



Harnessing the potential of administrative data to inform child welfare programming with dynamic visualization methodologies



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ABSTRACT

The majority U.S. states maintain administrative databases to collect information on the entry, movement, and exits of youth in the foster care system, yet the power of these data to inform continuous improvement efforts remains largely untapped. This underutilization ignores the vast potential inherent in longitudinal child welfare data to better understand the trajectories of youth in care and the effectiveness of the services they receive. To help promote the use of administrative data to inform child welfare programming, this paper provides an overview and demonstration of a Feedback Improvement System with web-based visualization technology to illustrate child- and agency-level child welfare data from the state of Utah. The procedures and system design elements used to obtain, process, and display the feedback data are detailed. Recommendations for designing and implementing web-based feedback systems for child welfare agencies are provided.

1. Introduction

The United States Department of Health and Human Services Administration for Child & Families require child welfare agencies to collect data on youth in care (English, Brandford, & Coghlan, 2000). Many states adhere to a model of data collection that involves tracking youth through the use of Statewide Automated Child Welfare Information Systems (SACWIS) and its newer counterpart, Comprehensive Child Welfare Information System (CCWIS; USDHHS, 2017). As of 2017, 34 states have adopted automated models for collecting child welfare data and five other states have similar systems under development (USDHHS, 2015a). Nevertheless, child welfare agencies struggle to use the information in their databases to improve services for children and their families (Drake & Jonson-Reid, 1999; Green et al., 2015; Martin, 2002; Webster, Putman-Hornstein, & Needell, 2011). Researchers and child welfare professionals agree the pre-existing and richly detailed longitudinal data collected in child welfare databases could be better used to inform continuous performance improvement efforts (Barth & Jonson-Reid, 2000; Garstka, Collins-Camargo, Hall, Neal, & Ensign, 2012; Goerge & Lee, 2014; Green et al., 2015; MacMillan et al., 2007; Wulczyn, 2007).

Research has shown that it is difficult for professionals to improve and obtain expertise without the ability to connect interventions or services to desired outcomes (Kahneman & Klein, 2009; Tracey, Wampold, Lichtenberg, & Goodyear, 2014). In child welfare,

connecting child outcomes to the services provided at residential treatment centers is particularly difficult because many important outcomes, such as a youth's permanency status, happen months or years after a youth's discharge from a residential treatment center. Accordingly, residential service providers have no consistent method for measuring this outcome without ongoing access to child welfare data.

One method for tapping into the potential of child welfare administrative data to inform continuous improvement efforts is to have data readily available to key stakeholders in the form of feedback on the effectiveness of services children receive. Advancements in the field of child welfare research, in tandem with technological improvements and the ubiquity of open source tools for working with administrative data, now allow the possibility of innovative methods for delivering feedback. Online dashboards and automated processing can be used to deliver real-time data, on demand to child welfare administrators, policy makers, and program managers (Duncan, Kum, Caplick Weigensberg, Flair, & Stewart, 2008; Schoech, Bashmam, & Fluke, 2006). Presently, few child welfare systems harness the potential of administrative data to inform programming. In this study we demonstrate the potential of child welfare administrative data using a web-based feedback information system which employs dynamic data visualization technologies.

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1.1. Study purpose

This study provides an example of how one state's University-Agency partnership leverages pre-existing data to create an automated Feedback Information System (FIS) used for continuous improvement of child welfare systems and services. Using data obtained by the Utah Division of Child and Family Services (DCFS), we provide a simulation of the processes used to develop and implement a feedback information system with child welfare administrative data. Our FIS includes ongoing automated processing, analysis, and delivery of data in the form of feedback to key stakeholders, through an interactive web-based dashboard which utilizes modern data visualization techniques. In this case, data visualization is not simply a graphical presentation of data, but is an attempt to represent the underlying structure of data (Chen, Hårdle, & Unwin, 2007). This paper discusses the technical details of our FIS, including information on the procedures used to obtain, process, and display the data to child welfare stakeholders. We also review key elements, which can be used to design similar feedback systems, including (1) reporting relevant, readily accessible data in a timely fashion, (2) limiting the number of outcomes reported but with sufficient longitudinal information to guide continuous improvement efforts, and (3) reducing long-term costs and maintenance through the use of technology and automated analytic processing. Many of the methods and tools described in this paper utilize free, open source software, though the software may require some expertise to be used effectively, and can be implemented for different purposes by any child welfare agency that has a comprehensive administrative database.

2. Literature review

2.1. Child welfare administrative data systems

In 1994 Congress passed Section 479 of the Social Security Act, which led to the development of data systems that could collect, analyze, and report information about children involved with the child welfare system (Social Security Administration, 2017). This law resulted in an increased focus on standardized data and reporting in child welfare systems, which led the federal government to incentivize the use of statewide child welfare administrative databases, known commonly as SACWIS or CCWIS (English et al., 2000; USDHHS, 2017). These administrative systems replaced traditional paper-based case management record keeping and led to the collection of vast amounts of child welfare data. Despite these technological improvements, the ability of child welfare agencies to harness the data collected in these systems for improvement of services remains a challenge for many organizations (Drake & Jonson-Reid, 1999; Green et al., 2015; Martin, 2002; Webster et al., 2011).

One of the primary uses for automated data systems is to provide state level descriptive statistics through annual Adoption and Foster Care Reporting System (AFCARS) reports (USDHHS, 2012). Information reported includes a summary of the number of youth in care that fiscal year, the total number of entries and exits, number of youth waiting to be adopted, number of completed adoptions, youth whose cases are in the legal process for adoption, demographic characteristics of the child (e.g., age, race, gender), case characteristics (e.g., permanency goal, placement type, time in care, reason for discharge), and adoption information (e.g., caregiver relationship, family structure, subsidies). This information is collected over the course of a child's stay in foster and pre-adoptive care. All 50 states and the District of Columbia are required to collect this data and provide a summary report to Congress each fiscal year. The AFCARS report is used to identify trends in foster care and adoption programming, develop and tailor budgets, monitor compliance, and report to program stakeholders (USDHHS, 2015b).

While such summaries are valuable and can provide point-in-time estimates of the number of youth moving through the system each year, such summaries ignore patterns of movement inherent in tracking

children in foster care. Some researchers argue this type of cross-sectional look at child welfare populations will also be biased because children with longer stays in child welfare are more likely to be represented in the data (Barth, Courtney, Berrick, & Albert, 1994; Courtney, Needell, & Wulczyn, 2004; Usher, Randolph, & Gogan, 1999). Therefore, cross sectional reviews of administrative data may be misleading when identifying potential program improvement strategies. Furthermore, data presented in this format do not provide sufficiently detailed information to improve specific child welfare services.

2.2. Feedback and improvement

Feedback is necessary for individuals and agencies to develop professional expertise (Kahneman & Klein, 2009; Shanteau, 1992) and improve performance (National Child Welfare Resource Center for Organizational Improvement, 2002; Wulczyn, 2007; Wulczyn, Alpert, Orlebeke, & Haight, 2014). Kahneman and Klein (2009) and Tracey et al. (2014) argue that there are certain professions where individuals fail to improve their performance due to misleading feedback or an altogether lack of feedback. The reason for this trend is that interventions and outcomes are so far separated in time from the daily work that outcomes do not have the ability to influence work performance. For example, in helping professions such as counseling, the practitioner may receive immediate feedback during a session with a client; however, that practitioner is unlikely to receive feedback on the long-term outcomes of that client (Tracey et al., 2014). Consequently, interventions are reinforced by immediate feedback and related short-term outcomes, which may be unhelpful in achieving ultimate goals or long-term outcomes. In fields such as child welfare, many important outcomes, such as permanency status, are often too distal from the interventions children and families receive. Accordingly, interventions conducted by child welfare systems or providers are more likely to be influenced by feedback, such as client self-report (Garb, 2005; Oskamp, 1965; Tracey et al., 2014), that is more immediate and potentially unrelated to their long-term goals.

There is evidence from other fields that deliberate feedback helps improve performance. In the learning literature, researchers have found that feedback on how a skill is performed, or task performance, has a large positive effect on learning and improved performance of the skill (Kluger & DeNisi, 1996). Moreover, the effects of feedback on the acquisition of skills outweigh other important background factors, like cognitive ability and economic disadvantage, which are known to influence performance (Hattie & Timperley, 2007). Important aspects of feedback are that the feedback be focused on criterion information (outcomes) or feedback related to the processing or motivation of the task, but not a personal evaluation of the learner (Hattie & Timperley, 2007). Feedback is also known to improve performance in fields such as psychotherapy. Lambert, Harmon, Slade, Whipple, and Hawkins (2005) found that client outcomes improve when clinicians are shown data on clients' self-reported symptoms.

2.2.1. Feedback in child welfare

Typical examples of using data for service improvement involve use of federal performance indicators (USDHHS, n.d.) and continuous quality improvement efforts (National Child Welfare Resource Center, 2002; Wulczyn, 2007). There are also administrative reports used within agencies, such as tailored reports to supervisors (Moore, Rapp, & Roberts, 2000). Though utilized infrequently, data visualization has been used within the context of child welfare as a method for feedback and improvement. Examples include a data visualization of statewide data in North Carolina (Duncan et al., 2008; Kum, Stewart, Rose, & Duncan, 2015) and a similar statewide feedback system in Texas (Schoech et al., 2006). The feedback system in North Carolina focused on policy and practice improvement using principles of knowledge discovery and data mining (KDD) to conduct exploratory analysis and longitudinal descriptive modeling using a web-based platform (Duncan

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