Roadmap for Early Childhood and K–12 Data Linkages

Key Focus Areas to Ensure Quality Implementation

Where are we going?

Research shows that quality early childhood care and education experiences provide a strong foundation for success in school. States rely on data from both the early childhood and K–12 sectors to inform policy discussions and decisions; chart the progress of children, programs, and the state; strengthen and support the early childhood workforce; pinpoint best practices and areas of need; allocate scarce resources; and make other important education decisions every day. States need to securely link limited, but critical, early childhood and K–12 data to help them know whether policies and programs help children successfully transition from early childhood to the classroom and get them ready for school. Having high-quality data linkages between early childhood and K–12 data systems allows states to answer questions such as the following:

- Are children, birth to age five, on track to succeed when they enter school and beyond?

- Is the state meeting its goals in ensuring that all children enter school kindergarten ready?

- Are the policies that guide early childhood education programs aligned with the policies that guide K–12 education?

- Which early childhood experiences best prepare children from different backgrounds to be successful in school and beyond, and how can they be replicated statewide?

- How effective are state policies and programs that support high-quality early childhood education in preparing students for school?

Both the early childhood and K–12 sectors can benefit from high-quality data linkages. When early childhood data are securely linked with K–12 data, public schools can use information on prior experiences to help tailor curriculum and instruction for individual students. Early childhood providers can receive feedback on how well children progress after they enroll in public schools to improve services and support the success of children. At the local level, the linked data provide a common understanding of how well children transition from early childhood experiences to the classroom to help community and school leaders develop strategies for ensuring that every child in their community arrives at kindergarten ready to engage in learning. Building interest in the field of data systems is important. When providers, teachers, parents, community members, policymakers, and leaders at the state level have access to useful data, they will ask for more information, and this need for data will keep the data system's work moving forward.

Every state can create secure, robust linkages between early childhood and K–12 data systems and effectively use the information from these linkages to implement initiatives to support programs and children, answer key policy questions, and be transparent about how the state's early childhood investments prepare students for success in school and beyond. While the linkages are technical mechanisms that enable a state to connect information housed in different data systems, this document addresses the policies and supports that enable a high-quality link rather than focusing on the technical aspects of this work. Building state capacity, developing a governance structure, and engaging stakeholders are examples of the steps states can take to enable early childhood and K–12 data linkages and are included in the seven key focus areas highlighted in this document.

How do we get there?

What does great implementation of this work look like? The Data Quality Campaign (DQC) and Early Childhood Data Collaborative (ECDC) recommend focusing on seven key areas:

1. **State Capacity:** Ensure that the state has the structure and staffing in place to effectively manage, analyze, and share linked data to take action to support children's success.

2. **Data Governance:** Develop a structure in which to define the roles and responsibilities needed to ensure clear processes for collecting and reporting data and accountability for data quality and security.

3. **Privacy, Security, and Transparency:** Develop strong, multifaceted, and transparent processes to ensure that data are safeguarded.

4. **Linking, Matching, and Sharing:** Develop a deliberate, staged process for securely linking data from different early childhood systems to K–12 to ensure as broad

a link between early childhood programs and K–12 as possible. These linkages should include a high-quality matching process that allows data on individual children to be accurately and securely linked between data systems and shared with authorized users.

5. **Data Quality:** Develop a process to ensure that the linked data are accurate and useful.

6. **Data Access and Use:** Determine which entities have access to the linked data and how the linked data will be used to answer critical policy questions, improve the quality of programs, and support children's success.

7. **Stakeholder Engagement:** Engage with a wide range of internal and external stakeholders to build a transparent data culture that values linking and sharing data between early childhood and K–12 systems.

Early Childhood Data System Landscape

While this document describes the key focus areas in developing a high-quality link between early childhood and K–12 data systems, the early childhood data system landscape actually consists of many different, often unconnected, data systems. Early childhood programs—including subsidized child care, early intervention, special education, state prekindergarten, and Head Start/Early Head Start—are commonly administered by different state agencies independently of each other and have separate data systems. A 2013 Early Childhood Data Collaborative survey found that in most states, data on young children are housed in multiple, uncoordinated systems managed by different state and federal agencies and that information about programs, the early childhood care and education workforce, and the children themselves are not connected. This lack of coordination among the early childhood program data systems means that states cannot answer basic questions about early childhood experiences, such as how many children currently participate in high-quality early childhood programs. Developing high-quality early childhood and K–12 data linkages is critical for answering questions about children's transitions from early childhood to K–12, but high-quality linkages among early childhood data systems are equally important for improving program effectiveness and informing decisions to support children's success. References to "early childhood data systems" in this document refer to all of the data systems in the early childhood data system landscape.

Where are we coming from?

Through state surveys, both DQC and ECDC have found that most states report having at least some capacity to link K–12 and early childhood data systems, but these links are not able to provide all the data that stakeholders need. States were more likely to report linking K–12 data systems to special education and state prekindergarten programs but not to subsidized child care or Head Start/Early Head Start programs. Also, information such as program participation and child development data often flows only from early childhood to K–12, but information rarely moves from K–12 to early childhood, where providers could use data to improve services and children's outcomes.

According to the ECDC policy brief *Linking Head Start Data with State Early Care and Education Coordinated Data Systems,* states face numerous challenges in linking Head Start data with other state data systems. The federal Office of Head Start, part of the Administration for Children and Families in the U.S. Department of Health and Human Services, funds and oversees the local agencies providing Head Start services; the state does not. This direct link between local programs and the federal government means that Head Start programs are not required to report information about their programs to the state. Local Head Start programs follow federal reporting

guidelines, which may differ from the definitions and indicators of some state-managed data systems. Also, the disparate software used by individual Head Start programs may not align with state data systems.

This roadmap builds upon the work of the Institute of Education Sciences (IES) Statewide Longitudinal Data Systems (SLDS) Grant Program and the SLDS State Support Team (SST). The SLDS Early Childhood Integrated Data Systems (ECIDS) Toolkit—developed in collaboration by the SST, state representatives, and experts in the field—was created to support states working to develop an integrated early childhood data system. The ECIDS Toolkit focuses on the components of developing and implementing an integrated system and includes key indicators and elements of quality. The toolkit notes the importance of linkages to and alignment with K–12 data systems and beyond. This document takes this work further by focusing on high-quality linkages between early childhood and K–12 data systems. This document is aligned with the SLDS ECIDS Toolkit in many areas, particularly data governance, data use, and stakeholder engagement.

One State's Story

Pennsylvania links child-level data across all early childhood programs and to the state K–12 data system. Pennsylvania's Enterprise to Link Information for Children Across Networks (PELICAN) was developed as a data partnership between the Pennsylvania Department of Human Services and Office of Child Development and Early Learning to develop a data system that could link data across agencies. The goal of PELICAN is "a single integrated information system that automates and supports all of Pennsylvania's early learning and education programs."

Using a multiphase, multiyear implementation strategy, Pennsylvania integrated data across early childhood programs, the Quality Rating and Improvement System, provider licensing, and the state's K–12 data system.

The Early Learning Network is responsible for collecting information about children (e.g., assessments), teachers, and programs; the resulting data inform Pennsylvania's early childhood initiatives and services that support program evaluation and improvement. Authorized users are able to access reports on child enrollment, early learning outcomes data, and staff qualifications. These reports provide analyses of how children are progressing in different early childhood settings and can be linked to school outcome data in kindergarten through third grade to understand trends over time.

Pennsylvania's lessons learned in doing this work include engaging with stakeholders early and often, having a strong governance model, orienting the work toward data integrity, and providing a service to end users.

Future considerations

While states are still developing the capacity to build early childhood and K–12 linkages, the following suggestions are offered with the future in mind. As states develop secure, high-quality early childhood and K–12 data linkages, they can also begin to consider additional ways to improve and build upon these linkages when additional resources are available.

- Fully integrate data governance across early childhood, K–12, postsecondary, and other sectors.

- Determine how to incorporate parents into the governance structure as the key consumers of the linked data.

- Integrate early childhood data into the state research agenda to identify opportunities to use the linked data to examine issues that affect the well-being of children and school readiness.

- Collect and provide critical data in real time so providers, parents, teachers, and education leaders can act based on the data as soon as possible to meet children's needs.

- Consider including family-level data, in addition to child-level data, in the linkages because some early childhood programs, like Head Start, provide comprehensive services to the whole family.

- Determine whether data can be collected and analyzed at different levels (e.g., classroom, program, setting) to find out how various learning environments can affect children's success.

- Develop publicly available data reports or dashboards that meet the information needs of the community.

- Determine whether and how the state should collect health screening and developmental assessment data.

- Add geographic data to examine how neighborhood and community factors may affect children's success.

State Capacity

States need the capacity to establish a high-quality link between early childhood and K–12 data systems. Linked data allow the state to identify issues, like a misalignment between the early childhood programs and the expectations for kindergarten readiness, and mobilize resources to get children ready to learn.

Why does state capacity matter?

Having strong state capacity means the following:

- State agencies manage the data effectively to ensure quality.

- Entities responsibly report and interpret the data.

- Entities use these data to take informed action.

These three aspects of state capacity are interrelated. Without effective management and reporting, the state will not have quality data available for analysis. Without the ability to analyze the data and take action, it will be difficult for the state to justify the investment of funds, time, and staffing.

What does strong state capacity look like?

- The state leadership builds support for the linkages in local districts and communities and demonstrates the value of the data.

- The state models and encourages the use of data to inform conversations and inspire change at both the policy and program levels.

- The state focuses on the quality, not the quantity, of data and ensures that the data being collected are aligned with its work and goals. The emphasis is on using data for continuous improvement and not solely for accountability purposes.

- There are an adequate number of staff with the correct skills to manage, report, and analyze the data.

- The state provides, either directly or through partners, data literacy training or coaching to ensure that end users, such as providers and education leaders, have the skills to understand and use the data. This training or coaching could include fiscal and technical support to ensure that providers, teachers, and education leaders use data to reflect on practice.

How can a state achieve this?

Building high-quality early childhood and K–12 data linkages requires a state to create the conditions for a culture of effective data use. Such a culture considers data a catalyst for continuous improvement, not a tool for punishment. Put another way, the information collected should be used not as a hammer but as a flashlight.

Such shifts in culture require time, as changes must be made in both practice and policy. To lay the foundation, states can develop a set of policy questions to be addressed by the data collected (see DQC's Start with Your Questions for additional guidance). Trust between policymakers and stakeholders must be developed through relationship building and communication as state leaders begin to rally support for data linkages. Using existing information to allocate limited resources and create more effective policies demonstrates the potential of linking data systems. Providing adequate training for program leaders, teachers, and other stakeholders builds understanding and promotes future data quality. Breaking down silos among early childhood and K–12 agencies at the state and local levels increases collaboration and capitalizes on combined expertise to produce positive change. As state leaders take these steps, stakeholders begin to see the value of data as an instrument of progress.

State Capacity in Maine

Across **Maine,** school systems, cities, and towns want to ensure a return on their significant investment in education. In Maine's House and Senate chambers, lawmakers want to ensure that scarce taxpayer resources are spent wisely. And in state agency offices, officials want to ensure equal access to, and efficient delivery of, high-quality services for children, especially those with high needs. The goal is to create a single, aligned, high-performing system dedicated to preparing all children for successful and seamless entry into the K–12 system.

Both the Maine Department of Education (DOE) and the Maine Department of Health and Human Services (DHHS) manage programs and fund community- or state-level services to support young children and their families, but different and sometimes inconsistent policies, procedures, and structures lead to inefficiencies, duplication, and rough transitions across programs as children age. Based on the need to share and maximize resources, ensure consistent quality of programming, and better serve high-needs children and their educators, the Maine DOE and DHHS have laid the groundwork for coordinated management of the variety of early learning and development programs they oversee through the State Agency Interdepartmental Early Learning (SAIEL) team.

SAIEL supports efforts to improve transitioning services for children and families and is developing a protocol for coordinating early learning programming with the kindergarten programs that receive the children. SAIEL is also supporting the coordination of Head Start, Early Head Start, public prekindergarten, and child care programmatic standards. These efforts, among others, allow for a greater sharing of resources between the Maine DOE and DHHS—including funding, professional development, and best practices—so children across the state from families with high needs will get the skills they need to be successful in kindergarten.

To answer questions like "What are the effects of participation in quality early childhood programming on later statewide elementary assessments of proficiency or increased positive outcomes for children?" and "What are the characteristics of early childhood programs that yield greater outcomes for children?" the Maine DOE and DHHS need linked data. The two departments have a data sharing agreement and a trusted broker agreement, which allows student IDs to be matched across departments and be held by an independent entity. This matching process expedites data analysis and allows for coordinated data collection and analysis across the two departments to inform policy and practice.

FOCUS AREA 2

Data Governance

Data governance provides state agencies a structure in which to (1) define the roles and responsibilities surrounding data collection, reporting, and use and (2) create accountability for data quality and security. Data governance is more than an information technology issue. States can think broadly about data governance as a base on which to build the relationships and trust needed to securely share data across agencies to answer questions such as "Are children, birth to age five, on track to succeed when they enter school and beyond?" According to ECDC, 32 states have designated an early care and education data governance entity to guide the development and use of a coordinated, longitudinal state early care and education data system. However, it is important that states' data governance structures also include the roles and responsibilities necessary to develop linkages between early childhood and K–12 data systems.

Why does data governance matter?

Data governance is necessary for states to have secure, high-quality linkages between early childhood and K–12 data systems. In most states, early childhood programs, including subsidized child care, early intervention, special education, state prekindergarten, and Head Start/Early Head Start, are administered by different state agencies with separate data systems. A clear governance structure is essential to bringing the right individuals together to oversee and administer the integration of data across early learning programs. Because the structure of early childhood education programs and agencies differs greatly among states, each state may take a different approach to its data governance. All parties involved in the linkages need to feel invested in the work and understand the value of linking and sharing data across these often siloed systems.

The data governance structure can serve as the structure within which the early childhood and K–12 agencies can develop a good working relationship and develop policies and practices around linking and sharing data. Including early childhood and K–12 at the table during data governance meetings and policy discussions allows for continuing conversations to take place. The early childhood and K–12 agencies are working together to achieve common goals—supporting all children in their successful transition into the classroom and improving programs and services.

What does strong data governance look like?

- Regardless of the type or structure of the data governance committee, it has to account for early childhood programs in an intentional and coherent way and include the different types of early childhood programs in the state. Coherence refers to both coherence in how early childhood as a whole fits into a larger cross-agency data governance structure and coherence across individual early childhood programs.

- The structure of the data governance committee can look different in different states.

  – If there is an existing cross-agency data governance committee that includes different sectors (e.g., K–12, postsecondary, workforce), ensure that executive-level early childhood representatives are members of this committee.

  – If the data governance committees for early childhood and K–12 are separate, ensure that there is representation from each sector on each committee.

- The data governance committee builds trust among agencies and sectors through relationship building and communication about the data systems linkages work.

- The data governance committee makes the connections among different grants that fund early childhood and K–12 education and leverages funding opportunities to ensure that investments have the greatest impact.

- The data governance committee has the ability to influence decisions about early childhood and K–12 linkages.

- The data governance committee demonstrates the importance of early learning and its critical role in preparing children for success in school. The committee is grounded in the data and the data linkages.

- The data governance committee understands and takes into account current political priorities and realities and the changing education policy landscape when making decisions and taking action to build linkages.

- The data governance committee is committed to ensuring that stakeholders such as practitioners, educators, and parents have the opportunity to give input and are being assisted in understanding the value of linking early childhood and K–12 data systems (see Focus Area 7).

- The data governance committee creates data privacy policies that are consistent across programs and aligned with federal and state privacy laws (see Focus Area 3). An aspect of data privacy policies could include data access and use policies that define which agencies and individuals have permission to view linked data (see Focus Area 6).

How can a state achieve this?

To build a data governance structure, a state can start by developing its policy questions. Determining what information is needed and should be provided through data linkages helps the state choose the right data governance committee representatives, including members of the early childhood and K–12 communities. *Answering Key Questions with an Early Childhood Data System* (National Center for Education Statistics [NCES]) provides guidance on how to develop questions that drive the data linkages process. ECDC has identified key questions that states should be able to use data to answer.

Ensuring the alignment of early childhood and K–12 data systems and the sustainability of the linkages requires careful planning and a strong data governance committee. To get started, the SST's *Early Childhood Data Governance in Action! Initial Steps to Establish Data Governance* (IES) outlines the initial steps necessary for establishing data governance structures. The Build Initiative's *A Framework for Choosing a State-Level Early Childhood Governance System* is a resource for states in the foundational stages of building data governance structures. For an overview of governance structures and how they should function, state leaders can start with ECDC's 10 Early Childhood Fundamentals, specifically Fundamental 9. The Privacy Technical Assistance Center at the U.S. Department of Education has compiled a number of early childhood data privacy resources, including information about data governance.

Two Views on Data Governance

MAINE

Maine's Early Childhood Policy Committee is authorized to establish and enforce data governance standards and processes. Establishing a set of interagency policies and procedures to ensure the responsible management and use of early childhood data is a shared responsibility of multiple state agencies and entities. Data is a cross-agency asset. The importance of a single source of accurate early childhood data for interdepartmental operations and reporting must be emphasized from the highest level of the departments and organizations, and policies and procedures must be adopted, communicated, and enforced at all levels. The data governance standards and processes will reflect alignment with the respective departments' strategic plans.

The data governed by the early childhood integrated data system (ECIDS) will be from the Maine Department of Education, Maine Department of Health and Human Services, Maine Department of Labor, and Maine University System to address the key policy and program questions set forth by the executive leadership. The key activities governed by the policy are the following:

- Maintain confidentiality of all educational records as required under the Family Educational Rights and Privacy Act.

- Maintain confidentiality of all health records as required under the Health Insurance Portability and Accountability Act of 1996.

- Store data received in a secure manner.

- Review the related memoranda of understanding quarterly to ensure that they are being operated in compliance with the requirements of these agreements. If any data security problems are identified, a report specifying the problems, solutions, and timelines for implementation will be developed cooperatively with personnel from all parties.

- Ensure that all guidelines and procedures developed under this policy/charter are followed.

- Ensure that the studies conducted and/or systems created with the data are for or on behalf of the parties to improve instruction or agency services and that analysis and reports will be shared with the respective parties prior to publication.

- Ensure that no data will be released or reported in any manner that will allow the identification of any individual person, student, teacher, or school, unless explicitly approved in writing by the agency or agencies that produced, provided, or contributed to the specific data being released.

- Enter into data use agreements as necessary to enable specific uses or releases of identified data, as may be required by law.

- Ensure that all transfer and storage of data adhere to the State of Maine Information Technology Security Policy found at **http://www.maine.gov/oit/policies/SecurityPolicy.htm**.

The Executive Leadership Committee establishes and enforces data governance standards and processes. The committee further establishes a set of interagency policies and procedures to ensure the responsible management and use of early childhood data. Data coordinators are members of the Executive Leadership Committee.

The Data Management Group is responsible for making decisions regarding policy implementation and operations for specific functional areas and participating in decisions requiring systemwide policy and operations for the ECIDS. Members in individual program areas are responsible for ensuring that administrative system applications that create, capture, and update data elements incorporate edit and validation checks to protect data integrity. The Data Management Group makes policy recommendations to the Executive Leadership Committee. Data management is co-chaired by the data coordinators. Data stewards from the participating state agencies and entities implement the policies and procedures at the operational level in their respective programs.

NORTH CAROLINA

North Carolina currently has two separate but coordinated data governance structures: the P–20W Council (preschool through workforce) and the NC ECIDS Governance Council. The NC ECIDS Governance Council is comprised of leadership from key participating state agencies. These agencies are the North Carolina Department of Health and Human Services (Division of Child Development and Early Education, Division of Public Health, and Division of Social Services), the North Carolina Department of Public Instruction (NCDPI), the North Carolina State Head Start Collaboration Office, and the North Carolina Partnership for Children. An NC ECIDS Memorandum of Agreement and a Data Sharing Agreement have been signed by all the participating agencies.

The NC ECIDS Governance Council consists of two committees. The Program Management Committee includes the heads of each of the programs represented in the NC ECIDS. The Executive Committee includes the division directors who govern these programs. The NC ECIDS Executive Committee has official representation from the NCDPI—the executive director of early learning (who currently serves as chair of the Executive Committee) and a representative of the state superintendent (who is also chair of the P–20W Council). Two workgroups within the Program Management Committee have been created—one to work on standard reports and another to figure out an expedited process for data requests from the key participating agencies.

There is no official representative from the early childhood community outside NCDPI on the P–20W Council, but the NC ECIDS chair is also a member of the P–20W Council. The NC ECIDS project director and project manager sit on the P–20W Council as ad hoc members. The two councils frequently interact, communicate, and share information, including planning how to connect the NC ECIDS with the North Carolina P–20W data system to allow for the examination of longitudinal effects of early childhood programs and services. For example, the two councils are developing workflows and business requirements regarding how the two data systems will connect and be governed when there is a request for data from both systems. The two councils are also working closely to compare the two data systems and determine where they differ and how they can be aligned to be able to get data from each system.

The NC ECIDS Governance Council has experienced a very high level of trust and respect among its members, with a strong commitment to the development of an early childhood data system and willingness to be involved. Support from the highest levels of each agency—the North Carolina Department of Health and Human Services and the NCDPI—certainly contributed to this support and collaboration. A governance manual has been developed and will be amended as the project moves forward and new needs are identified.

FOCUS AREA 3

Privacy, Security, and Transparency

Methods to ensure data privacy and security must be in place, particularly when dealing with potentially sensitive information about young children. These strategies should be multifaceted and transparent so all stakeholders understand how information is kept secure. Privacy laws and the data security practices of contributing agencies must be considered to ensure compliance with federal and state regulations.

Why do privacy, security, and transparency matter?

If providers, parents, teachers, education leaders, and others do not feel that data about young children are being kept secure, they are unlikely to support data collection and linkages between early childhood and K–12 data systems. Both security of the data and transparency about the data security processes and procedures are essential to ensuring that stakeholders are comfortable with and understand how these data are being safeguarded. Creating clear data privacy policies that are consistent across programs and aligned with federal and state privacy laws is essential to ensuring data security and support for early childhood and K–12 linkages and can be a responsibility of the data governance committee (see Focus Area 2).

What do strong privacy, security, and transparency look like?

- The protections required by the Family Educational Rights and Privacy Act (FERPA), the federal law that protects the privacy of student education records, are fully integrated into systems and processes.

- National Institute of Standards and Technology standards are referenced and followed in areas such as data destruction.

- A data inventory or data classification (e.g., a data dictionary) defines each data element collected and stored by the state. The inventory or classification is regularly reviewed and updated.

- Levels of data sensitivity are clearly defined, and data are categorized by these levels, with corresponding differences in levels of protection depending on the sensitive nature of the data. The definitions and categorizations should recognize that although all student data may be considered sensitive, some pieces of data (e.g., special education indicators available to the teacher and parents) may be considered more sensitive than other pieces of data (e.g., aggregate attendance rates available to the general public).

- Procedures to handle data breaches are clearly in place and specified for all users and the public.

- Transparency and clear communication methods are explained to the field and interested parties.

- The state ensures that early childhood programs are aware of federal, state, and local privacy legislation.

How can a state achieve this?

Safeguarding student information is paramount to developing linkages between the early childhood and K–12 data systems. States can ensure that the data collected on students are secure by putting strong data privacy policies in place and aligning these policies with FERPA and other federal and state laws. Data privacy policies and practices should be clearly communicated to providers, teachers, parents, education leaders, and other stakeholders. Developing policies and procedures to safeguard data can be one of the responsibilities of the data governance committee (see Focus Area 2).

Several resources are available for states developing privacy policies and procedures. The U.S. Department of Education Family Policy Compliance Office's website provides information about FERPA and other federal laws that provide parents and students with privacy rights. DQC's *Cheat Sheet: Data Privacy, Security, and Confidentiality* offers a breakdown of basic privacy terms and why each is important to the security of education data. In addition, DQC's *Roadmap to Safeguarding Student Data* provides specific, practical recommendations for prioritizing the safeguarding of student data and continuously reviewing and updating data privacy policies and practices to address changes in technology.

For those looking for more information regarding current privacy regulations, *Complying with FERPA and Other Federal Privacy and Security Laws and Maximizing Appropriate Data Use* (DQC) is a tool for aligning new privacy policies with existing federal and state law. The SLDS ECIDS Toolkit—developed in collaboration by the SST, state representatives, and experts in the field—offers further guidance on creating data linkages that ensure the security of children's information. The Privacy Technical Assistance Center at the U.S. Department of Education has compiled a number of early childhood data privacy resources, including data sharing agreements and how to talk to parents about privacy. The Administration for Children and Families developed a *Confidentiality Toolkit* to help jurisdictions successfully navigate the delicate balance between privacy and security and the delivery of efficient and effective services.

Data Privacy Protections in Connecticut

In 2015, **Connecticut** passed a robust **data linkages and privacy law** designed to improve "data security and agency effectiveness." The law charges the Office of Policy and Management with developing the data linkages among state agencies and also describes requirements for state agency agreements with contractors to ensure that confidential data are safeguarded and accessed and used only as needed for approved activities.

The law strengthens the state's data protections and governance by requiring the secretary of the Office of Policy and Management to "develop a program to access, link, analyze and share data maintained by executive agencies"; develop a process for responding to queries and data requests from state agencies or others; and implement data security practices across the state.

The law also requires that any agreements that the Connecticut Office of Early Childhood, the state Department of Education, the Department of Children and Families, the Department of Developmental Services, or any other state agency makes with a data contractor must require the contractor to take the following actions:

● Implement specific data privacy and security safeguards, including following breach notification procedures and storing data on secure servers and drives.

● Limit access to data to those who need the data for contracted activities.

● Prohibit copying, reproducing, or transmitting data except as necessary for the completion of the contracted services.

In articulating the state's privacy requirements, security standards, and data linking considerations, Connecticut is ensuring that any data collected by the state is safeguarded and used only in ways that aid the functioning of the state and the quality of the services it provides.

Linking, Matching, and Sharing

Linkages are the connections between data systems that allow information to flow back and forth between programs and agencies. Linkages enable matching, which is a process that allows the same child's data to be found in different data systems. A high-quality matching process uses a statewide unique identifier (UID). UIDs are assigned to each child to match education records and help ensure that the records for the same individual are being accurately matched. Sharing means that the participating agencies, such as the agency that administers early intervention and the state education agency, are providing individual-level information that would not otherwise be available to the other agency.[1]

Why do linking, matching, and sharing matter?

Linkages allow early education providers and teachers to assess and respond to children's progress over time and across the early childhood and K–12 sectors. They provide the information that policymakers require to make effective decisions based on children's needs. High-quality data are essential to an effective matching system. This includes consistent and accurate methods for collecting, recording, and storing data used for matching.

Assigning children UIDs and creating a system with the capability to resolve match issues helps ensure the accuracy of data shared between systems. Children often attend more than one early learning program, and data systems should be able to

accommodate this combination of settings (e.g., linking different identifiers assigned to the same child in different programs or having a system to ensure that a child is assigned only one identifier despite participating in different early childhood programs).

Data sharing allows early childhood education providers, state agencies, districts, and educators to identify problems and mobilize resources as needed. It informs professional development for practitioners and increases collaboration between programs and agencies to help providers and teachers better serve the needs of their students. Linking, matching, and sharing critical data across sectors are essential to following children's progress over time and answering key policy and program questions.

What do strong linkages look like?

- A strategic staging process is put into place to ensure that the linkages between early childhood and K–12 data systems meet the priorities of practitioners and policymakers.

  - A staging process is a deliberate, thoughtful process for prioritizing the linkages made between the many possible early childhood and K–12 data systems.

  - Because the early childhood data system landscape can include many different data systems, knowing how easy, or difficult, making the linkages to K–12 may be and knowing where to start are important.

  - States can take different approaches to the staging process and deciding how to prioritize the linkages between early childhood and K–12 data systems. The state can link data program by program from different early childhood data systems starting with, for example, subsidized child care, followed by state prekindergarten, provider licensing, the Quality Rating and Improvement System, early intervention, and Head Start. Another approach is cohort based, which links data for a cohort of children, such as all four-year-olds, regardless of what early childhood programs they participate in.

[1] This focus area discusses linking, matching, and sharing data across separate early childhood and K–12 data systems. In some states, early childhood and K–12 data are in one data system, so linking data is not necessary.

– The staging process provides a way to determine when the data are linked, which agencies are responsible for verifying the accuracy of the linkages, and at what point the data become accessible and to what agencies.

– The staging process may take into account available technology, logistical concerns, obtaining answers to pressing policy questions, and other factors.

– The goal of the early childhood and K–12 data linkages is to be as comprehensive as possible while balancing the realities of limited resources.

• A trusted broker agreement with an independent entity exists to hold matches of student identifications between departments or agencies to expedite the gathering of data.

• Linkages include broad coverage of a wide range of programs and services, including all early childhood education programs; programs that address the health, development, and well-being of children being served; and relevant child and family support services for at-risk children (see box).

• Links among child, provider, teacher, and program (with quality rating, as applicable) are in place.

The Staging Process

Planning is needed to prepare for linking early childhood and K–12 data systems. Stakeholders should determine what data they already have available, what data should be included in the linkages, and what questions they need to answer with the linked data.

Programs that can be incorporated in linkages include the following:

• data from early childhood programs
  – prekindergarten (both state funded and not state funded)
  – subsidized child care, Child Care and Development Block Grant
  – early intervention, Individuals with Disabilities Education Act (IDEA) Part C
  – preschool special education, IDEA Part B of Section 619
  – Title I children ages five or below
  – Head Start/Early Head Start
  – early childhood workforce data
  – kindergarten entry assessment data
  – Quality Rating and Improvement System data
• all available education data in the state education data system, including student outcome data

• data from other programs that provide services to children and their families
  – Maternal, Infant, and Early Childhood Home Visiting
  – Special Supplemental Nutrition Program for Women, Infants, and Children
  – Temporary Assistance for Needy Families
  – food and nutrition services
  – foster care
  – child welfare
  – Medicaid and the Children's Health Insurance Program
  – vital statistics
  – child protective services
  – other family assistance programs

What do strong matches look like?

• A high-quality matching process uses a UID to accurately follow children across early childhood programs and into K–12.

– For "near matches," a feedback loop is in place and additional data elements are used to ensure an accurate match. For example, to determine if a child named "Tim Dalton" in one data system is the same as a child named "Timothy Dalton" in another data system, review additional data, such as date of birth, middle name, and ethnicity to decide whether or not these records represent the same child.

– Training in assigning and resolving "near match" issues is important for the continued improvement of data quality over time.

– The state has determined what agency will manage the matching process and near match issues.

– There is a process for assigning a UID to every child, such as upon enrollment into an early education program.

- The same data management vendors are used by early childhood programs, K–12, and the P–20W (prekindergarten through workforce) system.

- UIDs are also created for all relevant levels of data and embedded in all other levels: teacher-, classroom-, site-, grantee-, and program-level (e.g., early intervention, Head Start) data.

What does strong data sharing look like?

- Policy questions have been articulated and indicators chosen enabling states to identify what data need to be linked, matched, and shared between early childhood and K–12 data systems.

- Data sharing occurs in both directions. Early childhood programs share information with K–12 to assist in planning and resource allocation. Early childhood programs receive data from K–12 about children's needs and progress to inform their practices and professional development.

- All early childhood education experiences are examined, not only preschool experiences (e.g., child care attendance data are used to better understand dosage).

- States can calculate an unduplicated count of the number of children in early care and education programs, including all publicly funded programs.

- States are able to identify children with high needs (e.g., children enrolled in early childhood special education, Head Start, Early Head Start) and those benefiting from public early care and education subsidies to ensure that these children receive the support they need to be successful in school.

- Early education program entry and exit information (including involuntary removal) is included to ensure that all children have equitable access to early education programs.

How can a state achieve this?

Building effective early childhood and K–12 data linkages requires careful staging. A state can begin by determining what data currently exist at both the early childhood and K–12 levels, how the data are tracked, and what data should be linked to answer the state's key policy questions and effectively provide needed services to children. If a system for assigning UIDs to children in early education programs does not currently exist, the state can begin building this capacity by choosing how UIDs will be assigned and what agency will be responsible for assigning them. ECDC has identified the 10 Fundamentals of coordinated state early childhood data systems. DQC's resource on the *Early Care and Education Data Landscape* offers sample questions that may be answered by developing early childhood and K–12 data linkages and explains what child-level early childhood data would be useful for matching with K–12 data.

States can also develop a set of policy questions to determine what linkages should be made and how data should be shared between data systems. *Answering Key Questions with an Early Childhood Data System* (NCES) can assist states developing policy questions in preparation for linking data systems. Another key element of planning for early childhood and K–12 data linkages involves identifying which programs will be included in the linkages. Several resources can assist states, including ECDC's report *2013 State of States' Early Childhood Data Systems*, which offers strategies for overcoming linking hurdles and building coordinated data systems; ECDC's *Linking Head Start Data with State Early Care and Education Coordinated Data Systems,* which offers insight on how to effectively link Head Start data with other early childhood data systems; and the SST's resource *Confidentiality Issues: Addressing Questions about Sharing Data among Organizations.*

Matching Process in Pennsylvania

Pennsylvania's Office of Child Development and Early Learning (OCDEL) is under both the Department of Education (PDE) and the Department of Human Services (DHS). This structure allows for children participating in OCDEL programs to receive two unique identifiers: a master client index, or MCI (the DHS identifier), and a PAsecureID, the PDE identifier.

MCI is currently assigned to all OCDEL students who are entered into Pennsylvania's Enterprise to Link Information for Children Across Networks (PELICAN). MCI clearance refers to the process of comparing new data entered in PELICAN against data contained in a central database. All potential matches (limited to children eight years old and younger) found for the child in the MCI database are compared against the data entered. To protect the privacy of children shown during clearance, only the last four digits of the Social Security number are displayed. In scenarios where there is an exact match, the child record already exists in the system, and the provider chooses that specific child from the list of potential matches. In the case of a near match, the provider reviews both sets of demographics to determine whether it is the same child.

PAsecureID is currently assigned to students in Head Start, state prekindergarten, early intervention, subsidized child care, and the top two tiers of the Tiered Quality Rating and Improvement System. A batch file is downloaded nightly from PELICAN and is manually processed by state staff. Once the batch file is uploaded into the PAsecureID system, it is run against all students in the PAsecureID system. If an exact match is found, the student is automatically assigned the same PAsecureID. Near matches are caused when enough weighted information is entered to create the appearance of another record matching or nearly matching the information just entered. Near matches must be resolved manually. Once all students have been processed, the batch file containing PAsecureIDs is uploaded back into PELICAN. While these students are now assigned a PAsecureID, the ID is not visible to providers.

FOCUS AREA 5

Data Quality

Ensuring the quality of the data included in the linkages between early childhood and K–12 data systems is critical to building trust in the data used to inform sound decisions in which all stakeholders have confidence. High-quality data systems have the capacity to follow individual children over time and across the early childhood and K–12 sectors. High-quality data contained in these systems are also accurate, timely, user friendly, useful, comparable, and presented as part of a bigger picture.

The quality of data is frequently improved the more often they are used because the data are refined with additional use and any errors are more quickly spotted and corrected. Tracking data sources further enhances data quality, as inaccurate information or other issues can be reported to the applicable program or agency. Professional development in this area can be used to coach providers and teachers on how to determine the quality of data they use.

Why does data quality matter?

If data are to be used and valued across the early childhood and K–12 sectors, they must be high quality. Ensuring the quality of early childhood data is especially challenging given the number of programs and agencies involved. Communication between programs and agencies is essential to ensuring that high-quality data are being linked across the early childhood and K–12 sectors.

When collecting information, data quality should be considered over quantity. Accurately recording a few pieces of vital information on student progress and using that information to improve student outcomes allow policymakers, providers, teachers, education leaders, and parents to focus on the most important data and see the value in data linkages.

What does data quality look like?

- The state has taken measures to build data capacity at the program level, removing any technology barriers and increasing practitioners' ability to collect data in electronic systems.

- Feedback loops are in place that allow users to report data issues to the program involved to ensure data quality. Feedback loops also allow information to flow back to programs to communicate data value and quality.

- The state has created a program management group of internal stakeholders that meets periodically (e.g., quarterly) to assess how the linkages are working (e.g., look at audit statistics, usage statistics) and resolve data issues.

- A process is in place to systematically review data for quality.

- Documentation (e.g., codebooks, manuals, data dictionaries) has been created to ensure accurate data collection and is aligned across early childhood and K–12 data systems. Documentation for data entry has been distributed to those responsible for data entry and guidance has been provided on authoritative sources for data (e.g., vital records).

- Data elements and option sets are aligned across early childhood and K–12 data systems (e.g., race and ethnicity categories are the same) and mapped (e.g., unique names are assigned to each variable).

- States have established and used classroom and teacher definitions consistently across programs.

How can a state achieve this?

States can encourage the collection of high-quality data by building program capacity. Removing existing barriers that prevent programs from accessing necessary technology, such as limited finances or lack of internet access, and developing feedback structures to report data discrepancies to the programs involved lay the groundwork for effective data linkages and high-quality data. Convening a group of internal stakeholders to regularly assess and manage data shared through linkages ensures that data needs are met and data quality is continuously monitored. ECDC's 10 Fundamentals provide a foundation for coordinated early childhood education data systems that can be linked to the K–12 data system to provide high-quality data.

A key component of ensuring quality data is the alignment of data systems among programs and agencies. Using a common set of elements allows providers, parents, researchers, and other stakeholders to seamlessly share and interpret data among linkages. The Common Education Data Standards website is one resource for states looking to standardize their data systems for linking and sharing data between early childhood and K–12 data systems.

Data Quality in Pennsylvania

Pennsylvania uses the Pennsylvania Information Management System (PIMS) to manage student-, teacher-, and school-level K–12 information. PIMS, Pennsylvania's Enterprise to Link Information for Children Across Networks, and certain data sets related to higher education are linked in the statewide longitudinal data system (SLDS) to collect service and outcome information for students from birth to age 20. Child outcomes are linked through the SLDS virtual bridge. The virtual bridge securely draws data from both PIMS and the Early Learning Network (ELN) in the Department of Public Welfare Enterprise Data Warehouse, using PAsecureID to link the student data across the two systems. There are secure ad hoc querying and reporting capabilities. ELN providers are able to download a collection of Child Longitudinal Outcomes Reports that display aggregate outcomes data for children who were previously enrolled with early childhood education programs or providers that participate in the ELN.

Data Access and Use

Data access refers to the rules that define which agencies and individuals have permission to view linked and shared data. Data use, including reporting and analysis, allows practitioners, education leaders, researchers, and other partners to answer questions about children's progress and the education system at large.

Permission to access data should be tailored to the needs of the individual or agency that will be accessing the data. Such individuals or agencies are given access only to the information that their jobs or roles entitle them to access. For example, providers are entitled to access records on the children in their programs, but privacy-based access rules prevent ineligible individuals from seeing individual children's records. Data at the aggregate level on groups of children can be accessible to education and community leaders, policymakers, and others who are working to support children's successful transition from early childhood education programs into the classroom. Data access rules are particularly important when working with sensitive data on young children. Determining data access rules can be one of the responsibilities of the data governance committee (see Focus Area 2).

In terms of data use, states should consider who will have access to the data and what questions need to be answered through their analysis. Additionally, states should determine how the results of data analysis will be delivered to stakeholders, such as parents and the public, so that needed information is available while individuals' data remain protected.

Why do data access and use matter?

Data are useful only if they can be accessed. Allowing authorized entities to access data ensures that the information collected is being used to make the best decisions to support children and their education. Data analysis is key to finding solutions for identified policy issues. Reporting the findings of data analysis allows policymakers, providers, parents, and other stakeholders to take action. When early childhood data are linked to K–12 data and used to meet the needs of children, support for the practical use of linkages can grow. For example, as sharing incoming students' developmental levels with kindergarten teachers to assist them in crafting classroom activities becomes more common, teachers will rely upon, request, and use data more frequently.

What does strong data access and use look like?

- The state has determined how data will be used and who will have access (e.g., parents, teachers, community organizations, state agencies, policymakers) based on their specific needs and roles (e.g., principals versus researchers). The state has determined at what grade classroom teachers can no longer access individual students' early childhood education data (e.g., third grade, fifth grade).

- Child-level data and classroom-level data are in an easy-to-access and quick-to-understand format (e.g., a dashboard) to help providers and educators inform instruction.

- A governance process is in place to answer questions from researchers, state agencies, and other stakeholders (see Focus Area 2). There is a documented process for responding to requests

for data, including steps to determine whether and how to respond to internal and external requests for data.

- Access to view individual data is granted only when it is necessary for educational purposes and allowed under FERPA and any relevant state laws or regulations. Outside entities have the ability to access data with permission and for specific purposes (e.g., for program audits and evaluations or special studies with an agreement to share findings with reporting agencies).

- The state has provided training to those who have access to data to ensure that they are able to understand and interpret the information provided.

- Parents are able to view their own children's data.

- Data can be broken out by specific child populations, such as dual language learners, children with special needs, or children living in poverty, and by level, such as program, school district, county, or state.

- Early childhood education programs are able to view aggregate data for children who have formerly attended their early learning programs,

with options to display data in different ways (e.g., kindergarten entry inventory proficiencies for children in kindergarten, percentage of the population with Individualized Education Programs for children in kindergarten through grade three, grade retention for children from kindergarten through grade three).

- Aggregate data about young children's developmental screenings are collected, stored, and reported on.

- Authorized users have the ability to easily query multiple variables to determine causal impacts or influences that yield effective child outcomes.

- The state issues regular and periodic public reports based on the linked data at the aggregate level to meet the needs of programs, schools and districts, parents, and the public (e.g., kindergarten entry assessment data can be used to inform professional development for early learning providers).

- There is an online database (e.g., a dashboard) with aggregate, searchable data that is easy for the general public to access and use.

How can a state achieve this?

States can lay the foundation for secure, but accessible, linked data by creating data access policies that answer the following questions:

- Who has access to the data?
- What data do they have access to?
- How do they have access to the data?
- Why do they have access to the data?

Guidelines for data privacy and access are included in DQC's report *Complying with FERPA and Other Federal Privacy and Security Laws and Maximizing Appropriate Data Use* and the SST's *Confidentiality Issues: Addressing Questions about Sharing Data among Organizations.*

To guide data analysis and use, states can develop a set of questions to be answered with linked data. These questions may include the following:

- What characteristics of programs are associated with positive outcomes for which children?
- How prepared are all children for K–2, as a whole and by subgroups?
  - What challenges have children encountered?
  - What milestones have been reached?
- Are the data used to help mobilize resources on behalf of the children who need them most?
- Are the data used to inform program planning and policies?
- What capacity exists to actually make use of whatever linked data the state is able to produce?
- Is the analysis of data valid?

Examining Eighth Grade Outcomes for Virginia's Preschoolers

A **study** conducted by the **Virginia** University Research Consortium on Early Childhood used linked early childhood and K–12 data to answer questions about the longer-term outcomes for children who attended Virginia's publicly funded preschool program, the Virginia Preschool Initiative (VPI). Many research studies have shown that preschool provides short-term benefits to children as they move through the early grades, but the positive effects of preschool often fade later in elementary and middle school, as measured by achievement tests. The focus of this study was to learn whether children who participated in VPI were more likely to be promoted on time to third and eighth grades than their peers and whether children who participated in VPI demonstrated greater literacy skills than similar peers in eighth grade.

The research study team was authorized to access data for children who were in kindergarten in the 2005–06 school year and followed approximately 77,000 students through eighth grade in the 2013–14 school year. The research study team linked students' kindergarten records to subsequent school records through eighth grade and to prekindergarten early literacy screeners to identify children who participated in public prekindergarten in 2004–05. Student records were linked through the Virginia Longitudinal Data System, which uses a computerized algorithm to match records at the student level so that personally identifying information is not revealed.

The research showed that children who had attended Virginia public prekindergarten were more likely to be promoted on time to first, third, and eighth grade compared to their peers. No differences were found between the children who had attended Virginia public prekindergarten and their eighth grade peers on reading and writing tests.

Stakeholders in Virginia, such as the Governor's Office and the state education agency, are interested in early childhood education and wanted to know whether VPI is leading to long-term benefits for children. The VPI program serves approximately 18,000 children from low-income families per year, and knowing whether the program is effective is important. The research study team found that access to and use of the linked data was an important, and cost-effective, tool in learning more about the benefits of the VPI program, and they recommend additional study of the on-time promotion and literacy outcomes for key student groups (e.g., economically disadvantaged) and of the influence of additional factors, like attendance.

FOCUS AREA
7

Stakeholder Engagement

Stakeholder engagement is the process by which the state systematically involves its stakeholders in its work. Specifically, this roadmap is referring to stakeholder engagement surrounding those directly or indirectly affected by the decisions made about the early childhood and K–12 data systems linkages, including design, development, implementation, and use.

Why does stakeholder engagement matter?

Stakeholder engagement is key to having high-quality data linkages between early childhood and K–12 data systems. Stakeholder engagement should start not when the data linkages are established but at the very beginning of the process to develop the questions that the linked data will answer. Stakeholder engagement builds demand for data linkages by building trust in the data linkages and understanding of the linked information, helping sustain this work over time. Because of the wide range of stakeholders affected by the early childhood and K–12 data linkages—from providers and teachers to education and community leaders and parents—each group's role in the linkages process must be well defined. Stakeholder engagement requires the identification of each audience's data needs and engaging them in the work in a meaningful way. Helping early childhood education providers and K–12 educators see the value in collecting, linking, and sharing data increases the likelihood that they will use quality information in their work. If parents understand the value of the linked data, they can use the data to help choose education programs that best meet their child's needs.

What does strong stakeholder engagement look like?

- The state clearly defines internal and external stakeholder groups, with the continuous involvement of a variety of stakeholders from the early childhood and K–12 data systems work, with an eye toward continuous improvement. The state clearly outlines the roles of internal and external stakeholders at the outset to enhance buy-in. Internal and external stakeholders may have different roles.

  – Internal stakeholders (e.g., key state agencies, providers, teachers) have extensive input into the development of the early childhood and K–12 data systems linkages.

  – Internal stakeholders (and external stakeholders, as applicable) help test the system linkages (especially in making data requests).

- The state allows stakeholders (e.g., policymakers, program advocates, researchers) to help determine what policy questions need to be answered with the early childhood and K–12 data systems linkages.

- The state solicits initial and ongoing feedback on the use and clarity of products that make use of the early childhood and K–12 data systems linkages and data, like websites that showcase analyses of the data.

- The state crafts messaging to ensure clear communication with various stakeholders, particularly around the data linkages. The state determines if the data communicated meet the needs of the intended audiences.

- The state identifies circumstances in which parents can participate in data-related decisions.

- The state communicates about what state agencies are not doing with data, both to provide clarity about the safeguarding of children's data and to note where information gaps exist and more information is needed.

- The state builds a culture of transparency by making publicly available data readily accessible. Such data are easy to understand, and materials contain examples of how data can be used

to produce positive change. The state makes stakeholders aware of how data are collected, used, reported, and destroyed.

- The state provides data literacy training to build understanding of how to read, interpret, and use data.

- The state has a waiver or permission process to be used as needed that engages and informs parents about the use of their child's data.

How can a state achieve this?

Involving practitioners, parents, and other key stakeholder groups builds support for early childhood and K–12 data linkages and fosters a sense of community ownership of education data. Several resources are available for states exploring new ways to engage stakeholders in building data linkages, including "It's All About Collaboration: Kentucky's Early Childhood Profiles" (DQC), *Stakeholder Communication Best Practices Brief* (NCES), *Strategies for Engaging Early Learning Stakeholders* (NCES), and ECIDS Toolkit: Stakeholder Engagement (SST).

Kentucky Early Childhood Profiles

The **Early Childhood Profiles**, produced by the **Kentucky** Center for Education and Workforce Statistics (KCEWS), provide community leaders, Community Early Childhood Councils, and school districts with data to assist them in developing local strategies for helping every child in their community get ready for kindergarten. The profiles include information about the quality and availability of child care; results from the statewide kindergarten screener; and information about participation in publicly funded preschool, Head Start, and child care. Finally, demographic data, participation in public health and social service programs, and key indicators of possible obstacles to success for young children and their families are also provided.

KCEWS worked closely with stakeholders to develop a report that was useful to local leaders. Together, they selected data from different sources that could be compiled into one easy-to-understand report that was tailored to each county and could be used to improve policies and programs to support children's success.

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