

Integrating Early Childhood Data



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Integrating Early Childhood Data in Scott County, Minnesota

Capstone Paper

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Executive Summary

Birth to age five are critical years for brain development. Early childhood education provides curriculum designed to stimulate the minds of children and prepare them for kindergarten. Currently, there are too many families missing out on essential early childhood services in Scott County. Missing these services is detrimental to ensuring children are prepared for kindergarten. Allegheny and Dakota counties have been successful in creating integrated early childhood data systems that coordinate programs to serve children in more holistic ways. Integrated data systems can help future and current students and can provide tools that can be used by lawmakers to advocate for evidence-based policies to better student outcomes.

Combining early childhood data can improve programming and planning of services, provide opportunities to better meet child needs, and promote efficiency, accuracy, and speed in the decision-making process. Integrated databases make use of already existing data to create a more complete picture of all the ways early childhood services are impacting children living in the community. Based on our survey of three data integration efforts in Minnesota and around the country, we recommend that Scott County take the following steps:

1. Prioritize transparency and engagement with the community. Create a group of diverse stakeholders to create a well-planned data system that meets specific community needs.

2. Consider first developing a population level database that does not include information on specific children but can show aggregate level trends, participation, and outcomes.

Population level data integration is relatively low risk and could be used to get a better count of incoming kindergarteners, which can in turn increase school funding. Individual level data has more challenges but may also have a larger impact in Scott County.

Introduction

Scott County has identified early childhood data integration as an opportunity to gain greater insight into the needs of young children and connect them with services that can improve their success both in and out of school. Our report provides recommendations concerning the practical implications Scott County should consider in the development of an early childhood integrated database.

We have identified three general methods for integrating early childhood data that Scott County should consider and explore further: population level data integration, individual level data integration, and predictive analytics. These methods are drawn from the various states and counties around the country that have pursued data integration efforts to improve coordination between local governments, schools, and service providers.

Population Level Data Integration

Combines early childhood data from relevant public and private groups into a system that can show aggregate level participation, trends, and outcomes, without identifying individual children.

- Examples: MN ECLDS, Alleghany County

Individual Level Data Integration

Combines early childhood data from relevant public and private groups into a system that allows selected users to access information on individual children. This approach allows for more effective and expedient case management, but presents various ethical, logistical, and legal challenges that must be considered.

- Examples: Dakota County Birth to Age Eight Initiative, Allegheny County Client View

Predictive Analytics

Involves using integrated early childhood data to develop forward-looking statistical models that can predict adverse educational or health outcomes for individual children. Predictive Analytics might allow for better prioritization of services, since interventions could focus on children with the highest probability of not reaching third grade reading proficiency. It is more of a supplemental tool, and it is fraught with challenges and ethical concerns.

- Example: Ramsey County JPA

In the development of any of these three models, Scott County should prioritize transparency and engagement with the community. Meaningful community engagement should occur early on in the process in order to reduce the risk of misinformation and misconceptions around data integration efforts. Working with people in the community and those who would be served by an early childhood data initiative is especially important when considering implementation of individual level data integration and predictive analytics. These latter two models present distinct issues around the kinds of information that might be stored, who might have access, and what the data might be used for in the short and long terms.

There are a number of projects involving the integration of early childhood data currently taking place around the country. Community leaders should become familiar with lessons and challenges experienced in the several counties discussed in this report. Scott County would be well served to collaborate with its federal and state partners to reduce administrative burdens.

Project Background

In 2018, Scott County Minnesota issued its 2040 Comprehensive Plan and set out policy goals for its future development. The 2040 plan incorporated findings and recommendations from the Scott County Association for Leadership & Efficiency (SCALE). As part of its “50 by 30: Live Learn Earn” project, SCALE convened an Educational Preparedness work group to study barriers to educational and economic achievement for young people and potential opportunities for improvement within Scott County (Scott County Association for Leadership and Efficiency, 2017). The work group identified third grade reading proficiency as a key indicator for future success and voiced concern over a recent decline in third grade reading scores by Scott County students. To reverse this trend, the county is starting to explore options for improving early childhood services (Scott County, 2018).

In their proposed legislative priorities for 2019, SCALE suggested that although many early childhood intervention services are currently available in the county, there are substantial information gaps between providers that are preventing optimal outcomes for at-risk children. SCALE believes that if “agencies can share actionable data, they can coordinate services and leverage existing programs to improve student outcomes” (Scott County Association for Leadership and Efficiency, 2019). At the most basic level, the lack of data sharing between stakeholders makes it difficult for Scott County school districts to know how many children will show up for kindergarten on the first day. This also prevents schools from receiving the proper level of funding for early childhood programs. The county hopes to reduce social service support costs for adults in the long-run by making early childhood intervention more effective and efficient.

Scott County partnered with the University of Minnesota’s Resilient Communities Project to further explore the idea of early childhood data integration as a means of improving third grade reading proficiency. Building on previous research conducted by Leneave (2018) as part of this partnership, our report will review recent literature and similar data integration projects from around the country to inform potential best practices that Scott County should consider as it moves forward with the development of an early childhood database. Some of the key questions we will attempt to answer include:

- What data is currently being collected from programs in Scott County that could inform efforts to track progress on early childhood development and learning?
- What models for early childhood data integration have been implemented around the country? How were they developed and structured? What process was followed?
- How can Scott County ensure continued compliance with applicable laws and regulations, while maintaining public support and stakeholder buy-in?

- If a database were to be created, who would have access? How would data be kept private? What ethical considerations surrounding data integration are relevant to the continued success of the database?

Literature Review

Need for Accurate Estimates of Incoming Kindergarteners

Scott County has identified that a lack of data sharing between early childhood service providers and school districts hinders school administrators from knowing how many children will show up on the first day of kindergarten. Scott County public schools are funded per pupil by federal and state dollars, with additional funding allocated for children with disabilities. The integration of early childhood data between relevant stakeholders could improve the likelihood that school districts receive the proper level of funding by improving their abilities to take accurate estimates of the number of incoming kindergarteners.

Conversations with several schools within Scott County revealed that parents typically register their children for school the winter before the next school year begins in the fall. This registration takes place online through the district website. Schools in Scott County also hold open houses around January and February where families can register their children for kindergarten. Around May, registered students are typically invited to kindergarten for a half day to get a sense of what school will be like. Unfortunately, some families do not know that they need to register their children for kindergarten. As a result, they are unable to take advantage of these opportunities and are not contacted by the school district since administrators do not know they exist.

Currently, schools in Scott County send out reminders to families to register their children for kindergarten. The reminders are sent to families based off census data. While this makes sending out reminders a relatively simple task for the school district, it is likely not the most effective method for reminding all families to register for kindergarten. McCarthy (2018)

has reported that census data is not always entirely accurate and does not necessarily represent all families that are living in a given community. He found that the 2010 U.S. Census failed to count almost one million children younger than age five, and those from racial minorities or low socioeconomic status make up a disproportionate share of the individuals left out. It can be even harder to accurately represent the number of immigrant families in the community since they are sometimes too scared to respond to the survey.

Not all parents learn to register their child through reminders sent to the home. Some parents find out about registration through flyers in their apartments, the school district website, social media, or their preschool. Despite the wide variety of ways schools can notify families when it is time to register their children for kindergarten, some still fall through the cracks. Not all families live in apartments, have access to internet and social media, or have children that attend preschool. Even children in preschool can miss out on registration, since those programs are under no obligation to facilitate a child's move to kindergarten.

This lack of timely registration for kindergarten is a critical issue that could be addressed by bringing relevant stakeholders together to coordinate better information sharing. Given that there is likely some record, somewhere, of most of the children who fail to register for kindergarten on time, it is possible this is an information gap that could be addressed through an integrated data system.

Early Intervention, Closing the Socioeconomic Achievement Gap, Boosting Kindergarten Readiness

Experiences and environmental influences early in a child's life affect brain development and long-term health (Boyce, 2012). These experiences can affect the likelihood of children in Scott County achieving third grade reading proficiency later on. It is essential that a well-

coordinated social service system be available to families during critical years of early childhood development to improve kindergarten readiness and close achievement gaps.

Under Minnesota law¹, a child is ready for kindergarten if they are at least five years old by the first day of September in their enrollment year, they have received an early childhood screening, and they have received medically acceptable immunizations. While children can be screened as young as age three, many do not take part in early childhood screening until it is time to enroll for kindergarten.

Early childhood screenings can determine if a child's development is on track based on their language, motor, and problem-solving skills (Minnesota Department of Education, 2018). Screenings collect health history and information on social and emotional development. The tests also check for hearing and vision issues. Families are encouraged to schedule their children for early childhood screenings as early as age three, but some students do not receive a screening until kindergarten. This can make it difficult to identify children who are behind on their developmental progress.

Garcia and Weiss (2017) have found that the socioeconomic status of young children is one of the most significant predictors of future academic achievement. The determinants of a child's socioeconomic status include their parent's educational attainment, job status, and household income. Each of these factors are correlated to kindergarten readiness. Children from low socioeconomic backgrounds fall behind wealthier children in cognitive and noncognitive development early in life, and this divide is often readily apparent when they begin kindergarten.

Schools are not solely responsible for achievement gaps. By the time children enter kindergarten, dramatic socio-economic and racial school-readiness gaps are deeply

¹ Minnesota Statutes § 120A.20; 121A.17; 121A.15

entrenched. Students in the highest socioeconomic groups score significantly higher in reading and math than children in the lowest socioeconomic groups, and this gap persists throughout a child's academic career. Loeb and Bassok (2007) have shown that Hispanic and non-Hispanic black students on average score lower than non-Hispanic white students on math and reading standardized tests. Likewise, the average student from a low-income family scores much lower on standardized tests than students from higher-income families. This gap is particularly harmful long term as its impacts persist into lifetime earnings and productivity (Reynolds, Temple, White, Ou, & Robertson, 2011).

Achievement gaps also stem from the fact that impoverished children often experience family stress, child abuse or neglect, food insecurity, and exposure to violence (Black et al., 2017). Significant adversity can produce physiological disruptions that undermine the development of the body's stress response systems, which in turn affect the developing brain, cardiovascular system, immune system, and metabolic regulatory controls. These physiological disruptions can lead to physical and mental health impairments in adulthood (Boyce, 2012). A lack of necessary protective factors in the home, such as consistent caregiving and coordinated health care, can negatively affect the health trajectories of young children (Black et al., 2017).

Children from low socioeconomic backgrounds also have fewer opportunities to develop language skills that are critical to kindergarten readiness. Hart and Risley (1995) found that by age three, children from higher income homes had an average vocabulary of more than 30 million words, while children from working class families and families on government welfare programs had vocabularies of 20 million and 10 million words respectively. This gap is problematic for Scott County students' potential for achieving third grade reading proficiency, as

students are entering school with varying exposure to the language that must be used to build literacy.

Hernandez (2018) shows an alarming link between the failure to read proficiently by the end of third grade and failure to graduate from high school on time. Children who do not meet the National Assessment of Educational Progress' "basic" reading level in the third grade are four times more likely to leave school without a diploma than proficient readers. This is a problem because the lack of a high school diploma affects the chances of a student succeeding economically later in life — including their ability to break the cycle of intergenerational poverty. Steep high school dropout rates can adversely affect the ability of the United States to remain productive and globally competitive (Fiester, 2013).

Early childhood programming can be effective in supplementing the environments of children from low socioeconomic status families. For example, programs that provide childcare to mothers with little education can improve performance on academic readiness and achievement tests by their children (Geoffroy et al., 2010). Early childhood data integration can be an effective tool for improving Scott County services that are essential to the long-term health of children and the community at large.

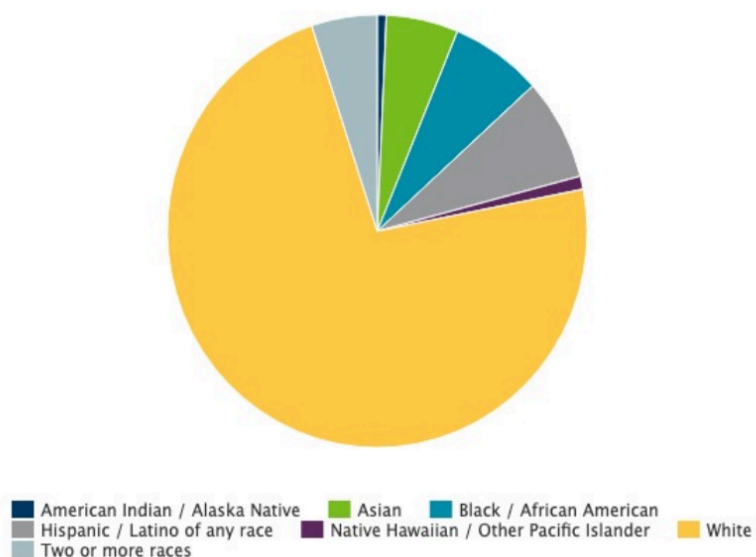
Vulnerable Populations

It is critically important to recognize the broad historical and socioeconomic context behind many of the families that Scott County will serve with an early childhood integrated database. Scott County early childhood data integration efforts will likely involve the sensitive personal information of children living in poverty and many people of color who throughout history have faced economic barriers and maltreatment under government policy informed by systemic racism. Initiatives to improve social service provisioning through data integration, no

matter how well intended, will have to confront the broad effects of this dark past and current reality.

Statewide Demographics

Census data shows that in Minnesota, 14.8 percent of youth under the age of five are living below the poverty line. Across all ages, Minnesota has startling racial disparities of who is in poverty. While just 7.9 percent of white citizens are living in poverty, all other minority groups are more likely to be in poverty. 31.9 percent of black or African Americans, 31.5 percent of American Indians or Alaska Native Americans, 15.4 percent of Asians, 19.9 percent of Native Hawaiian or other Pacific Islander, 23.4 of other races, and 18.3 of people who are two or more races are living in poverty. Additionally, 20.9 percent of those who identify as Hispanic/Latino are living below the poverty line, compared to 7.5 percent of non-Hispanic/Latino people. This unequal racial composition of who is exposed to poverty is troublesome given the negative effects poverty has on child development and kindergarten readiness.



Race/Ethnicity of Scott County Kindergartners, 2016-2017 School Year

(Early Childhood Longitudinal Data System, n.d.)

Local Demographics

The United States is becoming increasingly more diverse and the enrollment and demographic data for Scott County is consistent with this growing diversity. Scott County has a student population that is approximately 76 percent white, 8.5 percent Hispanic/Latino, 6.7 percent black or African American, 6 percent Asian, .8 percent Native American, and 4.6 percent students who report two or more races (Minnesota Report Card, 2019).

Utilization of early childhood programs varies by race. Looking at 2016-2017 Scott County kindergartner data, we can see which students participated in services before they entered kindergarten. These services include the Child Care Assistance Program, Early Childhood Family Education, Early Childhood Special Education, and Minnesota District Preschool. Of Scott County children, Key There were not enough American Indian or Alaska Native students registered in programming to report. These lower rates of enrollment among students of color are alarming and should be addressed.

Historical Context

The United States education system has a dark history of maltreatment when it comes to people of color, and the effects of this discrimination remain in school districts around the country to this day. Scott County will likely need to be cognizant of the injustices that have been carried out against vulnerable populations in the United States as it develops an integrated database that could implicate many of these groups. These injustices, to name a few, include the genocide and forced assimilation of Native Americans and the denial of and unequal education provided to African Americans. This following history is not intended to fully explain the trauma these communities have experienced but to provide some background on why these groups may be hesitant to welcome a database that would connect them to government services. Scott County

will likely need to handle this distrust by bringing people from these communities forward as key stakeholders during the creation of an integrated database.

Throughout history, Native Americans have been killed at the hands of colonizers by disease, famine, and warfare. The United States government took their land and forced them to move west. This movement, called the Trail of Tears, resulted in the death of over 3,000 indigenous people. Instead of being allowed to live off of their native land, they were moved to “Indian territory.” This territory was mostly located in areas that were unwanted because of harsh conditions. During this same time period, children were forcibly taken from their families and brought to boarding schools. These boarding schools were susceptible to deadly infections which killed many children. In addition to disease, these schools prohibited children from using their own languages, names, and practicing their religion and culture. They were forced to cut their hair, dress like white people, speak English, and face abuse from school staff.

African Americans were enslaved for hundreds of years. During this time, African American children were prohibited from receiving an education, and it was not until after slavery was abolished that they were allowed to attend school. Yet, even after the abolishment of slavery, schools were segregated between black and white students, and the schools available to African American students were grossly underfunded. The United States approval of slavery and unequal education has caused and continues to cause distrust and resentment between African American people and the United States government

Another vulnerable group in Scott County that could be implicated by an early childhood integrated database are undocumented children and their families. In 2007, more than 12.5 million Mexican immigrants were living in the United States and about 55 percent of them were undocumented. The number of children born in the United States to undocumented immigrants

has been rising in recent years, now representing almost 8 percent of all U.S births. Families where either one or both parents (or siblings) are undocumented face numerous challenges, especially in accessing social programming and schools for their children born in the United States. Despite the trauma endured by many immigrant families and the potential benefits public services could provide to their U.S. born children, mixed status families are often hesitant to seek out assistance for fear of retribution by immigration authorities (Alejandra et al., 2016; Passel, 2011). An effective integrated database of early childhood data that includes the undocumented population will need to pay special attention to these concerns.

While these communities may be more reluctant to co-sign an integrated database given their distrust of institutions and government, they could also stand to gain the most from such an effort since they are more likely to be living below the poverty line and not fully utilizing early education programs in Scott County. There are many programs available to families and children living below the poverty line that serve to provide cash assistance and services to families. An integrated data system would help to connect families to these services which in turn would help to minimize the damaging effects of poverty. Later on, this could improve educational outcomes of minority children.

Data Integration Efforts

The isolation of systems related to early childhood education has created barriers to the effective and efficient provision of services (Langworthy & Robertson, 2014). Academic research and experiences reported by counties that have implemented data integration arrangements have identified a variety of actual and potential benefits to merging early childhood data across relevant stakeholders (Downs, Gilbert, Hayes, Hotopf, & Ford, 2017; Leneave, 2018). Combining early childhood data can improve programming and planning of services, provide opportunities to better meet child needs, and promote efficiency, accuracy, and

speed in the decision-making process. Integrated databases make use of already existing data to create a more complete picture of all the ways early childhood services are impacting children living in the community. An integrated database in Scott County could be a useful tool for service providers and school districts as they seek to reach students earlier in life in order to improve their chances of reaching third grade reading proficiency. Examples of information sharing initiatives around the country provide important insights into potential benefits, challenges, and opportunities to various logistical methods for data integration.

Allegheny County, Pennsylvania

In 2009, the Pittsburgh Public School District (PPS) signed a memorandum of understanding with the Allegheny County Department of Human Services (ACDHS) to allow childhood data sharing. It was the first school district in the county to do so. Because this decision was unprecedented, a significant focus was placed on confidentiality concerns which are inherent in sharing student and client data. A main concern was how to legally obtain consent to use student records. This concern was addressed by using a 2008 FERPA amendment. This amendment permitted the release of personally identifiable student data as long as organizations signed a memorandum of understanding which outlined confidentiality parameters and data use protocols. The agreement provided a framework for integrating student data which includes confidentiality provisions, responsibilities of each party, type of information that can be shared and the purposes for which information can be shared (The Allegheny County Department of Human Services, 2018). This framework resulted in the analytic and decision-making tools listed in the chart below:

Analytic and Decision—Making Tools		
Tool	Purpose	Availability
www.AlleghenyCountyAnalytics.us	Holds data sets, publications, and visualizations	Publicly available
QuickCount	Interactive tool to see participation in services	Publicly available
Client View	Information about individual clients and their service involvement	Authorized DHS users, provider agencies and clients
Allegheny Family Screening Tool	Predictive model to support decision making	Child welfare call screening staff and supervisors
Outcomes Tool	Monitor success of programs	DHS staff
Alerts	Notifications about client life events	DHS staff
Reports Portal	Location for seeing automated reports and dashboards	DHS staff
Dashboards	Custom visualizations that show demographics and service/system participation	DHS staff

The first analysis of the shared data showed that of PPS' 14,450 students, about 53 percent had previous involvement with at least one of 17 human services programs ranging from child welfare to homelessness. Of these students, 36 percent had received those services within the last year (Fraser, 2015). After this analysis, Alleghany County recruited new school districts to the data sharing program by meeting with school officials to explain the details of the agreement and its potential benefits. By the spring of 2015, 16 school districts, Propel Schools and the Alleghany Intermediate Unit had signed agreements with ACDHS to allow data to be shared. Before agreeing to share data, school staff did not know which students were addressing

issues such as child welfare or mental health issues and ACDHS lacked an understanding of how children in services were faring in school, including their grades, attendance, and disciplinary records. Data sharing allowed ACDHS and the school districts to work collaboratively and has created opportunities to network with a range of stakeholders to prevent students facing hardships from hurting their potential.

The agreements between these partners addressed legal, school-related, and service-related data. Under the agreement, ACDHS received three basic data sets from the districts. One set contained attendance records, including details such as the amount of absences or times students were late to school. Another contained enrollment information, such as where students went to school and what grade they were in. The third contained year-to-date summary information related to academic outcomes, including standardized test scores and grade point averages from each quarter. This data was then integrated into the Data Warehouse where ACDHS is able to match the school information with human services information. This comprehensive information allows ACDHS to work with districts to identify indicators of academic and behavioral successes and deficits. Then they prepare statistical analyses and develop interventions and strategies to improve the delivery of services and academic outcomes for students in need.

Alleghany County's integrated database model incorporates tools that can use integrated data to get a more accurate statistical profile of the student population. It gives service providers and schools the ability to explore the issues facing their students at a systemic level and how those issues are related to things like chronic absenteeism and poor grades. The county has found that utilizing data that has been integrated among service providers and schools has impacted

state funding and creates opportunities to earlier identify students in need and better coordinate service planning (Allegheny County Pennsylvania, 2009; Fraser, 2015).

This collaboration has already shown encouraging results. ACDHS researchers found a gap between the number of students that DHS identifies as homeless and the number of students that schools identify as experiencing a housing crisis. This led to the discovery of about 500 additional children who were not identified as experiencing homelessness. This previous disconnect between students considered homeless meant that those students lacked access to services and support designed to increase housing stability and avert a crisis. Now, due to an increase in identification, the state is able to receive more funding in order to help these students. Alleghany County is continuing to create tools to address the housing crisis as well address other issues such as suspensions and absenteeism.

Dakota County, Minnesota

Dakota County has made progress recently in early childhood data integration with its “Birth to Age Eight Collaborative Initiative.” From 2000 to 2010, Dakota County experienced a growing and diversifying population and reported alarming increases in childhood poverty (Dakota County Public Health Department, 2018). County officials began to recognize problems in the community around third grade reading proficiency and inefficient social service provision. In 2014, schools were reporting that many students were showing up for kindergarten with almost no experience in early childhood education or did not speak English. Too many families were missing out on essential early childhood services that had been available to them long before the first day of kindergarten. The issues identified by Dakota County were almost identical to those Scott County is dealing with today.

Dakota County began to explore ways to improve coordination between school districts and early childhood service providers (Dakota County Community Services Administration,

2014). The county recognized that a better way to track early childhood performance milestones was needed in order to make sure kids were accessing services that could improve their chances for long-term success. Birth to Age Eight was developed as a pilot program that would partner school districts, public agencies, and nonprofit service providers together to better coordinate service provision through data sharing. With access to an integrated database, Birth to Age Eight providers would be able to share developmental progress of children in the program and alert partners of children who are behind and who could benefit from a particular service. Dakota County also sought to increase the number of three-year-old children who complete a preschool screening.

For the pilot program, the Dakota County Public Health department entered into an agreement with four school districts, Dakota County Community and Social Services, and two nonprofit organizations: Community Action Partnership and 360 Communities. After prolonged discussions on how best to share the early childhood data under current data privacy laws, the Initiative developed a system where participating families could sign an annual informed consent form allowing information to be shared between the partners. Families could be referred to the Birth to Age Eight program at three different contact points throughout the child's development. The Minnesota Department of Health shared birth certificate information with Dakota County, who could then contact families whose children exhibited certain risk factors and may have been a good fit for the program. Families receiving benefits from the Women, Infants and Children (WIC) program or those enrolled in English Language Learners programs could also be referred to the Initiative. Those who consented to enrollment in the Initiative could then be connected to relevant early childhood services available within their school district (Harris, Hartsig, & Istrate,

2017). Improvements in the referral and consent process are an ongoing focus of the Initiative steering committee.

Information tracked by the Birth to Age Eight integrated database is narrow in scope and subject to a number of privacy restrictions. Data are kept as “Milestone Measurements,” which indicate only whether a child has or has not met certain benchmark criteria. For example, birthweight, which can indicate risks of future developmental concerns, simply shows whether a child was born less than 2500 grams. It does not show the exact weight. Other variables, without going into any great detail, indicate whether a child shows signs of hearing or vision problems or has been enrolled in programs like Medicaid, SNAP, or TANF. Participants are monitored until they reach seven or eight years old, or until they score at or above grade level in reading. Other limited demographic and contact information may also be contained in the database subject to agreement with participating partners and families (Dakota County Minnesota, 2018).

Dakota County has reported encouraging results from the pilot program and planned a full-scale rollout of the Initiative to the entire county for Fall 2019 (Adler, 2019). By the end of 2017, the Initiative had referred more than 380 families receiving WIC benefits to the four school districts participating in the pilot program. Approximately 75 percent of these families were unknown to the school districts and would not have been contacted had they not been participating in the pilot program. Many children were able to be enrolled in early childhood education services provided by the school districts and receive preschool screenings at age three (Dakota County, 2018). Birth to Age Eight won the 2017 Achievement Award from the National Association of Counties and the 2016 Local Government Innovation Award from the Humphrey School of Public Affairs.

Ramsey County, Minnesota

In recent years, Ramsey County has explored data integration as a means to improve early interventions with young people in order to keep them out of the criminal justice system. While the Ramsey County approach does not deal specifically with early childhood data, important lessons can be drawn from their recent failed attempt to utilize data integration to improve social service provision in the community.

Community engagement meetings held in 2015 and 2016 highlighted a need in Ramsey County to more effectively intervene with youth earlier in life in order to promote better long-term outcomes and reduce racial disparities in the criminal justice system. In their 2017 Strategic Plan, county officials set out data integration as a top priority for the improvement of these interventions. The Safety and Justice Service Team and the County Attorney's Office would lead a data integration effort in partnership with social service agencies, educational institutions, and fellow justice officials (Ramsey County, 2017). Since many families interact with local social services for different needs and at different times, a countywide process that would facilitate data sharing between these service providers was needed to get a more holistic and tailored picture of the needs of people in the community (Ramsey County, 2018). A specific focus was placed on achieving equity in the criminal justice system through policies informed by analysis of integrated outcomes data, disaggregated by race and ethnicity (Ramsey County, n.d.).

This process eventually led to the development of a joint powers agreement between the county, the City of St. Paul, St. Paul Public Schools, and Northeast Metro 916 Intermediate School District. The agreement was intended to facilitate sharing of student data in order to better identify students and families potentially in need of streamlined social services. It would allow partners to track information on individual students, such as school attendance, grades, and disciplinary issues. Data would be shared with the National Council on Crime and Delinquency,

who would then utilize predictive analytics to identify individual students at risk of entering the criminal justice system later in life. Despite concerns raised by the community over how the data would be used and who would have access, the St. Paul City Council voted unanimously to approve the agreement (Gray, 2018).

In January of 2019, in the face of growing opposition from community advocates, the agreement was dissolved before it even started (Nelson, 2019). Opponents to the data integration effort argued that the use of predictive analytics, even when designed to divert individuals from the criminal justice system, could amount to racial profiling. Ramsey County officials responded to criticism of the program by highlighting the intentional focus that had been placed on reducing racial disparities in the criminal justice system. While critics of the data integration effort agreed proactive, front-end interventions were a laudable goal, they disagreed that predictive analytics was a policy worth pursuing, since in their opinion, the data used would be biased from the start. Some also expressed disapproval with the County's efforts to engage with and listen to people in the community (Lonetree, 2019).

Coalition to Stop the Cradle to Prison Algorithm (CPA Coalition), an organization formed by various social justice organizations and members of the community in response to the Ramsey County effort, applauded the dissolution of the agreement. The CPA Coalition (2019) responded to the announcement in a press release:

"Today we welcome the decision by city and county officials to dissolve the Joint Powers Agreement [JPA]... Community leaders have been demanding an end to this flawed and bias based policy that uses an algorithm to create another cradle to prison pipeline... We know that predictive technologies cannot be detached from human bias and error. And while data can be a tool for positive change, it is also clear that there are many risks that we need to unpack in relationship to the JPA and Big Data, Predictive Analytics and Algorithms and their potential to amplify racial and ethnic disparities in the education and the juvenile justice systems"

Potential Data Integration Partners*Early Childhood Longitudinal Data System (ECLDS)*

The State of Minnesota recently launched an integrated system of early childhood data with funding from a federal grant. The Early Childhood Longitudinal Data System (ECLDS) integrates early childhood data from the Minnesota Departments of Health, Human Services, and Education in order to provide decision makers with a more complete picture of participation in state social services and outcomes over time. The system integrates data from various state and federal programs but does not display individual records in order to protect the privacy of Minnesota children (ECLDS Governing Body, 2018; Minnesota ECLDS, 2019; U.S. Department of Health and Human Services & U.S. Department of Education, 2016).

A report released in April of 2018 by the Office of the Legislative Auditor for Minnesota detailed several challenges that the state has had with data integration. The report noted that state agencies lack a universal identification number for children participating in early childhood programs, which makes it difficult to track children who participate in more than one program at a time. It also suggested that there are very few ways for the state to evaluate early childhood programs, and that current data privacy laws inhibit state agencies from sharing individual level-data from public early childhood programs (Office of the Legislative Auditor, 2018). This suggests that while the ECLDS may be a step in the right direction for the state, there is quite a lot more work to be done.

Minnesota Automated Reporting Student System (MARRS)

The Minnesota Automated Reporting Student System (MARRS) is a unique 13-digit identification number given to a child when they first enter the public-school system. The MARRS number is also referred to as the state student ID number or state reporting number. The same ID follows them throughout their public-school education. MARRS data is sent from the

Department of Education to Minn-Link. The data contains variables such as birthdate, district number/district type, school number/school type, grade, gender, home primary language, race/ethnicity, migrant flag, homeless student, limited English proficiency, free or reduced lunch eligibility, primary disability, special education service receipt/service hours, school transfer, marriage, detention, dropout, graduation, gifted and talented participation, state aid category, and supplemental education services (Minnesota Department of Education, 2014a). The Minnesota Department of Education is responsible for screening MAARS numbers. Screening gradually tightens the use of the MARSS ID, so that each ID can only be held by one student. Improving the accuracy of the data leads to more accurate reporting, payments, and longitudinal data analysis (Minnesota Department of Education, 2014b).

Federal Programing

Various federal programs that exist to benefit low income families collect data that could be relevant to Scott County as it develops an integrated set of early childhood data. These federally funded programs include but are not limited to health and unemployment insurance, tax credits, food assistance, free and reduced school meals, housing vouchers, and programs for women and children such as child care assistance and early education. Data integration could be mutually beneficial for Scott County and their federal partners as it could ease the administrative burden of attempting to meet the needs of families through largely disconnected programs. Research has suggested that the needs of low-income individuals are often not met by federal programming due to unclear eligibility criteria, a lack of effective marketing, and social stigma (Tout, Halle, Daily, Albertson-Junkans, & Moodie, 2013; Wu & Eamon, 2010).

In fact, food assistance through the Supplemental Nutrition Assistance Program (SNAP) is so underused that nonprofit organizations have in some cases taken it upon themselves to promote eligibility for the public program. According to 2010 data from the U.S. Department of

Agriculture, almost 51 million Americans were eligible for SNAP, but just 38 million received benefits (United States Department of Agriculture Food and Nutrition Service, 2013). This discrepancy between eligibility and enrollment can be at least partially explained by the difficult application process and complex web of services that are available to low-income families (Delaney, 2013). Although people may be aware of different programs offered in their community, there are a number of challenges to applying for and staying in these programs. Each has different eligibility requirements and application processes. Furthermore, as a person's eligibility changes, they often have to update each program separately. Coordination between Scott County and federal service providers could potentially streamline these programs and improve outcomes for at-risk students.

Other countries have shown that the incohesive and cumbersome web of federal programs for low-income families could be made better by an integration of resources and data. In the Netherlands, citizens are able to check their eligibility for all welfare programs by using their "DigiD." The DigiD is an online identification that is used by citizens to do their taxes, access benefits and allowances, and check their pensions. The DigiD is used by hundreds of organizations, including government departments, police, and healthcare providers (DigiD, n.d).

Scott County Programming

The State of Minnesota and local communities also offer services to low-income families. There are a number of these services and programs in Scott County that serve children before kindergarten and would potentially have an interest in an early childhood integrated database. These services include health care providers, dental offices, local daycares, food shelves, and more (Scott County, 2018b).

There are also groups in Scott County that work to connect families with services, such as Community Action Partnership (CAP) and Help Me Grow. CAP is an agency located in

Shakopee that seeks to empower community members by connecting them to federal and community programs (“Community Action Partnership of Scott, Carver & Dakota Counties: ‘Who we Are,’” n.d.). Help Me Grow is a Minnesota state resource that provides resources for families to understand developmental milestones (State of Minnesota, n.d.). If there are concerns, Help Me Grow provides a comprehensive, confidential screening or evaluation at no cost. They will then connect community members to state and community-based services where families of vulnerable children are matched to services that provide the support they need.

There are a number of other services and programs in Scott County that might have an interest in the development of an early childhood integrated database. These programs include: Scott County Public Health, Scott County school districts, public health nurses, special education outreach committees, and family child care associations.

Recommendations

Methods for Early Childhood Data Integration

We have identified three general models of data integration that Scott County can consider for further exploration: population level data integration, individual level data integration, and predictive analytics. Each of these models have been developed or tested in some form or another in various states around the country, and each has its own potential benefits and challenges that should be considered. Population level data integration combines information collected by relevant public and private groups to show aggregate level participation, trends, and outcomes, without identifying individual children (e.g. MN ECLDS). Individual level data integration combines the same sort of information and can utilize population level tools, but it allows users to access data on individual children (e.g. Birth to Age Eight). Individual level predictive analytics combines population and individual level methods to make predictions about future outcomes for individual children (e.g. Ramsey County JPA).

Scott County will also need to ensure that any data integration effort maintains compliance with applicable laws and regulations governing early childhood data. LeNeave (2018) lays out a process for obtaining and maintaining informed parental consent under the Family Educational Rights and Privacy Act (FERPA), the Health Insurance Portability and Accountability Act (HIPAA), and the Minnesota Government Data Practices Act (MGDPA). Each law provides exceptions for what personal medical, education, and government data can be shared and under what circumstances. Scott County, as well as all partners to their integrated data effort, will need to work closely with legal counsel to ensure that the consent process remains in compliance with state and federal law, while promoting transparency and communication with the families involved in the program.

Population Level Data Integration

A population level data integration approach utilizes aggregated information from participating partners without identifying the personal information of individual students. This method of data integration would allow Scott County to better understand how families interact with the complex web of services available to children in the years before they enter kindergarten. It could also enable school districts to get a more accurate count of who will show up for kindergarten on the first day, and in turn receive the proper level of per pupil funding. Even though partners would not necessarily be able to identify specific service gaps for individual children and families, a population level integrated database would allow Scott County service providers and schools to be more strategic in their decision making around early childhood education. At the very least, an effective population-based data sharing program would alleviate some of the issues Scott County is having with estimating the number of children who might show up for kindergarten in a given year.

This approach essentially mirrors the methods utilized in the MN ECLDS, but there is potentially room for improvement and expansion in Scott County.

Individual Level Data Integration

Individual level data integration permits those with access to the system to see information about individual students. There are a number of potential benefits to allowing partners in a data integration agreement to identify specific students, but this also presents numerous logistical, ethical, and legal challenges that must be considered. This approach allows for more effective and expedient case management and could improve current processes for determining eligibility for early childhood services. If given the capacity to track individual students from birth to age eight or when children are tested for third grade reading proficiency, Scott County could tailor its approach to early childhood services to maximize the potential for each individual child. Given potential privacy concerns, counties that have implemented this model have differed on how exactly they present the individualized information.

A model based on the Birth to Age Eight initiative in Dakota County appears to be an extremely viable alternative that Scott County should consider. Given the proximity of Dakota County to Scott County, the similar issues both are facing, and recent success of the Birth to Age Eight Initiative, Scott County would well-served to further explore this model of early childhood data integration.

Predictive Analytics

Predictive analytics involves using data on individual children and parents to develop statistical models that predict poor education or health outcomes. Integrated early childhood data can be analyzed with these models to look into the future and identify relative probabilities that individual students will have specific long-term outcomes. The idea is then that early childhood interventions can be targeted toward children with the highest probability of ending up with a

certain negative outcome. This method goes a step further than the other models that have been discussed by opening the analysis beyond the present and into the future. Predictive analytics is the most controversial of the three approaches and has its own unique challenges and ethical considerations.

Teixeira and Boyas (2017) have identified four general areas where early childhood services have utilized predictive analytics. Agencies around the country have used early childhood predictive analytics for: estimating increased risks of child maltreatment, injury, or death, forecasting repeated adverse events suffered by a child or committed by perpetrators, analyzing how children and families interact with systems outside of child welfare, and looking inward at their own services for evaluation. These predictive analytical frameworks could be useful to Scott County as it works to increase third grade literacy by improving coordination between early childhood service providers.

On the other hand, it is worth noting that this approach is more of a supplemental tool to an established integrated data system, and it is fraught with challenges and ethical concerns. Teixeira and Boyas (2017b) detail the many conditions that must be established in order to run an effective predictive analytics data integration effort. Scott County would need readily available, broad, accurate, and sizeable data to build statistical models that provide any real benefit. Additionally, this approach may require advanced technical resources to create and act on the predictive models. Many of the agencies who have successfully implemented a predictive analytics system have contracted the task to outside organizations with more expertise (B. C. Teixeira, Jacobs-Smith, & Boyas, 2018). This could come at a large cost to the county. Such an effort would also require broad stakeholder buy-in and public transparency. Ramsey County is a good example of the consequences of a predictive analytics effort gone wrong. Given where

Scott County is at in the data integration process, it appears that it would be best for county officials to explore population and/or individual level data integration before moving towards predictive analytics.

Stakeholder Engagement

There are important lessons to be drawn from the various groups that have explored early childhood data integration. The history behind vulnerable populations in the United States explored above must inform how the county engages with the community as it moves forward with an early childhood integrated database. The spread of misinformation and misunderstanding can happen, and it is essential that Scott County prioritize collaboration and engagement with the community it hopes to serve. Scott County should work with stakeholders including community groups, Minnesota child welfare and education professionals, school districts, etc.

When Minnesota began developing the Early Childhood Longitudinal Data System in 2014, administrators recognized the need to maintain transparency and engage with the community since the data at issue involved young children. The state completed a systematic stakeholder review process that identified relevant state agency leaders, service partners, and parents who had an influence or interest in early childhood education. Focus groups composed of these stakeholders were then convened to review the proposed process for establishing the ECLDS, what data would be included, and how the development of the system could best be communicated to the public. This was an important step for the state in the data integration process as it uncovered and corrected common misconceptions around this kind of effort. Even though the proposed ECLDS would be a population level data integration system, many of the stakeholders mistakenly thought it would make individual level data open to the public. Despite the fact that the ECLDS would simply make already existing data more readily available and useable, many expressed concerns that it sounded like just another data collection effort that

would divert already strained resources. This process allowed ECLDS developers to collect feedback before launching the site, potentially avoiding major conflict down the road (U.S. Department of Health and Human Services & U.S. Department of Education, 2016).

Scott County should consider a similar kind of thoughtful engagement with stakeholders in the community. These stakeholders could include state and federal partners, local service providers and community groups, parents, and more. It is essential that such a process invite, value, and consider criticism of a potential data integration effort. There are stark contrasts between the outcomes of data integration efforts like Birth to Age Eight in Dakota County and the failed joint powers agreement in Ramsey County. Despite both of these initiatives professing similar goals and utilizing somewhat similar methods, Dakota County won awards and Ramsey County is back at square one. Effective stakeholder engagement can make or break Scott County's future data integration program, and it must be ready to invite all those with an interest to the table.

Data Privacy

Scott County will have to strike a delicate balance between the often-competing interests of different groups to ensure that early childhood data is processed ethically, privately, and effectively. While data privacy is important in protecting children and their families, the ability to access more complete information about a child improves professionals' ability to intervene.

The U.S. Department of Health and Human Services and the U.S. Department of Education (2016) recommend that early childhood data integration initiatives convene data governance bodies to establish clear policies for the management and use of information contained in the system. The data contained in integrated databases is extremely personal, and its unauthorized release could have long term implications for the children being served. The boundaries of what should or should not be contained in an integrated database, how information

should be presented, and who should have access are issues that Scott County should decide at the local level, in consultation with legal counsel.

Scott County could consider mirroring the approach taken by the ECLDS. The ECLDS has two governing bodies that make decisions about how to manage the database. The first, the “ECLDS Governing Body,” is responsible for approving requests for new data to be included in the system, data security protocols, and ensuring compliance with data privacy laws. The second, the ECLDS Research and Data Committee, is a group of relevant stakeholders that advises the ECLDS Governing Body on how best to utilize the information and tools within the integrated data system (ECLDS Governing Body, 2018).

Many data privacy issues are local in nature and specific to certain communities. Scott County’s approach to data privacy should go hand in hand with stakeholder engagement. Information that might seem harmless to one community could be extremely threatening to another. The best way to uncover data privacy issues is for Scott County to engage in a deliberative and thoughtful process in consultation with those who will use the system and those who will be served by it.

Conclusion

Early childhood education is essential for future academic achievement. Socioeconomic inequality in the United States makes interventional services necessary to ensure all children have an opportunity to succeed. Connecting more children in Scott County to early education programs through data integration would enable students to be better prepared for kindergarten and increase the number of children attaining third grade reading proficiency. Nurturing healthy child development must start early and requires leveraging the entire community. Some served by early childhood programs are considered to be part of vulnerable populations and may be

generally distrustful of government intervention due to a history of cultural trauma and systemic racism. An integrated data system would help connect students to more services and programs to buffer the effects of poverty.

The United States health, social service, and education systems are extremely interrelated, yet unfortunately isolated. These systems are usually constructed with good intentions to support our youth and assist low income families, but they often unintentionally create more roadblocks than bridges. Programs and services too often serve the same population but fail to work together in a meaningful way. An integrated database would provide an opportunity to close the gap between these systems and provide better services to children and families.

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