments.
- Clean medical equipment or facilities.
- Process medical billing information.
- Merchandise healthcare products or services.

Find occupations related to multiple detailed work activities

back to top

Work Context

All 25 displayed

- **Telephone —** 95% responded “Every day.”
- **Contact With Others —** 80% responded “Constant contact with others.”
- **Face-to-Face Discussions —** 91% responded “Every day.”
- **Spend Time Standing —** 80% responded “Continually or almost continually.”

- **Indoors, Environmentally Controlled —** 88% responded "Every day."
- **Importance of Being Exact or Accurate —** 76% responded "Extremely important."
- **Time Pressure —** 80% responded "Every day."
- **Electronic Mail —** 72% responded "Every day."
- **Work With Work Group or Team —** 62% responded "Extremely important."
- **Deal With External Customers —** 63% responded "Extremely important."
- **Physical Proximity —** 45% responded "Very close (near touching)."
- **Spend Time Making Repetitive Motions —** 52% responded "Continually or almost continually."
- **Importance of Repeating Same Tasks —** 58% responded "Extremely important."
- **Deal With Unpleasant or Angry People —** 57% responded "Once a week or more but not every day."
- **Spend Time Using Your Hands to Handle, Control, or Feel Objects, Tools, or Controls —** 69% responded "Continually or almost continually."
- **Exposed to Disease or Infections —** 63% responded "Every day."
- **Consequence of Error —** 47% responded "Extremely serious."
- **Frequency of Decision Making —** 61% responded "Every day."
- **Frequency of Conflict Situations —** 53% responded "Once a week or more but not every day."
- **Impact of Decisions on Co-workers or Company Results —** 39% responded "Very important results."
- **Spend Time Walking and Running —** 29% responded "More than half the time."
- **Structured versus Unstructured Work —** 50% responded "Some freedom."
- **Coordinate or Lead Others —** 25% responded "Extremely important."
- **Responsibility for Outcomes and Results —** 38% responded "Moderate responsibility."
- **Freedom to Make Decisions —** 31% responded "Limited freedom."

back to top

Job Zone

Title Job Zone Three: Medium Preparation Needed

Education Most occupations in this zone require training in vocational

schools, related on-the-job experience, or an associate's degree.

Related Experience Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.

Job Training Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers. A recognized apprenticeship program may be associated with these occupations.

Job Zone Examples These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include food service managers, electricians, agricultural technicians, legal secretaries, occupational therapy assistants, and medical assistants.

SVP Range (6.0 to < 7.0)

back to top

Education

Percentage of Respondents	Education Level Required
60	High school diploma or equivalent
14	Post-secondary certificate
13	Some college, no degree

back to top

Credentials

Find Training | Find Certifications | Find Licenses | Find Apprenticeships

back to top

Interests

All 2 displayed

Interest code: **CR**

- **Conventional —** Conventional occupations frequently involve following set procedures and routines. These occupations can include working with data and details more than with ideas. Usually there is a clear line of authority to follow.
- **Realistic —** Realistic occupations frequently involve work activities that include practical, hands-on problems and solutions. They often deal with plants, animals, and real-world materials like wood, tools, and machinery. Many of the occupations require working outside, and do not involve a lot of paperwork or working closely with others.

back to top

Work Styles

All 16 displayed

- **Attention to Detail —** Job requires being careful about detail and thorough in completing work tasks.
- **Integrity —** Job requires being honest and ethical.
- **Concern for Others —** Job requires being sensitive to others' needs and feelings and being understanding and helpful on the job.
- **Cooperation —** Job requires being pleasant with others on the job and displaying a good-natured, cooperative attitude.
- **Dependability —** Job requires being reliable, responsible, and dependable, and fulfilling obligations.
- **Stress Tolerance —** Job requires accepting criticism and dealing calmly and effectively with high stress situations.
- **Adaptability/Flexibility —** Job requires being open to change (positive or negative) and to considerable variety in the workplace.
- **Self Control —** Job requires maintaining composure, keeping emotions in check, controlling anger, and avoiding aggressive behavior, even in very difficult situations.
- **Initiative —** Job requires a willingness to take on responsibilities and challenges.
- **Achievement/Effort —** Job requires establishing and maintaining personally challenging achievement goals and exerting effort toward mastering tasks.
- **Social Orientation —** Job requires preferring to work with others rather than alone, and being personally connected with others on the job.
- **Independence —** Job requires developing one's own ways of doing things, guiding oneself with little or no supervision, and depending on oneself to get things done.

- **Persistence —** Job requires persistence in the face of obstacles.
- **Leadership —** Job requires a willingness to lead, take charge, and offer opinions and direction.
- **Analytical Thinking —** Job requires analyzing information and using logic to address work-related issues and problems.
- **Innovation —** Job requires creativity and alternative thinking to develop new ideas for and answers to work-related problems.

back to top

Work Values

All 3 displayed

- **Relationships —** Occupations that satisfy this work value allow employees to provide service to others and work with co-workers in a friendly non-competitive environment. Corresponding needs are Co-workers, Moral Values and Social Service.
- **Support —** Occupations that satisfy this work value offer supportive management that stands behind employees. Corresponding needs are Company Policies, Supervision: Human Relations and Supervision: Technical.
- **Achievement —** Occupations that satisfy this work value are results oriented and allow employees to use their strongest abilities, giving them a feeling of accomplishment. Corresponding needs are Ability Utilization and Achievement.

back to top

Related Occupations

All 10 displayed

29-2061.00	Licensed Practical and Licensed Vocational Nurses
29-2081.00	Opticians, Dispensing
31-2011.00	Occupational Therapy Assistants
31-2021.00	Physical Therapist Assistants
31-2022.00	Physical Therapist Aides
31-9091.00	Dental Assistants
31-9092.00	Medical Assistants **Bright Outlook**
31-9095.00	Pharmacy Aides
31-9096.00	Veterinary Assistants and Laboratory Animal Caretakers

31-9099.02 Endoscopy Technicians

back to top

Wages & Employment Trends

Median wages (2014)	$14.33 hourly, $29,810 annual
State wages	Local Salary Info
Employment (2012)	355,000 employees
Projected growth (2012-2022)	Faster than average (15% to 21%)
Projected job openings (2012-2022)	105,900
State trends	Employment Trends
Top industries (2012)	Retail Trade Health Care and Social Assistance

Source: Bureau of Labor Statistics 2014 wage data and 2012-2022 employment projections. "Projected growth" represents the estimated change in total employment over the projections period (2012-2022). "Projected job openings" represent openings due to growth and replacement.

back to top

Job Openings on the Web

Find Jobs Job Banks

back to top

Sources of Additional Information

All 4 displayed

Disclaimer: Sources are listed to provide additional information on related jobs, specialties, and/or industries. Links to non-DOL Internet sites are provided for your convenience and do not constitute an endorsement.

- Pharmacy Technicians. Bureau of Labor Statistics, U.S. Department of Labor.

Occupational Outlook Handbook, 2014-15 Edition.

- American Society of Health-System Pharmacists (ASHP), 7272 Wisconsin Ave., Bethesda, MD 20814. Phone: (301) 657-3000.
- National Healthcareer Association (NHA), 11161 Overbrook Rd., Leawood, KS 66211. Phone: (800) 499-9092. Fax: (913) 661-6291.
- Pharmacy Technician Certification Board (PTCB), 2215 Constitution Ave. NW, Washington, DC 20037. Phone: (800) 363-8012.

back to top

Health: Allied Health

December 1, 2011

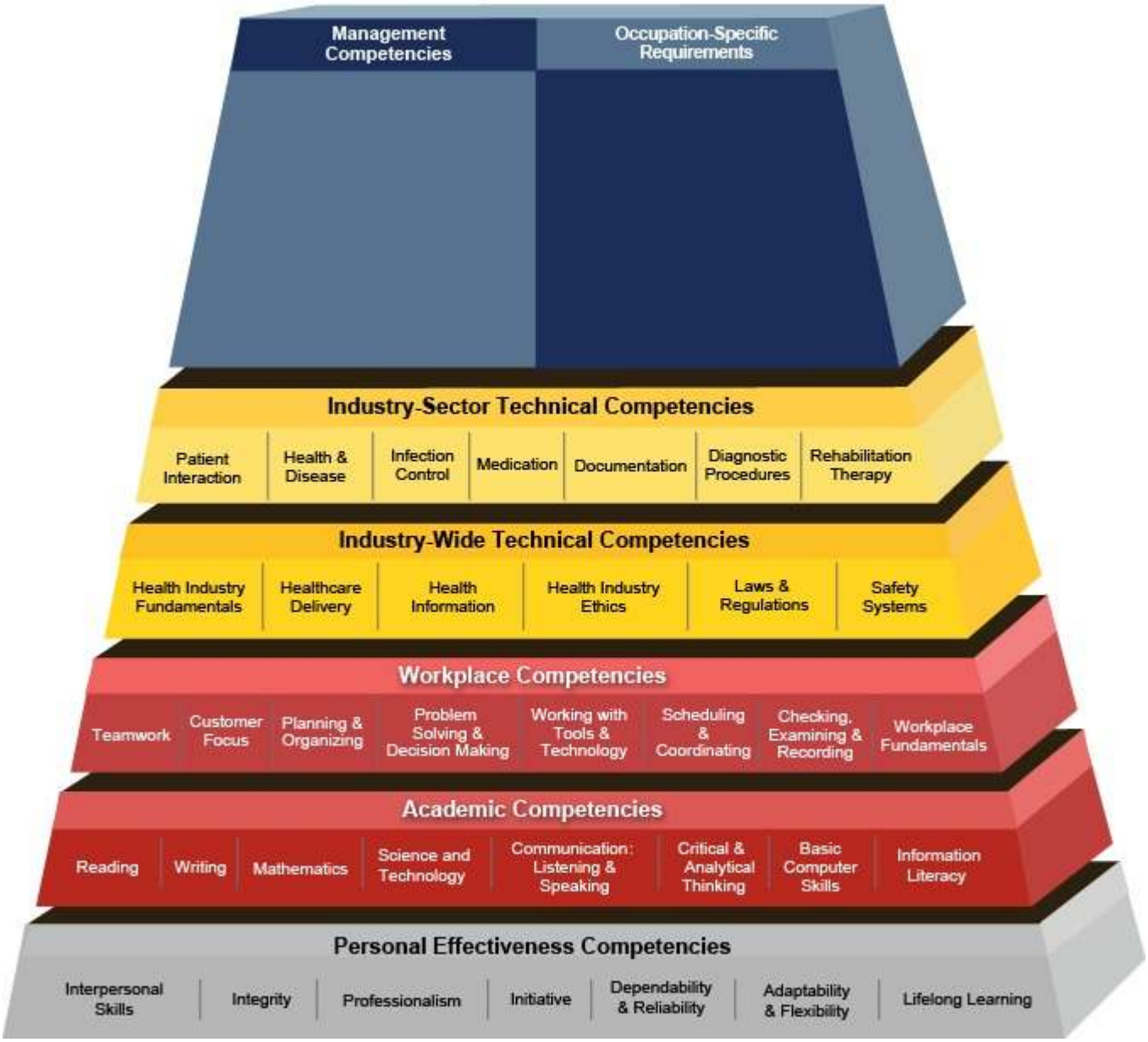


Table of Contents

About the Model

The Health: Allied Health Competency Model identifies the knowledge, skills, and abilities needed for workers to perform successfully in the field of Allied Health. For the purpose of this model, Allied Health professionals are defined as health care practitioners – other than physicians and nurses – who have received formal education or clinical training and who are credentialed through certification, registration, or licensure. Allied Health professionals work as part of the health care team in multiple environments and settings to identify, prevent, and treat diseases, disabilities, and disorders; provide dietary and nutrition services; promote mental and physical health; manage health systems; and deliver therapeutic and rehabilitative services.

While the model is designed to provide a comprehensive collection of Allied Health knowledge, skills, and abilities, it is not intended that Allied Health workers possess all of the competencies listed. The model is rather a compilation of competencies that can be included as a basis for preparation in an Allied Health occupation. As a result, there are no metrics or distinction between entry and advanced level competencies.

The Health: Allied Health Competency Model is depicted in a graphic consisting of several tiers. The arrangement of the tiers in a pyramidal shape is not meant to be hierarchical, or to imply that competencies at the top are at a higher level of skill. The model's shape represents the increasing specialization and specificity in the application of skills as you move up the tiers. Tiers 1-5 have been developed and are divided into blocks. The blocks represent competency areas, that is, the applied skills, knowledge, abilities essential to successful performance in the increasingly specialized environment of the health industry. A table of the competency definitions and associated key behaviors follows the graphic.

Tiers 1 through 3 form the foundation competencies generally needed for entry and success for most jobs in the workplace. These competencies represent 'soft-skills' that most employers demand.

Competency – A cluster of related knowledge, skills, and abilities that affects a major part of one's job (a role or responsibility), that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training

Tier 1 – Personal Effectiveness Competencies are personal attributes essential for all life roles. Often referred to as "soft skills," personal effectiveness competencies are generally learned in the home or community and reinforced and honed at school and in the workplace.

Tier 2 – Academic Competencies are critical competencies primarily learned in a school setting. They include cognitive functions and thinking styles. Academic competencies are likely to apply to all industries and occupations.

Tier 3 – Workplace Competencies represent motives and traits, as well as interpersonal and self-management styles. They generally are applicable to a large number of occupations and industries.

Tiers 4 and 5 show the cross-cutting industry-wide technical competencies needed to create career lattices within an industry wherein a worker can move easily across industry sub-sectors.

Rather than narrowly following a single occupational career ladder, this model supports the development of an agile workforce.

Tier 4 – Industry-Wide Technical Competencies represent the knowledge and skills that are common across sectors within a broader industry. These technical competencies build on, but are more specific than, competencies represented on lower tiers.

Tier 5 – Industry-Sector Technical Competencies represent a sub-set of industry technical competencies that are specific to an industry sector.

The upper tiers represent the specialization that occurs within specific *occupations* within an industry. Information on occupational competencies is available through O*NET OnLine (http://online.onetcenter.org/).

Tier One – Personal Effectiveness Competencies

1. Interpersonal Skills: Demonstrating the ability to work effectively with others.

Demonstrating concern for others

- Show sincere interest in others and their concerns
- Demonstrate sensitivity to the needs and feelings of others
- Look for ways to help people, and pitch in to help others

Demonstrating insight into behavior

- Recognize and accurately interpret the verbal and nonverbal behavior of others
- Show insight into the actions and motives of others
- Recognize when relationships with others are strained

Maintaining open communication

- Maintain open lines of communication with others
- Encourage others to approach him/her with problems and successes
- Establish a high degree of trust and credibility with others

Respecting diversity

- Demonstrate sensitivity and respect for the opinions, perspectives, customs, and individual differences of others
- Value diversity of people and ideas
- Deal with a wide range of people with flexibility and open-mindedness
- Listen to and consider others' viewpoints
- Work well and develop effective relationships with diverse personalities

2. Integrity: Displaying accepted social and work behaviors.

Behaving ethically

- Abide by a strict code of ethics and behavior
- Choose an ethical course of action and do the right thing, even in the face of opposition
- Encourage others to behave accordingly

Acting fairly

- Treat others with honesty, fairness, and respect
- Make decisions that are objective and reflect the just treatment of others

Taking responsibility

- Take responsibility for accomplishing work goals within accepted timeframes

- Accept responsibility/accountability for one's decisions and actions and for those of one's group, team, or department
- Understand that past behavior may affect ability to obtain occupation or its requirements
- Attempt to learn from mistakes

3. Professionalism: Maintaining a professional demeanor at work.

Demonstrating self-control

- Demonstrate self-control by maintaining composure and keeping emotions in check even in very difficult situations
- Deal calmly and effectively with stressful situations

Professional appearance

- Maintain a professional demeanor
- Dress appropriately for occupation and its requirements
- Maintain appropriate personal hygiene
- Wear appropriate identification
- Remain free from substance abuse

Maintains a positive attitude

- Project a professional image of oneself and the organization
- Demonstrate a positive attitude towards work
- Take pride in one's work and the work of the organization

4. Initiative: Demonstrating a willingness to work.

Persisting

- Pursue work with energy, drive, and a strong accomplishment orientation
- Persist and expend extra effort to accomplish tasks even when conditions are difficult or deadlines are tight
- Persist at a task or problem despite interruptions, obstacles, or setbacks

Taking initiative

- Go beyond the routine demands of the job
- Take initiative in seeking out new work challenges and increasing the variety and scope of one's job
- Seek opportunities to influence events and originate action
- Assist others who have less experience or have heavy workloads

Setting challenging goals

- Establish and maintain personally challenging but realistic work goals

- Exert effort toward task mastery
- Bring issues to closure by pushing forward until a resolution is achieved

Working independently

- Develop own ways of doing things
- Perform effectively even with minimal direction, support or approval and without direct supervision
- Strive to exceed standards and expectations
- Exhibit confidence in capabilities and an expectation to succeed in future activities

5. Dependability and Reliability: Displaying responsible behaviors at work.

Fulfilling obligations

- Behave consistently and predictably
- Fulfill obligations reliably, responsibly, and dependably
- Diligently follow through on commitments and consistently meet deadlines
- Demonstrate regular and punctual attendance

Attending to details

- Check work to ensure that all essential details have been considered
- Notice errors or inconsistencies that others have missed, and take prompt, thorough action to correct errors

Complying with policies

- Follow written and verbal directions
- Comply with organizational rules, policies, and procedures

6. Adaptability & Flexibility: Displaying the capability to adapt to new, different, or changing requirements.

Employing unique analyses

- Employ unique analyses and generate new, innovative ideas in complex areas
- Integrate seemingly unrelated information to develop creative solutions
- Develop innovative methods of obtaining or using resources when insufficient resources are available

Entertaining new ideas

- Remain open to considering new ways of doing things
- Actively seek out and carefully consider the merits of new approaches to work
- Embrace new approaches when appropriate and discard approaches that are no longer working

Dealing with ambiguity

- Take effective action when necessary without having to have all the necessary facts in hand
- Change gears in response to unpredictable or unexpected events, pressures, situations and job demands
- Change plans, goals, actions or priorities to deal with changing situations

7. Lifelong Learning: Displaying a willingness to learn and apply new knowledge and skills.

Demonstrating an interest in learning

- Demonstrate an interest in personal learning and development
- Seek feedback from multiple sources about how to improve and develop, and modify behavior based on feedback or self-analysis of past mistakes

Participating in training

- Take steps to develop and maintain knowledge, skills, and expertise necessary to achieve positive results
- Participate fully in relevant training and professional development programs
- Pursue opportunities to develop knowledge and skills

Anticipating changes in work

- Anticipate changes in work demands and search for and participate in assignments or training that address these changing demands
- Treat unexpected circumstances as opportunities to learn

Identifying career interests

- Take charge of personal career development by identifying occupational interests, strengths, options and opportunities
- Make insightful career planning decisions based on integration and consideration of others' feedback, and seek out additional training to pursue career goals

Tier 2 – Academic Competencies

1. Reading: Understanding written sentences and paragraphs in work-related documents.

Comprehension

- Locate, understand, and interpret written information in prose and in documents such as manuals, reports, memos, letters, forms, graphs, charts, tables, calendars, schedules, signs, notices, applications and directions
- Understand the purpose of written materials
- Attain meaning and comprehend core ideas
- Locate definitions of unfamiliar terms
- Critically evaluate and analyze information in written materials
- Integrate and synthesize information from multiple written materials

Attention to detail

- Identify main ideas, implied meaning and details, missing information, and trends
- Note details, facts, and inconsistencies

Application

- Integrate what is learned from written materials with prior knowledge
- Apply what is learned from written material to follow instructions and complete specific tasks
- Apply what is learned from written material to future situations

2. Writing: Using standard English to compile information and prepare written reports.

Organization and development

- Prepare reports that are easy to understand using proper terminology
- Communicate thoughts, ideas, information, messages and other written information, which may contain technical material, in a logical, organized, and coherent manner
- Present ideas that are well developed with supporting information and examples

Mechanics

- Use standard syntax and sentence structure
- Use correct spelling, punctuation, and capitalization
- Use appropriate grammar (e.g., correct tense, subject-verb agreement, no missing words)
- Write legibly
- Proof read finished documents for errors

Tone

- Write in a manner appropriate for industry
- Use language appropriate for the target audience
- Use appropriate tone and word choice (e.g., writing is professional and courteous)

3. Mathematics: Using principles of mathematics to solve problems.

Quantification

- Read and write numbers
- Count and place numbers in sequence
- Recognize whether one number is larger than another

Computation

- Add, subtract, multiply, and divide with whole numbers, fractions, decimals, and percents
- Calculate averages, ratios, proportions and rates
- Convert decimals to fractions
- Convert fractions to percents

Measurement and estimation

- Take measurements of time, temperature, distances, length, width, height, perimeter, area, volume, weight, velocity, and speed
- Use and report measurements correctly
- Convert from one measurement to another (e.g., from English to metric or International System of Units (SI), or Fahrenheit to Celsius)

Application

- Perform basic math computations accurately
- Translate practical problems into useful mathematical expressions
- Use appropriate mathematical formulas and techniques

4. Science and Technology: Using scientific methods and technology to solve problems.

Comprehension

- Understand basic scientific principles and how to use commonly available technology
- Understand the scientific method (i.e., identifies problems, collects information, forms opinions and draws conclusions)
- Knowledge of Biology, Chemistry, Nutrition, Anatomy, Physiology, Physics

Application

- Understand overall intent and proper procedures for set-up and operation of equipment

- Apply basic scientific principles and technology to complete tasks

5. Communication – Listening & Speaking: Giving full attention to what others are saying and speaking in English well enough to be understood by others.

Speaking

- Express information to individuals or groups taking into account the audience and the nature of the information (e.g., technical or controversial)
- Speak clearly and confidently
- Speak using common English conventions including proper grammar, tone, and pace
- Track listener responses and react appropriately to those responses
- Effectively use eye contact and non-verbal expression

Listening

- Receive, attend to, interpret, understand, and respond to verbal messages and other cues
- Pick out important information in verbal messages
- Understand complex instructions
- Acknowledge feelings and concerns of verbal messages

Two-way communication

- Practice meaningful two-way communication (i.e., speak clearly, pay close attention and seek to understand others, listen attentively and clarify information)
- Attend to nonverbal cues and respond appropriately

Persuasion/influence

- Influence others
- Persuasively present thoughts and ideas
- Gain commitment and ensure support for proposed ideas

6. Critical & Analytical Thinking: Using logic, reasoning, and analysis to address problems.

Reasoning

- Possess sufficient inductive and deductive reasoning ability to perform job successfully
- Critically review, analyze, synthesize, compare and interpret information
- Draw conclusions from relevant and/or missing information
- Understand the principles underlying the relationship among facts and apply this understanding when solving problems

Mental agility

- Identify connections between issues
- Quickly understand, orient to, and learn new assignments
- Shift gears and change direction when working on multiple projects or issues

7. Basic Computer Skills: Using a computer and related applications to input and retrieve information.

Comprehending the basics

- Understand and efficiently use basic computer hardware (e.g. Pcs, printers) and software (e.g. Word processing software, spreadsheet software) to perform tasks
- Understand common computer terminology (e.g., program, operating system) and possess familiarity with the fundamental capabilities of computers

Entering data

- Enter data into computer files quickly, with an acceptable degree of accuracy
- Double check data entry carefully
- Notice when data are missing or look wrong
- Take steps to ensure computer files are complete and accurate

Preparing documents

- Use word processing programs to create, edit, and retrieve document files
- Type materials quickly and accurately
- Check work carefully and identify/correct typographical errors
- Use basic reference materials and tools (e.g., spell check) to ensure accuracy

Keyboarding and word processing

- Skillfully use word-processing software
- Streamline document processing by employing a variety of common software functions
- Use correct style and format, even when confronted by uncommon requirements that deviate from standard guides
- Consult appropriate manuals when uncertain about the correct style and format

Internet applications

- Effectively use the internet and web-based tools to manage basic workplace tasks (e.g., timekeeping, maintaining employee records, conducting information searches)
- Understand and perform internet functions requiring the use of log-in and password information
- Understand and comply with guidelines surrounding internet usage
- Understand and comply with information security processes and guidelines

E-mailing

- Compose professional e-mails to communicate business-related information to coworkers, colleagues, and customers
- Understand the company e-mail system and its basic functions (e.g., replying to/forwarding messages, using electronic address books, attaching files)

- Ensure that key stakeholders are kept informed of communications by copying (i.e., "ccing") them on important e-mails when appropriate

Spreadsheets

- Use spreadsheet software to enter, manipulate, edit and format text and numerical data
- Effectively create and save worksheets, charts, and graphs that are well organized and useful

8. <u>Information Literacy</u>: Functional and critical thinking skills related to information, media, and technology.

Locate and Evaluate Information

- Locate information efficiently (time) and effectively (sources)
- Navigate information systems in academic or workplace settings
- Evaluate information critically and competently
- Review information obtained for relevance and completeness
- Recognize important gaps in existing information
- Take steps to eliminate those gaps

Use and Manage Information

- Use information accurately and creatively for the issue or problem at hand
- Manage the flow of information from a wide variety of sources
- Organize/reorganize information as appropriate to get a better understanding of a problem

Analyze Media

- Understand both how and why media messages are constructed, and for what purposes
- Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors

Tier 3 – Workplace Competencies

1. Teamwork: Working cooperatively with others to complete work assignments.

Acknowledging team membership and role

- Accept membership in the team
- Identify the roles of each team member
- Show loyalty to the team
- Determine when to be a leader and when to be a follower depending on what is needed to achieve the team's goals and objectives
- Encourage others to express their ideas and opinions
- Identify and draw upon team members' strengths and weaknesses to achieve results
- Learn from other team members

Establishing productive relationships

- Develop constructive and cooperative working relationships with others
- Exhibit tact and diplomacy and strive to build consensus
- Show sensitivity to the thoughts and opinions of other team members
- Deliver constructive criticism and voice objections to others' ideas and opinions in a supportive, non-accusatory manner
- Respond appropriately to positive and negative feedback

Identifying with the team and its goals

- Identify the goals, norms, values, and customs of the team
- Cooperate with others and contribute to the group's effort
- Use a group approach to identify problems and develop solutions based on group consensus
- Effectively communicate with all members of the group or team to achieve team goals and objectives

Resolving conflicts

- Bring others together to reconcile differences
- Handle conflicts maturely by exercising "give and take" to achieve positive results for all parties
- Reach formal or informal agreements that promote mutual goals and interests, and obtain commitment to those agreements from individuals or groups

2. Customer Focus: Actively looking for ways to meet customer or client needs.

Understanding customer needs

- Demonstrate a desire to understand client/patient needs
- Listen to what clients/patients are saying and asks questions as appropriate

Providing personalized service

- Provide prompt, efficient, and personalized assistance to meet the requirements, requests, and concerns of clients/patients
- Provide thorough, accurate information to answer clients/patients' questions
- Actively look for ways to help clients/patients by identifying and proposing appropriate solutions and/or services
- Establish boundaries as appropriate for unreasonable client/patient demands

Acting professionally

- Deal with internal or external customers in a pleasant, courteous, and professional manner
- Develop constructive and cooperative working relationships with clients/patients, and display a good-natured, cooperative attitude
- Deal with difficult clients/patients in a calm and empathetic manner
- Represent the organization to the public

Keeping customers informed

- Follow up with clients/patients
- Keep clients/patients up to date about decisions that affect them

3. Planning & Organizing: Planning and prioritizing work to manage time effectively and accomplish assigned tasks.

Planning

- Approach work in a methodical manner
- Plan and schedule tasks so that work is completed on time
- Keep track of details to ensure work is performed accurately and completely
- Work concurrently on several tasks
- Anticipate obstacles to project completion and develop contingency plans to address them
- Takes necessary corrective action when projects go off-track

Prioritizing

- Prioritize various competing tasks and perform them quickly and efficiently according to their urgency
- Find new ways of organizing work area or planning work to accomplish work more efficiently

Allocating resources

- Estimate resources needed for project completion
- Allocate time and resources effectively and coordinate efforts with all affected parties

- Keep all parties informed of progress and all relevant changes to project timelines

Project Management

- Team work
- Team building
- Goal setting
- Organization
- Adaptation
- Communication

4. <u>Problem Solving & Decision Making</u>: Applying critical-thinking skills to solve problems by generating, evaluating, and implementing solutions.

Identifying the problem

- Anticipate or recognize the existence of a problem
- Identify the true nature of the problem by analyzing its component parts
- Evaluate the criticality of the situation
- Use all available reference systems to locate and obtain information relevant to the problem
- Recall previously learned information that is relevant to the problem
- Document the problem and corrective action

Locating, gathering, and organizing relevant information

- Effectively use both internal resources (e.g., internal computer networks, manuals, policy or procedure guidelines) and external resources (e.g., internet search engines) to locate and gather information
- Examine information obtained for relevance and completeness
- Recognize important gaps in existing information and take steps to eliminate those gaps
- Organize/reorganize information as appropriate to gain a better understanding of the problem
- Refer the problem to appropriate personnel when necessary

Generating alternatives

- Integrate previously learned and externally obtained information to generate a variety of high-quality alternative approaches to the problem
- Use logic and analysis to identify the strengths and weaknesses, the costs and benefits, and the short- and long-term consequences of different approaches

Choosing a solution

- Choose the best solution after contemplating available approaches to the problem
- Make difficult decisions even in highly ambiguous or ill-defined situations

Implementing the solution

- Commit to a solution in a timely manner, and develop a realistic approach for implementing the chosen solution
- Observe and evaluate the outcomes of implementing the solution to assess the need for alternative approaches and to identify lessons learned

5. Working with Tools & Technology: Selecting, using, and maintaining tools and technology to facilitate work activity.

Selecting tools

- Select and apply appropriate tools or technological solutions to frequently encountered problems
- Set up and adjust equipment

Keeping current

- Demonstrate an interest in learning about new and emerging tools and technologies
- Seek out opportunities to improve knowledge of tools and technologies that may assist in streamlining work and improving productivity
- Read technical operating, service, or repair manuals to identify information

Troubleshooting

- Clean, inspect, and maintain equipment
- Troubleshoot tools and technologies
- Identify possible defects or other problems

6. Scheduling & Coordinating: Making arrangements and scheduling appointments.

Informing

- Respond to the schedules of others affected by arrangements
- Inform others of arrangements, giving them complete, accurate and timely information
- Ensure that others receive needed materials in time

Verifying

- Take steps to verify all arrangements
- Recognize problems, generate effective alternatives, and take corrective action

Coordinating in distributed environments

- Coordinate schedules of colleagues, co-workers, and clients to ensure that inconvenience is minimized and productivity is enhanced
- Leverage technology (e.g., internet, teleconference) to facilitate information sharing in distributed work environments

Shiftwork

- Disseminate crucial information in an organized manner to rapidly bring employees up to speed at the start of their shifts
- Ensure that employees are updated on work completed on past shifts and work that still needs to be completed

7. Checking, Examining, & Recording: Entering, transcribing, recording, storing, or maintaining information in written or electronic/magnetic format.

Completing forms

- Select and complete appropriate forms quickly and completely
- Attend to and follow through on important information in paperwork
- Forward or process forms in a timely and accurate manner

Obtaining information

- Obtain appropriate information, signatures, and approvals promptly
- Verify that all information is complete and accurate before forwarding materials

Maintaining logs

- File documentation in accordance with agency requirements
- Keep logs, records, and files that are up-to-date and readily accessible
- Update logs, files, and records, noting important changes in status

Detecting errors

- Detect and correct errors and inconsistencies even under time pressure
- Identify vague or ambiguous documentation
- Route to appropriate person to correct documentation

8. Workplace Fundamentals: Knowledge of basic business principles, trends, and economics.

Situational awareness

- Understand the organization's mission and functions
- Recognize one's role in the functioning of the organization and understand the potential impact one's own performance can have on the success of the organization
- Grasp the potential impact of the organization's well-being on employees

Business ethics

- Demonstrate respect for coworkers, colleagues, and customers
- Act in the best interest of the client/patient, the organization, the community, and the environment
- Comply with applicable laws and rules governing work and report loss, waste, or theft of company property to appropriate personnel

Tier 4 – Industry-Wide Technical Competencies

1. Health Industry Fundamentals: Understanding the basic components and culture of the Health Industry.

Critical Work Functions

- Understand the components of the Health Industry: the key stakeholders, command and control processes, and workflow
- Understand the components of the Health Industry and services provided by each
- Understand difference between independent practices and practices that require patient-referral (dependent)
- Understand the importance of licensure, registration, and certification requirements
- Maintain and improve knowledge and skills by:
  - Reading journal articles
  - Studying text books related to the field
  - Attending continuing education courses
  - Critically evaluating and appropriately implementing new techniques and technologies supported by research-based evidence
- Understand the purpose, function and types of health insurance
- Understand patient-billing processes and means of paying for care
- Understand compliance issues with third party payer treatment requirements

Technical Content Areas

Practitioners Offices

- Dependent – by referral
- Independent

Treatment Facilities

Hospitals – Such as:

- Critical Access and Long Term Acute Care
- Medical and Surgical
- Psychiatric and Substance Abuse
- Specialty

Outpatient Centers – Such as:

- Ambulatory Surgery Centers
- Home Healthcare Services
- Medical and Diagnostic Laboratories

- Other Ambulatory Services
- Primary Care Medical Home (PCMH)
- Retail Health Clinics

Nursing and Residential Care Facilities – Such as:

- Residential Care Facilities (assisted living) for the Elderly
- Residential Facilities for People with Disabilities
- Skilled Nursing Facilities

Occupational Requirements

- Education and continuing education requirements
- Occupational regulation (e.g., licensure, registration, certification) and facility/program accreditation requirements
- State and federal legislation and regulations that govern the delivery of health services

Related Health Industry – Such as:

- Health industry product vendors
- Health research organizations
- Pharmaceutical research companies
- Public health agencies

Health Insurance

- Health insurance options (HMO, PPO, EOP, POS, etc.)
- Medicaid/Medicare compliance guidelines
- Record-keeping
- Referrals

Healthcare Standards

- Culture of safety
- Patient-centric service
- Quality outcomes
- Service excellence

2. Healthcare Delivery: Understanding the practices, procedures, and personnel used to deliver quality patient care.

Critical Work Functions

- Understand and adhere to the principles of quality care

- Understand the roles and responsibilities of the major health occupations
- Demonstrate a basic understanding of the roles, boundaries, and working relationships of interdisciplinary teams
- Identify one's role on a team, in the department, organization, and overall health environment
- Evaluate the appropriateness of an ordered plan of care to ensure consistency with evidence-based practice
- Understand the basic healthcare delivery models and their impact on work processes and information exchange
- Understand and implement quality improvement processes, including:
    - Identify errors and hazards in care
    - Continually measure quality of care in terms of structure, process, and outcomes in relation to patient and community needs
    - Design and test interventions to change processes and systems of care with the goal of improving care
- Apply research findings in the provision of patient care (evidence-based practice)
- Understand patient rights and responsibilities

Technical Content Areas

Principles of Quality Care

- Patient-centered care
- Interdisciplinary teams
- Evidence-based practice
- Quality and continuous improvement
- Use of Informatics

Major Health Occupations[1]*:*

- Audiologists
- Dentists
- Dietitians
- Expressive/Creative Arts Therapists
- Health Information and Communication Professionals
- Healthcare Managers and Administrators
- Medical Imaging Professionals
- Medical Laboratory Scientists
- Nurses

[1] Additional health care occupations can be found using the American Medical Association's Health Care Career Directory (http://www.ama-assn.org/ama/pub/education-careers/careers-health-care/directory.page), or by visiting Explore Health Careers.org (http://explorehealthcareers.org/).

  - Licensed Practical Nurses
  - Nursing Aides, Orderlies, and Attendants
  - Nurse Practitioners
  - Registered Nurses
- Physician Assistants
- Physicians and Osteopaths
- Podiatrists
- Psychologists
- Speech Language Pathologists
- Therapists and Rehabilitation Specialists
- Vision-related Professions

Healthcare Delivery Models, such as but not limited to:

- Chronic Disease Management
- Community Health Network
- Inpatient Hospital Care

Health Technology (e.g. Telehealth) for the purpose of:

- Diagnoses
- Monitoring
- Treatment

3. Health Information: Understanding the types of health information and the rules and regulations surrounding their use.

Critical Work Functions

- Understand the role and importance of health information to manage knowledge and mitigate error
- Identify and understand health documentation requirements
- Identify and understand health insurance documentation requirements
- Maintain the security and confidentiality of patient records, per HIPAA & other related regulations
- Understand the two-way flow of information and data through the medical organization (originating with both patient and provider)
- Ensure documentation in health records reflect completeness, accuracy, timeliness, appropriateness, quality, integrity, and authenticity as required
- Use medical terminology within a scope of practice in order to interpret, transcribe and communicate information, data and observations
- Use appropriate procedures for submitting and accessing medical information through a Health Information Exchange
- Understand the importance of using secure measures to transmit and dispose of documents and records

Technical Content Areas

The Medical Health Record (paper, electronic, hybrid)

- History - What care has been provided and what is outstanding
- SOAP (Subjective, Objective, Assessment, Plan)
  - Outcomes of care provided and responses to the plan of care
  - Current patient status & assessments
  - Support decisions based on assessments to drive new plans of care
- Diagnoses
- Treatments, Procedures
- Progress notes
- Laboratory results
- Consents
- Nursing and other therapeutic monitoring reports
- Administrative and referral documentation
- Discharge summary and instructions

Medical terminology foundations

- Abbreviations
- Acronyms
- Diagnostic and procedure terms
- Roots, prefixes, suffixes, eponyms

Record keeping and documentation procedures

- Confidentiality
- Record retention and disposal
- Release of information documentation

Health Information Exchange

- Access, retrieval, and submission procedures
- Software

4. Health Industry Ethics: Evaluating and applying the merits, risks, and social concerns of activities in the field of health care.

Critical Work Functions

- Act in the best interests of the client/patient
- Interpret and adhere to a code of ethics
- Adhere to professional standards of clinical practice
- Demonstrate dependability: follow through with all tasks regarding education and

professional training
- Report and prevent abuse and neglect
- Protect confidentiality of client/patient records
- Differentiate between ethical and legal issues impacting health care
- Make ethical decisions
- Respect clients rights and responsibilities
- Understand the role of organizational structures to support ethical decision making (e.g., ethics committees)
- Demonstrate an awareness of cultural competence in the context of cultural, social, age, and ethnic diversity

Technical Content Areas:

Morality and ethics
- Ethical and legal issues impacting the health industries
- Malpractice, liability, and negligence
- Problem sensitivity – the negative consequences of action/inaction
- Problem solving techniques when confronted with ethical dilemmas or issues

Confidentiality
- Expressed, informed, implied, and involuntary consent
- HIPAA
- Patient's Bill of Rights

Cultural sensitivity
- Language assistance services (e.g., bilingual staff and interpreter services)
- National Standards on Culturally and Linguistically Appropriate Services (CLAS)
- Service area demographics

5. Laws and Regulations: Understanding the relevant local, state, and federal laws and regulations that impact the Health industry

Critical Work Functions:
- Understand how changes in laws, regulations, or policies; or new and emerging technologies impact the industry
- Apply the fundamentals of privacy and confidentiality policies and procedures
- Comply with applicable federal and state laws, policies, regulations and legislated rights of clients
- Practice responsibly within the ethical framework of the Patients' Bill of Rights
- Understand the legal responsibilities, limitations, and implications of actions

- Comply with policies and requirements for documentation, information security and record keeping
- Keep up to date on facility/program accreditation standards, as well as federal and state laws and regulations
- Follow agency/facility policies and procedures

Technical Content Areas:

Client/Patient

- Client/patient advocacy
- Client/Patient Bill of Rights
- Good Samaritan Law

Laws and Regulations – Such as:

- Clinical Laboratory Improvement Amendments (CLIA) Regulations
- Emergency medical treatment and active labor act (EMTALA) regulations
- Health Insurance Portability and Accountability Act of 1996 (HIPAA) and updates
- Needle Stick Prevention Act
- Occupational Safety and Health Administration (OSHA)
- Privacy and confidentiality policies and procedures
- Protected Health Information (PHI)
- Relevant state and local laws and regulations

Voluntary Accreditation – Such as:

- American Osteopathic Association regulations
- Commission on Accreditation of Rehabilitation Facilities, CARF International standards
- Joint Commission standards

6. Safety Systems: Understanding the procedures and protocols necessary to ensure a safe and healthy work environment.

Critical Work Functions:

- Understand and implement patient safety practices that promote quality health outcomes, patient security, and health information security
- Understand and follow established safety, security, and environmental practices
- Comply with safety procedures that help prevent and mitigate errors
- Comply with procedures to ensure safe use of equipment
- Comply with local, state, federal, and organization health, safety, security, and environmental policies and regulations
- Follow emergency procedures and protocols
- Decrease waste

Technical Content Areas:

- Biohazard waste procedures
- Centers for Disease Control and Prevention (CDC) Standard Precautions
- Disease prevention
- Infection control
- Material safety data sheets
- Occupational Safety and Health Administration (OSHA) Blood borne Pathogen Standards
- Safety signs, symbols, and labels
- Universal precautions

Tier 5 – Industry-Sector Technical Competencies

1. <u>Patient Interaction</u>: Interacting with a patient or client in a safe, informative, respectful, and effective manner with the goal of communicating medical information or providing patient-centered care.

Critical Work Functions

- Apply principles of patient-centered care
- Use the appropriate methods to verify and record patient information (name, age, DOB, ID number, doctor, etc.)
- Observe and note overall physical condition mental, behavioral, and consciousness states.
- Note pertinent patient history and familial medical history
- Note current medications
- Recognize life-threatening situations and determine the need for emergency intervention
- Ascertain the capacity to cooperate with procedure or treatment
- Apply risk management protocols

Technical Content Areas

Patient-centered Care

- Procedures and goals
- Rapport with the patient and patient's family
- Personal communication skills
- Empathy when client/patient verbalizes questions or concern
- Client/patient response to healthcare status
- Mental capacity and age-appropriate response
- Respectful attitude
- Response to patient/client needs
- Pain control
- Shared decision making and management
- Continuous and reliable care
- Needs of special patient groups

Patient Monitoring

- Methods of patient monitoring, including ambulatory and long-term monitoring
- Signs of improvement or deterioration warranting a change in the plan of care
- Patient monitoring devices
  - Indications
  - Contraindications
  - Preparation Techniques
  - Interpretation

Risk Management

- Risk management protocols
- Informed consent and medical clearance
- Medical emergency procedures

2. Health and Disease: Understanding the human body and the impact of disease and injury on normal function.

Critical Work Functions

- Demonstrate basic knowledge of typical and atypical human systems and development
- Demonstrate an understanding of common injuries, illnesses and diseases to body systems
- Demonstrate basic knowledge of the potentials and problems of illnesses, injuries, and disabilities
- Demonstrate basic knowledge of the causes and symptoms of major exceptionalities
- Understand the basic terminology used in diagnosis and classification

Technical Content Areas

Basic anatomy and physiology

- Body systems and their functions
- Human development
    - Anatomical
    - Physiological
    - Psychological
    - Social

Disease

- Signs and symptoms of common diseases and injuries
- Physical disabilities and health concerns related to physical limitations
- Major developmental disabilities
- Mental and behavioral health disorders (mental illness, chemical dependency)

Terminology

- Medical terminology
- Medical shorthand and abbreviations
- Acronyms
- International Classification of Diseases and Related Health Problems (ICD-9 and ICD-10)
- Diagnostic and Statistical Manual of Mental Disorders (DSM IV-R)

3. Infection Control: Producing and Maintaining an environment to minimize pathogenic microorganisms.

Critical Work Functions

- Understand and apply infection control protocols according to local, state, and federal regulations
- Use all appropriate personal protective equipment (gloves, face mask, scrubs)
- Understand and apply equipment and instrument sterilization techniques
- Report breaches to infection control procedures
- Implement procedures to correct and prevent further contamination in a timely manner
- Follow protocols for disposal of infectious waste

Technical Content Areas

- Occupational Safety and Health Administration (OSHA) Blood borne Pathogen Standards
- Centers for Disease Control and Prevention (CDC) Standard Precautions
- Communicable diseases
  - modes of transmission
  - methods of control
  - related personal and public health risks
- Biohazard waste procedures

4. Medication: Understanding the types of drugs/medications and their purpose, function, and effects on the body.

Critical Work Functions

- Describe the fundamental mechanisms responsible for various types of drug interactions
- Describe the anatomical and physiological factors that influence the delivery of a drug by common dosage forms
- Describe the anatomical and physiological factors which influence the elimination of a drug from the body
- Use appropriate procedures for care and handling of medications and solutions
- Understand the concepts of the indications, contraindications, precautions, and adverse reactions for pharmaceutical use
- Identify possible drug-drug or drug-nutrient interactions
- Recognize the common signs and symptoms of adverse medication reactions
- Understand procedures for dealing with adverse reactions to medication

Technical Content Areas

Medication Purpose

- Diagnosis
- Cure

- Mitigation
- Treatment
- Prevention

Medications and Pharmaceuticals

- Medication Identification
- Dosages
- Routes of administration
- Effects and side effects

5. <u>Documentation:</u> Entering, transcribing, recording, storing, or maintaining information in written or electronic/magnetic format to efficiently manage record-keeping.

Critical Work Functions

- Maintain accurate and objective records
- Submit records to appropriate sources in a timely fashion
- Maintain standards of confidentiality and ethical practice
- Learn and keep current with appropriate documentation systems, setting priorities
- Comply with policies and requirements for documentation and record keeping

Technical Content Areas

Obtaining Information

- Information requirements
- Signature requirements
- Approvals

Completing Forms

- Appropriate form selection
- Time requirements
- Accuracy
- Completeness

Maintaining Records

- Organizational requirements
- Timeliness
- Accessibility

Confidentiality

- Legal requirements
- Medical terminology

6. Diagnostic Procedures: Understanding the purpose of diagnostic procedures and the recording and reporting of test and assessment results.

Critical Work Functions

- Demonstrate an understanding of the goals, methods, and relevant technology used for common diagnostic procedures
- Review and evaluate diagnostic records for currency and diagnostic quality
- Demonstrate understanding of the effects of physiological variables on monitoring results

Technical Content Areas

Imaging procedures, such as but not limited to:

- Computed Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Musculoskeletal Imaging
- Nuclear Medicine
- Positron-emission Tomography (PET)
- Radiography (X-Ray)
- Sonography

Diagnostic Procedures, such as but not limited to:

- Cardiac Catheterization
- Electrocardiogram (EKG), (ECG)
- Electroencephalogram (EEG)
- Electroneurodiagnostics
- Electromyography
- Pulmonary Function Testing
- Sleep Disorders Testing

Laboratory Diagnostic tests, such as but not limited to:

- Collection techniques
- Reference ranges
- Test Types
  - Blood Gas
  - Cytology
  - Hematology
  - Histology
  - Immunohematology
  - Immunology
  - Microbiology
  - Molecular
  - Serology

- Urinalysis
- Virology

7. Rehabilitation Therapy: Understanding the purpose of therapy as a means to restore the function of a patient/client diagnosed with an illness or disability through therapeutic measures and reeducation to participate in the activities of a normal life within the limitations of the person's physical disability or health status.

Critical Work Functions

- Understand the elements of a treatment plan for cognitive, emotional, physical, or psychosocial adjustment or development
- Understand the benefits of a rehabilitation/therapy program appropriate to the patient's needs and selected activity(s)
- Understand the various types and benefits of rehabilitative therapies
- Describe the general principles of health maintenance and personal hygiene

Technical Content Areas

Legislation

- Americans with Disabilities Act
- Individuals with Disabilities Education Act
- Older Americans Act

Assessments

- Affective assessment (e.g., attitude toward self, expression)
- Cognitive assessment (e.g., memory, problem solving, attention span, orientation, safety awareness)
- Leisure assessment (e.g., barriers, interests, values, patterns/skills, knowledge)
- Physical assessment (e.g., fitness, motor, skills function)
- Sensory assessment (e.g., vision, hearing, tactile)
- Social assessment (e.g., communication/interactive skills, relationships)

Types of Therapy

- Art Therapy
- Dance/Movement Therapy
- Music Therapy
- Occupational Therapy
- Physical Therapy
- Recreational Therapy
- Respiratory Therapy
- Speech Therapy

Resources Reviewed

Developer	Resource	URL
Academy for Certification of Vision Rehabilitation and Education Professionals	*Low Vision Therapist Certification Handbook*	http://www.acvrep.org/downloads/CLVT%20Certification%20Handbook%202011.doc
Academy for Certification of Vision Rehabilitation and Education Professionals	*Orientation and Mobility Specialist Certification Handbook*	http://www.acvrep.org/downloads/COMS%20Certification%20Handbook%20(F)%202011.doc
Accrediting Bureau of Health Education Schools	*Accreditation Manual, 16th Edition*, 2010	http://abhes.org/assets/uploads/files/2009-07-024a4cce32a4388Accreditation%20Manual%2016th%20Edition.pdf
American Association of Medical Assistants	*Certification/Recertification Examination Content Outline*	http://www.aama-ntl.org/resources/library/ContentOutline.pdf
American Board for Certification in Orthotics, Prosthetics & Pedorthics, Inc.	*Practitioner Book of Rules & Candidate Guide*	http://www.abcop.org/certification/OrthotistsProsthetists/Documents/Practitioner%20guide%208-3-10.pdf
American Board of Cardiovascular Perfusion	*Certification*	http://www.abcp.org/certification.htm
American College of Sports Medicine	*Prepare for the RCEP*	http://www.acsm.org/AM/Template.cfm?Section=Prepare_for_the_RCEP
American Medical Association	*Health Care Career Directory*	http://www.ama-assn.org/ama/pub/education-careers/careers-health-care/directory.page
American Medical Technologist (AMT)	*Content Outline for Medical Technologist and Medical Laboratory Technician Certification Examinations*	http://www.amt1.com/files/MTMLT%20Content%20Outline.pdf
American Music Therapy Association	*AMTA Advanced Competencies*	Hard Copy
American Registry of Radiologic Technologists	*Radiography Certification Handbook and Accreditation Materials*	https://www.arrt.org/publications/2011/RAD_HB_2011.pdf
American Society for Clinical Laboratory Science (ASCLS)	*Practice Levels and Educational Needs of Clinical Laboratory Professionals*	http://www.ascls.org/?page=Pos_Pap_2
American Society of Electroneurodiagnostic Technologists, Inc. [ASET]	*National Competency Skill Standards for ICU/cEEG Monitoring*	http://www.aset.org/files/public/ICU_cEEG_Competencies.pdf
American Society of Exercise Physiologists	*Board Certification for Exercise Physiologists: Test Dates, Benefits, and Requirements*	http://www.asep.org/services/EPCexam
American Speech-Language-Hearing Association	*2011 Audiology Certification Standards*	http://www.asha.org/Certification/Aud2011Standards/#Standard%20IV
American Speech-Language-Hearing Association	*2011 Audiology Certification Standards*	http://www.asha.org/Certification/Aud2011Standards/#Standard%20IV
American Speech-Language-Hearing Association	*SLP Certification Standards*	http://www.asha.org/certification/slp_standards.htm#Std_III

Arizona Department of Education	*Medical Imaging Support Services*	http://www.aztechprep.org/CTE_Programs/Career_Prep/Allied_Health/MedImageSS/MISSsck.xls
Association of Schools of Allied Health Professionals	*Definition of Allied Health*	http://www.asahp.org/definition.htm
Association of Surgical Technology	*Core Curriculum for Surgical Technology*	http://www.mavcc.org/cw/ISTcrosswalk.pdf
Cardiovascular Credentialing International	*Certified Cardiographic Technician (CCT) Matrix, Knowledge List, & Task List*	http://cci-online.org/content/cct-matrix-task-list
Career clusters HIT	*Health Science Career Cluster: Diagnostic Services Pathway Knowledge and Skill Statements*	http://www.careerclusters.org/resources/pos_ks/KSChart/2008/HS-149-KSCHART.pdf
Commission on Dietetic Registration – the credentialing agency for the American Dietetic Association	*Registration Examination for Dietitians: Handbook for Candidates*	http://www.cdrnet.org/PDFs/ADA%20CDR%20RD%20Handbook.pdf
Commission on Rehabilitation Counselor Certification	CRC/CCRC Scope of Practice	http://www.crccertification.com/pages/crc_ccrc_scope_of_practice/43.php
Committee on Accreditation for Education in Electroneurodiagnostic Technology (CoA-END)	*END Program Graduate Competencies*	http://www.aset.org/files/public/END_Program_Graduate_Competencies.pdf
CSEP Certified Exercise Physiologist	*CSEP Certified Exercise Physiologist - Certification Process*	http://www.fitnessnb.ca/cepcertification.htm
Explore Health Careers.org	*Healthcare Careers*	http://explorehealthcareers.org
Far West Laboratory for Educational Research and Development	*National Health Care Skill Standards Project*	Hard copy
Federation of State Boards of Physical Therapy	*2010 NPTE Candidate Handbook For the National Physical Therapy Examinations: PT, PTA*	http://www.fsbpt.org/download/CandidateHandbook20110114.pdf
Hartford Community College	*Histotechnology Certification Program Online*	http://www.harford.edu/cet/histotech/courseoutline.asp?FA=Welcome
Health Professions Network	*Allied Health Fact Sheet*	http://www.healthpronet.org/docs/allied_health_fact_sheet.pdf
Health Workforce Solutions	*Innovative Care Models*	http://www.innovativecaremodels.com/
IBM Institute for Business Value	*Healthcare 2015 and Care Delivery: Delivery Models Refined, Competencies Defined*	http://www-03.ibm.com/industries/ca/en/healthcare/files/hc2015_full_report_ver2.pdf
Illinois Occupational Skill Standards and Credentialing Council	*Illinois Occupational Skill Standards Dental Hygienist*	http://www.ioes.org/media/documents/1729152.pdf
Institute of Medicine of the National Academies	*Health Professions Education: A Bridge to Quality*	Hard copy
Joint Commission on Allied health Personnel in Ophthalmology	*Criteria for Certification and Recertification*	http://www.jcahpo.org/certification/pdfs/CriteriaforCert_FULL.pdf

Joint Commission on Allied health Personnel in Ophthalmology	*Certified Ophthalmic Technician Certification Requirements*	http://www.jcahpo.org/certification/pdfs/COT_Content_New_2010.pdf
National Athletic Trainers' Association	*Athletic Training Educational Competencies, 2005*	http://www.hawkeyehealthcare.com/Education/Handbook/Competencies/Compentencies_v4.htm
National Board of Respiratory Care	*Detailed Credentialing Examinations Content Outlines*	http://www.nbrc.org/Examinations/tabid/70/Default.aspx
National Certification Board for Therapeutic Massage & Bodywork Code of Ethics	*National Certification Examination: Candidate Handbook*	http://www.ncbtmb.org/pdf/CandidateHandbook.pdf
National Council for Therapeutic Recreation Certification	*Information for the Certified Therapeutic Recreation Specialist and New Applicants*	http://www.nctrc.org/documents/2ExamInfo.pdf
National Healthcare Association	*Clinical Medical Assistant Certification Exam (CCMA) Candidate Handbook*	http://www.nhanow.com/Libraries/pdf/CCMA_Candidate_Handbook.sflb.ashx
NBCRNA Council on Certification of Nurse Anesthetists (CCNA)	*Candidate Handbook*	http://www.nbcrna.com/downloads/CCNA/NCE%20Materials/11%202011%20CCNA%20Candidate%20Handbook.pdf
Oregon.gov	*Clinical Dietitian*	http://www.oregon.gov/DAS/HR/class/ccrt/spec/6268.pdf?ga=t
Pharmacy Technician Certification Board	*Candidate Guide*	https://www.ptcb.org/AM/Template.cfm?Section=PTCB_Exam&Template=/CM/ContentDisplay.cfm&ContentID=3100
The American Registry for Diagnostic Medical Sonography (ARDMS)	*Adult Echocardiography Content Outline*	http://www.ardms.org/downloads/Content%20Outlines/AE/aefinall.pdf
The American Registry of Radiologic Technologists	*Nuclear Medicine Technology Certification Handbook and Application materials*	https://www.arrt.org/publications/2011/NMT_HB_2011.pdf
The American Registry of Radiologic Technologists	*Components of Preparedness*	http://www.nmtcb.org/exam/cops.php#GROUP1
The American Registry of Radiologic Technologists	*Radiation Therapy: Certification Handbook and Application Materials*	https://www.arrt.org/publications/2011/THR_HB_2011.pdf
The University of Iowa	*Competencies for Pharmacokinetics and Biopharmaceutics*	http://www.uiowa.edu/~c046138/kineticscomp.htm
University of Rochester Medical Center	*Competencies and Goals for Radiology Residents*	http://www.urmc.rochester.edu/smd/Rad/ResidentGoals.pdf
University of Sydney	*Radiology Required Competencies*	www.itl.usyd.edu.au/.../docs/dent%20Radiologyassessform.doc
University of Wisconsin School of Pharmacy	*Learning Outcomes and Competencies Pharmacology/Toxicology Program*	http://pharmacy.wisc.edu/sites/default/files/content/facstaff-resources/curriculum-assessment/pharmtox-outcomes-competencies.pdf

US Department of Labor, Occupational Information Network (O*Net) Occupation Profiles	*Anesthesiologist Assistants; Athletic Trainer; Audiologist; Cardiovascular Technologists and Technicians; Dental Assistant; Dental Hygienist; Dental Laboratory Technicians; Diagnostic Medical Sonographers; Dietitians and Nutritionists; Electroneurodiagnostic Technicians; Emergency Medical Technicians and Paramedics; Exercise Physiologist; Histotechnologists and Histologic Technicians; Low Vision Therapists; Orientation and Mobility Specialists, and Vision Rehabilitation Therapists; Massage Therapist; Medical and Clinical Laboratory Technicians; Medical and Clinical Laboratory Technologists; Medical Assistants; Nuclear Medicine Technologists; Ophthalmic Assistant/Technologist; Opticians, Dispensing; Orthotists and Prosthetists; Pharmacy Aides; Pharmacy Technicians; Physical Therapist Aides; Physical Therapist Assistants, Physical Therapists, Radiation Therapists, Radiological Technicians; Radiological Technologists; Recreational Therapists, Rehabilitation Counselors, Respiratory Therapists, Speech-Language Pathologists; Speech-Language Pathology Assistants; Surgical Technologists*	http://www.onetonline.org/
US Department of Labor, Office of Apprenticeship	*Air Force Enlisted Job Descriptions & Qualifications – Dental Assistant*	http://www.careeronestop.org/competencymodel//modelFiles/Dental%20Assistant.pdf
US Navy	*Competency Assessment: Hospital Corpsman Dental Assistant*	http://www.med.navy.mil/directives/ExForms/NAVMED%201510-1%20%2806-2009%29.pdf
Utah Department of Health, Division of Health Systems Improvement, Bureau of Emergency Medical Services	*STUDENT HANDBOOK Emergency Medical Technician - Basic*	http://health.utah.gov/ems/stdseval/training/emt-b_handbook.pdf

Washington State Skills Standards	*Dental Hygienist*	http://www.learningconnections.org/ss/pdfs/Allied_oral_health/Dental%20Hygienist.pdf
Washington State Skills Standards	*Dental Laboratory Technician*	http://www.learningconnections.org/ss/pdfs/Allied_oral_health/Dental%20Lab%20Tech.pdf