Leveraging Federal, State, and Facility-Level Early Care and Education Systems and Providers Toward Optimal Child Nutrition in the First 1000 Days

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Early childhood is a critical period in the development, growth, and health of children. Many infants and toddlers in the United States spend time in nonparental early care and education (ECE) arrangements, which include care from child-care centers, family child-care homes, family members, and neighbors, or a combination of these providers. As of 2019, 14% of infants (0–12 months of age) and 27% of toddlers (1–2 years) participated in a center-based care arrangement; however, these statistics do not account for children cared for in family child-care homes, which are also an important source of care for this age group.[1]

Children spend much of their time in the care of ECE providers, with infants and toddlers who attend ECE centers spending an average of 32 hours per week there,[2] and it is recommended that children who attend an ECE program full time consume at least one half to two thirds of their daily calories at the program.[3] ECE settings are therefore critical nutrition contexts to consider when helping children establish lifelong healthy dietary behaviors.

Several scientific and expert consensus guidelines have helped advance our collective understanding of best practices when it comes to what and how to feed young children, including the *Dietary Guidelines for Americans*,[4] the Healthy Eating Research feeding guidelines for infants and toddlers,[5] and the Healthy Eating Research healthy beverage recommendations for young children.[6] Also, *Caring for Our Children (CFOC)*, created by the National Resource Center for Health and Safety in Child Care and Early Education, outlines standards for a multitude of topics in ECE settings including breastfeeding and nutrition.[7] Together, these guidelines help parents and caregivers understand important nutrition topics such as maintaining breastfeeding, providing opportunities for children to consume a diverse array of nutrient-dense foods, and engaging in feeding practices that allow children to communicate their hunger and fullness cues.

The ECE system in the United States is complex, layered, and decentralized, with providers connected to information and resources through sometimes overlapping federal, state, and local programs.[8] These can include federal and state programs and polices such as ECE subsidies, state licensing regulations, state quality improvement programs, and accrediting organizations. Over the past decade, with support from federal and state agencies, nongovernmental partners, and the research community, efforts have been undertaken and progress has been made to incorporate standards that support early child nutrition and feeding (ECNF) into national and state systems[9,10] and to support ECE providers in the use of best-practice ECNF guidelines. However, opportunities exist to strengthen these efforts.

This work takes place within the dynamic nature of the ECE sector. For example, permanent closures of ECE programs before the COVID-19 pandemic, with 97 000 licensed US family

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child-care homes closing between 2005 and 2017,[11] and temporary and permanent closures during the pandemic may have disproportionally affected the country's most vulnerable families and children.[12] ECE programs can provide strong nutritional environments for children; however, not all families who want ECE care can access it, and thus improving access to quality ECE care also merits attention and consideration. Finally, the pandemic brought to light many issues within the ECE system, and as such there has been renewed attention to supporting and strengthening this important setting.

Our objective here is to document strategies at the federal, state, and local levels to support ECE providers' use of ECNF best practices (Box 1). We also aim to highlight opportunities to monitor and study existing programs and policies as a means of better leveraging investments in and possibilities to codesign research and programs with ECE providers to further advance children's optimal nutrition during the first two years of life.

FEDERAL-LEVEL PROGRAMS AND POLICIES

Many federal agencies support early childhood efforts, including the Administration for Children and Families through important programs such as the Child Care and Development Fund (CCDF)[14] and the Head Start and Early Head Start programs. The CCDF is the primary federal program providing subsidies to help low-income families afford child care, supporting child development and contributing to family well-being. These federal programs are large; for example, the CCDF serves approximately 1.3 million children. However, this is about 15% of those who are eligible under federal law.[15]

Head Start and Early Head Start, which promote school readiness among children 5 years or younger from low-income families, served 1 047 000 children in that age group and pregnant women in 2018–2019, with approximately 25% of these children 0 to 2 years old.[16] On the basis of their funded enrollment, Head Start programs have the capacity to serve about 10% of infants and toddlers from families below the federal poverty threshold.[17]

BOX 1— Examples of Federal, State, and Program-Level Actions Supporting Early Childhood Nutrition and Feeding in ECE Settings and Opportunities to Strengthen Efforts

Level	Type of Action	Examples	Areas of Opportunity
Federal	Programmatic	■ CACFP ■ CDC investments within the Spectrum of Opportunities for Obesity Prevention in ECE ■ ACF investments such as the Child Care Development Fund and the Head Start Program	■ Understand reasons providers do not participate in federal programs such as CACFP and ways to address barriers to participating, which can be used to inform interventions to improve participation ■ Create surveys and surveillance systems to better understand ECNF in ECE programs
	Standards/policies	■ CACFP meal pattern requirements ■ Caring for Our Children	■ Improve understanding of uptake of federal and national guidelines, co-designed with providers and aggregated at the state level
State	Programmatic	■ TA networks ■ Statewide Go NAPSACC	■ Train TA networks on ENCF and study models of diffusion ■ Assess uptake of Go NAPSACC in different types of ECE settings and assess needs
	Standards/policies	■ State licensing regulations ■ QRIS standards ■ PD hours around early childhood nutrition (required or optional)	■ Continue to monitor and encourage uptake of ECNF practices in state licensing ■ Develop ongoing QRIS monitoring plans ■ Understand use of PD, how PD affects practices, and whether there are unmet PD needs
ECE program	Programmatic	■ Breastfeeding recognition programs ■ Use of evidence-based interventions such as Go NAPSACC ■ Support for ECE provider knowledge of ECNF best practices	■ Assess ongoing and new ECNF recognition programs ■ Monitor and assess whether there is equitable use of Go NAPSACC according to ECE capacity, urbanicity, and other factors ■ Co-design interventions to support ECE providers' knowledge and use of ECNF guidelines
	Policy	■ Written ECE program policies that support breastfeeding and infant feeding ■ ECNF professional development and training for staff (required or optional)	■ Study interventions or TA models that assist ECE programs in improving written policies and ECNF environments ■ Provide training/PD for staff

Note. ACF = Administration for Children and Families; CACFP = Child and Adult Care Food Program; CDC = Centers for Disease Control and Prevention; ECE = early care and education; ECNF = early childhood nutrition and feeding; Go NAPSACC = Nutrition and Physical Activity Self-Assessment for Child Care; PD = professional development; QRIS = quality rating and improvement system; TA = technical assistance. For more examples, see CDC's Spectrum of Opportunities.[23]

Although these programs are vital to low-income families, our subsequent emphasis is on two other federal agencies—the US Department of Agriculture (USDA) and the Centers for Disease Control and Prevention (CDC)—because these agencies are most focused on nutrition and health in children.

US Department of Agriculture

The Child and Adult Care Food Program (CACFP) is a federal nutrition program that reimburses nutritious meals and snacks for 4.2 million children in ECE programs each day.[18] Participation in the CACFP among ECE programs has been associated with provision of more nutritious meals for children.[19,20] In 2017, CACFP meal pattern requirements were updated to include serving more fruits and vegetables, fewer solid fats and added sugars, and more whole grains, further improving the quality of what children were being served. The update also included resources to support implementation as well as several "optional best practices" to further promote ECNF (e.g., practices to support breastfeeding such as providing a quiet, private area at the ECE facility for parents to breastfeed).[21]

Despite the numerous positive effects of CACFP participation on ECE programs and participating children,[20,22] evidence suggests that the CACFP is underused and that ECE providers find the administrative burden of participation to be high.[23] A better understanding of why providers do not participate in the CACFP and ways to address administrative barriers to involvement could be used to inform interventions to improve participation.

Centers for Disease Control and Prevention

The CDC's Spectrum of Opportunities Framework for Obesity Prevention in ECE (CDC Spectrum) helps state agencies and their ECE partners consider nine policy and system levers to improve the nutrition, physical activity, and breastfeeding environments in ECE facilities.[13] The CDC is currently providing funding and technical assistance to 32 states to use CDC Spectrum as a blueprint to advance their work.

STATE-LEVEL PROGRAMS AND POLICIES

Examples of CDC Spectrum state policy levers are advancing state ECE licensing regulations and improving quality rating and improvement systems (QRISs) by including nutrition, physical activity, breastfeeding support, and screen time limits in state licensing or standards.

State Licensing Regulations

States adopt regulations that delineate the requirements licensed ECE providers must follow to legally operate, making licensing an important policy lever for influencing the health of millions of young children attending licensed ECE programs. States can prioritize the health of infants and toddlers attending ECE programs by adopting infant feeding and nutrition regulations that fully align with current *CFOC* standards and guidance.[10] From 2010 to 2018, 39 states adopted regulations affecting infant feeding, nutrition, physical activity, or screen time limits (https://nrckids.org/HealthyWeight).

A 2010 to 2018 national study assessing center-based licensing regulations showed that feeding best practices aligned with national *CFOC* infant feeding and nutrition standards had high uptake among states, meaning that numerous states had adopted these standards into their licensing regulations.[10] For example, in 2010, only two states had adopted regulations requiring age-appropriate introduction to solid foods, but, by 2018, 30 states included this best practice in their center-based licensing regulations. Also, prohibiting provision of fruit juice to children younger than 12 months was not included in any state's regulations in 2010, but 29 states had fully included the restriction in their licensing regulations by 2018.

Federal nutrition standards and meal pattern requirements, such as those contained in the CACFP, can be used by states to improve nutritional quality for not only children from lower-income households but all children enrolled in licensed ECE programs.[24] States can set more comprehensive dietary standards by adopting licensing regulations that require providers to follow current CACFP standards and guidance regardless of program participation. As of 2018, 23 states required all licensed ECE providers to adhere to CACFP guidance, irrespective of program participation or reimbursement.[10] Because CACFP meal pattern standards undergo scientific review and revision, they represent a gold standard by which states can set minimum requirements for licensed child-care providers.[10,25]

State Quality Rating and Improvement Systems

Layering ECNF best practices into QRIS systems is a lever for states to support early child nutrition.[13] QRISs systematically assess, improve, and communicate

the level of quality of ECE programs. In 2015, 38 states operated statewide QRISs, and 27 of these systems included obesity prevention standards.[26] Of the 11 infant feeding best practices contained in the *CFOC*, only one related to encouraging and supporting breastfeeding onsite was included in multiple state QRIS systems; however, it is important to note that QRIS standards in states may have changed since 2015.

State Monitoring

CDC's investments using the Spectrum as a blueprint to support state system change levers are described in the ECE State Indicator Report.[9] This 2016 compilation report gathered data from a variety of sources because no single state-level monitoring system fully captures this type of progress. Monitoring systems for state-level ECNF policies and systems to monitor individual ECE facilities and practices with respect to ECNF would help both federal and state agencies understand where investments are needed. CDC's Childcare Survey of Activity and Wellness was piloted in four states in 2021 to show the feasibility of implementing state surveys assessing the practices of individual ECE facilities. That survey augmented data collected nationally among CACFP-participating centers through the USDA's 2016–2017 Study of Nutrition and Activity in Child Care Settings. The UDSA plans to repeat the survey in 2022–2023.

ADDITIONAL PROGRAM SUPPORT OPPORTUNITIES

ECE providers are trusted caregivers and can be a source of information for parents. In addition to policy levers at the federal and state levels, additional support for providers could help enhance their understanding of implementation best practices related to breastfeeding and ECNF.[8] However, this should be done carefully in collaboration with providers and without placing an undue burden on them.

Dissemination Tools

One way providers can learn about these practices is through tools developed as part of dissemination of guidelines. For example, the Healthy Eating Research infant and toddler feeding guidelines are among the few sets of guidelines that highlight ECE as a key setting for advancing responsive feeding and ECNF. They also provide user-friendly resources including handouts and videos on key topics such as responsive feeding for infants and young children. However, it is unknown how much uptake there has been of these guidelines and resources by ECE providers and whether there are additional provider needs. Also, resources and guidelines are available for ECE providers who participate in the CACFP, but, as noted, not all providers participate in this program.

Professional Development

Professional development is an opportunity for ECE providers to learn about ECNF best practices and advance their knowledge and skills on the topic. Health systems, national organizations (e.g., Penn State Better Kid Care), and states themselves have created online modules on breastfeeding, nutrition, and responsive feeding. Although these modules address logistical barriers providers face, including lack of time to attend in-person training, few data exist on the effects of this training on practice or whether there are additional training or resource needs.

Recognition Programs

Recognition programs are another way to advance the training and knowledge of ECE providers regarding key ECNF issues. States use branded recognition programs to officially recognize ECE facilities that meet a set of predetermined criteria in particular topic areas, and staff training can be included as part of the recognition requirements. A recent peer-reviewed publication showed that 15 states had programs designated as breastfeeding friendly, largely because of the efforts of state health departments and other breastfeeding stakeholders.[27] These types of initiatives can increase ECE providers' confidence in their breastfeeding knowledge, attitudes, and practices. Support for such programs at the state and local levels and efforts to include both high- and low-resource ECE programs can help address disparities.

Use of Evidence-Based Interventions

The polices of individual ECE programs play an important role in shaping providers' day-to-day practices and create environments that are either supportive or unsupportive of breastfeeding and ECNF. One evidence-based intervention for facilities, the online Go NAPSACC program (Nutrition and Physical Activity Self-Assessment for Child Care), is cost effective,[28] is publicly available, and has been shown to improve childhood obesity.[29] Go NAPSACC aims to improve the nutrition and physical activity environments and policies of ECE facilities and includes a module specific to breastfeeding and infant feeding. The intervention is currently licensed for use in 22 states and has been used by more than 6270 ECE

programs. Also, many states have embedded Go NAPSACC into state systems such as QRISs, recognition programs, and professional development systems. Challenges related to the intervention remain, however, including cost (approximately $30 000 for a statewide license) and the need for trained and certified technical assistance providers to help ECE programs reach intended outcomes.

Interventions to improve nutrition can be resource intensive and can be overwhelming for already-overburdened ECE programs with many competing needs. Programs may need additional support to maximize ECNF improvements and ensure that implementation of interventions does not exacerbate disparities between high- and low-resource facilities.

As noted, ECE providers are essential and trusted people in infants' and toddlers' lives. However, efforts could be strengthened to ensure that providers can gain the skills needed to support and advance ECNF in the first two years of life.

IMPLEMENTATION SCIENCE RESEARCH GAPS AND OPPORTUNITIES

Despite a growing evidence base on behavioral and health outcomes of parent-based feeding interventions,[30] research on infant and toddler interventions in ECE settings, including implementation research on what works to support ECE providers in implementing ECNF practices, is limited.[31] Participatory co-design of research efforts (e.g., collaboratively identifying components of effective ECE interventions and policies) can help researchers understand the acceptability of their interventions for busy ECE providers.

Researchers can also consider contextual factors and organizational capacities of ECE programs and explore greater tailoring of interventions to the identities of providers and the children and families they serve. For example, factors such as cultural food preferences, child-rearing traditions, race/ethnicity, and socioeconomic status may affect intervention acceptability and implementation. Finally, developing ECNF interventions and programs in collaboration with businesses (ECE programs) and workers (providers) can help ensure that intervention components are part of daily work routines and are not overly burdensome or costly to programs or providers, potentially improving fidelity and uptake by providers.

CONCLUSION

Research demonstrates the health and social benefits of high-quality ECE in the United States.[32] We have outlined the interconnected layers of federal, state, and ECE program-level policies and highlighted a framework developed by the CDC outlining policy levers and ways to support ECE providers in advancing ECNF. With increased attention to the importance of ECE, additional federal investments during the COVID-19 pandemic (approximately $2 billion for Head Start[33] and $38 billion to the CCDF[34]), and concerted efforts to stabilize and elevate ECE programs, it is an opportune time to leverage investments, programs, and policies to further advance child health and optimal nutrition in ECE settings during the first years of life. AJPH

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

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