INVENTORY OF INNOVATIONS:
Data and Child Welfare

Capacity Building
CENTER FOR STATES

Big data refers to "extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions" (Big data, 2017). The term "big" in this case refers not only to volume but also to the variety of the data and the complexity of the processes required to turn the raw data into usable information (Coulton et al., 2015).

In recent years, collection and use of data, especially big data, have become an important part of child welfare practice. For example, advances in data technologies can allow agencies to seamlessly share information to help the children in their care, facilitate adoptions across state lines, or help a child welfare professional decide whether an intervention is necessary in a particular case. In other words, effectively gathering, sharing, and using data can help child welfare agencies better serve children and families.

Collecting and working with big data require new methods in data management, processing, and analysis. It requires innovation, which can be defined as the creation and/or adoption of new ideas and practices to improve organizational outcomes (Borins, 2006).

Adopting new ways to gather, share, and use data in child welfare—and the social service sector more generally—has many benefits, both for agencies and the populations they serve. These may include:

▶ Increasing efficiency of information gathering

▶ Helping child welfare agencies demonstrate progress toward targeted goals (Webster, Putnam-Hornstein, & Needell, 2011)

▶ Increasing creation of evidence-based practices and policy (Coulton, Goerge, Putnam-Hornstein, & de Haan, 2015)

▶ Expanding the amount and type of useful data available by sharing information among agencies

▶ Allowing for the creation of new types of information by cross-referencing data in new ways (Walker, Farley, & Polin, 2012)

▶ More easily generating useful and user-friendly reports for analysis

▶ Allowing child welfare agencies to better understand the impact of existing programs on the children and the families they serve

▶ Better identifying service gaps and/or underserved populations

Because "technology has created new ways of working in many places, including child welfare agencies" (Smith & Eaton, 2014, p. 137), new approaches to using data and child welfare information systems call for a "culture-centered approach" to technology that takes into account organizational culture and the needs of child welfare workers at all levels (p. 156). In practice, this means that agencies considering implementing particular data technology should work with child welfare workers to evaluate agency-specific needs and flows of information to determine whether a particular type of technology is the right fit. Below are examples of some ways data are beginning to be incorporated into child welfare and a discussion of things to consider when thinking about implementing a new data system.

The following are examples of data innovations adopted by states and jurisdictions. They are intended as informational examples only and are not endorsed by the Children's Bureau or the Capacity Building Center for States. Child welfare agencies are encouraged to consider their specific program needs when deciding whether to adopt any kind of technology solution.

Data Exchange and Sharing

Data exchange and data sharing technologies focus on providing accessible, linkable, and secure data resources derived from multiple sources. Though social service, health-care, and educational organizations of all kinds have long collaborated in an attempt to better serve children, families, and others, sharing information has become much easier in recent years because of the widespread use of electronic data systems that track and store a variety of data about the populations these organizations serve.

Data are considered linked or shared when information from two or more separate data systems or databases are connected, combined, or merged. These data systems or databases may be housed in the same agency or in two or more separate agencies. Data linking can occur in various ways, ranging from simple (e.g., having staff from two different agencies enter information into the same spreadsheet) to more complex (e.g., using integrated data systems that link data across multiple programs or agencies that serve children and families) (King, et al., 2016). Title IV-E agencies that elect to build a Comprehensive Child Welfare Information System (CCWIS) are required, if practicable, to exchange data with other health and human service agencies, education systems, and child welfare courts (Administration for Children and Families, 2016).

Child Welfare–Education System Collaborations

Child welfare–education system collaborations allow child welfare agencies and school systems to share information about children under both of their jurisdictions. A link between the education and child welfare systems already exists since the education of children and young people in the child welfare system is one of the factors of well-being evaluated by the U.S. Department of Health and Human Services during the Child and Family Services Review (CFSR) process. In 2011, the Children's Bureau funded 10 Child Welfare–Education System Collaborations to Increase Educational Stability grants, each lasting 17 months and designed to support increased collaboration between state, local, or tribal agencies and education systems. Improving the ability to share data among child welfare and education organizations was a significant focus of several of the grants, including those in Pennsylvania, California, Florida, Kansas, North Carolina and Ohio (Child Welfare Information Gateway [Information Gateway], 2016).

For example, using the grant, the Allegheny County (PA) Department of Human Services (DHS), the Pittsburgh Public School District, and the Allegheny County Family Court were able to enhance and improve an existing data-sharing partnership that began in 2009. Two core initiatives of the project were EdMap, which improved the technological infrastructure that supported the collaboration, and the Shared Accountability for Education program, which established joint accountability among DHS, the courts, and educational institutions for the well-being of children served by all three groups (Information Gateway, 2013). Positive project outcomes included:

▶ Improvement of data sharing and integration between the school systems and Allegheny County DHS. First, the schools integrate student data—including personal identifiers, demographic data, performance data, and attendance data—into the Allegheny County DHS warehouse. The data is then made accessible to relevant DHS and court stakeholders under certain agreed-upon conditions. In addition, DHS uses the data to "prepare analytical, aggregate reports related to students who receive services through DHS" (Information Gateway, 2013, p. 5).

▶ Creation of a cross-agency consent form to share the educational records of school-age children among agencies

▶ Automation of the Pennsylvania State Education Screen, which reduced the workload of DHS caseworkers

"by populating some of the fields from the integrated data acquired through the data-sharing agreement" (Information Gateway, 2013, p. 2; Skakalski, Murphy, & Whitehill, 2013).

▶ Implementation of the Best Interest Placement Tool, a decision-support tool for caseworkers to identify the best possible placements for children who need to be placed in out-of-home care

In Solano County, CA, the Child Welfare–Education System Collaborations to Increase Educational Stability grant was used, in part, to create data-sharing protocols between the California Child Welfare Services (CWS) and Solano County Office of Education that allowed the schools to receive notice of a placement change within 24 hours. As in Allegheny County, education data from the school system were integrated into the California CWS case management system, which permitted caseworkers to obtain useful information on school-age children and youth in foster care (Information Gateway, 2016).

Also in California, an effort is underway to better support children and youth in foster care to succeed in school. In 2000, Sacramento's County Office of Education partnered with local schools, mental health and probation departments, and child protective services to create Foster Focus, a database that links information from partner agencies, including foster students' attendance, grades, courses and credits, placement and residential history, with the goal of creating the best outcomes for children and youth in foster care. Data are available for practitioners, including district foster youth services staff, social workers, and probation officers, to use in real time to ensure a holistic understanding of foster youths' needs and circumstances. As of 2017, educators and social workers across 38 California counties used Foster Focus to track services and outcomes for more than 24,823 foster youth in participating school districts (California Child Welfare Co-Investment Partnership, 2013).

As a result of participation in the Child Welfare–Education System Collaborations to Increase Educational Stability grant, agencies in Florida, Kansas, and North Carolina implemented automated data systems to track children's data and facilitate information sharing.

National Information Exchange Model

One major resource for data sharing among government agencies, including child welfare, is the National Information Exchange Model (NIEM). NIEM is a community-driven, standards-based approach to exchanging information across federal, state, and local government boundaries. It is an XML-based framework that contains a shared vocabulary, concepts, and core elements agreed to by all organizations that use it, enabling them to build data-sharing platforms that are compatible with one another. The NIEM model provides rules and methodologies around the use of the model, as well as standardized information for developing and implementing the model that can be used by everyone. NIEM also includes governance, training, tools, technical assistance, and an engaged community to support users and organizations in adopting NIEM (National Information Exchange Model [NIEM], n.d.). One of the most useful aspects of NIEM is the provision of a template for structuring data exchanges to states and jurisdictions so they won't have to start from scratch when building their data exchange infrastructure. The NIEM template also "provides vendors with a common set of data requirements that will be needed by all states, thus reducing the costs of incorporating them into existing case management systems" (NIEM, 2009).

Court–Child Welfare Agencies Collaborations

Since its inception, the NIEM template has been adapted for use in a number of child welfare initiatives. Some of the most important ones focus on data sharing between the court system and child welfare agencies. Data sharing between child welfare agencies and courts is particularly important since the two collaborate closely to make decisions about a child's safety, permanency, and well-being within the child welfare system.

Court/Child Welfare National Exchange Template Task Force

The Court/Child Welfare National Exchange Template Task Force is a working group convened by the National

Center for State Courts in 2007 that helps states create the infrastructure necessary to facilitate timely and accurate data sharing between child welfare agencies and courts. This model expedites service provision, party notification, and court orders. It also reduces redundant data entry for both agency and court staff, improves data accuracy, and provides for performance measurement (NIEM, 2009). Courts and child welfare agencies together can choose which data will be shared. Templates produced by the task force have been field-tested in Vermont, where they were used to facilitate information sharing between the state child welfare agency and state courts (Flango, 2011).

The Child Welfare Court Improvement Project

The Child Welfare Court Improvement Project (CWCIP) is a federally funded program established in 1994 "to develop child welfare court data measures to report information regarding child welfare court operations within a child welfare outcomes framework" (Drezelo & Lepore, 2008, p. 6). Administered by the Children's Bureau, the CWCIP operates in all 50 states, the District of Columbia, and Puerto Rico. Under CWCIP grants, which are awarded to the highest court of each participating state, recipients complete a detailed self-assessment, develop recommendations to improve the court system, and implement the recommended reforms. For example, using metrics from both court and child welfare agency data, the CWCIP compiles and disseminates a comprehensive report to all family courts and local social services departments in the State of New York. The county-by-county data indicators provide benchmarks in the categories of child safety, time to permanency, child well-being, and due process. In another example, North Carolina established a case management information system for collaborative data collection to improve child outcomes in abuse, neglect, and dependency cases. JWise is a unique, multiuser automated system developed over many years. It serves as the official index for juvenile court clerks in North Carolina and as a case management tool for court improvement, family court, and guardian ad litem staff. This information system is only viewed by judges and state-level users, and the system is updated by clerks, guardian ad litem staff, and other authorized parties (Capacity Building Center for Courts, 2015).

National Electronic Interstate Compact Enterprise

Another recent application of the NIEM template is the National Electronic Interstate Compact Enterprise (NEICE), "a cloud-based electronic system for exchanging the data and documents needed to place children across state lines as outlined by the Interstate Compact on the Placement of Children (ICPC)" (American Public Human Service Association [APHSA], n.d.). NEICE allows child welfare caseworkers to share information with courts, private service providers, and families regarding a child's interstate placement. It was launched in 2013 as a pilot project with funding from the Children's Bureau to the American Public Human Service Association (APHSA) and ICPC with six state participants: the District of Columbia, Florida, Indiana, Nevada, South Carolina, and Wisconsin (Sciamanna, n.d.). In 2015, APHSA worked with the research firm WRMA to evaluate the impact of NEICE in the six pilot states. WRMA found that NEICE implementation increased administrative efficiency, improved service delivery, and reduced barriers to accessing interstate placement resources (APHSA, 2015). At this time, the NEICE project is expanding nationwide, with more than 15 participating states and jurisdictions to date (APHSA, 2017).

Predictive Analytics

Predictive analytics, or Predictive Risk Modelling (PRM), "uses routinely collected administrative data to model future adverse outcomes that might be prevented through a more strategic delivery of services" (Vaithianathan, Putnam-Hornstein, Jiang, Nand, & Maloney, 2017). PRM has previously been used in health-care and hospital settings and has recently been suggested as a useful tool for child welfare. PRM could potentially be used to prevent sex trafficking of children, for example, by implementing statistical analyses to predict the likelihood that a particular youth will run away and then to support a proactive intervention (Capacity Building Center for States, 2015). PRM could also be used to help child protection workers make better service decisions when a child has been named in an abuse or neglect report or to predict other outcomes, such as permanency or length of time in care.

Allegheny County, PA is one jurisdiction that has implemented PRM in a child welfare setting. In 2016, after 2 years of research and exploration, Allegheny County DHS implemented the Allegheny Family Screening Tool (AFST), a predictive model designed to improve call screening decision-making in the county's child welfare

system. The AFST calculates a Family Screening Score (FSS) by analyzing and synthesizing approximately 730 data variables; the score predicts the long-term likelihood of new referral if the call is screened out without an investigation or of home removal if the call is screened in for investigation. The FSS provides additional information to assist child welfare workers in making call screening decisions in real time. Because the tool is not perfect, Allegheny County DHS policy makes clear that the FSS is only one of many pieces of information used in the decision-making process and that it should never override the workers' clinical judgment regarding whether to investigate a particular referral. To protect the privacy of children and families, the FSS is only accessible to workers who have been trained to use the AFST and who have a direct need to access the score.

As of April 2017, there are two independent evaluations of the AFST in progress. A process evaluation, conducted by Hornby Zeller Associates, Inc., will assess whether the screening tool is being implemented with fidelity. An impact evaluation, conducted by Stanford University, focuses on the accuracy of decisions, reduction in unwarranted variation in decision-making, reduction in disparities and overall referral rates, and workload (Vaithianathan, et al., 2017, pp. 35–36).

In 2013, Florida launched its own risk modeling tool called Rapid Safety Feedback (RSF), which was developed in Tampa's Hillsborough County after a spike in child deaths between 2009 and 2012. Hillsborough County worked with Eckerd, a private child welfare services provider, to retrospectively analyze child abuse cases to identify risk factors for abuse (Heimpel, 2015). RSF uses software that scans real-time data and identifies a list of high-risk cases. Once the cases are identified, they are flagged and reviewed, often leading to an immediate, intensive meeting between quality management specialists and the family's case management team to discuss the most appropriate course of action. It is the combination of the two—data and intensive intervention—that makes RSF so promising. As of 2016, interest in RSF has spread to additional Florida counties, as well as to Alaska, Illinois, Connecticut, Oklahoma, and Maine (Commission to Eliminate Child Abuse and Neglect Fatalities, 2016).

In 2016, the Children's Data Network, a data and research collaborative at the University of Southern California, in partnership with the California Department of Children and Family Services, received a grant "to establish whether the statistical modeling of historical child protection records can be used to improve the initial screening and triaging of child abuse and neglect referrals." The project is expected to conclude in June 2018 (Children's Data Network, n.d.).

In sum, though predictive analytics is potentially a powerful tool to help identify vulnerable children, agencies should be aware of ethical considerations, such as privacy and others.

Data Visualization and Geographic Information Systems

Geographic Information Systems (GIS) is an information management system that stores, presents, and analyzes data referenced by geography (Dailey & Keegan, 2011). Multiple layers of data—for example, geographic features, foster child placement, schools, locations of biological parents and other relatives, services, medical and psychiatric care facilities—are presented visually, making trends easier to identify and analyze. Layers can be added to and removed from the map to vary the complexity level of the information presented. Data visualization is the presentation of data in a graphic format. It enables decision-makers to see analytics presented visually so that they can grasp difficult concepts or identify new patterns. If the visualization is interactive, users are able to drill down into charts and graphs for more detail, changing the relationship of the data parameters and organization of the data presented (SAS, n.d.). Data visualization can be used to comprehend information quickly, identify trends and patterns, pinpoint emerging trends, and more effectively communicate information to others.

Child welfare agencies in some states and jurisdictions are using GIS in innovative ways to gather information about the populations they serve in order to provide better services for children and families. GIS programs allow users to interpret visual data to identify patterns, relationships, and trends that might not be immediately obvious by reviewing other types of data. As one researcher observes, "a fundamental aspect of GIS is locating people in their environment, complementing the work of those providing direct services, such as casework" (Brunsink, 2016, para 6). For example, child welfare workers would be able to see where clients live in relation to the services they need to access or areas that need more recruitment efforts because they lack suitable foster parents (Brunsink, 2016, para 7).

Considerations for Implementing Data Innovations

A number of considerations exist when developing and implementing data and information systems innovations in and for child welfare agencies. They include issues related to privacy, governance, and the technology itself. States and child welfare agencies may want to consider the following when deciding whether to adopt a particular data and information systems innovation:

▶ Child welfare agencies should work collaboratively with information technology leaders early in the process to evaluate a particular organization's technology needs and establish requirements for the creation of quality data systems.

▶ Relying on data as the major source of information for decision-making requires high-quality data that are both valid and reliable. Data duplication or redundancies could make issues appear larger than they really are, and errors in data sets could incorrectly classify individuals as high risk. Ongoing efforts to monitor and improve the quality of data require participation by all members of the child welfare agency, as well as the entities involved with data-sharing agreements, and should include a balance of technology- and human oversight-based approaches. Making clear connections between the data and improved outcomes helps support the user's investment in helping to improve the quality of data.

▶ Much of the success of a data-sharing program depends on the participants' expectations, which should be established at the beginning. Questions such as how the agencies will work together to collect data, what types of data will be shared and how often, and how the data will be used in practice should be discussed at the outset. Arriving at a true consensus and getting buy-in from all participants about methods and goals is critically important for success (Walker et al., 2012).

▶ Privacy is a central concern when using large data sets, since data security breaches are a common danger in the human service, educational, and health sectors. When creating a data sharing system, agencies should take into account the practical considerations of protecting their clients' data as well as the legal considerations related to individuals' right to privacy. In addition, "the social sector must consider the ethical matter of using digital information for purposes of which individuals may not have been aware when providing personal information" (Coulton, et al., 2015, p. 6).

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