Using State Early Care and Education Workforce Registry Data to Inform Training-Related Questions: Issues to Consider

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POLICY INFORMATION REPORT

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RESEARCH REPORT

Using State Early Care and Education Workforce Registry Data to Inform Training-Related Questions: Issues to Consider

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The current early care and education (ECE) policy context is bringing increased attention to the training completed by the child care workforce and to the use of registries to track such training. Although ECE workforce registries are designed to record individuals' data, aggregate registry data have the potential to shed light on the workforce's training needs. However, to date, registries have not been tapped in this way, and there is limited research on the data collected across registries and the extent to which they are standardized. In this report, I share the results of research on the training focus variables used across these databases and on the extent to which such variables are comparable. Also explored is when registries began recording these data and whether enrollment is voluntary, incentivized, or mandatory. The results of the study suggest that aggregate registry data have the potential to address questions related to the focus of the training in which the ECE workforce participates. However, additional research on ECE workforce registries is needed to confirm their usefulness as a source of data on child care training as well as the accessibility of these data.

Keywords Early care and education; training; workforce registries

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The current U.S. early care and education (ECE) policy landscape has a strong focus on improving the quality of child care for children under the age of 5 years (Boller, Tarrant, & Schaack, 2014). These efforts have been both funded and guided in large part by states' respective Child Care and Development Fund (CCDF) grants (see also the Child Care and Development Block Grant Act of 2014) and Race to the Top – Early Learning Challenge (U.S. Department of Education, 2015) awards. Related contributors include state child care Quality Rating and Improvement System (QRIS) initiatives, the majority of which are linked to Race to the Top – Early Learning Challenge and CCDF plans and are being implemented, piloted, or planned in every state except Missouri (QRIS Compendium, 2016).

As part of these quality improvement efforts, policy makers are focusing on the child care workforce's capacity to support young children's social, emotional, physical, and cognitive development. For example, states' biennial CCDF plans must include ongoing workforce training and other professional development related to meeting the developmental needs of participating children (Matthews, Schulman, Vogtman, Johnson-Staub, & Blank, 2015; Office of Child Care, 2015). Within QRIS initiatives, at least 38 states have elements focusing on staff education and training (National Center on Child Care Quality Improvement, 2011a, 2011b; National Infant and Toddler Child Care Initiative, 2011). The focus on training is particularly critical given that no state requires child care teachers to obtain a college degree prior to being hired (Child Care Aware, 2012).

In addition, there is a growing state interest in using what are known as ECE workforce registries to track the child care workforce's training, credit-bearing course work, and formal educational attainment (Prentice, 2013; The National Registry Alliance [TNRA], 2009). These databases typically record a training's title and length in hours. Registries also may document if enrollees meet licensing and/or QRIS requirements and, in states with what is known as a career ladder or lattice, the criteria for a specific level. In addition, some registries record an enrollee's employment history. Finally, the majority of registry Web sites allow individuals to search for trainings, trainers, and associated training organizations (Kipnis & Whitebook, 2011; Prentice, 2013; U.S. Government Accountability Office, 2012; Wolfe, 2015).

Given the interrelated goals of this policy landscape, it would be helpful for ECE policy makers, program administrators, training providers, advocates, and researchers to have accurate information on the training needed by the child

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care workforce. Furthermore, although workforce registries are designed to record individuals' data, aggregate registry data have the potential to provide such information (Early Learning Challenge Technical Assistance Program [ELC TA], 2015; National Center on Child Care Professional Development Systems and Workforce Initiatives [PDW Center], 2013). Yet, to date, few researchers have tapped data from single registries (e.g., Douglass, Carter, Smith, & Gadhadharan, 2012; Lipscomb, Schmitt, & Pratt, 2015; Weber & Grobe, 2014; Weber & Lipscomb, 2015). Even more importantly, there has been limited research on the exact data collected across registries and the extent to which such data are standardized or comparable (e.g., Mayfield, 2012; Prentice, 2013; TNRA, 2009).

In this report, I share the results of research on the variables ECE workforce registries use to denote the focus of participants' training and on how long such data have been collected. Also shared is the extent to which registry enrollment is voluntary, incentivized, or mandatory. To set the stage for the study, I take a closer look at the child care workforce training policy context. I then review three issues to consider before using aggregate ECE workforce registry data to inform training-related purposes. After discussing the study's results, I conclude the report with some future research to be conducted on ECE workforce registries as a means for further informing their potential to be used as a source of data on child care training.

Child Care Workforce Training Policy Context

Thinking about the knowledge and skills needed to effectively support student learning can be helpful for situating a discussion about the child care workforce training policy context, particularly when policies aim to enhance the workforce's capacity to support young children's social, emotional, physical, and cognitive development. As Sykes and Wilson (2015) described, high-quality teaching involves a complex set of instructional competencies, such as planning and preparing for instruction (including determining what students already know and can do), developing relationships with students, and managing the physical environment of the classroom. Teachers also must communicate effectively with other professionals and students' families. Furthermore, these competencies are not only dependent on the content of what is being taught (e.g., literacy vs. mathematics) and student characteristics (e.g., age 3 vs. age 8; monolingual vs. dual language) but also influenced by the settings in which teachers work and the support received in those settings.

In settings serving infants, toddlers, and preschoolers, it is especially critical for teachers to possess a strong foundational knowledge about child development as well as the biological and environmental factors that can both enhance and impede young children's behavior and learning. Such knowledge also is important for organizing the classroom learning environment and using ongoing assessment data to inform instruction (Institute of Medicine [IOM] & National Research Council [NRC], 2012). In addition, teachers' instructional interactions with their students may be particularly crucial to effective teaching; that is, while teachers need to be caring, responsive, and mindful about children's health and safety, also important are the activities and conversations that promote students' higher order thinking skills and early learning outcomes (Burchinal et al., 2008; Cameron, 2012; Hamre et al., 2013; Pianta, 2011). In addition, effective teachers will know when to use different learning approaches (e.g., one-on-one, small group, whole group, hands-on activities) and "have a repertoire of content-specific instructional strategies that promote learning" (Hamre, 2014, p. 225).

Prehire Requirements

While effective teaching may require a specialized knowledge base and set of competencies, state policies require child care teachers[1] in licensed centers to attain minimal prehire qualifications. Simply put, no state requires center-based child care teachers to have a college degree prior to being hired. Moreover, 20 states require attainment of only a high school diploma or equivalent exam, and an additional 20 states have no minimum educational requirement. Just three states require individuals to obtain a Child Development Associate (CDA) credential (Ackerman & Kingsley, 2015). To attain a CDA, individuals must complete a variety of activities, including 120 clock hours of training across eight topics (Council for Professional Recognition, 2015). The CDA also is a voluntary milestone step in the majority of states' child care career ladders or lattices (Missouri Coordinating Board for Early Childhood, 2014).

In contrast, the 2007 Head Start reauthorization mandated 50% of teachers in the federally funded Head Start program for preschoolers to have a minimum of a bachelor's degree in or related to early childhood by 2013 (Improving Head Start for School Readiness Act of 2007). Among state-funded pre-K programs, which mostly target 4 year olds, 18 states require

all teachers to have a minimum of a bachelor's degree. In an additional 33 states, teachers working in public school pre-K settings must have a minimum of a 4-year degree (Schilder, 2016).

Perhaps not surprisingly, national studies suggest that just 25% of center-based child care teachers have a 4-year degree (Bassok, Fitzpatrick, Loeb, & Paglayan, 2013; National Survey of Early Care and Education Project Team, 2012; U.S. Government Accountability Office, 2012). Conversely, an analysis of recent Head Start Program Information Report data shows that 74% of its teachers are reported to have a bachelor's degree or higher (Office of Head Start, 2015).

Child Care and Development Fund

Several additional policy contexts drive the training completed by the child care workforce both initially and on an ongoing basis. The first context stems from the CCDF program, which is part of the Child Care and Development Block Grant Act and applies to staff in settings accepting CCDF family assistance vouchers. For example, new staff must receive training on a variety of health- and safety-related topics, including recognizing symptoms of illness, preventing and controlling infectious disease, administering medication, emergency procedures, and first aid and cardiopulmonary resuscitation (National Center on Child Care Quality Improvement, 2015; Office of Child Care, 2015). States' biennial CCDF plans also must provide an assurance that training will be conducted on an ongoing basis and reflect current research and best practices related to the skills necessary to meet the developmental needs of participating children. Furthermore, states must report via their CCDF Quality Performance Reports how many child care center-based teachers, family child care providers, and legally exempt providers received training on the state's early learning guidelines (Matthews et al., 2015).

Child Care Licensing Regulations

A second key context is state child care licensing regulations, which, in addition to governing prehire qualifications, require center-based child care teachers to complete posthire training. As might be expected given CCDF requirements, the majority of states require initial training related to children's health and safety, emergency preparedness, licensing regulations, and child abuse reporting. In addition, 48 states require staff in child care centers to undergo specific amounts of annual training. These amounts vary widely, with 10 states requiring 11 or fewer hours, 24 states requiring between 12 and 17 hours, and the remaining states requiring 18 or more hours. While 40 states require annual training on health and safety issues, in roughly two-thirds of states, varying amounts of annual training related to child development, child guidance and behavior, and/or learning activities also are required (Child Care Aware, 2013; U.S. Government Accountability Office, 2012).

Quality Rating and Improvement System Initiatives

A third context driving child care training is QRIS initiatives, which are being implemented, piloted, or planned in 49 states and the District of Columbia (QRIS Compendium, 2016). These initiatives generally have two primary purposes, both of which reflect the intent of the Child Care and Development Block Grant Act. The first purpose is to provide parents and other consumers with information regarding the relative quality of any child care program. A second primary purpose is to incentivize participating programs to maintain or improve their quality as a means for better supporting children's development and early learning.

As mentioned in the introduction, at least 38 QRIS initiatives have quality improvement categories focusing on staff education and training. Some of these states also require training related to specific topics, such as caring for infants and toddlers or a state's early learning guidelines. And, as an incentive to the workforce to attain higher education levels and/or participate in training, many QRIS offer scholarships (National Center on Child Care Quality Improvement, 2011a, 2011b; National Infant and Toddler Child Care Initiative, 2011). However, in most states, the participation of licensed center-based child care programs is voluntary (QRIS Compendium, 2016).

Summary

In summary, owing to the minimal qualifications needed to enter he licensed child care workforce, individuals likely will need training if they are to effectively contribute to efforts to improve child care quality and support young children's learning and development. At the same time, because of different regulatory policies, staff formal educational backgrounds, and

the ages of the children served (e.g., infants and toddlers vs. preschoolers), the focus and amount of training needed are not likely to be one size fits all (Wasik, Mattera, Lloyd, & Boller, 2013). It therefore could be helpful for ECE policy makers, program administrators, training providers, advocates, and researchers to have accurate information on the training needs of staff within and across settings, programs, and states. Discussed next are some methodological considerations when using aggregate data from ECE workforce registries for this purpose.

Issues in Using Aggregate Registry Data to Inform Training-Related Questions

ECE programs are increasingly using data from a variety of sources to satisfy reporting requirements related to licensing, funding, ongoing monitoring, and accountability as well as part of quality improvement efforts (Jordan & King, 2015; Kipnis, Stebbins, & Szekely, 2012; Riley-Ayers, Frede, Barnett, & Brenneman, 2011; The Early Childhood Data Collaborative, 2014). These data also can be useful for performing needs assessments (e.g., Office of Child Care, 2013a), including the training needed by the child care workforce to support state and federal regulations and quality initiatives. Secondary analysis of aggregate data from one or a combination of ECE workforce registries has the potential to serve as another source of data and thus inform the efforts of a wide array of stakeholders. However, at least three registry-specific issues can undermine this potential: the data variables used, the years of data available, and the percentage of eligible individuals enrolled.

Training Data Variables Used

The first issue to consider prior to potentially relying on aggregate registry data is the focus of the available data and, if using multiple registries, the extent to which the variables used are standardized or at least comparable in terms of their focus (Friese, King, & Tout, 2013; PDW Center, 2013). For example, some stakeholders may be interested in participation in exact training titles as a means for documenting the number and percentage of individuals meeting specific licensing requirements (e.g., the process for reporting potential child abuse). However, other stakeholders may wish to examine the extent to which participants engage in training related to an overall content area (e.g., health and safety).

To address this latter issue, The National Registry Alliance (TNRA, 2013), a voluntary organization of ECE workforce registry leaders, urges registries to use seven primary core knowledge/core content area categories to describe a training's main focus. These categories are Administration and Management; Child Growth and Development; Early Childhood Education Profession and Policy; Family and Community Relationships; Health, Safety, and Nutrition; Observing, Documenting, and Assessing; and Teaching and Learning.

The saliency of these topics within the larger ECE field is illustrated when considering the competencies to be displayed by candidates for the CDA credential (Council for Professional Recognition, 2015) and the standards for early childhood professional preparation program curriculum advocated by the National Association for the Education of Young Children (NAEYC, 2009). As mentioned earlier, the CDA is the minimum qualification to be hired as a child care teacher in licensed centers in three states and a voluntary milestone step in the majority of states' child care career ladders or lattices. CDA candidates also must complete training across eight topics. NAEYC is considered to be the largest professional association for individuals working in settings for children ages birth through age 8 years in the United States and also an important author of early childhood position statements, particularly related to high-quality ECE. And although each organization has a different target audience, the CDA Competencies and NAEYC's professional preparation program curriculum standards are acknowledged as comparable (NAEYC & Council for Professional Recognition, 2012).

To help demonstrate the relevancy of TNRA's category suggestions, Table 1 displays this organization's categories in alphabetical order as well as their corresponding CDA Competencies and NAEYC standards. As can be seen, the titles across the three organizations are not standardized. However, for the most part, they are comparable in terms of their phrasing and focus. For example, the TNRA category of Child Growth and Development is comparable to the CDA competency of Understanding Principles of Child Development and Learning and the NAEYC standard of Promoting Child Development and Learning. In addition, the TNRA category of Family and Community Relationships is similar to the CDA Competency of Building Productive Relationships with Families and NAEYC's Building Family and Community Relationships standard.

Two exceptions to this comparability are seen in the TNRA categories of Administration and Management and Health, Safety, and Nutrition. More specifically, both categories have a corresponding CDA competency, but neither of these topics

Table 1 Comparability of The National Registry Alliance, Child Development Associate, and National Association for the Education of Young Children Core Knowledge/Competency Standards Titles

TNRA Core Knowledge/Core Content Areas[a]	CDA Competencies[b]	NAEYC Standards for Early Childhood Teacher Preparation Program Curriculum[c]
Administration and Management	Managing an Effective Program Operation	(No stand-alone equivalent)
Child Growth and Development	Understanding Principles of Child Development and Learning	Promoting Child Development and Learning
Early Childhood Profession and Policy	Maintaining a Commitment to Professionalism	Becoming a Professional
Family and Community Relationships	Building Productive Relationships With Families	Building Family and Community Relationships
Health, Safety, and Nutrition	Planning a Safe and Healthy Learning Environment	(No stand-alone equivalent)
Observing, Documenting, and Assessing	Observing and Recording Children's Behavior	Observing, Documenting, and Assessing to Support Young Children and Families
Teaching and Learning	Advancing Children's Physical and Intellectual Competence; and Supporting Children's Social and Emotional Development	Using Content Knowledge to Build Meaningful Curriculum; and Using Developmentally Effective Approaches to Connect With Children and Families

Note. The three organizations' respective core knowledge/competency standards have been reordered to demonstrate their alignment with each other. CDA = Child Development Associate. NAEYC = National Association for the Education of Young Children. TNRA = The National Registry Alliance.

[a]Available in The National Registry Alliance, *Core Data Elements for Early Childhood and School-Age Registries*, 2013, Washington, DC: Author. [b]Retrieved from http://www.cdacouncil.org/credentials/apply-for-cda/preschool. [c]Retrieved from https://www.naeyc.org/files/naeyc/file/positions/ProfPrepStandards09.pdf

is a stand-alone category within the NAEYC standards. In addition, although the focus of the categories related to Teaching and Learning is similar, the phrasing of the titles across the three organizations is very different.

Years of Data

A second potential challenge in using registry data for secondary analyses is for what length of time aggregate data related to any variable are available. Such longitudinal data can be particularly useful when new policies or programs are implemented and stakeholders are interested in measuring change over time (Kemper, Stringfield, & Teddlie, 2003). For example, state administrators or researchers might wish to determine whether the carrot of access to free training or eligibility for potential scholarships is correlated with an increase over several years in enrollment in a state's voluntary ECE workforce registry. Aggregate longitudinal data also might shed light on whether programs' participation in state QRIS initiatives is correlated with greater workforce participation in specific training, such as supporting and/or assessing children's learning.

Percentage of Eligible Individuals Enrolled

A third issue to bear in mind when considering the use of aggregate workforce registry data is the extent to which the data have the potential to accurately inform specific policy or practice questions about specific populations of ECE teachers (Mauzy, Tout, & Whitehead, 2014). For example, some training questions may focus on the ECE workforce as a whole, whereas others may be designed to compare staff working in different auspices (e.g., licensed child care centers, state-funded pre-K, Head Start) or at varying points in their careers (e.g., teachers at Step 1 or 2 in a state's ECE career lattice vs. those at higher levels). In other cases, the training question may focus only on staff from a specific program or demographic.

A key ingredient in this potential is the extent to which registry enrollees are representative of the target population in that jurisdiction (Gliklich, Dreyer, & Leavy, 2014). An example of a target population is infant, toddler, and preschool

teachers working in licensed child care centers throughout a state. In an ideal research world, an ECE workforce registry's database will enroll all eligible individuals in the target population(s). One next best option is for the database to be proportionally representative to the population of interest across the jurisdiction. As an example, suppose a researcher wishes to compare rates of participation in health and safety training between infant/toddler teachers and preschool teachers working in licensed centers within a single state. In this case, it would be helpful from a sampling perspective if the proportion of registry enrollees reflected not only the teachers who do—and do not—attend health and safety training but also the two child age groups. Conversely, if the percentage of teachers enrolled from either training category or age group is significantly different than is actually the case—and the researcher does not take this difference into account—a subsequent analysis of the data may result in an inaccurate estimation of each group's participation in health and safety training (e.g., National Survey of Early Care and Education Project Team, 2016).

Assuming a workforce registry is open to everyone in a target population, determining its representativeness first requires pinning down exactly how many individuals are eligible to enroll at any point in time. However, this can be challenging due to the presence of multiple ECE auspices, variations in child care regulations regarding which settings are required to be licensed, and the names of common job roles (e.g., child care worker vs. preschool teacher). Another contributor is the nature of the child care field, which is dominated by low-waged hourly staff and high rates of turnover. As a result, more than one individual may fill an otherwise full-time position within a single year (IOM & NRC, 2012; Kipnis & Whitebook, 2011, 2012; National Survey of Early Care and Education Project Team, 2013; Whitebook, Phillips, & Howes, 2014).

Even if the approximate number of eligible individuals can be determined, a database's representativeness typically is conditional on there not being any reason to suspect that any subgroup of interest was less likely to enroll (e.g., infant/toddler teachers or teachers who attend very few trainings) and/or systematically excluded (Kadam & Bhalerao, 2010). Historically, the percentage of eligible individuals enrolled in states' respective ECE workforce registries has varied widely (Bellm & Whitebook, 2004; Mayfield, 2012). This is not surprising given that another issue facing voluntary registries of all types is recruitment and retention (Bishop, Tiro, Sanders, Craddock Lee, & Skinner, 2015).

To the best of my knowledge, no published research examines the percentage of eligible individuals enrolled in all active ECE workforce registries. However, a review of states' Race to the Top—Early Learning Challenge performance reports suggests that enrollment policies may serve as a proxy for registries being representative of the workforce in specific auspices. For example (and as is highlighted later in the report), Oregon mandates practitioners working in regulated ECE settings to enroll in the state's registry. In turn, Oregon's 2013 Race to the Top Annual Performance Report (Oregon Department of Education, 2013) noted that, "as of 2012 … the online registry provides workforce data on 100% of practitioners in regulated facilities" (p. 6). Georgia anticipates that enrollment in its newly implemented Professional Development Registry also will be representative of its ECE workforce by the end of 2017 and when all programs are required to be enrolled in the state's QRIS initiative (State of Georgia, 2015). Illinois began requiring all staff in licensed child care settings to enroll in its registry in 2012, and as a result, membership more than doubled from 32,402 in 2013 to 80,769 in 2014 (State of Illinois, 2015).

Data from other sources also suggest that enrollment policies can shape registry enrollment. Nevada began requiring the participation of staff working in licensed child care in 2009 and anticipated that full participation would be phased in by the end of 2012 (The Nevada Registry, 2016). Oklahoma's registry reported a marked increase in enrollment after regulations required the enrollment of staff in QRIS-participating settings (ELC TA, 2015). Wisconsin also requires the enrollment of staff working in licensed programs (Wisconsin Department of Children and Families, 2009). In fact, based on Bureau of Labor Statistics data on the size of the ECE workforce in both Oklahoma and Wisconsin, Mayfield (2015) has estimated that these registries represent close to 100% enrollment. In sum, though not a guarantee, the experiences of these registries suggest that a jurisdiction's requirements for participation are likely to be correlated with the percentage of eligible individuals enrolled.

In the absence of mandatory enrollment, another way voluntary registries can mitigate recruitment and retention issues is to reduce the cost of registry participation and increase the related rewards (Gliklich et al., 2014). Previous research has suggested that ECE workforce registries also have implemented varying initial application or enrollment fees and participation incentives (Bellm & Whitebook, 2004; Prentice, 2013). However, I could not identify any research exploring the extent to which such fees and/or incentives play a role in boosting registry enrollment and, in turn, the representativeness of any ECE subgroup.

In conclusion, there are a variety of potential training-related uses for aggregate workforce registry data. At the same time, the usefulness of these data may be dependent on a variety of registry-specific issues, including the type of data recorded and the degree of comparability across registries, how long such data have been collected, and the extent to which jurisdictions promote participation through their enrollment policies. These are important topics given the larger policy focus on improving the quality of child care and the capacity of the workforce to support children's learning and development, as well as ongoing state training requirements. Furthermore, because there has been limited research on the exact data collected across ECE workforce registries, it is difficult to gauge the potential for aggregate data from one or more registries to inform a variety of child care workforce training-related questions.

To shed light on these issues, the research questions for this study are as follows:

1. Which jurisdictions (e.g., states, District of Columbia, regions within single states) currently implement ECE workforce registries?
2. Which registries use variables to denote the focus of participants' training?
3. To what extent do registries use a set of training focus variables that appear to be comparable based on variable title?
4. In what year did registries begin recording the focus of participants' training?
5. Across registries, to what extent is enrollment voluntary, incentivized, and/or mandatory for child care teachers in licensed settings?
6. What are the implications of the study for potentially using aggregate registry data to inform child care workforce training-related questions?

The methodology for the study is discussed next.

Study Methodology

Data Collection and Sample

To address these questions, I engaged in three phases of data collection in fall 2015. The first phase consisted of identifying all potentially active ECE workforce registries in the 50 states and District of Columbia through a review of the Office of Child Care Technical Assistance Network's State Profile information.[2] In Phase 2, I identified and reviewed registry Web sites not only to confirm that the database was active but also to determine if the jurisdiction uses core knowledge or content categories to describe the main focus of noncredit training aimed at the child care workforce. If so, these categories were noted as the potential registry noncredit training content variables for that state. This Web site review also was used to identify which entity is responsible for administering the registry as well as a potential informant for the third phase of data collection. If no specific contacts were provided, to determine who might serve in that role, I telephoned the registry's administrating entity, e-mailed the general information address, and/or reached out to colleagues with knowledge about key early childhood stakeholders within that jurisdiction for advice regarding potential informants.

Phase 3 involved e-mailing a jurisdiction-specific survey to each registry's identified informant in November 2015. The survey questions were as follows:

1. Does your registry include variables denoting the focus of participants' noncredit training?
2. If so, do the following categories accurately reflect the variables used to denote the focus of participants' noncredit training? (The categories were derived from a review of the registry's training Web site. Administrators also were given the option of adding variables and noting any incorrect variables.)
3. In what year did your registry begin using variables to denote the focus of noncredit training?
4. To what extent is enrollment in your registry voluntary, incentivized, or mandated?

In the majority of cases, I followed up the survey invitations, as well as responses, with additional e-mails and/or phone conversations in December 2015 and January 2016. Informants from 41 of the 44 identified registries participated in the survey for a response rate of 93%. Because I could not confirm information for the three nonresponding registries,[3] data on their respective training focus variables, year in which such data were first recorded, or enrollment policies and/or incentives are not included here.

Data Analysis

To facilitate data analysis, I entered all of the study data into an Excel database. The analysis regarding which jurisdictions currently implement ECE workforce registries (Research Question 1), use variables to denote the focus of participants' training (Research Question 2), and in what year registries began recording the focus of participants' training (Research Question 4) involved the generation of simple descriptive statistics via a count of the number of registries with responses relevant to each of these questions.

To determine to what extent registries use a set of comparable variable titles to denote the focus of participants' training (Research Question 3), I initially coded each registry's variables according to the seven categories suggested by TNRA (2013) and noted earlier in Table 1. In analyzing these data, it became apparent that four additional categories were required: Interactions, Guidance, and Social/Emotional Development; Diversity; Special Needs; and Other. In addition, Teaching and Learning was expanded to reflect the CDA credential's and NAEYC's use of the words *curriculum*, *learning environment*, and *intellectual development* to describe this knowledge area.

To illustrate this coding process, Table 2 displays the titles of Arizona's eight training focus variables in alphabetical order as well as their corresponding TNRA categories. As can be seen, for seven of the eight Arizona variables, the coding process was very straightforward, as the variable titles are either identical or very similar to TNRA's categories (e.g., Family and Community Partnerships vs. Family and Community Relationships). The one instance in which the phrasing was not similar was for the Arizona variable Curriculum and Learning Environment, which was coded as Teaching and Learning.

Table 2 Research Question 2 Coding Example

Arizona registry variable	Corresponding TNRA category
Child Growth and Development	Child Growth and Development
Child Observation and Assessment	Observing, Documenting, and Assessing Children
Curriculum and Learning Environment	Teaching and Learning
Effective Interactions	Interactions, Guidance, Social/Emotional Development
Family and Community Partnerships	Family and Community Relationships
Health, Safety, and Nutrition	Health, Safety, and Nutrition
Professionalism	Early Childhood Profession and Policy
Program Management	Administration and Management

Note. TNRA = the National Registry Alliance.

To determine to what extent enrollment is voluntary, incentivized, and/or mandatory (Research Question 5), data on states' registry enrollment policies were coded as voluntary (and defined as individuals having the option to enroll in the registry and with no incentive beyond tracking their training), conditional/incentivized (voluntary, but enrollment is required to be eligible for or to access a financial or training incentive), or mandatory (required as part of employment within a specific ECE setting). Finally, to determine the implications of the study for potentially using aggregate registry data to inform child care training questions (Research Question 6), I juxtaposed two hypothetical research questions with the results of the study's first five research questions. The results of all of these analyses are discussed next.

Results

States With Early Care and Education Workforce Registries

The study's first research question focused on which jurisdictions were implementing ECE workforce registries at the time of the study. On the basis of a review of the Office of Child Care Technical Assistance Network's State Profile information, registry Web sites, and/or registry administrator participation in the study's survey, there were 44 registries in some stage of implementation in 42 states and the District of Columbia (see Figure 1).

Among these jurisdictions, Rhode Island and Michigan each had single, under-development registries, and Virginia's sole registry was being piloted. In addition, I classified two states as having regional registries: California, which had a single registry but with enrollment limited to individuals in specific regions, and Florida, which had two separately administered, regional registries based in Palm Beach and Miami-Dade counties. There also were 38 jurisdiction-wide, in-operation registries. These registries were located in the District of Columbia as well as the states of Alaska, Arizona,

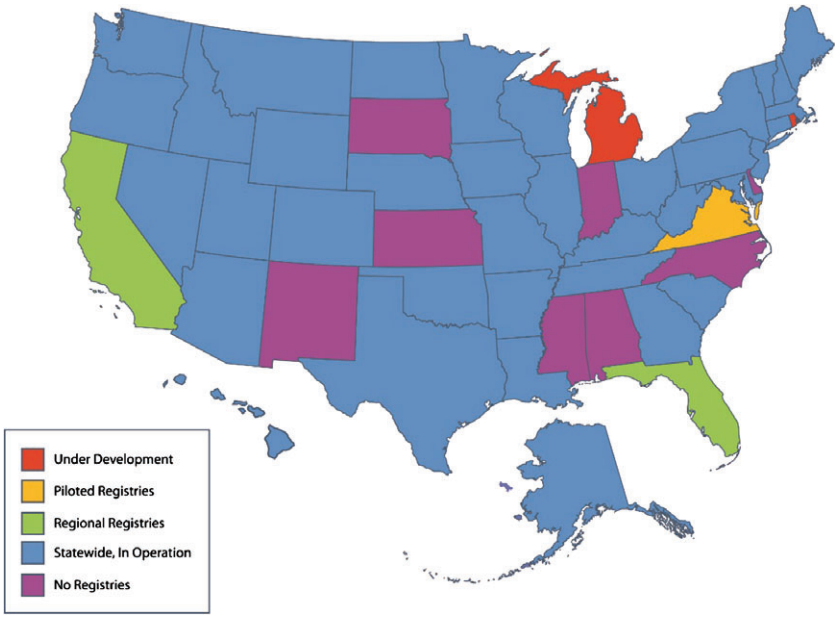

Figure 1 Jurisdictions with early care and education workforce registries.

Arkansas, Colorado, Connecticut, Georgia, Hawaii, Iowa, Idaho, Illinois, Kentucky, Louisiana, Maine, Massachusetts, Maryland, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming.

As can also be seen in Figure 1, eight states did not have an ECE workforce registry at the time of the study. These states were Alabama, Delaware, Indiana, Kansas, Mississippi, New Mexico, North Carolina, and South Dakota. Among this group, Alabama, Delaware, North Carolina, and South Dakota appear to have previously implemented registries (Bellm & Whitebook, 2004; Kipnis & Whitebook, 2011; Southern Early Childhood Alliance, n.d.). However, I did not examine why these registries were no longer operational as part of the study.

Registries Using Variables to Denote the Focus of Enrollees' Training

Research Question 2 focused on which ECE workforce registries use variables to denote the content of training completed by enrollees. This query was addressed through data from the study's 41 survey responses. In addition, *training* was defined as being a noncredit class, course, or workshop that did not result in credits being awarded by a degree-granting institution.

Thirty-eight of the 41 registries participating in the study reported the use of variables to describe the focus of completed training. These include 33 statewide registries; the registries in the District of Columbia, Palm Beach County (Florida), and California; and the under-development databases in Rhode Island and Virginia. The single statewide registry that did not have this capacity was Nebraska's, which was launched in 2014. This also was the case for the Miami-Dade County regional registry in Florida and the registry under development in Michigan.

Across the 38 registries reporting use of variables to denote the focus of training, the quantity of variables ranged from 6 to 20. However, 29 registries reported the use of 7 to 10 variables. Among the six registries using more than 10 individual variables, each registry separated out related variables which other registries combined. For example, instead of having a single Health, Safety, and Nutrition variable, one registry reported four separate variables related to this topic. Another registry separated out the single variable coded as Teaching and Learning into the two variables of Curriculum and Learning Environments.

Comparability in Variable Titles

Research Question 3 focused on the extent to which registries' training variables are comparable and also was addressed through analysis of survey data from the 38 registries with such variables. As mentioned earlier, the predetermined codes

used to analyze these data were based on TNRA's (2013) suggested categories and included Administration and Management; Child Growth and Development; Early Childhood Profession and Policy; Family and Community Relationships; Health, Safety, and Nutrition; Observing, Documenting, and Assessing; and Teaching and Learning. I also added codes for Interactions, Guidance, and Social/Emotional Development; Diversity; Special Needs; and Other.

As was the case with Arizona's registry and as highlighted in Table 2, the titles of most of the registries' training focus variables were similar to TNRA's categories. For example, registry titles related to the category of Child Growth and Development included Child Development; Child Development and Learning; and Child Growth, Development, and Learning. Similarly, for the category of Family and Community Relationships, registry variable titles included Family and Community Partnerships; Positive and Productive Relationships With Families; and Families, Schools, and Community Collaboration.

However, the phrasing of the variable titles related to the topic of Teaching and Learning were not as similar. Instead, these variables included the words *curriculum*, *learning environment*, and *children's intellectual development* and likely reflect the phrasing used in the CDA Competencies (Council for Professional Recognition, 2015) or NAEYC's (2009) Standards for Professional Preparation. As mentioned earlier, it was for this reason that the initial Teaching and Learning code was expanded to include these specific words.

It also was interesting to note that within single jurisdictions, the exact phrasing used for their registry's variables was not always exclusively aligned with the categories used by TNRA, the CDA, or NAEYC. For example, Pennsylvania's Core Knowledge Competencies are reported as aligned with the NAEYC Standards for Professional Preparation Programs (Pennsylvania Office of Child Development and Early Learning, 2013). Yet, the state's registry variable titles (Assessment; Child Growth and Development; Communication; Curriculum and Learning Experiences; Families, Schools, and Community Collaboration; Health, Safety, and Nutrition; Professionalism and Leadership; and Program Organization and Administration) are an amalgam of all three organizations' phrasing.

Comparability in the Set of Variables Used Across Registries

As mentioned earlier, though 38 registries reported using training focus variables, the number of variables used ranged from 6 to 20. I therefore undertook further analysis of the study's data to determine to what extent registries contained a comparable *set* of variables. As is displayed in Table 3, all 38 registries reporting the use of variables to denote the focus of training also had variables related to Child Growth and Development; Health, Safety, and Nutrition; and Teaching and Learning. Furthermore, nearly every registry included variables related to Early Childhood Education Profession and Policy ($N = 37$); Family and Community Relationships ($N = 37$); and Observing, Documenting, and Assessing Children ($N = 35$).

The variables least likely to be included across all 38 registries were Diversity ($N = 12$) and Special Needs ($N = 9$). At first glance, it might appear that little training on these topics is completed within the jurisdictions that do not include these variables. However, my study-related correspondence with their respective registry administrators suggests this is not the case. Instead, these topics often are incorporated into training tagged with one of the other variable categories.

Year in Which Registries Began Recording Training Content

Research Question 4 focused on the year registries began recording the focus of participants' noncredit training as a means for approximating the extent to which registries have longitudinal data related to this topic. This question also was addressed through analysis of the survey data from the 38 states that reported using variables to record the focus of participants' training.

As can be seen in Table 4, the dates in which registries first used such variables ranged from 1991 to 2016. In some states, these dates also reflect the year in which states began implementing their respective ECE workforce registries (Bellm & Whitebook, 2004). In other states, such variables were added at a subsequent date.

For example, Oklahoma and Missouri began implementing statewide registries in 1999 and 2000, respectively (Bellm & Whitebook, 2004), but reported that training variables were incorporated in 2012. Anecdotal information gathered during data collection suggests that these additions were sometimes due to the implementation of new iterations of the registry database and/or database administration. Additional research suggests other contributors include states' Race to the Top—Early Learning Challenge awards and its focus on A Great Early Childhood Education Workforce (Kipnis et al.,

Table 3 Registry Variables Used to Denote the Focus of Noncredit Trainings

Registry	Administration and Management	Child Growth and Development	Diversity	Early Childhood Education Profession and Policy	Family and Community Relationships	Health, Safety, and Nutrition	Interactions, Guidance, and Social/Emotional Development	Observing, Documenting, and Assessing Children	Special Needs	Teaching and Learning	Other(s)
N	30	38	12	37	37	38	32	35	9	38	5
Alaska	X	X		X	X	X	X	X		X	X
Arizona	X	X		X	X	X	X	X		X	
Arkansas	X	X		X	X	X	X	X		X	
California	X	X	X	X	X	X	X	X	X	X	X
Colorado	X	X		X	X	X	X	X		X	
District of Columbia	X	X	X	X	X	X	X	X	X	X	
Palm Beach County FL	X	X		X	X	X	X	X		X	
Georgia		X		X	X	X	X	X		X	
Hawaii	X	X	X	X	X	X	X	X		X	
Iowa	X	X		X	X	X	X	X		X	
Idaho	X	X		X	X	X	X	X	X	X	X
Illinois		X		X	X	X	X	X		X	
Kentucky	X	X		X	X	X		X		X	
Maine		X	X	X	X	X	X	X		X	
Maryland		X		X	X	X			X	X	
Massachusetts	X	X	X	X	X	X	X	X		X	
Minnesota	X	X		X	X	X	X	X		X	
Missouri	X	X		X	X	X	X	X		X	
Montana	X	X	X	X	X	X	X	X		X	X
Nevada	X	X		X	X	X	X	X		X	
New Hampshire	X	X	X	X	X	X	X	X	X	X	
New Jersey	X	X	X	X	X	X	X	X		X	
New York	X	X		X	X	X		X		X	
North Dakota	X	X		X	X	X	X	X		X	
Ohio		X		X	X	X		X		X	
Oklahoma	X	X		X	X	X	X	X		X	
Oregon	X	X	X	X	X	X	X	X	X	X	
Pennsylvania	X	X		X	X	X	X	X		X	
Rhode Island		X		X	X	X		X		X	
South Carolina	X	X		X		X	X		X	X	
Tennessee		X		X	X	X	X	X		X	
Texas		X	X	X	X	X	X	X		X	
Utah	X	X	X		X	X	X	X	X	X	
Virginia	X	X		X	X	X	X	X		X	
Washington	X	X		X	X	X	X	X		X	
West Virginia	X	X		X	X	X		X		X	
Wisconsin	X	X	X	X	X	X	X	X	X	X	X
Wyoming	X	X		X	X	X	X			X	

Note. $N = 38$.

Table 4 Year Early Care and Education Workforce Registries Began Recording Focus of Training

Year	Registries
1991	Wisconsin
1993	Tennessee
1997	Oregon
1998	Montana
2000	Utah
2001	Arkansas, Hawaii, Maryland
2002	Maine, Pennsylvania, South Carolina
2003	Idaho, New Jersey, Texas
2004	Nevada
2005	West Virginia
2006	Alaska, Ohio
2007	Kentucky, Minnesota
2008	Palm Beach County, Florida
2009	Iowa, Illinois
2010	Massachusetts
2011	Washington
2012	District of Columbia, Missouri, New York, North Dakota, Oklahoma
2013	New Hampshire
2014	(No jurisdictions)
2015	Arizona, Colorado, Virginia
2016	California, Georgia, Rhode Island
Unknown	Wyoming

Note. $N = 38$.

2012; McDonald, 2013; PDW Center, 2013), as well as the more recent CCDF requirement regarding the submission of states' annual Quality Performance Reports (Office of Child Care, 2013b).

Voluntary Versus Mandatory Participation

The study's fifth research question examined whether enrollment in registries is voluntary versus mandatory for child care teachers working in licensed settings. The data for this research question were derived from participants' survey responses as well as a review of registry Web sites. In addition, I coded these responses as voluntary (defined as individuals having the option to enroll in the registry and with no incentive beyond tracking their training), conditional/incentivized (voluntary, but enrollment is required to be eligible for or to attain access to an incentive), or mandatory (required as part of employment within a specific ECE setting).

As can be seen in Table 5, policies regarding registry enrollment span all three of these categories, but 23 registries have some type of mandatory policy. More specifically, no jurisdiction mandates all child care staff to enroll in its ECE workforce registry. However, Oklahoma essentially requires this by mandating all staff in any child care setting to enroll in the state's Professional Development Ladder, which is only accessible via the state's registry. In 22 additional jurisdictions, enrollment is mandatory if child care staff work in a specific program/setting. Examples of settings include all licensed ECE programs ($N = 10$) and programs that participate in a state's QRIS ($N = 10$). In addition, while enrollment may be mandatory for some or all child care staff, some of these jurisdictions also offer potential incentives, including eligibility for CDA fees and scholarships.

As also can be seen in Table 5, registry enrollment is voluntary in the remaining 15 jurisdictions. However, in eight states, enrollment is necessary to gain access to and/or to be eligible for a variety of incentives. Five of these eight states offer financial incentives, including partial or full payment of the CDA application or renewal fee, college scholarships, and one-time bonuses for achieving certain levels within a state's career ladder or lattice. Two of the states in this group offer access to training that is not otherwise available to the general public. Enrollment in Tennessee's registry offers access to both financial and training incentives.

In the final group of seven jurisdictions, registry enrollment also is voluntary, but aside from keeping track of an individual's data, there do not appear to be any extra incentives to enroll. I did not focus on why this might be the case. However, at the time of the study, Rhode Island's registry was under development and Virginia's registry was being piloted, with

Table 5 Registry Enrollment Requirements for Licensed Child Care Staff

Enrollment requirement	Jurisdictions
Mandatory/setting dependent[a]	
Staff in licensed ECE programs	Arkansas, Hawaii, Illinois, Kentucky, Nevada, Oklahoma,[b] Oregon, South Carolina, Washington, Wisconsin, Wyoming
Staff in QRIS programs	Arizona, Colorado, Palm Beach County, Florida, Georgia, Maine, Minnesota, Montana, New Jersey, Ohio, Pennsylvania
Staff in licensed ECE programs and nonlicensed QRIS programs	Massachusetts
Staff in city- or state-contracted programs	California
Conditional/incentivized[c]	
Financial incentive	Alaska, Idaho, Maryland, North Dakota, Texas
Training incentive	Iowa, Utah
Training and financial incentive	Tennessee
Voluntary/no extra incentives[d]	District of Columbia, Missouri, New Hampshire, New York, Rhode Island,[e] Virginia,[f] West Virginia

Note. $N = 38$. Includes the registries that participated in the study and use variables to denote the focus of training. ECE = early care and education. QRIS = Quality Rating and Improvement System.
[a] $n = 23$. [b] Oklahoma requires all child care staff to enroll in the state's Professional Development Ladder, which is accessible only through the state's registry. [c] $n = 8$. [d] $n = 7$. [e] Enrollment is required for state's publicly funded pre-K teachers only. [f] Enrollment is required for state's publicly funded Virginia Preschool Initiative pre-K teachers only.

both states planning to initially require teachers working in their respective state-funded pre-K programs to enroll. Also, the registries in the District of Columbia, New Hampshire, and New York were in operation for just a few years. Finally, although Missouri's registry had been operational for roughly 15 years (Bellm & Whitebook, 2004), the state cannot implement a QRIS without legislative action. And West Virginia was planning a QRIS (Quality Rating and Improvement System National Learning Network, 2016). So, while this is conjecture only, the voluntary/no incentive status of some of these registries may reflect their respective internal capacities and/or lack of an active role in the larger child care quality improvement process (i.e., QRIS) at the time of the study.

Interestingly, a review of registry Web sites suggested that no jurisdictions were charging an enrollment fee at the time of the study. Oregon mandated all staff in licensed programs to enroll and also had an enrollment fee of $10, but only if an individual met the qualifications for Steps 3–12 on the state's career ladder, and this fee was "waived until further notice … to support the Race to the Top Early Learning Challenge Grant project goals" (Oregon Center for Career Development, 2016). Based on earlier research conducted by Bellm and Whitebook (2004) and Prentice (2013), the current no-fee approach appears to represent a turnaround in registry policies. However, the study's survey did not include a question about past and current fees, and thus this information was not verified.

Implications of the Study for the Potential Usefulness of Aggregate Registry Data

The study's final research question focused on the implications of these findings for potentially using aggregate workforce registry data to inform child care training-related questions. To address this issue, I juxtaposed two hypothetical research questions with the results of Research Questions 1–5 as a means for illustrating how researchers and other ECE stakeholders might determine which aggregate registries' data sets could serve as a source of useful data.

More specifically, assume a researcher is interested in conducting secondary analyses of aggregate registry data to compare hours of training focused on Child Growth and Development and Health, Safety, and Nutrition. In addition, one study will focus solely on 2015, and a second study will examine trends in participation from 2010 to 2015. Finally, the focus will be on individuals working in licensed child care settings across the United States.

Recalling the three key issues to consider when contemplating the use of aggregate registry data, based on the results of the current study, we know 38 registries use variables focusing on training content, and all 38 have variables related to these two training topics. Accordingly, aggregate data for all of these registries initially can be considered for inclusion. However, one study focuses on 2015 alone, and the second focuses on 2010–2015 participation rates, and both studies wish to focus on ECE staff in licensed child care centers. Therefore we also need to consider which data sets to exclude based on these parameters.

Table 6 Registries' Initial Use of Training Focus Variables and Current Enrollment Policies

Initial year using training focus variables	Registry	Enrollment policies			QRIS density[a] (%)
		Voluntary/no extra incentive	Conditional/ incentivized	Mandatory	
1991	Wisconsin			Licensed ECE program staff	
1993	Tennessee		X		
1997	Oregon			Licensed ECE program staff	
1998	Montana			Staff in QRIS programs	21
2000	Utah		X		
2001	Arkansas			Licensed ECE program staff	
	Hawaii			Licensed ECE program staff	
	Maryland		X		
2002	Maine			Staff in QRIS programs	41
	Pennsylvania			Staff in QRIS programs	64
	South Carolina			Licensed ECE program staff	
2003	Idaho		X		
	New Jersey			Staff in QRIS programs	Not reported
	Texas		X		
2004	Nevada			Licensed ECE program staff	
2005	West Virginia	X			
2006	Alaska		X		
	Ohio			Staff in QRIS programs	32
2007	Kentucky			Licensed ECE program staff	
	Minnesota			Staff in QRIS programs	36
2008	Palm Beach County, Florida			Staff in QRIS programs	27
2009	Iowa		X		
	Illinois			Licensed ECE program staff	
2010	Massachusetts			Licensed ECE and nonlicensed QRIS program staff	
2011	Washington			Licensed ECE program staff	
2012	District of Columbia	X			
	Missouri	X			
	New York	X			
	North Dakota		X		
	Oklahoma			Staff in all child care programs	
2013	New Hampshire	X			
2015	Arizona			Staff in QRIS programs	19
	Colorado			Staff in QRIS programs	52
	Virginia	X			
2016	Georgia			Staff in QRIS programs	50
	Rhode Island	X			
	California			Staff in city-contracted or state-funded programs	

Note. $N = 37$. Wyoming is not included due to the survey respondent not knowing the year in which the state's registry began including training content variables. ECE = early care and education. QRIS = Quality Rating and Improvement System.

[a]Derived from data generated through the QRIS Compendium's Create a Report feature at http://qriscompendium.org/create-a-report

To help explore the ramifications of these study design conditions, Table 6 combines the year in which registries began including variables to denote the focus of training (and previously displayed in Table 4) and their respective current enrollment policies (and previously displayed in Table 5). The registries also are listed chronologically according to the year in which training focus variables were first used.

For the 2015 study, Table 6 suggests that registry data from Arizona, Colorado, Virginia, Georgia, Rhode Island, and California likely will *not* be useful, as each reported that training variables were first used sometime in 2015 or 2016. There may be additional reasons why data from any of these six registries are not suitable (e.g., being in the pilot phase or

regional), but given the focus on 2015, they can be excluded on the basis of date alone. Similarly, for the 2010–2015 study, the researcher also would exclude from consideration the registry data sets from Massachusetts, Washington, the District of Columbia, Missouri, New York, North Dakota, Oklahoma, and New Hampshire, as each did not begin recording the focus of training until 2010 or later.

Once the years-of-data issue is taken into account, the next issue to consider is the extent to which a registry enrolls a representative sample of the child care workforce working in licensed settings. As mentioned previously, to the best of my knowledge, no published research has examined this specific issue across registries. However, based on Oregon's experience, regulations regarding the mandatory enrollment of staff in licensed child care settings might serve as a suitable proxy. Therefore the best candidates for the 2015 study (in alphabetical order) appear to be the aggregate registry data sets from the 11 states of Arkansas, Hawaii, Illinois, Kentucky, Massachusetts, Nevada, Oklahoma, Oregon, South Carolina, Washington, and Wisconsin. However, because of the years-of-data issue, this group of 11 registries would need to be whittled down to eight registries for the study focusing on 2010–2015 training.

For either study, the researcher also may consider using aggregate data from the year-relevant registries mandating the enrollment of staff in programs participating in their respective jurisdiction's QRIS initiatives. However, based on data from the QRIS Compendium's (2016) Create a Report tool, although a few QRIS initiatives have enrolled 100% of their respective licensed ECE centers, none of these is located in the nine states that mandate staff in QRIS programs to enroll in their respective workforce registries. Instead, the density rates of participation in these states' QRIS range from 19% to 64% (see Table 6).

Summary

In summary, in this study, I determined that 44 ECE workforce registries were in some stage of operation in 43 jurisdictions. In 37 states and the District of Columbia, a single, jurisdiction-wide registry was up and running. In addition, California limited participation in its single registry based on region, and Florida had two separately administered regional registries. Finally, three states were piloting or developing their registries.

Furthermore, among the 41 registries participating in the study, 38 reported the use of variables denoting the focus of training completed by enrollees. Although these training focus variables are not standardized, the results of the study suggest that registries use variables that can be considered comparable due to their similar focus. In addition, the majority of registries have variables related to the topics of Child Growth and Development; Teaching and Learning; Documenting and Assessing Children's Knowledge, Skills, and Abilities; Early Childhood Education and Profession; Family and Community Relationships; and Health, Safety, and Nutrition.

At the same time, registries vary widely in the year in which they began including variables to denote the focus of participants' noncredit training. And although 23 variable-using registries require staff in specific child care settings to enroll, this is not the case for 15 registries. These findings have implications not only for the potential to use aggregate registry data to inform an array of child care training questions but also for the additional registry-related research that needs to be conducted.

Research Implications

In this report, I aimed to address a gap in the literature base on ECE workforce registries by sharing the results of a study of the training focus variables these databases use and of the extent to which these variables are comparable across states. Also of interest was when registries began using these variables and whether enrollment in a registry is voluntary, incentivized, or mandatory. The study is especially salient given the increasing reliance on registries to track the training completed by the child care workforce as well as the ongoing need for valid data to inform a wide variety of ECE-related programmatic, policy making, and research. Moreover, highlighting the potential use of aggregate registry data to address a variety of child care training-related questions is timely given the larger policy emphasis on improving child care quality and the capacity of the child care workforce to support children's development and learning.

Of course, a key limitation of this study is its partial reliance on data from a self-reported survey and a policy context that is in continual flux. As a result, although every attempt was made to link survey data with online information regarding training content variables and other relevant policies, the information reported here may not continue to be accurate in the short or long term. The study also is limited in that only a select group of aggregate registry data issues were examined.

Therefore, to further inform the process by which researchers and other ECE stakeholders determine which registries might serve as useful data sources to address questions related to child care training, several other topics should be investigated through future research. In addition to the percentage of eligible individuals enrolled in all active ECE workforce registries, these topics include the comparability of the training related to any focus variable, the policies on and processes for entering and verifying training data, and the extent to which access to aggregate registry data is available.

Comparability of Training

Although it is helpful to know which registries include specific variables related to the focus of the training completed by its enrollees, I did not investigate the extent to which the training related to any of these variables is comparable between different jurisdictions. That is, though the variable titles appear to be aligned, the variable alone does not indicate the types of training events recorded (e.g., workshop vs. technical assistance); a training's objectives; whether it was considered to be at a beginner, intermediate, or advanced level; and if it was targeted at teachers who work with infants and toddlers versus preschoolers. It therefore would be helpful for future research to investigate the other training-related variables used across registries and whether these variables also are comparable across individual ECE workforce registries.

Entering and Verifying Training Data

Another key question that I did not address through the study reported on here is to what extent registry data accurately reflect the training completed by any individual. More specifically, even if all eligible individuals within a target population are enrolled, does their respective registry data reflect all of the training the database was designed to record, or only some of it? For example, in Douglass, Carter, Smith, and Killins' (2015) study of the extent to which ECE staff train together, the research team had to merge the state's workforce registry identification numbers with professional development attendance data because the training of interest was not consistently reported in the registry. Data completeness has been a challenge in using child welfare administrative data to help inform program development and policy decisions, as well (Permanency Innovations Initiative Evaluation Team, 2016).

To determine if this is potentially an issue in other ECE workforce registries, it would be helpful for future research to survey registry administrators regarding who is responsible for adding new training-related data into an individual's registry record (e.g., enrollee vs. trainer), by what means (if any) new information is verified, and whether adding the information is optional versus mandatory. Having such information will shed further light on which registry data sets are likely to provide useful information to address specific child care workforce training questions.

Access to Aggregate Early Care and Education Workforce Registry Data

When combined with the results of this current study, future research on these topics has the potential to help a wide array of ECE stakeholders determine which aggregate registry data sets might inform a training-related question of interest. However, another important issue to be researched is whether it is possible for a stakeholder to gain access to any relevant registry's aggregate data. This also is a two-pronged issue.

First, a key issue is the capacity of both the software platform a registry uses and its data analysis staff to generate deidentified, aggregate data related to a defined set of variables (Friese, Tout, & Kirby, 2014; Kreader & Schneider, 2011; Weber & Iruka, 2014). Again, to the best of my knowledge, no published research is available that examines this capacity across ECE workforce registries. This study's review of ECE workforce registry Web sites showed that registries are administered by a range of entities, including 2- and 4-year colleges and universities, child care resource and referral agencies, nonprofit organizations, and state departments, so such an inquiry is particularly relevant.

Second, a review of each registry's Web site demonstrated that none of these data sets is in the public domain. This is not surprising given their main purpose, which is to record and maintain the confidentiality of information about individuals, including their names, addresses, where they are/have been employed, and how much they earn. In fact, the inclusion of such personally identifiable information is precisely why some researchers and other stakeholders might seek access to aggregate data.

However, given the range of entities administering and governing these registries, a related question to be explored via future research is the extent to which registry administrators are permitted to share aggregate data sets and, if so, the

process researchers and other stakeholders need to undergo to request such access (Hotz, Goerge, Balzekas, & Margolin, 1998; The Early Childhood Data Collaborative, 2014). For example, does a researcher merely ask for the dataset via an e-mail request, or is a formal Freedom of Information Act request required? What other departments or agencies, if any, must also provide approval prior to releasing aggregate data? In short, knowing that an aggregate data set has the potential to inform research related to ECE workforce training is of little use if the data ultimately are not available.

Summary

Given the ongoing policy attention paid to improving child care quality and the capacity of the child care workforce, ECE workforce registries play an important role in documenting the training completed by individuals who play a key role in supporting the learning and development of our nation's young children. This study suggests that registry data also have the potential to shed light on the focus of the training completed by the workforce both within and across jurisdictions and, in so doing, inform a wide variety of ECE stakeholders. To build on this study, additional research should focus on the extent to which registries enroll all eligible members of the child care workforce and on the comparability of the training related to any focus variable, the policies on and processes for entering and verifying training data, and the capacity of registries to produce and share aggregate data with researchers and other ECE stakeholders.

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Notes

1 Teacher is defined here as the adult who is primarily responsible for the care and/or education of the children in a specific classroom and counted in that classroom's staff-child ratio.
2 https://childcareta.acf.hhs.gov/data#tab-pds-state-profiles
3 The three nonresponding ECE workforce registries were those in Connecticut, Louisiana, and Vermont.

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