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Early Childhood Data Systems: Putting Data to Work

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To address states' need for help in meeting the challenges of using existing early childhood data to answer policy questions, REL Mid-Atlantic convened a cross-state workgroup. Members of this peer group exchanged ideas and strategies for collecting, analyzing, and using state data. Participants identified common challenges as well as innovative solutions.

Early childhood state data systems are being developed in all 50 states and the District of Columbia. Policymakers and the public are pursuing state data systems with the hope that evidence-based decision making will guide states' expanding investments into early childhood education (ECE) programs. State data systems are looked to for policy solutions in reducing the school readiness gap (Snow, 2011), breaking the cycle of poverty, and ensuring that all children have a bright start (Nguyen, 2012). Associations such as the National Governors Association and the National Conference of State Legislatures have championed ECE data systems as vital to inform state policies and investments, while at the same time conceding that they are yet unable to answer even basic questions about state programs and the families they serve (Early Childhood Data Collaborative, 2014). Unable to meet the original intent of these systems, data initiatives are expanding to collect more information and to more closely integrate data across systems and departments.

State early childhood data systems face challenges related to system design, analytic capacity, and organizational processes

Due to increasing interest in high-quality and accountable programming, the demand for information about early childhood programs is rising. States have responded by building or buying the analytic functions necessary for data collection and reporting. The purpose of reporting these data is often to demonstrate that a given program is helping families and children at a reasonable cost, so that the public will want to continue the investment. Program administrators and stakeholders would also like to see state data systems being used for ongoing improvement of program operation.

A big challenge for state offices responsible for early childhood programs has been cultivating the resources and capacity for effective systems research and program analytics. Through state and federal initiatives, many states are now building integrated data systems that collect and manage information on early childhood programs and the children and families they serve. States are now ready to move forward in the use of early learning data to improve the outcomes of early childhood education (ECE). In addition, these conditions have created a great opportunity for cross-state collaboration in sharing and developing new strategies for using data.

As evidenced by states' responses to section E(2) of the Race to the Top Early Learning Challenge Grant, state early childhood data systems are at different levels of maturity. Moreover, while many states are integrating their early childhood and state longitudinal data systems, the Early Childhood Data Collaborative detected a gap emerging between data collection efforts and the sophistication of data use. Although there are many examples of successful state efforts to launch transactional data systems, these

states typically offer only a limited set of static reports that contain mostly raw data. This is, in part, because a state formulates its approach to knowledge management after, and often in response to, attempts to use the data for a variety of purposes. Despite the progress in developing state data systems, few are advanced enough in data reporting and data analytics to inform strategic investments, drive program integrity, guide support for training and quality improvement, and enable program accountability.

Mid-Atlantic Early Childhood Data Systems Workgroup-shares ideas and strategies for collecting, analyzing, and using state data

The states in the region (Delaware, Maryland, New Jersey, Pennsylvania) and the District of Columbia are not only in different stages of system design, development, and use, but also have different overall strategies for system governance and integration. State personnel who lead the collection and analysis of early childhood data have noted that the volume and sophistication of demands on state data are growing. To address this need, REL Mid-Atlantic convened a regional workgroup for the state staffs that design, manage, and use data systems (referred to here as the Data Workgroup). This workgroup provides a forum for regular peer exchange of ideas and strategies for collecting, analyzing, and using state data. Hearing a range of perspectives gives the group members an opportunity to identify common challenges and learn about innovative solutions. This report summarizes the lessons learned and overall themes of the quarterly workgroup meetings that took place during 2013 and 2014 but is not meant to detail the issues state by state.

Accurate community data are essential to informing strategic investments

The most basic questions that states want to answer with early childhood data are what services are needed, where they are needed, and how best to deliver them. The Data Workgroup addressed these questions by considering three aspects of strategic planning: (1) community needs assessments, (2) financial planning, and (3) reporting the number of children receiving early childhood services.

Without accurate community data, states reported they were unable to identify the communities (or subpopulations within communities) that were disproportionately underserved. Without the ability to assess how services were geographically distributed, states found it hard to target program improvements and investments. A common challenge was that disparate state data systems could not provide state and local decision makers with a complete, unified picture of services in a given geographic area.

In response to these problems, workgroup members shared various strategies for coordinating across state agencies to assemble the data needed to identify high-risk communities. Several states in the region produce annual reports that allow policymakers to understand where children with risk factors reside and how the state can allocate resources to better reach those communities. These data were used to reallocate service dollars to maximize the number of eligible children served in high-quality settings. Two states are developing geographic information system (GIS) tools to explore communities in which children are exposed to a variety of risk factors (poverty, single-parent home, home without a vehicle). These states are using these data to address inequities in access to quality care for high-risk populations, as well as to help parents make informed

choices when selecting a care provider in their area. Workgroup participants agreed that data were frequently requested for use in considering community needs and the distribution of existing services to inform strategic planning and investments.

Early childhood education data systems can be used to foster and monitor program integrity

A major component of program integrity is the consistent application of policies and business practices. To address this topic, the Data Workgroup focused on the use of data systems to foster and monitor program integrity through a combination of data collection and auditing strategies that track program outputs. For example, some states in the region are deploying data systems that automate and verify eligibility, conduct background clearances of staff, or audit provider payments. States are also beginning to audit their data warehouses to identify anomalies or patterns of data that warrant further inquiry. One state runs automated queries on a schedule to identify potential improper duplication of services, and the state has acted quickly to eliminate and recoup duplicate payments. Either through proprietary systems or simple in-house data queries, states are using administrative data to accomplish a range of audits such as automated verification of child eligibility and identification of potential fraud in provider payments. With these analytic tools and strategies, states are looking for new ways to use early childhood data to drive program integrity.

Early childhood education systems data can be used to identify training needs and to guide technical assistance

States are interested in using data for continuous improvement in the quality of early childhood services, but their efforts have been limited by data collection systems that were not designed for that purpose. In practice, state supports to early care and education programs are often generic and not aligned with specific program needs.

Data Workgroup participants shared ways that states are using data to identify prevalent statewide issues such as training needs and gaps in technical assistance. One state, for example, regularly analyzes violations for regulated child care. Trends are disaggregated by type of inspection and region. These reports are used to make revisions to the orientation sessions for prospective child care operators. From this annual report, violations that are of greatest concern are targeted in professional development and training for the upcoming year. States are working to find ways to use local community and provider data to guide specific quality improvement strategies. Right now, however, the states are struggling not only with the analytics required to identify training needs, but also the tools for translating information into action.

Comprehensive data models are needed to support high-quality and accountable systems

Central to the mission of state data systems is assessing whether children are on track to succeed when they enter school and in the future. For Data Workgroup participants, this entailed both identifying the components of quality programming associated with kindergarten readiness and understanding how state services and supports relate to child outcomes. Although various outcomes are important to states, group members cited kindergarten readiness most often. A key strategy (and challenge) in answering

states' accountability questions is the careful design of comprehensive data models that combine information about providers, staff, classrooms, and children served. As states develop systems that integrate information and link to longitudinal education systems, participants anticipate an increasing need to enhance data schemas and back-end services to capture complex data reflecting the experience of a child in a given classroom for a given part of the day.

Dynamic reporting solutions enhance the use of data at the local level

Ensuring best practices at the point of service for children and families requires states to enhance reporting solutions. To equip providers and others at the local level with useful and timely data, states must communicate actionable information in near real time. Some states are now thinking through and designing reporting solutions to produce a contextualized and useful report for providers.

At least one state has designed such a solution, which allows providers to access early learning outcomes for children who were previously enrolled in their program. Providers are able to view aggregate outcome data for their former students once the children reach kindergarten and grades 1–3. The data include kindergarten entry assessments, grade retention, IEP status, and scores on grade 3 state achievement assessments. The system enables providers to view aggregate outcomes for children at a specific location and to generate a report by cohort year. Other states are working towards reporting solutions with similar capabilities. Two of the main obstacles related to this work are the reliability of data and the need to merge data across systems. Because developing these types of reporting solutions takes time and a long-term commitment from staff, a lack of continuity due to staff turnover can also be an obstacle to creating sustainable reporting solutions.

Sustainable partnerships are essential for integrated solutions

As states work to answer important policy questions, establishing sustainable internal partnerships across agencies is essential but challenging. One of the biggest struggles for many states has been to establish common data definitions across systems. Workgroup participants identified opportunities for combining data from different state offices to provide a more comprehensive picture of the communities being served and the resources available for ECE. To achieve the goal of easily shared data, it is necessary to first understand the data and how they are collected. Understanding the data's structure and use is particularly complex when addressing ECE. Programs related to children ages 0–5 are often dispersed among several state departments (i.e., education, health, and public welfare). Also, governance of ECE programs is structured differently from state to state, making it difficult to take lessons learned from one state and apply it to another. Participants noted that centralized program governance or strong partnerships between state offices supported a more unified and sustainable project management structure for integrated systems.

Workgroup participants discussed managing partnerships within and across their agencies to coordinate the goals and use of state data. They expressed a desire for leadership and data administrators to meet regularly across departments and invest time in reaching agreement about common elements and common goals, as well as articulating the overall purpose of the data integration. It is also important for systems analysts to regularly meet and solve technical issues together. A truly integrated data system requires continuity of communication, ongoing participation, and support. While many states have created new roles for data governance coordinators, success will depend on partnerships that fit within a larger mission and that lead to long-term solutions.

One group member, for example, mentioned that not all state agencies were originally involved in the state longitudinal data system. However, as a result of more interest and involvement at the state level in making the system truly integrated and useful, the ECE staff are now part of the state longitudinal data system project team. Another participant described how an effort to submit a federal grant was the impetus for bringing different departments to the table. This helped state staff to understand the types of data being collected by other departments and how work could be coordinated across departments in a complementary way.

Partnering with external organizations has advantages

Whether long-term or short-term, external partners often bring flexibility to project-specific hiring and can inject new expertise and thinking. States are struggling with capacity in a number of areas, including technology, resources, research expertise, and data use. In addition to providing support and flexibility, external partners can add credibility to an issue through independent analysis. Change is hard but new messengers can make it easier. A state agency engaged in a long-term partnership can best utilize the fresh perspectives and expertise of external partners. If the state is clear about its mission and goals for ECE data and understands its own capacities and limitations, it can more thoughtfully engage in and rely on external partnerships. Identifying and prioritizing shared goals for data systems are important to achieving sustainability, which can lead to a good support structure of external stakeholders who are invested in the success of these data systems and their products.

Participants noted that states must actively manage and facilitate partnerships; external partners cannot be effectively leveraged in a piecemeal way to meet short-term needs. Participants also discussed the importance of building trust through sustainable partnerships. Success often relies on external partners embedded within state agencies who have knowledge, experience, or day-to-day interactions with departments responsible for the early childhood data systems. Looking ahead, sustainability and maintainability of the partnerships will remain a challenge and may depend on the availability of continued funding. For example, one state has partnered with a research institution for help in operating its Quality Rating System (QRS) program. The external partner collects registration data and information on which providers are changing levels and who is receiving technical assistance. The state then receives these data and feeds them directly into its data warehouse. This partnership succeeds, in part, because the state has a clear sense of its priorities and its own limitations in collecting and keeping these data organized.

New organizational solutions for data use are essential

Although challenges remain, independent state efforts to expand and integrate early childhood data systems have resulted in more information being available about the usage, quality, and outcomes of early childhood programming than ever before. Leveraging federal grant programs, many state early childhood offices have significantly improved their data collection and management systems over the last decade. Although progress has been gradual and the work is unfinished, states have also improved their data and reporting capabilities. However, these data resources are significantly underutilized: most states lack the analytic capabilities and dissemination channels required to use this information effectively. A clear emerging lesson is that to utilize data, states must have a coherent strategy that connects program analytics with policy and operations in a productive and sustainable culture of evidence-based decision making.

States efforts to use early childhood data for accountability and improvement efforts must focus on IT solutions, analytic solutions, and organizational solutions that are connected in a productive culture of data use. Translating ECE state data into useful information for policy and programming requires cultivating capacities for system integration, knowledge management, and intentional organizational solutions resulting in convergence.

State peer exchange fosters sharing of challenges and innovations

The peer exchange among workgroup participants from different states and the District of Columbia identified common challenges and revealed innovative analytic strategies being implemented in the region. All jurisdictions were at different levels of system development and maturity, although each had recognized areas of strength. Two of the most-discussed challenges were inadequate data models and lack of resources. Workgroup members also shared many strategies for using data. Successful strategies, two of which are described below, included use of data to both scale up and to change early childhood programs.

Data governance leaders face continuous challenges in integrating systems

While identifying the essential data elements was a clear priority for all state systems, participants voiced a common concern about how their data are organized into a schema that defines its properties and relationships with other data. Each jurisdiction is pursuing various system initiatives, each producing a fresh data stream. One factor complicating the system development efforts is the need for chief information officers to constantly rethink how all the information is going to connect. States recognized the need to avoid delay in defining the underlying data models. Group members also valued the role of data governance coordinators in developing an integrated data model. In several workgroup meetings, the common recommendation from participants was to proactively specify the protocols and formatting of data across different systems, often managed by different government offices.

States often struggle to meet data demands because the transactional data systems were not designed to easily incorporate major changes. In many states, legacy data systems have required extensive modifications; too often, policymakers, funders, researchers, and others do not recognize the complexity and scope of improvements. In response, there is interest in developing common data definitions to standardize information across disparate data systems in the absence of integrated models. As states work on the front-end transactional data systems, they are also updating or rebuilding older reporting solutions to enable full, dynamic, and secure access to data across systems in a way that can support office planning and evaluation with timely and actionable information.

As states have considered the use of ECE data, it has not been possible to anticipate all of the demands. Solutions for information management have been slower and started later than expectations, and often come only in response to the availability of raw data. States are working to enhance data schemas and back-end services to integrate increasingly complex data systems. A gap is emerging between the transactional systems and the states' capacity to access and use the data. A new focus of state data system work is on developing data schemas that connect and define the relationships between systems and elements and on finding knowledge management solutions that provide access across a larger enterprise system. State leads have made it clear that data schemas and analytic solutions cannot be an afterthought to data collection.

Another common challenge was a lack of resources, particularly a lack of personnel with expertise in data analytics and information systems. Workgroup participants were concerned that inadequate staffing could lead to issues with data integrity and missed opportunities for data integration. States may not be able to monitor data streams if personnel are not available.

Members shared examples of successful strategies

As an example of successful data use, one state in the region described how it was able to analyze enrollment data for infant/toddler services across the state as part of a credentialing initiative. Data from both state and local systems were reviewed to explore community risk and program reach for very young children in local communities. This review found that services in several communities were almost entirely targeted to preschool-aged children. In response, the state used data to make investment decisions to increase access to quality infant/toddler care in specific communities. This effort required local and state coordination of data and resulted in a policy and investment decision based on the collection and analysis of data.

Another example of state data use illustrated how data were essential to changing the funding structure of the state childcare quality initiative. Data were essential because any changes to the program funding structure had to be neutral to total cost and waitlist volume. A cost model was used as a rate-setting tool to explore the impacts of variable- or fixed-base rates, various tiered rates, and eligibility. Using real data on the population of children and providers, the planning team was able to predict the annual encumbrances of various scenarios based on the number of current providers at each level and the number of subsidized children that each served. This state was able to direct more resources to higher level providers and gave those providers more flexibility in using these resources. This was a major structural improvement to the program with long-term political and programmatic benefits. Data were critical in launching that initiative because the state would not have had the confidence to move forward with changes without knowing that the changes would not affect the total cost and waitlist volume.

Future collaboration will be needed

The Mid-Atlantic Early Childhood Data Systems Workgroup demonstrates how well cross-state collaboration can work. Participants shared their own experiences and challenges and responded to questions and suggestions from their colleagues in other jurisdictions. This workgroup is one response to an emerging gap between states' data collection efforts and the sophistication of their data use. Participants are able to share and develop new strategies for data use through periodic, detailed conversations about common challenges and informed recommendations. The workgroup findings also highlight the challenges ahead. As states develop advanced data systems and analytic products, they will need new organizational solutions to support ongoing and meaningful data use.

The challenges that states face in using early childhood state data are becoming better understood. Many states have comprehensive and integrated data systems but still struggle to use the data for public sector planning and evaluation. States need organizational strategies for engaging data users at many levels and leveraging external partnerships in effective and sustainable ways that facilitate application of evidence. Translating ECE state data into useful information for policy and programming requires cultivating capacities for technology, knowledge management, and organizational processes resulting in convergence. Rather than waiting for more data to make the difference, progress will depend on comprehensive thinking about IT and analytics while also ensuring that an appropriate organization is in place. More research is needed to discover effective solutions and strategies that can lead to greater efficiency in working with early childhood data.

References

Early Childhood Data Collaborative. (2014). 2013 State of states' early childhood data systems. Berkeley, CA: The Early Childhood Data Collaborative.

National Governors Association (n.d.). Early Childhood Data Systems. Retrieved October 1: http://www.nga.org/cms/home/nga-center-for-best-practices/center-divisions/center-issues/page-edu-issues/col2-content/main-content-list/early-childhood-data-systems.html

Nguyen, P. (2012). How data play a role in early childhood education. NCSL, Vol. 20, 11. Retrieved from: http://www.ncsl.org/research/education/how-data-play-a-role-in-early-childhood-education.aspx.

Snow, K. (2011). Developing kindergarten readiness and other large-scale assessment systems: Necessary considerations in the assessment of young children. Washington, DC: National Association for the Education of Young Children.