



SLDS Issue Brief

Sources and Linking Strategies for Employment Data

An increasing number of states are pursuing opportunities to link education information to data related to workforce and employment. Longitudinal records based on these data can provide a clearer picture of how well schools, higher education institutions, and workforce training programs are preparing individuals for successful careers, and they can contribute to the development of employment and wage metrics. They can also provide insight into general workforce characteristics, the alignment between workforce needs and the education pipeline, opportunities for economic and workforce development, and the migration of graduates outside the state.

In 2015, nine states were awarded federal Statewide Longitudinal Data Systems (SLDS) grants specifically to develop their capacity to use data to improve college and career readiness for students. A total of 34 states have received grants through the U.S. Department of Labor's Workforce Data Quality Initiative (WDQI) to integrate workforce and employment data into longitudinal data systems. In addition to supporting state interests in education and employment outcomes, these data efforts feed outcomes-based reporting requirements under the federal Workforce Innovation and Opportunity Act (WIOA), passed in 2014. Nationwide, the increased focus on career readiness and return on investment for education and training underscores the need for comparable outcomes information across states.

As the demand to connect education and employment data grows, states are navigating the challenges of locating essential data across a number of sources as well as establishing agreements and technical processes. This brief describes common sources of workforce data and processes states use to link data across education and workforce programs. It is the first in a series of publications focused on the integration and use of workforce data for SLDS work.

Connecting Education and Employment Data

There are different models for connecting education and employment data. In some cases, the state may have a centralized SLDS where copies of data from multiple agencies such as K12 education agencies, postsecondary institutions, and workforce programs are integrated together. Other states may utilize a federated approach where data from the various agencies are connected on an as-needed basis to produce a report or analysis without maintaining permanent copies of the connected data. The model a state chooses will depend on its specific legal situation and needs. Regardless of the SLDS model used, the goal for these efforts is to create information from data that will help stakeholders better understand the connections and flow between education and the workforce.

Sources of Employment Data

In the past, secondary and postsecondary education institutions often relied on alumni surveys, follow-up calls, or similar piecemeal methods of collecting employment information from former students. Such self-reported information often is not reliable or comprehensive, and collecting it usually requires significant staff time and resources. Additionally, different collection methods and definitions make it difficult to compare information across schools and institutions, preventing users from seeing their graduates as part of a broad talent pipeline. By linking to or incorporating employment data with data from the education sector over time, P-20W+ (early childhood through

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For more information on the IES SLDS Grant Program or for support with system development, please visit <http://nces.ed.gov/programs/SLDS>.



workforce) SLDSs can offer more complete, comprehensive longitudinal data than has been available in the past to a wider range of stakeholders.

Most states rely primarily on unemployment insurance wage records for employment data, but some states use additional data sources for information on workers not included in these records. Table 1 (see page 3) lists workforce data sources that states might include in their SLDSs, as well as limitations and important considerations for using data from each source.

Starting Point: Unemployment Insurance

The Social Security Act at §1137(a)(3) requires employers to report quarterly wage data including worker names, Social Security numbers, and quarterly wages. In most states, these data are reported to the agency that administers unemployment compensation programs. These state unemployment insurance quarterly wage records constitute the largest share of the workforce data included in many SLDSs. The records include employer-reported wage information for the majority of workers in a state, as well as employer names, addresses, and industries as represented by their North American Industry Classification System (NAICS) codes. They do not generally include information about individuals' occupations or specific work sites in cases where employers have multiple offices. A few significant groups of workers are not covered by a state's unemployment insurance records, including federal and military employees, many self-employed workers, and individuals who live in one state but work in another. Processes for and limitations on sharing, storing, and using unemployment insurance records are dictated by federal regulations, state mandates, and the terms of data sharing agreements approved by the SLDS partner agencies.

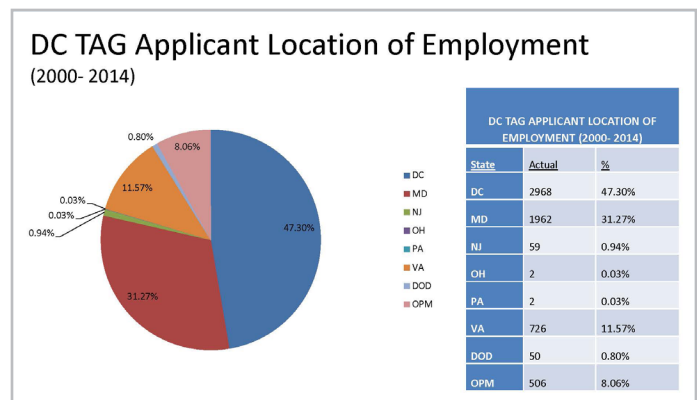


Figure 1. To track employment outcomes for applicants to its Tuition Assistance Grant (TAG) program, the District of Columbia worked with the Jacob France Institute to compile employment data from several sources. In addition to local unemployment insurance records, the district used Federal Employment Data Exchange System (FEDES) data to identify federal employees (OPM and DOD) as well as a multistate data exchange to locate applicants working in nearby states.

Closing the Gap: Other Workforce Data Sources

Unemployment insurance records offer a limited amount of information about the majority of a state's workforce, but many states turn to additional data sources for more detailed information about worker occupations and categories of workers that are not reported to unemployment insurance programs. Income tax records from the state's department of revenue can provide wage information for self-employed individuals, contractors, part-time workers, and employees of businesses that do not report unemployment insurance information. Some states draw job titles, education history, and additional data about employers from statewide employment assistance websites such as those established under the federal Wagner-Peyser/Labor Exchange initiative.

**Multistate Data Exchange:
Western Interstate Commission for Higher Education (WICHE)**

WICHE's Multistate Longitudinal Data Exchange (MLDE), funded by the Bill & Melinda Gates Foundation, is building a system to exchange individual-level education and workforce data among several states. The effort will help state policymakers and researchers answer important research questions about the development and mobility of human capital by linking education and employment outcomes across state lines. WICHE member states are Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming, and the U.S. Pacific territories and freely associated states.

An MLDE pilot project involving Hawaii, Idaho, Oregon, and Washington resulted in each state locating data for between 9 and 22 percent of its postsecondary degree earners in employment records from the other three states.¹ They also were able to find additional graduates enrolled in continuing higher education in the other states. The pilot project established data sharing agreements and architecture among the participating states, and it produced analyses of human capital development and mobility among the states.

¹ Prescott, Brian T. (2014). *Beyond Borders: Understanding the Development and Mobility of Human Capital in an Age of Data-Driven Accountability*. Boulder, CO: Western Interstate Commission for Higher Education. Retrieved June 2, 2016, from <http://www.wiche.edu/content/beyond-borders-understanding-development-and-mobility-human-capital-age-data-driven>.

| Record Type | Typical Data | Linking Fields | Strengths | Limitations |
|---|---|--|---|--|
| State unemployment insurance wage records <i>Source: State unemployment insurance programs (often located in state departments of labor, commerce, or revenue)</i> | <ul style="list-style-type: none"> Quarterly wages Industry of employer (NAICS code) Employer name and location (typically the central office) | <ul style="list-style-type: none"> Social Security number Partial first and last names | <ul style="list-style-type: none"> Records cover the vast majority of workers. Quarterly data allow for within-year trend analysis. Records are relatively easy to obtain and are the most commonly used source of employment data. | Records do not cover some self-employed workers, military or federal employees, or employees who live in one state but work in another. Records also do not identify individuals' occupations. |
| State unemployment insurance claims payments <i>Source: State unemployment insurance programs (often located in state departments of labor, commerce, or revenue)</i> | <ul style="list-style-type: none"> Biweekly payment amounts Date of payment Amount of income recipient has earned outside of unemployment insurance Recipient address | <ul style="list-style-type: none"> Social Security number First, middle, and last names Date of birth Race/ethnicity Gender | <ul style="list-style-type: none"> Records provide information about individuals currently seeking work. Records cover actual payments made. Social Security numbers are very reliable. Dates of payment allow for calculation of time frame of unemployment. | Individuals who pay child support may have two records for each payment period—one showing payment made directly to the state division of child support and one showing payment to the individual. These two amounts need to be matched by Social Security number and added together for a total payment. |
| State income tax <i>Source: State departments of revenue</i> | <ul style="list-style-type: none"> Annual wages Number of dependents Address Marital status | <ul style="list-style-type: none"> Social Security number First and last names Date of birth | <ul style="list-style-type: none"> Records typically cover all residents with income and some without income. Records include address of residence. Records include individuals who live in the state but work in another state. | There may be strong restrictions on allowable uses of the data. Records also do not identify individuals' occupations. |
| Federal and military employment <i>Source: Federal Employment Data Exchange System (FEDES)</i> | <ul style="list-style-type: none"> Wages Agency or branch of service Occupation | <ul style="list-style-type: none"> Social Security number Partial names | FEDES provides data for federal and military employees that are not available from state agencies. | Defense-related data can be used only for federal reporting purposes. |
| Out-of-state and additional in-state employment <i>Source: Wage Record Interchange System (WRIS and WRIS 2)</i> | <ul style="list-style-type: none"> Quarterly wages Industry of employer (NAICS code) Employer name and location (typically the central office) | <ul style="list-style-type: none"> Social Security number | Records provide data for out-of-state workers not included in other state agency sources. | WRIS and WRIS2 are designed to support performance reporting for federal and state workforce, education, and training programs, and data must be reported in the aggregate. Use of WRIS and WRIS2 data for other purposes may be limited. State participation in the exchange is voluntary, and data are not available from all states. |

Table 1. Types and sources of employment data commonly included in SLDSs

The Federal Employment Data Exchange System (FEDES) offers data on federal employees gathered from the Office of Personnel Management, the U.S. Department of Defense, and the Defense Manpower Data Center. Additional multistate data exchanges can further supplement employment information available from states' own agencies. The Wage Record Interchange Systems (WRIS and WRIS2) can provide employment data on individuals who have moved out of state or who live in one state but work in another. Some states have established interstate data sharing agreements to provide further information on out-of-state workers. Many of these exchanges place limits on how their data can be used. For example, military employment data obtained through FEDES can only be linked to other state data for federal reporting purposes. Use of WRIS and WRIS2 data is similarly limited to specific reporting purposes. Additionally, because WRIS and WRIS2 are voluntary programs, they do not include data from all states. Despite these constraints, most states find that the value of linking these data with additional education and employment records far outweighs the limitations.

Measuring Additional Outcomes

Pursuing data sources outside of traditional education and workforce agencies can provide states with additional context for education and employment outcomes. Data from public assistance services such as the Supplemental Nutrition Assistance Program (SNAP) and Temporary Assistance for Needy Families (TANF), as well as incarceration and probation data from departments of corrections, can help further illustrate connections among education attainment, workforce and human services, and labor market outcomes for individuals and families.

Linking Employment and Wage Data with Education and Other SLDS Data

State processes for linking wage records from workforce agencies with those from other SLDS partner organizations depend on the data available to identify individuals across those sources. Typically, states must develop solutions for two broad matching challenges: linking postsecondary education records to workforce records, and linking K12 education records to workforce records.

Postsecondary to Workforce Matching

Linking postsecondary and workforce records for individuals is facilitated by the fact that both sectors generally collect Social Security numbers (SSNs). SSNs are the primary identifier used by most state workforce agencies. Colleges and universities may use institution-specific identifiers internally but also collect SSNs for students. SSNs are also key identifiers for postsecondary financial aid services.

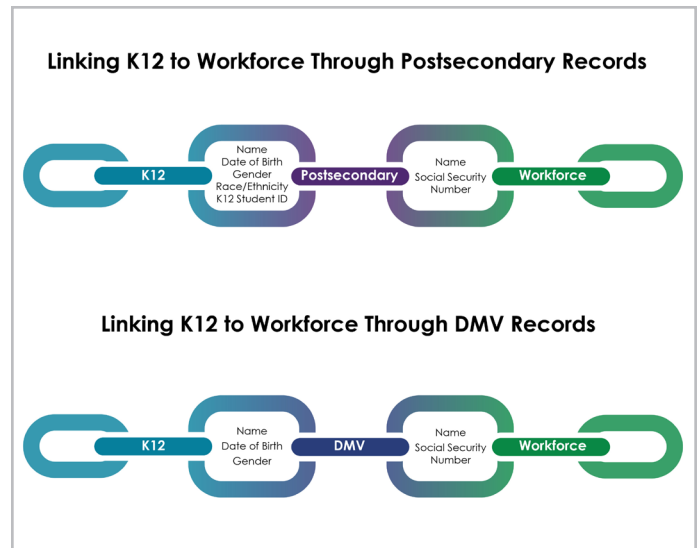


Figure 2. K12 education records that do not contain Social Security numbers must be linked to workforce records using intermediary data sources. This figure shows the data elements in postsecondary education and division of motor vehicles (DMV) records that are commonly used to link K12 student records to workforce records.

K12 to Workforce Matching

Rather than SSNs, most state education agencies rely on combinations of data such as name, date of birth, gender, and usually a statewide unique K12 identifier to distinguish individual students. These identifying data have little overlap with employment and wage records, which generally include only SSNs and partial names for individuals. States can use postsecondary education records as a bridge between K12 and workforce by matching K12 and postsecondary records using demographic data and education identifiers, and then matching postsecondary and workforce records using SSNs and extending that link back to K12 (see figure 2). However, this approach covers only individuals who have enrolled in postsecondary programs within the state, which may be a minority of workers in many areas. These limited matches also likely fail to provide information about populations of workers and families who may need the most assistance.

Many states that do not collect SSNs at the K12 level are identifying intermediary sources to provide additional data that will help link K12 and workforce records. Records of driver's licenses and IDs issued by state divisions of motor vehicles (DMVs) are becoming popular sources of matching data. DMV records generally contain individuals' names, dates of birth, and genders—which can be matched to K12 education records—as well as SSNs that can be linked to employment and wage data. Due to the sensitivity of personally identifiable data, especially SSNs, any process for linking records across multiple agencies must conform to state and federal privacy regulations and include measures to exchange, match, and store data securely.

Best Practices and Future Opportunities

Collaborating Across Agencies

Incorporating any new data source into an SLDS requires significant efforts to engage, communicate, and establish partnerships with contributing agencies. The guiding vision, authority, and procedures for sharing and linking data across SLDS partners need to be formally established in a memorandum of understanding (MOU) or in data sharing agreements signed by agency leaders.

Even with legislative authorization and data sharing agreements in place, high-quality and timely employment data cannot be obtained without buy-in and cooperation at all levels of partner organizations, from executive leadership to the data stewards. Strong cross-agency data governance groups and processes should engage key data managers and decisionmakers to ensure appropriate handling and use of the data. Additionally, education agencies should work with their workforce partner agencies to identify benefits to the citizens, agencies, and state from linking their data to the SLDS, how this collaboration will help education and workforce partners across the state, and how their data will be safeguarded and used appropriately.

Using Linked Data

When linked to education records, individual employment data provides states with invaluable insight into the impact and value of education and training programs. Federal initiatives such as WIOA and state interests in economic development and return on investment emphasize employment rates and wages as key measures of the value of such programs. However, even though job prospects and potential earnings are important and measurable metrics, they are not the only factors in individuals' education and training decisions, nor do they represent the only value of education. By making this information available, states can help to focus attention on these issues and work toward identifying and providing additional data to calculate more comprehensive indicators of return on investment for education and training programs. They can also provide useful consumer information to students, workers, and

families as they decide how to continue their education in order to meet their goals.

Incorporating Additional Data Sources

Increasing interest in workforce outcomes can both highlight the limitations of existing SLDS workforce data and generate support for incorporating data from additional sources. The gaps in employment data from unemployment insurance records and the need for more comprehensive data have led some states to open discussions about data sharing with organizations not previously involved in SLDS work, such as Social Security Administration and revenue offices.

Expanding Data Collections and Improving Data Quality

As states rely more on employment data for federal and state reporting, policy analysis, and research, they also identify opportunities to improve existing data collections to produce more accurate and reliable information. For example, collecting complete names and dates of birth in unemployment insurance records would make matching them to K12 education data easier and enhance the quality of those matches. Uniformly storing K12 student identifiers in postsecondary education records—or establishing a statewide unique identifier to take the place of SSNs in both education and workforce records—would also streamline data matching across agencies. Expanding wage record data collections to include occupations, hourly earnings, and other employment details could provide greater insight into education and employment outcomes. Using employment data for reports and research will also help draw attention to data quality issues in specific datasets and pinpoint areas for improvement.

In most states, plans to alter or expand existing data collections will face numerous hurdles, including compliance with state and federal regulations, legal review, approval by state leaders, and implementation of administrative and technical processes to collect the data. Even so, demonstrating the value of comprehensive workforce data to state and federal policy objectives can create a solid starting point for these discussions.

Additional Resources

College Measures
<http://collegemeasures.org/>

Employing WRIS2: Sharing Wage Records Across States to Track Program Outcomes: Workforce Data Quality Campaign Report
<http://www.workforcedqc.org/sites/default/files/images/WRIS2%20Report%20May%202014.pdf>

Employment Outcome Indicators: SLDS Webinar
<https://slds.grads360.org/#communities/pdc/documents/9944>

Federal Employment Data Exchange System (FEDES)
<http://www.ubalt.edu/jfi/fedes/index.cfm>

Linking K12 Education Data to Workforce: SLDS Webinar
<https://slds.grads360.org/#communities/pdc/documents/5871>

The Match Rate Dilemma: SLDS Webinar
<https://slds.grads360.org/#communities/pdc/documents/8982>

Using DMV Records to Access Social Security Numbers: SLDS Webinar
<https://slds.grads360.org/#communities/pdc/documents/5909>

Wage Record Interchange System (WRIS and WRIS 2)
<https://www.doleta.gov/performance/wris.cfm>

Western Interstate Commission for Higher Education (WICHE) Multistate Longitudinal Data Exchange
<http://wiche.edu/longitudinalDataExchange>

Workforce Data Quality Campaign (WDQC) State Solutions
<http://www.workforcedqc.org/state-solutions>

State memoranda of understanding (MOUs) and multi-agency data governance examples

Connecticut P20 WIN Data Governance Manual
<https://slds.grads360.org/#communities/pdc/documents/8987>

Connecticut P20 WIN Data Governance Policy
<https://slds.grads360.org/#communities/pdc/documents/8986>

Kentucky MOU for Workforce Data
<https://slds.grads360.org/#communities/pdc/documents/3735> (GRADS login required)

Virginia Longitudinal Data System Book of Data Governance, April 28, 2016
<https://slds.grads360.org/#communities/pdc/documents/10362>

Washington State P-20W Data Sharing Matrix
<https://slds.grads360.org/#communities/pdc/documents/2663>

Washington State MOU: Responsibilities and Principles for Sharing and Using P-20 and Workforce Data
<https://slds.grads360.org/#communities/pdc/documents/2771>

State education and employment data use examples

Arkansas Research Center (<https://arc.arkansas.gov/>)

- Arkansas Education to Employment Report 2013
http://arc.arkansas.gov/arc_web/resources/publications/AEER2013.pdf
- Education and Wage Outcomes for the Arkansas Workforce
https://arc.arkansas.gov/arc_web/resources/publications/The_Arkansas_Workforce.pdf

Kentucky Center for Education and Workforce Statistics (<https://kcews.ky.gov/>)

- More College = More Money
<https://kcews.ky.gov/Reports/MoreCollegeMoreMoneyJuly2014.pdf>
- No College = Low Wages
<https://kcews.ky.gov/Reports/NoCollegeLowWagesJuly2014.pdf>
- Outcomes for Career Ready High School Graduates
<https://kcews.ky.gov/Reports/2016%20CTE%20Outcomes.pdf>

Virginia Longitudinal Data System (<http://vlids.virginia.gov/>)

- First Look: Post-Completion Wages of Graduates
<http://research.schev.edu/apps/info/Articles.First-Look-Post-Completion-Wages-of-Graduates.ashx>
- Return on Investment for Virginia's Workforce Programs
<http://vlids.virginia.gov/media/1014/vcureturnoninvesment04032014final.pdf>

Washington Education Research and Data Center (<http://www.ercd.wa.gov/>)

- Earnings Premium Estimates for Bachelor's Degrees in Washington State
<http://www.ercd.wa.gov/publications-and-reports/earnings-premium-estimates-for-bachelors-degrees-in-washington-state>
- Earnings Premium Estimates by Gender and Race Category for STEM Bachelor's Degrees in Washington State
<http://www.ercd.wa.gov/publications-and-reports/earnings-premium-estimates-gender-race-category-stem-bachelors-degrees>
- Graduate Earnings Reports
<http://www.ercd.wa.gov/student-and-school-data/graduate-earnings/graduate-earnings-reports>
- Postsecondary Education Assessment in Washington State: Earnings Premium Estimates for Associate Degrees
<http://www.ercd.wa.gov/publications-and-reports/postsecondary-education-assessment-washington-state-earnings-premium-estimates>
- Workforce Participation, Washington State High School Graduates, 2008-09
<http://www.ercd.wa.gov/publications-and-reports/workforce-participation-washington-state-high-school-graduates-2008-09>