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Building Analytic Capacity and Statistical Literacy Among Title IV-E MSW Students

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Abstract

Building and sustaining effective child welfare practice requires an infrastructure of social work professionals trained to use data to identify target populations, connect interventions to outcomes, adapt practice to varying contexts and dynamic populations, and assess their own effectiveness. Increasingly, public agencies are implementing models of self-assessment in which administrative data are used to guide and continuously evaluate the implementation of programs and policies. The research curriculum described in the article was developed to provide Title IV-E and other students interested in public child welfare systems with hands-on opportunities to become experienced and “statistically literate” users of aggregated public child welfare data from California’s administrative child welfare system, attending to the often missing link between data/research and practice improvement.

Keywords

child welfare; evidence-based practices; workforce issues

Building and sustaining effective child welfare practice requires an infrastructure of social work professionals trained to use data to identify target populations, connect interventions to outcomes, and adapt practice to varying contexts and dynamic populations. Increasingly, public agencies are adopting models of self-assessment in which administrative data are used to guide and evaluate the implementation of programs and policies. Public child

welfare agency staff at all levels, from case-carrying social workers to deputies, are now required to operate within a continuous quality improvement (CQI) framework. No longer is it sufficient to merely comply with federal outcome reporting under the Child and Family Service Reviews (CFSR), nor is it enough to simply evaluate the quality of existing services without connecting them to specific outcomes. The U.S. Department of Health and Human Services, Administration on Children and Families, Children's Bureau issued an information memorandum in 2012 that directed states to design quality assurance systems that involve a "complete process of identifying, describing, and analyzing strengths and problems and then testing, implementing, learning from, and revising solutions" (ACYF-CB-IM-12-07, p. 2). It is within this increasingly evidence and data-driven environment that social workers throughout the field of child welfare find themselves charged with being more critical consumers of research, possessing an ability to make sense of data trends and tie them to evidence-based interventions best positioned to support vulnerable children and families. As such, public agencies require individuals in leadership and practice positions who not only possess an appreciation for how data can be used to inform practice and policy, but who are statistically literate and have practical data analysis skills, including the ability to intelligibly explain and present empirical findings.

Unfortunately, MSW research coursework often fails to develop these highly desirable and practical analytic skills among students. Research coursework tends to adopt one of two approaches. The first approach provides students with limited opportunities to work with actual data, perhaps because there is an assumption (whether correct or not) that social work students come to their programs with a lower level of quantitative experience, aptitude, and interest compared to their counterparts in public health and public policy. These courses may require students to conduct a case study, or a focus group, for example. The second approach moves to the other extreme by adopting a *junior scientist* model, stressing relatively advanced statistical techniques infrequently used after graduation. Beyond alienating MSW students from research it may also be unrealistic for students to become proficient in both descriptive and multivariate statistics in a one or two semester course that additionally covers research methods. Both approaches represent a missed opportunity for students to become critical consumers and knowledgeable users of data to guide their practice or inform programs and policies.

The curriculum described in this article (hereafter, the Curriculum) provides a re-envisioning of a second-year MSW research course designed to adapt and re-visit some common approaches to teaching research. It emphasizes practical data analysis skills and the informed consumption of research while avoiding instruction in statistical computation better placed in a statistics course. Relying on a publicly available secondary data source intended for everyday use, it provides ample opportunities for students to become comfortable querying and working with real data to answer practice-relevant questions.

CHILD WELFARE PROJECT AND ASSEMBLY BILL 636

In 2001, California passed the Child Welfare System Improvement and Accountability Act (AB636). This legislation was designed to improve outcomes for children in the child welfare system and also to hold county and state agencies accountable for the achievement

of positive outcomes for children and families in their jurisdictions. This Child Welfare Services Outcomes and Accountability System—also known as the California Child and Family Services Review (C-CFSR)—uses data to continuously measure and evaluate performance to ensure the safety, permanency and well-being of every child who comes into contact with California’s child welfare system.

To support counties in engagement with data to inform child welfare practice and policy, the California Child Welfare Indicators Project (CCWIP), hosted at the University of California, Berkeley School of Social Welfare (<http://cssr.berkeley.edu/ucb_childwelfare>), was funded to create state and county-level data outcome reports that tracked performance over time. The data, derived from the state’s administrative data system and case management tool for child welfare caseworkers, are configured longitudinally and published on a publicly available website hosted at the CCWIP. The site functionality allows users to create ad hoc tabulations to examine such topics as time trends in permanency rates; geographic differences in the incidence and prevalence of maltreatment referrals; and racial/ethnic subgroup disparities in foster care entry rates. In addition, researchers and staff from the CCWIP provide technical assistance to help counties better understand their data and to develop System Improvement Plans.¹ This relationship continues today as counties continue to understand how their child welfare systems are affecting the children and families they serve, and as they implement their improvement plans and continue to monitor performance.

In working with the counties and the state, however, members of the CCWIP team frequently heard that there was an unmet need for graduating MSW students who possessed strong critical thinking skills, practical data analysis and interpretational skills, and an appreciation for the growing role of evidence in driving practice and policy (Executive Office of the President, 2012; Testa et al., 2014; Zeira, 2014). In collaboration with the California Social Work Education Center (CalSWEC) and the California Department of Social Services (CDSS), this Curriculum is a response to that need.

Literature Review

Within the field of social welfare, there is a long-established interest in research-minded practice. The National Association of Social Workers (NASW) Code of Ethics (1999) strongly urges the use of research and encourages social workers to advance the field through the use of research and teaching. In addition, one of the Council on Social Work Education (CSWE, 2013) draft accreditation standards includes the principle that:

Social workers understand quantitative and qualitative research methods. Social workers know the principles of logic, scientific inquiry, and ethical approaches to building knowledge. Social workers understand that evidence that informs practice derives from multi-disciplinary sources. They also understand the processes for translating research findings into effective practice. (p. 5)

¹System improvement plans (SIPs) outline the changes a county plans to make in order to improve outcomes for children and families. The SIP is now developed every 5 years and includes targeted improvements and time frames. Please see <http://calswec.berkeley.edu/CalSWEC/CCFSR1.html>

With the advent of the evidence-based practice movement, the question of whether or not social service interventions are effective at creating change has received increased attention. With greater frequency, service providers are being asked to implement evidence-based interventions and to demonstrate the effectiveness of their practice (Howard, McMillen, & Pollio, 2003). In addition to evaluating specific social service interventions, social workers are focusing on whether case management can also be improved through research. In particular, researchers and practitioners are evaluating the level to which research can assist social workers in screening clients, creating frameworks and models for intervention, and evaluating the effectiveness of referred services (Lochman, 2006).

The importance of educating social workers in research-related skills, however, extends beyond applying evidence-based interventions to client problems. In educating social workers, it is also necessary to imbue them with statistical literacy. As defined by Gal (2003), statistical literacy is the “ability to comprehend, interpret and critically evaluate messages with statistical elements or arguments” (p. 80). In a sense, statistical literacy enables people to think for themselves, judge independently, and discriminate between good and bad information. These objectives are consistent with social work’s history and consistent with the NASW Code of Ethics’ principles on social justice, integrity and competence (NASW, 1999). Also, the ability of social workers to engage in critical thinking enables them to dispute wrongful or discriminatory claims about clients and interventions. As Lutsky (2008) stated:

Numbers are not only important because they are pervasive; they are pervasive because they are important. It is because numbers have both the power to influence and the power to inform that we need to educate citizens to attend to numbers, to understand them, and to think thoughtfully and critically about them. (p. 61)

Instilling social workers with statistical literacy enables them to advocate more effectively on behalf of the clients they serve. At the very least, basic statistical literacy is essential to creating workers who are comfortable converting data into evidence (Trocmé, Milne, Esposito, Lauderndeau, & Gervais, 2014; Wulczyn, Alpert, Orlebeke, & Haight, 2014).

Barriers to Research Learning

Research on the effectiveness of education in creating research-minded practitioners has largely focused on the attitudes of social work students towards research (Green, Bretzin, Leininger, & Stauffer, 2001; Hardcastle & Bisman, 2003; Royse & Rompf, 1992), and the difficulties in transferring knowledge gained during MSW training to social work practice (McCrystal & Wilson, 2009). Studies have demonstrated that social work students enter research classes with great anxiety, particularly around methods and statistics (Green et al., 2001; Hardcastle & Bisman, 2003; Royse & Rompf, 1992). Yet, some authors have argued that research education can help relieve these anxieties and increase self-efficacy (Orme & Powell, 2007; Unrau & Grinnell, 2005). Others have demonstrated that although social work students may have positive attitudes about research while they are students, these views do not always extend into actual practice (McCrystal & Wilson, 2009). In their study, McCrystal and Wilson found that the majority of their sample of social work students felt that research was relevant to practice and an important component of their training. Despite

this attitude, only one-third of respondents felt that workers should conduct research alongside their normal casework after graduation.

Additional barriers to social worker implementation of research-related skills include beliefs that research will not be relevant to social work practice (Green et al., 2001; Harder, 2010), and that there will be too many demands when they enter the field to devote time and energy to research (Wilson & Douglas, 2007; Shlonsky & Stern, 2007). To shift these beliefs, some researchers have advocated teaching social workers skills that they consider useful, and that they can use immediately upon entering practice (Howard, Allen-Meares, & Ruffolo, 2007; Shlonsky & Stern, 2007). These skills include formulating searchable questions, using online resources and computerized databases, and analyzing datasets to better understand the needs of clients and the effectiveness of interventions.

Service-Learning Pedagogy

The use of a service-learning pedagogy in social work courses has been demonstrated to enhance students' perceptions about the relevance of data and research to social work practice and policy, and to improve students' skills in statistical methods. This approach, which integrates academic learning and relevant service, has many documented advantages. In their review of research since the early 1990s, Eyler, Giles, Stenson, and Gray (2001) demonstrated that participation in service learning is associated with positive changes in students' critical thinking, problem analysis, academic learning, interpersonal and leadership skills, racial and cultural understanding, commitment to service, and satisfaction with college. Additional research (Harder, 2010; Lowe & Clark, 2009; Wells, 2006) has demonstrated that service-learning can increase students' comfort with and self-efficacy regarding social work research.

Service-learning has also been demonstrated to increase students' abilities in specific research and evaluation skills such as data entry, cleaning and recoding of data, and basic statistical analysis. In an effort to reduce student anxiety and increase student appreciation for the value of research in her master's level statistics course, Wells (2006) asked students to conduct community-based statistics projects in consultation with a local service agency. Student evaluations revealed that nearly 80% found the service-learning pedagogy employed in the course to be useful in meeting the course objectives of building an SPSS data file and applying statistics to analyze data relevant to social work practice. In their qualitative remarks, students also reported that the course helped them acquire practical and marketable skills, clarify statistical concepts, and made learning "purposeful." Similarly, Harder (2010) utilized a service-learning model in a graduate-level social work research course and found that this model enhanced student motivation and provided students skills in understanding research methodology, consuming empirical literature, and conducting basic data analyses.

Curriculum Rationale

This Curriculum provides instructional modules focused on the formulation of research questions, research design, data collection, and data analysis. Uniquely, these modules are oriented around the secondary analysis of publicly available data sources, principally data from the CCWIP. Universities in California are in a unique instructional position among

states with Title IV-E programs because the state provides access to publicly available, comprehensive, longitudinal child welfare administrative data through the CCWIP's website. Access to this rich data source, coupled with partnerships with county child welfare agencies that use these data, position schools of social work to enrich the utility of Title IV-E internships for both students and agencies. Through this Curriculum, students learn applied data and statistical principles using information from the system they will soon be working within. They also begin to engage in the CQI process by choosing research projects that attend to local performance goals and research priorities. In turn, local child welfare agencies benefit from having better-trained MSWs who enter agencies with an appreciation for data, quality assessment, and relevant analytic skills.

Students are taught how to examine and evaluate child welfare data, while simultaneously engaging in direct practice with the children and families whose experiences are represented in administrative data. In certain cases, students (as part of their responsibilities as interns) may also be entering data into the same case management system that sourced the public data they will be examining through these research modules. As such, the data that students examine from the CCWIP enhances their knowledge about long-term outcomes for families involved with the child welfare system—allowing students to contextualize their own practice experiences within broader county and state trends.

Utilizing a service-learning pedagogy aligned with the social work competencies outlined in the CSWE's draft of the 2015 Educational Policy and Accreditation Standards (CSWE, 2013), the Curriculum attempts to make research training for social work students as approachable, learnable, and relevant as possible. Additionally, the class teaches higher-level skills, such as generating answerable research questions, critically reviewing literature, and analyzing how research informs practice and policy. The objective for the modules is to help students to develop a working knowledge of statistical inference and other research-based competencies, to become familiar with publicly available data sources, and to be able to explain and present numerical findings. Additionally, the modules can help students understand the significance of data in capturing the experiences of child welfare clients and be better equipped to have an impact in their future agencies as well as the larger field of child welfare.

The benefits of a research course that ties an examination of administrative data into students' fieldwork experiences are numerous. As researchers have noted, service-learning for social work students is essential in overcoming the sense that research is irrelevant to social work practice and to increasing students' comfort and skill in research methods (Harder, 2010; Lowe & Clark, 2009; Wells, 2006). Student familiarity with administrative child welfare data equips social workers with the skills needed to use data to inform and improve practice and decision-making (Unrau & Grinnell, 2005), thus enhancing workers' competency and potential for career advancement – skills linked to job satisfaction and retention (Ellett, 2009). Finally, by educating social work students to be comfortable with analyzing existing administrative data, research courses can help promote a child welfare culture that embraces data and research.

Curriculum Overview

The Curriculum is based on separate modules created to support MSW students' development of practical data analysis skills and statistical literacy. The complete Curriculum materials include a two-semester overview of possible topics along with a sample syllabus, but the modules are not meant to replace an instructor's core syllabus. Rather, modules have been developed as five topical areas comprised of materials for use by research instructors who wish to draw upon the rich, publicly available child welfare data in California for teaching examples, data analysis exercises, and collaborative, agency-relevant student research projects. The complete Curriculum can be accessed at <http://calswec.berkeley.edu/specialized-practice-areas>. While the focus of the Curriculum is on child welfare, it is designed to be useful for other students interested in applying the principles of secondary data analysis to their population of interest. The analytic principles apply to other fields of social work and the exercises translate well to other publicly available data sets, as Shaw, Lee, and Wulczyn (2012) explain.

Table 1 describes the objectives, competencies, course exercises, and translations to child welfare practice examples for each of the five modules: (1) Child Welfare Data 101; (2) Lessons in Using (and Misusing) Data; (3) Developing Answerable and Relevant Research Questions; (4) Presenting Data Graphically and Writing an Empirical Report; and (5) Basic Statistics. The Table includes specific examples of how the material translates to typical tasks in a child welfare agency that uses evidence to understand and serve its target populations.

Module I: child welfare data 101—Module I is designed to introduce and normalize the regular use of secondary data in social work. The module emphasizes the value of summarizing data in order to identify patterns and trends. The material is intended to make students comfortable with the presentation of data and basic statistical concepts. A number of secondary data sources are reviewed, particularly the CCWIP website, from which most data examples in the course are drawn. For example, one exercise demonstrates how to graph an outcome over time, and calculate a percent change in an Excel spreadsheet in order to describe how the number of children reported for sexual abuse in California has declined over the past decade.

Module II: lessons in using (and misusing) data—A major theme introduced in Module II and emphasized throughout the course is the difference between entry cohort, point-in-time, and exit cohort data, and what types of questions can be answered with each. Federal and state performance measures are critically discussed in this module with the utility of longitudinal data in mind. Significant time is devoted to understanding the measures, assessing how adequately they capture key safety and permanency outcomes, and demonstrating additional ways of querying data on the CCWIP website, often from an entry cohort perspective. Exercises that reinforce these concepts include calculating correlations among county-level rates of entry, reunification, reentry, and median duration, and examining the difference between a permanency measure that relies on an exit cohort perspective and one that is drawn from an entry cohort. The module also guides students to

begin thinking critically about the visual presentation of data and identify when data are misused.

Module III: developing answerable and relevant research questions—Module III provides activities to help transition students from a basic exposure to California’s child welfare data toward more specific considerations of applied research questions that may be explored using these data. Students placed in a county child welfare agency are asked to develop research questions answerable with secondary data that contribute to their agency’s practice improvement efforts related to one of their targeted outcomes in their System Improvement Plans. Using their developing knowledge about longitudinal data, students practice narrowing a broad social problem to a specific, answerable question. For example, a question about the impact of a policy requires data that offer clarity with respect to the timing of an outcome relative to the start of the policy—something that entry cohort data are poised to do. Data queried in this way can be used to answer questions about change over time, and whether or not the change can be associated with the onset of a policy.

Module IV: presenting data graphically and writing and empirical report—Highly practical, hands-on instruction about the graphical representation of data and the composition of an empirical research report comprise Module IV. The chart and table assignment demonstrates students’ capacities to connect a question with data, and to both narratively articulate and visually illustrate the question and the answer. Students spend significant time in lab practicing table and chart production in Excel so that they may become very comfortable with this software, which is likely to be the primary (or perhaps the only) analytic tool available to them in their professional settings.

Module V: basic statistics—Module V surveys basic statistical approaches most often used in child welfare research. Distinct from a statistics course, the intent is not for students to become proficient in the methods or to understand their mathematical underpinnings. Rather, the purpose is to impart students with a rudimentary ability to match a research question with the appropriate analytical method. For example, causal questions require longitudinal data, and cross-sectional questions may be answered using chi-square statistics if the data source is categorical in nature. Armed with this skill, students are better able to critically survey the research literature (Shaw, Lee, & Wulczyn, 2012; Wulczyn et al., 2014).

In addition, students explore more deeply one particular method that applies to their individual culminating research projects. For example, much of the summarized data available on the CCWIP website is presented in the form of cross tabulations, which lend themselves to chi-square tests of association between two categories. An assignment that develops critical thinking skills about the appropriate use of data more broadly than that available on the CCWIP website is a small group analysis and presentation of an instructor-approved research article. Statistical methods surveyed in this assignment include correlation, chi-square, t-test, ANOVA, ratio measures, and regression. Students discuss the clarity of the data and method, and how well the method matches the research questions. The class discussion format allows the instructor to help explain any key conceptual aspects of the method-question match that pose a struggle for the students. Throughout the course,

students are introduced to different statistical topics through a pragmatic lens by being asked to read and discuss empirical articles each week.

Table 2 describes five examples of student research projects to illustrate the direct links between social work practice and data/research skills that the Curriculum seeks to make. The table outlines the major processes necessary for undertaking a research project. These include identifying a problem, articulating a research question, designing a method, preparing the results of an analysis, and translating the results into practice. In addition, students are assigned to a second-year field placement according to the student's population concentration and are expected to carry out a research project that is relevant to that placement. In California, Title IV-E students are placed within a local county child welfare agency. During the first 2 weeks of the first semester, the student identifies a social problem—ideally one related to their county's system improvement plan (SIP).¹ By the end of the first semester, the student articulates well-focused research questions that follow from the selected social problem, and identifies the analytic method best suited to answer those questions. During the second term the student conducts the analysis and produces a full research report to be shared with field placement staff.

Table 2 includes examples from four Title IV-E students as well as a non-IV-E student in the Children and Families concentration placed at a children's hospital. For example, one Title IV-E student placed in a local county child welfare agency became aware that reentries to foster care were a persistent and pronounced problem, and an outcome targeted in the SIP. The student used the CCWIP website to query information about reentry by gender, age, race, and placement type. Then the student conducted descriptive, exploratory analyses of trends over time and compared her county's performance on the federal measure of reentry to that of other counties and statewide. The student went on to inferentially test associations between the county's reentry rates and each of the available child and case characteristics. Infants and teens emerged as subpopulations at highest risk for reentry. While these findings were not surprising, they provided local evidence for focusing scarce prevention resources on particular subpopulations. The county used the results of the student's project to select cases for deeper review among the identified high-risk groups.

It should be emphasized that these examples of student-generated projects were developed within the constraints of the secondary data available to them. Module V: Basic Statistics is devoted in part to exposing students to child welfare research articles that use a range of statistical methods. Most of these methods use individual level data and as such they lend themselves to more rigorous analyses than do descriptive statistics and simple inferential statistics such as chi square. As students develop their projects, they learn to formulate research questions answerable with summary data, and they gain a basic understanding of how individual level data is required for more rigorous analyses using regression and event history analyses.

DISCUSSION

The primary objective of this research course Curriculum is to prepare Title IV-E social work students to enter a field that increasingly demands practice grounded in evidence and

the continuous reevaluation of how well those practices address the needs of a dynamic child welfare population. Building an evidence-driven child welfare workforce takes time. One or two MSW courses in research is not enough to fully prepare students for a career in child welfare data analytics, nor is it enough time to generate expert knowledge of most any topic. Rather, this Curriculum co-opts a general EPAS-informed MSW research course to more explicitly connect scientific principles and research skills to everyday child welfare casework, administrative, and policy practice. It is not the first to do so. The University of Maryland School of Social Work has developed a course curriculum similar to the one presented here, largely relying on data from the Center for State Child Welfare Data (Data Center), as noted by Shaw et al. (2012). That curriculum also took an experiential learning approach to familiarizing MSW students with actual child welfare data to answer real-world research questions.

The timing of MSW research curricula redesign is aligned with other efforts underway to better train social workers entering the field of child welfare to be critical consumers of evidence. Nationally, Chapin Hall at the University of Chicago, in partnership with Casey Family Programs has been offering intensive 5-day Advanced Analytics courses to child welfare administrators since 2007, as a way to train existing agency staff. Chapin Hall also partners with the CCWIP to offer shorter versions of Advanced Analytics to California child welfare agency staff at the state and county level.

Social work programs in other states and counties whose foster care data are published on the Data Center website could easily use this Curriculum, exchanging references to the CCWIP with examples from the Data Center. A list of participating jurisdictions can be found at <<https://fcda.chapinhall.org/>>. Even jurisdictions that rely on other sources of summary level child welfare administrative data can apply the Curriculum's concepts, particularly the importance of longitudinal data for observing outcomes and connecting them to strategies and interventions meant to alter those outcomes. Likewise, the concepts are applicable to other aspects of social work beyond child welfare, such as health care, or any area that requires practitioners to identify client needs and align them with interventions or other services that stand the best chance of alleviating the problem.

CCWIP as a Tool for Continuous Quality Improvement

The CCWIP website provides public access to information critical to implementing a CQI process in that it outlines the progressive course of investigation, testing, comparing, replication, and adaptation. The Curriculum trains MSW students to use, understand, and, most importantly, regularly rely on the CCWIP data to inform their engagement in this process. Specifically, the Curriculum is designed largely to normalize inquiry for students and provide them with the analytical skills necessary to pursue and use evidence in their practice.

The first phase of a CQI cycle involves observing the prevalence or incidence of a problem and identifying target population(s) who suffer most acutely, who stand to benefit the most from intervention and/or who make up a large share of those who experience the problem. This Curriculum trains students to ask answerable questions, query the CCWIP data to obtain answers, manipulate, display, and interpret the data. From there, one can rely on the

literature of evidence, such as the California Child Evidence Based Clearinghouse for Child Welfare (available at <<http://www.cebc4cw.org/>>) to select an intervention or practice best suited to address the problem facing the identified target population.

Once an intervention or practice is selected and tested, one needs to return to the outcome data, observe it over a period of time, and assess whether or not the outcome change is associated with the intervention or practice change. As a practical matter, this is only possible with entry cohort data, and the Curriculum devotes significant time to the importance of longitudinal data. For example, child welfare data are often viewed from a point-in-time perspective. This view is insufficient for evaluating the impact of a new policy or practice because it includes children already in care before the change was implemented. The Curriculum instructs students in how to query and use entry cohort data available on the CCWIP website in order to properly evaluate outcomes and their association with practice change or the introduction of new policies. The value of being able to associate policy and programmatic change with outcomes is not restricted to policy makers and researchers. Front line child welfare workers should know the case mix of their service populations and the scope of their needs so that they can effectively and efficiently refer to or directly deliver interventions.

Consistent with the CQI approach, the Curriculum requires further testing and tuning. Several instructors have taught it as a two-semester sequence in the second year of an MSW program. Students come to the course with widely varying backgrounds in analytic skills; some need basic instruction in using spreadsheet software, while others have retained the knowledge gleaned from their undergraduate statistics courses. The emphasis on hands-on practice with the CCWIP data means that considerable class time needs to be dedicated to lab and one-on-one consultation with instructors in order to respond to the varying student skill levels. A two-semester sequence offers more opportunity to bring all students up to proficiency in fundamental data manipulation and basic statistical techniques. However, many but not all MSW programs allow room in their curricula for a full-year research course. In those cases, the module format of this Curriculum allows for the selection of particular topics in isolation. Modules may be applied to BSW courses as well. In particular, Modules I and II provide the necessary foundation for querying data and interpreting basic tables and trends, which is particularly important in jurisdictions that rely on BSW-level caseworkers.

A final advantage to using this Curriculum with Title IV-E students is related to one of social work's core ethical principles. The NASW Code of Ethics directs social workers to "... practice within their areas of competence and develop and enhance their professional expertise" (NASW, 1999, p. 6). Like medical professionals, social workers must, if they are to remain competent in a field with a developing knowledge base, know where to find high-quality research and data about their populations and critically evaluate the best evidence available to help them conduct and improve their work. Physicians and nurses are expected to enter practice with facility using professional databases such as Medline in order to stay up to date on evidence-based practices and to adapt and evaluate their work with different populations in various contexts. Child welfare workers can enter their profession similarly prepared, by being comfortable querying and using the data available to them, making

practice and policy decisions informed by those data, and continuously monitoring how well the two align. The relationship among CCWIP, CalSWEC, and CDSS provides a logical and convenient opportunity to use California's child welfare administrative data as a teaching tool. It also serves as an example for other states seeking to better prepare their incoming child welfare workforce to participate in the CQI process.

CONCLUSION

Educational interventions to better prepare MSW students and social workers to use data and other forms of evidence should be developed and tested both in the classroom and in the workforce. This Curriculum is an exploratory effort to improve the delivery and relevance of an MSW research course through the use of publicly available child welfare data. It is not yet known empirically whether this approach accomplishes that goal. However, related strategies that take place within child welfare organizations show promise. Training child welfare agency staff to consume and use research evidence for better management and practice can be effective (Palinkas et al., 2011; Trocmé et al., 2014), and connecting social workers to researchers can make research more applicable and evidence based practices to more sustainable (Epstein, 2010; Zeira, 2014). Preparing MSW students with critical thinking and practical analytical skills prior to entering the workforce may boost these effects; the question of whether or not it does so is an area for future research.

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TABLE 1

Competencies, Content, and Translation of Learning Modules

Competencies	Example Activities and Assignments	Translation to Typical Child Welfare Agency Tasks
<i>Module I: Child Welfare Data 101</i>		
Objective: Increase student comfort with data by applying basic descriptive statistical concepts to California's web-based child welfare administrative data.		
• Engage in critical analysis of quantitative and qualitative research methods and research findings by exploring the strengths and weaknesses of secondary data (EPAS 4b).	• Use CWP website sample data to calculate cell formulas, compute percent change, code variables, and generate trend lines in Excel.	• Query administrative data sources (e.g., CCWIP) to learn the local jurisdiction's profile of children entering foster care.
• Be familiar with basic research terminology, including the term "administrative data" and its relevance to social work and child welfare.	• Prepare a written description of the data sources that the student's project will rely upon.	• Identify a target population for an intervention.
• Interpret summary information from groups and communities through exploration of a variety of publicly available secondary data (EPAS 7a).	• Use county-level foster care entry rates to calculate statewide summary statistics in Excel.	
<i>Module II: Lessons in Using (and Misusing) data</i>		
Objectives: 1) Introduce state and federal child welfare indicators for tracking agency performance; 2) Demonstrate effective (and ineffective) presentations and interpretations of data through the review of popular press examples based on actual child welfare data.		
• Translate research findings by becoming familiar with and able to explain several important statewide trends in California's caseload (EPAS 4c).	• Prepare a literature review based on students' early identification of a research topic area. Students are expected to iteratively revise as the project develops.	• Survey the research literature to identify foster care prevention interventions that have an evidence base.
• Critically analyze indicators for tracking performance (EPAS 9b).	• Calculate county-level correlations among rates of entry, reunification, reentry, and median duration in Excel and Stata.	• Using the principles of longitudinal data, select an appropriate random sample of local case records to review for an examination of why permanency rates are low. The sample should come from an entry cohort and contain both children who exited foster care to permanency and children who did not.
• Select and use appropriate methods for evaluation of outcomes through an understanding of the difference between longitudinal and cross-sectional views of data and their appropriate applications (EPAS 9a).	• Critically review a peer's research proposal.	
• Appreciate the importance of critically evaluating data and statistics (EPAS 4b).		

Module III: Developing Answerable and Relevant Research Questions

Objectives: 1) Provide students with a deeper understanding of their field placement and their agency's performance goals; 2) Take students through a decision-making process that will help each student isolate an answerable research question.

- Critically analyze and interpret their county's child welfare System Improvement Plan performance goals (EPAS 7a).
- Work through the process of narrowing and shaping a research topic.
- Pose an answerable question about the characteristics of children most likely to enter foster care (e.g., *How*

Competencies	Example Activities and Assignments	Translation to Typical Child Welfare Agency Tasks
- Use practice experience to inform scientific inquiry and research by developing an answerable research question relevant to their public child welfare field placement (EPAS 4a). - Select appropriate methods for evaluation of outcomes and understand the core components of the analysis they will undertake (EPAS 9a).	- Develop a problem statement establishing the social problem. - Propose targeted, narrowly defined research questions based on the prior exercises. The questions should be feasible for publicly available secondary data. - Prepare a draft abstract of the proposed study early in the course in order to create a roadmap for carrying out the study.	<i>does the risk of entering foster care vary by race?</i> Formulate a hypothesis about the relationship between a practice or policy and child welfare outcomes (e.g., <i>Since my agency began using risk assessment tools in 2009 we have placed fewer children into foster care</i>).
<i>Module IV: Presenting Data Graphically and Writing an Empirical Report</i> Objectives: 1) Familiarize students with the benefits and drawbacks of different types of visual data presentation and their specific uses; 2) Provide students experience with producing charts and tables, and writing narrative to describe data.		
- Understand the strengths and weaknesses of different quantitative methods for visualizing data (EPAS 4b). - Translate research findings through creation and presentation of data charts and tables in Excel to the class (EPAS 4c). - Apply knowledge of theoretical frameworks in the assessment of data from client systems through development of a structured research report (EPAS 7b).	- Using data from the CCWIP website, prepare a chart and a table in Excel, and a narrative explanation of the visuals. - Present final research project orally, focusing on brevity, clarity, and data visualization. - Prepare full research report including abstract, rationale, literature review, method, analysis, and discussion.	- Generate (or interpret) a dashboard of indicators describing the composition of the local child welfare population and their current outcomes. - Synthesize data in a written report for local stakeholders.
<i>Module V: Basic Statistics</i> Objectives: 1) Define basic statistical terms and methods and provide example usages in applied child welfare practice and research; 2) Expose students to variable and comparative data, and broaden their ability to identify trends in data.		
- Select and use appropriate methods for evaluation of outcomes by developing familiarity with correlation, T-tests, Analysis of Variance, Chi-Square, Regression Analysis, and Ratio Measures (EPAS 9a). - Critically analyze quantitative research methods by exploring how each may be applied to answer questions in the child welfare literature (EPAS 4b). - Use and translate research findings by computing and critically examining disparity indices among children of different races within California's child welfare system (EPAS 4c).	- Critique and orally present a child welfare research article. Students assess the suitability of the method for the research questions. - Examine gender differences in counts of maltreatment recurrence using t-test in Excel. - Test association between race and disposition using chi-square test in Excel and Stata. - Use county-level allegations to calculate relative risks based on race in Excel, and confidence intervals in Stata.	- Generate trend lines in Excel to examine allegation rates over time. - Compare local outcomes performance to another county or state and assess meaningful differences.

Competencies	Example Activities and Assignments	Translation to Typical Child Welfare Agency Tasks
	Use Stata to test the relationship between race and risk of maltreatment, controlling for age.	

Examples of Student Research Projects Directly Linking Problem Identification to the Use of Data, Systematic Analysis, and Quality Improvement

TABLE 2

Field Placement	Problem	Research Question	Method	Results	Contribution to Quality Improvement
County child welfare agency	High Reentries to foster care	What are the characteristics of children most likely to reenter in the county?	Chi-square tests of association between gender, age, race, placement type, and probability of reentry	Infants and teens were more likely to reenter. Children last placed with relatives were less likely to reenter than were children in other placement settings.	Results contributed to a larger agency study of reentry that included case record reviews of those subgroups at highest risk for reentry.
Children's Hospital	Sexual abuse	Among sexual abuse allegations, are boys less likely to be substantiated than girls?	Chi-square tests of association between gender and substantiation	Males were less likely to be substantiated within the field placement county as well as statewide.	Highlighted the unique factors (lack of physical evidence, reluctance to disclose) involved in investigations of sexual abuse with male clients.
County child welfare agency	Long lengths of stay in foster care	What child characteristics are associated with longer stays in care in the county?	Differences in median length of stay were summarized within groups: age at entry, race, and placement type	On average, newborns less than one month old spent more time in foster care than children ages 1–2 years.	Very young children were identified as a target population for deeper understanding about permanency trajectories in the county's next system improvement plan (SIP).
County child welfare agency	High rates of psychotropic medication use among foster children	What characteristics are associated with psychotropic medication use among foster children at in the county and across the state?	Chi-square tests of association between gender, race, placement type and authorization for psychotropic medication.	White children in the county and black children across the state had higher rates of psychotropic medication use. Authorization was also associated with being male and with placement in congregate care.	Contributed to the county's SIP, which included a plan to identify the children in foster care most likely to receive mental health services, particularly those who are authorized for psychotropic medications.
County child welfare agency	Low Rates of adoption	How have rates of adoption changed over time? How do they vary by age and race?	Chi-square tests for trends over time and chi-square tests of association between adoption rates and age, race, and placement type.	Overall, rates of adoption increased significantly between 2000 and 2009. Rates were lower among black and Native American children; and as children aged, they were less likely to be adopted.	Highlights areas where important improvements have been made in adoption statewide, as well as those groups for whom further efforts are still needed.