

## Early Intervention Services

### Evidence Review Findings: Effective / Roadmap Strategy

Participation in Early Intervention services can improve children’s cognitive, motor, behavioral, and language development, especially for infants born preterm or low birthweight, for whom the most rigorous research exists. Relatively little causal evidence exists to support impacts on parent outcomes, but the research suggests mixed effects that lean positive. The evidence base for Early Intervention focuses on the benefits that services can produce for infants and toddlers, rather than examining the impacts of a state-level policy.

Early Intervention services support the healthy development of infants and toddlers with developmental delays, diagnosed medical disabilities, or who are at risk for delays. Early Intervention programs are implemented at the state level but are partially funded by Part C of the federal Individuals with Disabilities Education Act (IDEA). Access to Early Intervention services, such as speech therapy for a child with language delays or physical therapy for a child with motor challenges, can improve the developmental trajectories of infants and toddlers. Services can prevent further delays, the need for special education services, or more intensive supports when children are older. Family-centered services can help parents and caregivers develop skills to interact with their infant or toddler in ways that will best support their development. State programs vary considerably in their eligibility criteria, the administrative agency managing Early Intervention, the funding mechanisms, and in the percentage of children under age 3 who are served. The federal IDEA legislation requires that all children determined to be eligible for EI receive evidence-based services, but states continue to struggle to identify and serve all of the children who are likely to benefit from services. Research does not currently offer clear guidance regarding the optimal funding mechanism or state policy lever for reaching all children who can benefit from services, but the evidence *does* support Early Intervention as an effective strategy to improve child development and parent wellbeing. Decades of research in the field of child development have made clear the conditions necessary for young children and their families to thrive.<sup>1</sup> These conditions are represented by our eight policy goals, shown in Table 1. The goals positively impacted by Early Intervention services are indicated below.

Table 1: Impacts of Early Intervention Services on Policy Goals

Positive Impact	Policy Goal	Overall Findings
	Access to Needed Services	No strong causal studies identified for this goal
	Parents' Ability to Work	No strong causal studies identified for this goal
	Sufficient Household Resources	No strong causal studies identified for this goal
	Healthy and Equitable Births	No strong causal studies identified for this goal
●	Parental Health and Emotional Wellbeing	Mixed impacts on parental mental health, with positive findings for self-confidence and role satisfaction
	Nurturing and Responsive Child-Parent Relationships	No strong causal studies identified for this goal
	Nurturing and Responsive Child Care in Safe Settings	No strong causal studies identified for this goal
●	Optimal Child Health and Development	Positive impacts on cognitive, language, behavioral, and motor skills

## What Are Early Intervention Services?

Early Intervention (EI) is a federal grant program authorized by Part C of the Individuals with Disabilities Education Act (IDEA) that provides funds to states to coordinate services for infants and toddlers (birth to age 3) with disabilities or developmental delays, regardless of family income.<sup>68</sup> IDEA requires that services funded by Part C be evidence-based.<sup>46</sup> The federal IDEA law was first enacted in 1975, and its reauthorization in 1986 included the creation of a program (then Part H, which became Part C in 1997) focused on services for children under age 3.<sup>2</sup> IDEA programs are overseen by the Office of Special Education Programs (OSEP) within the US Department of Education. Early Intervention services are intended to support the development of infants and toddlers with a variety of delays and disabilities, not just the most severe impairments. For example, 38 states<sup>i</sup> serve children with hearing impairments, 32 states serve children with Down syndrome, 25 states serve children with autism spectrum disorders, 20 states serve children with attachment disorders, and 21 states serve children born preterm.<sup>43</sup>

The Early Intervention program aims to provide support to families caring for young children with special needs, reduce the need for special education services in grade school, and help children with disabilities to develop independent living skills in the long term.<sup>3</sup> The four key principles that should drive quality EI programs, according to the federal law, are 1) service coordination, 2) child development, 3) family-centered care, and 4) inclusion.<sup>4</sup> The only service that the federal government requires that participating states provide, however, is service coordination.<sup>5</sup> State leaders sometimes describe the federal EI funding as “glue money” because it is meant to support the integration of existing state programs and supplement, not supplant, state funds for these programs.<sup>6</sup>

States are not required to participate in the Part C grant program, but by 1994, all states and eligible territories had opted in,<sup>7</sup> and states have established their own EI programs with a variety of names (“Early Start,” “First Connections,” “Birth to Three,” etc.). States accepting federal funds must guarantee that every eligible child and family will be able to access services. To reach this goal, state administrative agencies are required to conduct public awareness and outreach activities, formally known as “Child Find” in the legislation, to inform parents about Part C and to identify and refer children for an eligibility screening if parents have concerns about their child’s development.<sup>8</sup> Children can be referred by a doctor or other professional, or parents can contact their state EI program themselves to request an evaluation.

States are charged with developing eligibility rules and ensuring that children who have a developmental delay or who may be at risk for developing a delay are evaluated for Part C eligibility in a timely manner.<sup>9</sup> The federal legislation enumerates cognitive, physical, communicative, social, and adaptive developmental delays as the five key developmental domains, but states have wide discretion to establish eligibility rules, as is discussed further in the state variation section of this summary and shown in Table 3 at the end of this review.<sup>10</sup> A variety of developmental screening tools can be used to determine a child’s eligibility for EI services; some of the most common include the Ages and Stages Questionnaire, 3<sup>rd</sup> Edition and Social-Emotional (ASQ), the Battelle Developmental Inventory (2<sup>nd</sup> Edition), and the Bayley Scales of Infant and Toddler Development (3<sup>rd</sup> Edition), among many others.<sup>60</sup>

Children deemed eligible must receive an Individualized Family Service Plan (IFSP) within 45 days of the referral date documenting their current functioning level, the services they will receive and from whom, and the child and family goals to be reached. At age 3, a child may transition into Part B special education services (for ages 3 through 21) or may exit services altogether, depending on the child’s developmental progress. States may also choose to provide extended Part C services until a child reaches kindergarten.<sup>11</sup>

### Who Is Affected by Early Intervention Services?

According to the US Department of Education, Part C served 409,315 children (and their families) ages 0 to 3 in 2018.<sup>52</sup> This number represents approximately 3.5 percent of the US and territories population under age 3 (which was estimated to be 11.8 million in 2018).<sup>53</sup> However, nationally representative surveys suggest that 13 to 20 percent of children under age 3 may have delays and disabilities that could improve with EI services.<sup>7</sup>

<sup>i</sup> State counts include the District of Columbia.

Data suggest that the average child in EI is referred at approximately 13 months old and begins receiving services at 16 months old.<sup>13</sup> The most recent federal data indicate that almost 90 percent of children receive Part C services in their homes, with the remaining children receiving supports in community-based organizations or other settings.<sup>12</sup> The federal law requires that children be served in the most “natural environments” possible, which means that children are served in care settings that would be typical of a same-age infant or toddler who did not have a disability.<sup>9</sup> Data on children served per eligibility category vary by source, but the widely cited National Early Intervention Longitudinal Study (NEILS), funded by the US Department of Education and completed in 2007, reported that 64 percent of children served were eligible because of a developmental delay, 20 percent qualified because of a diagnosed condition, and 16 percent were eligible because they were determined to be at risk of developing a delay.<sup>14</sup> For children who entered EI services between ages 24 and 36 months, 75 percent were eligible because of a communication delay; sometimes, speech or language delays are the first indications of more severe impairments, and it is important to identify them as early as possible.<sup>58</sup> In addition, the study found that almost 30 percent of the EI participants were at or below the federal poverty level. For comparison, the poverty rate for all US children at the time of the survey was 18 percent.<sup>51</sup>

Children involved in the child welfare system have been found to be at increased risk for developmental delays given the effects of physical and psychological maltreatment, but data suggest that rates of EI service receipt remain low among this population relative to their need.<sup>15</sup> A 2008 study using nationally representative data on children ages 0 to 3 who were involved in child welfare investigations estimated that over 35 percent had delays or risk factors that would make them eligible for Part C services, but only 12.7 percent of those in need were receiving services.<sup>15</sup>

### *What Are the Funding Options for Early Intervention Services?*

Part C federal funds are not intended to be used for services themselves, but rather to assist states in coordinating a system of care that aligns and more seamlessly connects existing state services and supports for children with delays and disabilities.<sup>68</sup> In a 2017 survey of state EI leaders by the IDEA Infant & Toddler Coordinators Association, states reported that 36 percent of Part C funding came from federal sources, with 52 percent coming from state sources and 12 percent from local revenue.<sup>16</sup> However, the funding composition varies by state, with 85 percent comprised of state funds in Hawaii, for example.<sup>17</sup> According to the Congressional Research Service, federal funds for Part C amounted to \$470 million in Federal Fiscal Year (FFY) 2019, which is just under 4 percent of the \$13.4 billion in IDEA funding authorized that year (most of the funding is directed toward Part B).<sup>68</sup> The portion awarded to each state is based on the number of children under age 3 in a state as compared to other states. According to the Early Childhood Technical Assistance Center (ECTAC) and the First Five Years Fund, annual federal Part C funding per child has diminished in recent years.<sup>18,59,61</sup> The ECTAC data revealed a peak of \$1,979 per child served in FFY 1999, declining to \$1,209 per child served in FFY 2018 and to \$1,143 in FFY 2020.<sup>59,61</sup> Meanwhile, the number served has trended upwards, from 275,000 children in 2004 to over 409,000 in 2018, suggesting a shift toward fewer federal resources available for each child.<sup>19,52,68</sup> It is important to note that states vary widely in the federal funds they receive per child served; for example, in FFY 2020, per-child federal Part C appropriations (using the most recent child count data, from 2018) ranged from \$381.69 in Massachusetts (which served 21,558 children) to \$4,499.61 in Arkansas (which served just 964 children).<sup>61</sup>

To supplement the federal grants and fund the services themselves, states use a variety of funding streams, including Medicaid, private insurance, and parent fees for services, often on a sliding scale.<sup>19</sup> The reported total state and local contribution has increased over time as the federal per-child amount has declined.<sup>16,55,56</sup> Recent surveys of state leaders have found that many states have responded to growing need and insufficient funding by narrowing eligibility, implementing new family fees, instituting hiring freezes, reducing provider reimbursement, and implementing other measures that may negatively impact Early Intervention participation and service quality.<sup>19,20</sup> In 2003, for example, Connecticut saved over \$600,000 by eliminating low birthweight as an eligible medical condition for Part C, but this decision was controversial given the established links between low birthweight and risk for developmental delays.<sup>21</sup> The state has since re-instated this condition for infants born weighing less than 1,000 grams.<sup>22,23</sup>

## Why Should Early Intervention Services Be Expected to Impact the Prenatal-to-3 Period?

The rationale for Part C Early Intervention programs is based on the best available brain science regarding the importance of development in the earliest years,<sup>57</sup> which finds that infants and toddlers with developmental delays or disabilities, and their families and caregivers, may benefit from support services that address their unique needs and challenges as early as possible.<sup>54</sup> Early Intervention services may involve individual or group-based therapy services for children, as well as parent support groups that address the challenges involved in raising a child with a disability, and may help parents interact with children in a way that is developmentally appropriate.<sup>C</sup> Child-focused services may increase a child's rate of growth and development, potentially reducing or eliminating further delays and preventing the need for intensive special education services at later ages. Parent services may strengthen a parent's ability and confidence to provide developmentally appropriate care for the child and reduce stress, improving the parent-child relationship and ultimately boosting children's outcomes in a range of domains, from physical health to social-emotional skills and cognitive abilities.<sup>B</sup>

Research supports the theory that services that involve parents may produce better outcomes for children than services that only involve the child.<sup>A,F</sup> Without needed services, a child risks further decline or delay in development, especially if caregivers do not know how to facilitate the stimulating interactions and relationships infants and toddlers need for optimal development.<sup>G</sup> The most common services provided through Early Intervention include speech therapy, physical therapy, occupational therapy, and behavioral therapy provided through developmental specialists.<sup>14</sup>

## What Impact Do Early Intervention Services Have, and for Whom?

Numerous studies describe the features of state EI programs, such as the characteristics of children and families referred, evaluated, and enrolled, and the kinds of services received,<sup>24,26</sup> but very few examine outcomes using rigorous methodology sufficient for attributing causal impact to EI services. The vast majority of outcomes studies do not have a control or comparison group to measure against the group receiving Early Intervention services, relying instead on a single group's pre-intervention and post-intervention data, and many use parent self-reports through surveys to understand child and family outcomes, rather than using direct assessments of children's progress by trained observers.<sup>14</sup> As one researcher put it, a major "challenge to assessing impact of EI services on child outcomes is the mandate that services be available to all children who meet eligibility requirements. Conventional experimental approaches are, therefore, unobtainable and unethical" (pp. 74–75).<sup>27</sup> The studies that do employ treatment and control groups tend to examine specific programs unique to a particular community and often have small sample sizes, limiting generalizability.<sup>28,29</sup> Another EI researcher has cited "a critical gap in the literature linking [EI] service use and functional outcomes" (p. 2),<sup>30</sup> and still others have acknowledged "intense professional debate surrounding claims of the effectiveness of early intervention" (p. 320).<sup>G</sup>

Despite these limitations in the research, some consistent evidence has emerged from studies of EI programs, particularly those focused on children born low birthweight,<sup>C,D,H,I,J</sup> demonstrating that participation in services can boost children's developmental trajectories. However, more rigorous studies, with comparison groups when possible and larger sample sizes, would be valuable to broaden the evidence base and determine the impact of Early Intervention on more diverse groups of infants and toddlers.

The research on EI does not focus on the impact of a specific state policy lever on child and family outcomes, although some correlational studies have examined whether state eligibility thresholds impact participation in EI, given that eligibility is one of the aspects of the program that states independently determine. The research and most recent available data on the effect of broader or narrower eligibility thresholds find mixed results.<sup>42,47,48,49,50</sup> Despite positive correlations found in most studies, the research does not support a causal link between broader eligibility and greater participation or better child outcomes at the state level.

The research discussed here meets our standards of evidence for being methodologically strong and allowing for causal inference, unless otherwise noted. Each strong causal study reviewed has been assigned a letter, and a complete list of causal studies can be found at the end of this review, along with more details about our standards of evidence and review method. The findings from each strong causal study reviewed align with one of our eight policy goals from Table 1. The

Evidence of Effectiveness table below displays the findings associated with Early Intervention (beneficial, null,<sup>ii</sup> or detrimental) for each of the strong studies (A through H<sup>iii</sup>) in the causal studies reference list, as well as our conclusions about the overall impact on each studied policy goal. The assessment of the overall impact for each studied policy goal weighs the timing of publication and relative strength of each study, as well as the size and direction of all measured indicators.

Table 2: Evidence of Effectiveness for Early Intervention Services by Policy Goal

Policy Goal	Indicator	Beneficial Impacts	Null Impacts	Detrimental Impacts	Overall Impact on Goal
Parental Health and Emotional Wellbeing	Maternal Self-Confidence	D, H			Mixed
	Maternal Role Satisfaction	D			
	Maternal Anxiety		D		
	Caregiver Stress		E		
Optimal Child Health and Development	Cognitive Assessment Scores	A, B, C, D, F, G, H			Positive
	Motor Skills	F	A		
	Behavior Assessment Scores	C			
	Maternal Report of Infant Temperament	D			
	Receptive Language Skills	E			
	Expressive Language Skills		E		
	Language Skills	F			

### Parental Health and Emotional Wellbeing

Although many studies examine family and caregiver outcomes after participation in Early Intervention services for their infants and toddlers, most studies suffer from methodological weaknesses that preclude causal conclusions. For example, many studies draw on surveys that lack a control group, rely solely on parent self-report, have a small sample size, and/or may be vulnerable to self-selection bias.<sup>31,44</sup> However, three strong studies measured some indicators of parent wellbeing.<sup>D,E,H</sup>

A 1988 experimental study examined the long-term results of an 11-session Early Intervention program that sought to offer mothers support as they adjusted to parenting a low birthweight infant over the first 3 months of life.<sup>D</sup> Mothers who had received the treatment scored significantly higher on scales of maternal self-confidence when the child was 4 years old (a difference of 1.3 points in the mean score) and on maternal role satisfaction at age 6 months (a difference of 3.1 points in the mean score).<sup>iv</sup> The study found no significant differences in maternal anxiety. A 2009 randomized study of 138 Black mothers and their low birthweight, premature infants found that after an 8-session, 20-week Early Intervention program, mothers in the treatment group had significantly higher self-efficacy scores (the mean score was 1.2 points higher on the 40-point Maternal Self-Efficacy scale).<sup>H</sup>

<sup>ii</sup> An impact is considered statistically significant if  $p < 0.05$ .

<sup>iii</sup> Studies I and J are longer-term analyses for Study C and are not included in Table 2.

<sup>iv</sup> Maternal self-confidence was measured using the Seashore Self-Confidence Rating Paired Comparison Questionnaire, in which a total score is measured by counting the “number of items on which the mother rates herself at least as competent as...five other potential caretakers (spouse, own mother, another experienced mother, a pediatric nurse, and a physician)” (p. 548).<sup>D</sup> Maternal role satisfaction was measured using a semistructured interview when the infant was 6 months old, and two independent raters used 4-point Likert scales to score the interviews on 10 questions.<sup>D</sup>

A 2015 study focused on caregiver-implemented interventions for children with language delays, and although the study found significant impacts on child receptive language (discussed below), there were no significant findings for reducing caregiver stress.<sup>E</sup>

### *Optimal Child Health and Development*

#### **Cognitive, Motor, and Behavioral Outcomes**

Evidence from meta-analyses,<sup>A,F,G</sup> randomized controlled trials,<sup>C,D,E,H</sup> and studies using carefully matched comparison groups<sup>B</sup> suggests that EI services make a positive difference for the cognitive, motor, and behavioral skills of infants and toddlers with disabilities. For example, a 1987 meta-analysis of 31 studies found an average effect size of 0.62 for the cognitive skills of children in Early Intervention services.<sup>F</sup> The authors considered this impact to be a “moderate, positive effect” (p. 652)<sup>F</sup> and they noted some key features of programs that produced the greatest effects: they had more structured curricula, they enrolled children before 6 months old, and they involved parents to a greater degree. For example, services that involved parents and children together produced an average effect size of 0.74, compared to 0.44 for programs that involved either parents or children separately. The effect size for motor skills was somewhat smaller, at 0.43.

A widely cited randomized controlled trial begun in the 1980s, called the Infant Health and Development Program, involved 985 families with infants born low birthweight and premature at eight hospitals across the country.<sup>C</sup> The infants who were assigned to the EI treatment, which involved intensive services throughout the first 3 years of life, saw better cognitive and behavioral outcomes at age 3 (an average of 9 points higher on the Stanford-Binet Intelligence Quotient test, and an effect size of -0.2 on a behavior problems scale) than the control group, and a greater degree of participation in the program was associated with higher scores on the cognitive assessment. A 2006 follow-up to the study found positive long-term impacts at age 18 on those who had participated in the trial compared to the control group, on both academic and risk behavior assessments.<sup>I</sup>

The 1988 randomized controlled trial involving infants born low birthweight, discussed in the parental health section above, found that children who received EI services from a nurse showed significantly higher cognitive scores at 36 and 48 months than similar children who did not receive the intervention (a difference of 9.5 points at 36 months and 12.9 points, or approximately 0.8 standard deviations, at 48 months on the McCarthy Scales of Children’s Abilities).<sup>D</sup> The McCarthy General Cognitive Index, used in this study, has a mean standard score of 100 and a standard deviation of 16 points. The study also found that infants in the experimental group scored better on a scale of infant temperament (the Carey Infant Temperament Questionnaire, in which lower scores reflect more favorable infant temperament) at 6 months old. Low birthweight infants in the EI group scored 1.3 points lower than their counterparts in the control group on the 4-point scale.<sup>D</sup>

Similarly, a 2012 study using propensity score matching to examine the outcomes of preterm and low birthweight infants found that those who received EI services showed significantly better cognitive development trajectories by 24 and 36 months (using the Bayley Scales of Infant Development at 16 months and the Stanford-Binet scales at 24 and 36 months) than those who did not receive services.<sup>B</sup> The study also found that among children who received EI services, those whose mothers reported higher levels of maternal support (an index of emotional, financial, respite, and other supports offered by the mother’s family and social networks) saw greater cognitive outcomes relative to the control group. This finding underscores that children’s developmental trajectories are closely tied to their caregivers’ wellbeing.

The 2009 randomized intervention with 138 Black infants born low birthweight and premature found that the extremely low birthweight infants (less than 1,000 grams) assigned to the Early Intervention group scored 10 points higher on the Bayley Mental Development Index (a scale with a mean of 100 and standard deviation of 15) than those infants assigned to the control group.<sup>H</sup> The study did not find significant effects for infants born weighing more than 1,000 grams.

A 1998 meta-analysis of studies that employed a “randomized, prospective, longitudinal design with appropriate control groups” (p. 321) found effect sizes for cognitive outcomes that ranged from 0.50 to 0.75, depending on the characteristics of the samples examined.<sup>G</sup> Finally, a 2009 meta-analysis of 25 randomized controlled trials that analyzed various Early Intervention programs for preterm infants found significant differences between the cognitive scores of treatment participants as compared to control groups (a weighted mean difference of 9.7 points at 36 months for studies

using the McCarthy and Stanford-Binet scales).<sup>A</sup> However, differences that were measured at 36 months were no longer detected at 5 years.<sup>A</sup>

### Language and Communication Skills

Studies with rigorous methods have also shown positive impacts of EI services on infants' and toddlers' communication skills. In fact, the 1987 meta-analysis discussed above found the greatest effect size for language skills, at 1.17.<sup>F</sup> A 2015 randomized controlled trial examined the effects of a caregiver-led communication intervention on toddlers facing language delays, and the authors found that the treatment produced significant positive effects on receptive, but not expressive, language skills (a 0.27 to 0.35 effect size for receptive language skills, depending on the instrument used).<sup>E</sup>

## Is There Evidence That Early Intervention Services Reduce Disparities?<sup>v</sup>

Evidence suggests that children from lower-income families and communities of color do not have equitable access to EI services and often experience disruptions in the pathway from referral to evaluation and enrollment.<sup>32,34,35</sup> This inequity limits the ability of EI programs to reduce disparities. For example, a December 2019 report on EI in New York City found that communities with higher percentages of Black or Hispanic children had consistently lower rates of completed EI evaluations among children referred.<sup>34</sup> A 2011 study using nationally representative data from the Early Childhood Longitudinal Study found that no racial disparities in service receipt existed at 9 months, but by 24 months, Black children were five to eight times less likely to receive services than White children, depending on the eligibility category.<sup>35</sup> Finally, a 2008 study of low birthweight infants in Massachusetts found that referral rates to EI were significantly lower for infants of Black non-Hispanic mothers than all other racial groups, holding other factors constant.<sup>36</sup>

Funding shortages in recent years have affected children's access to EI services,<sup>19,21</sup> and one of the most notable impacts is the widening of racial and socioeconomic disparities in access to the program. For example, when funding for Texas' EI program was cut in 2011 and eligibility was narrowed, enrollment dropped 17 percent across the state, with disproportionate impacts on children of color – enrollment among Black children, Hispanic children, and children of other races “plummeted 44 percent, 24 percent, and 32 percent respectively, from 2011 to 2016” (p. 9), whereas enrollment for White children dropped just 5 percent over that period.<sup>37</sup>

In a 2018 survey of state EI leaders, 10 out of 32 respondents noted that they recently implemented family fees as a part of their cost recovery system.<sup>19</sup> In addition, 28 out of the 32 respondents noted provider shortages related to inadequate funding. Research has shown that implementing family fees for EI services may reduce low-income children's participation in the program, even when sliding scales would preclude them from out-of-pocket costs, because they may not be aware of the financial assistance available to them.<sup>21</sup>

## Has the Return on Investment for Early Intervention Services Been Studied?

A recent analysis of six states found that Early Intervention services helped between 760 and 3,000 children per state to avoid special education services at age 3, with a 1-year cost avoidance of between \$7.6 million to \$68.2 million depending on the state.<sup>38</sup> Three-year cost avoidance estimates, which accounted for children re-entering special education services after an initial exit, still projected substantial cost savings. For example, Michigan calculated a potential 3-year savings of \$27.1 million even when 25 percent of children were expected to return to special education services in the second and third years tracked.<sup>38,45</sup> A more comprehensive analysis of the return on investment is forthcoming.

## What Do We Know, and What Do We Not Know?

Evidence from eight strong studies, including three meta-analyses, suggests that Early Intervention services for infants and toddlers with developmental delays or diagnosed medical conditions can improve children's outcomes relative to those who do not receive services, in areas including cognitive development, language/communication skills, behavior, and motor skills.<sup>A,B,C,D,E,F,G,H</sup> Two additional analyses examining follow-up outcomes from one of the studies<sup>C</sup> found that the benefits of Early Intervention can be sustained through ages 8 and 18.<sup>I,J</sup> However, the causal research on outcomes is

<sup>v</sup> Disparities are defined here as differential outcomes by race, ethnicity, or socioeconomic status (SES).

limited, and much of the EI research tends to focus on programs serving very specific populations, such as children with autism or those born low birthweight.<sup>D,28,29</sup> The majority of studies purporting to examine the effectiveness of EI services on broader populations, such as national and state samples of children enrolled in services, do not use comparison or control groups.<sup>14</sup> For example, the EI progress reports that the federal government collects from states illustrate children's developmental progress over time using entry and exit data for key outcomes, but because there is no control group of similar children who did not receive the intervention, data of this kind cannot determine whether (and how much of) children's progress can be causally attributed to the EI program rather than other factors.<sup>39</sup> Conducting randomized controlled trials for Early Intervention is difficult because all children with eligible needs must be served, precluding a true control group in most cases. Because eligible conditions vary across states, however, future research may take advantage of this variation to conduct studies with quasi-experimental designs.

Early Intervention programs must be evidence-based, according to the federal IDEA legislation, but more research is needed to provide evidence for optimal state policy levers, in addition to programmatic components. For example, future research should examine how states can best implement their Child Find and referral processes, how to set eligibility policy to serve all children who can benefit from EI, which state agency should administer the EI program, and how to best allocate state and local funding, including Medicaid dollars, to retain quality EI providers and ensure that financing is not a barrier to service provision.

## Is Early Intervention an Effective Policy for Improving Prenatal-to-3 Outcomes?

As a strategy for improving the developmental trajectories and outcomes of infants and toddlers with delays and disabilities, Early Intervention services, supported by Part C of the federal IDEA law, have been shown in strong studies to be effective. However, state policy levers related to Early Intervention have not been studied sufficiently to reach a conclusion about the most effective state policies to enact related to EI services. Studies regarding state eligibility policy are correlational rather than causal and find mixed results, and the EI evidence base does not offer a clear conclusion regarding other state policies that would be most effective for improving the outcomes of children enrolled in state EI programs.

## How Do Early Intervention Services Vary Across the States?

Early Intervention programs are administered differently in each state, beginning with the agency overseeing the program. A 2018 survey of state leaders found that of the 47 responding states/territories, 19 states housed EI in the Department of Health or Health & Human Services, 10 in the Department of Education, and 18 in "other" agencies, such as the Department of Economic Security or Family Services.<sup>40</sup> One correlational study found that states that housed EI in the Department of Health achieved higher enrollment rates than states with the Education Department as the lead agency, after controlling for a number of factors including eligibility criteria and developmental screening rates.<sup>50</sup> However, more research would be valuable to guide states in this decision and determine whether the choice of lead agency has an impact on children's access and participation.

Each state determines its own eligibility requirements within the federal guidelines, which means that the percentage of children ages 0 to 3 who may qualify for Part C services varies greatly based on state policy. State eligibility policies are sometimes classified as "broad," "moderate," or "narrow," depending on the percentage delay<sup>vi</sup> required (typically 25 percent, 33 percent, and 50 percent, respectively), but specific eligibility criteria vary considerably.<sup>41</sup>

According to one study, states use over 20 unique eligibility formulas for determining the eligible level of developmental delay.<sup>26</sup> A child with the same diagnosed condition or delay may therefore qualify for EI services in one state but not in another. For example, a 2013 study found that states with the narrowest eligibility policies (those requiring a 50 percent or greater delay) may qualify less than 5 percent of children for Part C services, whereas in states with the broadest criteria, over 60 percent of 9-month-olds and 40 percent of 24-month-olds are likely to be eligible for services.<sup>26</sup> The percentage of all children under age 3 served by Part C also varies; in 2018, this proportion ranged from approximately 0.9 percent in Arkansas to 10.1 percent in Massachusetts.<sup>42</sup>

---

<sup>vi</sup>"Percentage delay" refers to the difference between a child's score and the mean score for the child's age on a validated, standardized screening tool.

A 2019 study examining the diagnosed conditions that may qualify a child for EI services in various states found that a total of 620 unique conditions are listed by at least one state, but 90 percent of them are used by fewer than 10 states.<sup>43</sup> The number of conditions that may qualify a child for Part C in a given state ranged from 0 to 167 across the states in this study, and the authors argued that this wide variation in eligibility leads to inequitable access to services based solely on a child's state of residence.<sup>43</sup> States also vary in whether they consistently refer children with low birthweight to EI programs for an evaluation: in Massachusetts, 93 percent of infants with birthweights of below 1,200 grams are referred to EI programs, whereas in South Carolina, just 54 percent of infants below 1,000 grams are referred.<sup>7</sup> Only five states consider at-risk children, such as those born low birthweight or preterm (if not already eligible through the diagnosed conditions list), to be eligible for Part C services with no other qualifying conditions or present delays: California, Massachusetts, New Hampshire, New Mexico, and West Virginia.<sup>42</sup> In addition, states vary in whether they are designated as "birth mandate" states, meaning that they guarantee a Free and Appropriate Public Education (including for children with delays or disabilities) from birth to age 3, and did so as part of state policy even prior to the federal Part C legislation. Only five states have birth mandate status: Maryland, Michigan, Iowa, Nebraska, and Minnesota.<sup>42</sup>

As discussed above, funding mechanisms also vary across states. The 2017 finance survey of state leaders by the IDEA Infant & Toddler Coordinators Association (ITCA) found that on average, states reported using six different funding sources for Part C, ranging from one to 17 sources reported.<sup>16</sup> The ITCA survey also found that 90 percent of Part C funding comes from the following six sources, listed in the order of greatest to least funding contributed: state Part C appropriations, state general funds, Medicaid, federal Part C funds, county taxes, and local education agencies.<sup>16</sup> Less than half of states (24) reported using private insurance, and 18 reported using family fees. The survey presented state information in the aggregate, rather than identifying which states fall into the various categories.<sup>16</sup> Future surveys may allow for the identification of funding mechanisms by state. Ensuring sufficient Part C funding for all children and families in need of services remains a national concern, with the survey asserting that "[t]he financing of Part C systems remains the most critical issue facing all of the states and territories. While all states and jurisdictions remain in Part C, the continued fragility of state funding and reductions or static federal funding call to question the survivability of the Part C system in each state" (p. 4).<sup>16</sup>

State EI funding policies vary in other ways, such as whether a state funds Early Intervention services through the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) component of its Medicaid state plan. EPSDT is Medicaid's child health benefit, guaranteeing preventive screenings and treatment to all individuals under age 21 enrolled in a state Medicaid plan.<sup>62</sup> If a state enumerates specific Early Intervention services covered by Medicaid in its state plan, then it is possible that some of the 17 core Early Intervention services<sup>vii</sup> in the federal legislation may not be covered by state Medicaid dollars.<sup>63</sup> For example, in 2005, only 15 states chose to cover physical therapy, occupational therapy, and speech language therapy (three of the most common EI services) in their Medicaid state plans.<sup>21</sup> However, if a state instead provides Early Intervention services through the EPSDT section of the state Medicaid plan, then all of the 17 core services can be covered by state Medicaid dollars and receive a federal match, per the Omnibus Budget Reconciliation Act (OBRA) of 1989. OBRA required that EPSDT cover "other necessary health, diagnostic, treatment, and other measures needed to ameliorate defects, physical and mental illnesses and conditions discovered by the screening services, whether or not such services are covered under the state Medicaid plan" (p. 2).<sup>64</sup> The Infant & Toddler Coordinators Association has suggested, therefore, that "EPSDT is an ideal portal for states to access reimbursement" for EI services (p. 9).<sup>65</sup> States including Connecticut, Maine, Iowa, Virginia, and Idaho (among others) have taken this route to maximize funding for EI services.<sup>viii,24,32,66,67</sup> More research on whether this avenue supports greater EI service participation or better outcomes among eligible children would be valuable.

---

<sup>vii</sup> The 17 core services enumerated in the federal legislation are the following: assistive technology, audiology, family training/counseling, health services, medical services, nursing, nutrition services, occupational therapy, physical therapy, psychological services, service coordination, sign language, social work services, special instruction, speech-language pathology, transportation, and vision services.

<sup>viii</sup> State-identified data regarding how, and whether, all states use Medicaid EPSDT to cover EI services are not readily available at this time.

Table 3: State Variation in Early Intervention Services

State	Generosity and Variation		
	Criteria Used to Determine Eligibility for EI Services	Categorical Assessment of State's Eligibility Criteria	% of All Children < 3 Receiving EI Services
Alabama	25% delay in one area	Broad	2.1%
Alaska	50% delay in one area	Narrow	2.7%
Arizona	50% delay in one area	Narrow	2.3%
Arkansas	25% delay in one area	Broad	0.9%
California	33% delay in one area or are at high risk for developing a delay, for children up to 36 months old	Moderate	3.5%
Colorado	25% delay in one area	Broad	4.1%
Connecticut	2 standard deviations below the mean in one area; or 1.5 standard deviations below the mean in two areas	Narrow	4.9%
Delaware	25% delay or 1.75 standard deviations below the mean in one area	Broad	3.3%
District of Columbia	50% delay in one area or 25% delay in two areas	Broad	3.7%
Florida	2 standard deviations below the mean in one area; or 1.5 standard deviations below the mean in two areas	Narrow	2.5%
Georgia	Diagnosed developmental delay confirmed by a qualified team of professionals	Narrow	2.5%
Hawaii	1.4 standard deviations below the mean in one area; or 1 standard deviation below the mean in two areas	Broad	3.1%
Idaho	30% delay, 6-month delay or 2 standard deviations below the mean in one area; or 1.5 standard deviations below the mean in two areas	Narrow	3.0%
Illinois	30% or more delay one area	Moderate	3.8%
Indiana	25% delay or 2 standard deviations below the mean in one area; or 20% delay or 1.5 standard deviations below the mean in two areas	Moderate	4.6%
Iowa	25% or more delay in one area	Broad	2.6%
Kansas	25% delay in one area; or 20% delay in two areas	Broad	4.8%
Kentucky	2 standard deviations below the mean in one area; or 1.5 standard deviations below the mean in two areas	Narrow	3.2%

Table 3: State Variation in Early Intervention Services (continued)

State	Generosity and Variation		
	Criteria Used to Determine Eligibility for EI Services	Categorical Assessment of State's Eligibility Criteria	% of All Children < 3 Receiving EI Services
Louisiana	1.5 standard deviations below the mean in two areas	Narrow	3.1%
Maine	2 standard deviations below the mean in one area; or 1.5 standard deviations below the mean in two areas	Narrow	2.5%
Maryland	25% delay or more in one area; or manifests behavior that is likely to result in a subsequent delay	Broad	4.0%
Massachusetts	1.5 standard deviations below the mean in one area	Moderate	10.1%
Michigan	20% delay or 1 standard deviation below the mean in one area	Broad	3.3%
Minnesota	1.5 standard deviations or more below the mean in one area	Moderate	2.9%
Mississippi	33% delay or 2 standard deviations below the mean in one area; or 25% delay or 1.5 standard deviations below the mean in two areas	Moderate	2.0%
Missouri	50% delay in one area	Narrow	3.2%
Montana	50% delay in one area or 25% delay in two areas	Narrow	2.3%
Nebraska	2 standard deviations below the mean in one area or 1.3 standard deviations below the mean in two areas	Moderate	2.7%
Nevada	50% delay in one area or 25% delay in two areas	Narrow	3.0%
New Hampshire	33% delay in one area or "atypical behavior" as documented by the family and qualified personnel	Moderate	5.7%
New Jersey	2 standard deviations below the mean in one area or 1.5 standard deviations below the mean in two areas	Narrow	4.6%
New Mexico	25% delay or 1.5 standard deviations in one area	Broad	8.7%
New York	33% delay, 12-month delay, or 2 standard deviations below the mean in one area; or 25% delay or 1.5 standard deviations below the mean in two areas	Moderate	4.6%

Table 3: State Variation in Early Intervention Services (continued)

State	Generosity and Variation		
	Criteria Used to Determine Eligibility for EI Services	Categorical Assessment of State's Eligibility Criteria	% of All Children < 3 Receiving EI Services
North Carolina	30% delay or 2 standard deviations below the mean in one area; or 25% delay or 1.5 standard deviations below the mean in two areas	Moderate	3.0%
North Dakota	50% delay in one area or 25% delay in two areas	Moderate	4.6%
Ohio	1.5 standard deviations below the mean in one area	Moderate	2.7%
Oklahoma	50% delay or 2 standard deviations below the mean in one area; or 25% delay or 1.5 standard deviations below the mean in two areas	Narrow	1.7%
Oregon	30% delay or 2 standard deviations below the mean in one area; or 15% delay or 1.5 standard deviations below the mean in two areas	Narrow	3.2%
Pennsylvania	25% delay or 1.5 standard deviations below the mean in one area	Broad	5.4%
Rhode Island	2 standard deviations below the mean in one area or 1.5 standard deviations below the mean in two areas	Moderate	6.5%
South Carolina	40% delay or 2 standard deviations below the mean in one area; or 25% delay or 1.5 standard deviations below the mean in two areas	Narrow	3.2%
South Dakota	1.5 standard deviations below the mean in one area or child born at 28 weeks or less	Moderate	3.3%
Tennessee	40% delay in one area or 25% delay in two areas	Moderate	3.2%
Texas	25% delay in one area; if the only delay is expressive language development there must be a 33% delay	Broad	2.3%
Utah	1.5 standard deviations below the mean or at or below the 7th percentile in one area	Moderate	3.1%
Vermont	Clearly observable and measurable delay in one area	Broad	6.1%
Virginia	25% delay in one area	Broad	3.5%
Washington	25% delay or 1.5 standard deviations below the mean in at least one area	Broad	3.4%

Table 3: State Variation in Early Intervention Services (continued)

State	Generosity and Variation		
	Criteria Used to Determine Eligibility for EI Services	Categorical Assessment of State's Eligibility Criteria	% of All Children < 3 Receiving EI Services
West Virginia	40% delay in one area; or 25% delay in two areas	Moderate	6.6%
Wisconsin	25% delay in one area	Broad	3.0%
Wyoming	25% delay or 1.5 standard deviations below the mean in one area	Moderate	5.9%
Best State	N/A	N/A	10.1%
Worst State	N/A	N/A	0.9%
Median State	N/A	N/A	3.2%

Categorical assessment and percentage served are as of 2018, provided by the IDEA Infant & Toddler Coordinators Association. The eligibility descriptions are as of 2020, and come from state regulations, legal statutes, health department regulations, and Early Intervention program websites. For additional source and calculation information, please refer to the Methods and Sources section of [pn3policy.org](https://pn3policy.org).

## How Did We Reach Our Conclusions?

### Method of Review

This evidence review began with a broad search of all literature related to the policy and its impacts on child and family wellbeing during the prenatal-to-3 period. First, we identified and collected relevant peer-reviewed academic studies as well as research briefs, government reports, and working papers, using predefined search parameters, keywords, and trusted search engines. From this large body of work, we then singled out for more careful review those studies that endeavored to identify causal links between the policy and our outcomes of interest, taking into consideration characteristics such as the research designs put in place, the analytic methods used, and the relevance of the populations and outcomes studied. We then subjected this literature to an in-depth critique and chose only the most methodologically rigorous research to inform our conclusions about policy effectiveness. All studies considered to date for this review were released on or before March 31, 2020.

### Standards of Strong Causal Evidence

When conducting a policy review, we consider only the strongest studies to be part of the evidence base for accurately assessing policy effectiveness. A strong study has a sufficiently large, representative sample, has been subjected to methodologically rigorous analyses, and has a well-executed research design allowing for causal inference – in other words, it demonstrates that changes in the outcome of interest were likely caused by the policy being studied.

The study design considered most reliable for establishing causality is a randomized control trial (RCT), an approach in which an intervention is applied to a randomly assigned subset of people. This approach is rare in policy evaluation because policies typically affect entire populations; application of a policy only to a subset of people is ethically and logistically prohibitive under most circumstances. However, when available, randomized control trials are an integral part of a policy's evidence base and an invaluable resource for understanding policy effectiveness.

The strongest designs typically used for studying policy impacts are quasi-experimental designs (QEDs) and longitudinal studies with adequate controls for internal validity (for example, using statistical methods to ensure that the policy, rather than some other variable, is the most likely cause of any changes in the outcomes of interest). Our conclusions are informed largely by these types of studies, which employ sophisticated techniques to identify causal relationships between policies and outcomes. Rigorous meta-analyses with sufficient numbers of studies, when available, also inform our conclusions.

### Studies That Meet Standards of Strong Causal Evidence

- A. Vanderveen, J. A., Bassler, D., Robertson, C. M. T., & Kirpalani, H. (2009). Early interventions involving parents to improve neurodevelopmental outcomes of premature infants: A meta-analysis. *Journal of Perinatology*, *29*, 343–351. <https://doi.org/10.1038/jp.2008.229>
- B. McManus, B., Carle, A., & Poehlmann, J. (2012). Effectiveness of Part C Early Intervention physical, occupational, and speech therapy services for preterm or low birth weight infants in Wisconsin, United States. *Academic Pediatrics*, *12*(2), 96–103. <https://doi.org/10.1016/j.acap.2011.11.004>
- C. Ramey, C., Bryant, D., Wasik, B., Sparling, J., Fendt, K., & LaVange, L. (1992). Infant Health and Development Program for low birth weight, premature infants: Program elements, family participation, and child intelligence. *Pediatrics*, *3*, 454–465. <https://pediatrics.aappublications.org/content/89/3/454.long>
- D. Rauh, V., Achenbach, T., Nurcombe, B., Howell, C., & Teti, D. (1988). Minimizing adverse effects of low birthweight: Four-year results of an early intervention program. *Child Development*, *59*(3), 544–553. <https://www.ncbi.nlm.nih.gov/pubmed/2454783>
- E. Roberts, M., & Kaiser, A. (2015). Early intervention for toddlers with language delays: A randomized controlled trial. *Pediatrics*, *135*(4), 686–693. <https://doi.org/10.1542/peds.2014-2134>
- F. Shonkoff, J. & Hauser-Cram, P. (1987). Early intervention for disabled infants and their families: A quantitative analysis. *Pediatrics*, *80*(5), 650–658. <https://pediatrics.aappublications.org/content/80/5/650>
- G. Guralnick, M. (1998). Effectiveness of Early Intervention for vulnerable children: A developmental perspective. *American Journal on Intellectual and Developmental Disabilities*, *102*(4), 319–345. [https://depts.washington.edu/chdd/guralnick/pdfs/effect\\_EI\\_AJMR\\_vol102\\_98.pdf](https://depts.washington.edu/chdd/guralnick/pdfs/effect_EI_AJMR_vol102_98.pdf)
- H. Teti, D., Black, M., Viscardi, R., Glass, P., O'Connell, M., Baker, L., Cusson, R., & Reiner Hess, C. (2009). Intervention with African American premature infants: Four-month results of an Early Intervention program. *Journal of Early Intervention*, *31*(2), 146–166. <https://doi.org/10.1177%2F1053815109331864>
- I. McCormick, M., Brooks-Gunn, J., Buka, S., Goldman, J., Yu, J., Salganik, M., Scott, D., Bennett, F., Kay, L., Bernbaum, J., Bauer, C., Martin, C., Woods, E., Martin, A., & Casey, P. (2006). Early Intervention in low birth weight premature infants: Results at 18 years of age for the Infant Health and Development Program. *Pediatrics*, *117*(3), 771–780. <https://doi.org/10.1542/peds.2005-1316>
- J. Hill, J., Brooks-Gunn, J., & Waldfogel, J. (2003). Sustained effects of high participation in an Early Intervention for low birthweight premature infants. *Developmental Psychology*, *39*(4), 730–744. <https://doi.org/10.1037/0012-1649.39.4.730>

### Other References

1. Shonkoff, J., & Phillips, D. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/9824>
2. Data Accountability Center. (2012). *Individuals with Disabilities Education Act (IDEA) Part C, data collection history*. <https://www2.ed.gov/programs/osepidea/618-data/collection-documentation/legacy-data-collection-information/data-history/c-datahistory.pdf>
3. US Dept. of Education, Individuals with Disabilities Education Act. *Section 1431*. <https://sites.ed.gov/idea/statute-chapter-33/subchapter-iii/1431>
4. Khetani, M., Cohn, E., Orsmond, G., Law, M., & Coster, W. (2013). Parent perspectives of participation in home and community activities when receiving Part C Early Intervention services. *Topics in Early Childhood Special Education*, *32*(4), 234–245. <https://doi.org/10.1177%2F0271121411418004>
5. Childress, D., Nichols, S., & Schnurr, M. (2019). Strengths and challenges of service coordination in eight states. *Infants & Young Toddlers*, *32*(2), 139–148. <https://doi.org/10.1097/IYC.0000000000000140>
6. Infant & Toddler Connection of Virginia. (n.d.). *What is Part C Early Intervention?* <http://www.infantva.org/ovw-WhatsPartC.htm>
7. Grant, R. & Isakson, E. (2013). Regional variation in early intervention utilization for children with developmental delay. *Journal of Early Intervention*, *17*, 1252–1259. <https://doi.org/10.1007/s10995-012-1119-3>
8. US Dept. of Education, Individuals with Disabilities Education Act. *Section 303.302 Comprehensive Child Find System*. <https://sites.ed.gov/idea/regs/c/d/303.302>
9. United States Federal Register. Vol. 76, No. 188. Sept. 28, 2011. <https://www.govinfo.gov/content/pkg/FR-2011-09-28/pdf/2011-22783.pdf#page=112>
10. Early Childhood Technical Assistance Center. (March 2015). *States' and territories' definitions of/criteria for IDEA Part C eligibility*. [https://ectacenter.org/~pdfs/topics/earlyid/partc\\_elig\\_table.pdf](https://ectacenter.org/~pdfs/topics/earlyid/partc_elig_table.pdf)
11. Early Childhood Technical Assistance Center. *Extended Part C option (for services beyond age 3)*. [https://ectacenter.org/partc/partc\\_option.asp](https://ectacenter.org/partc/partc_option.asp)
12. US Dept. of Education. (2020). *IDEA Section 618 data products: Static tables. Part C Child Count and Settings, 2017-2018*. <https://www2.ed.gov/programs/osepidea/618-data/static-tables/index.html#partc-cc>

13. Bailey, D., Hebbeler, K., Spiker, D., Scarborough, A., & Mallik, S. (2004). First experiences with early intervention: A national perspective. *Pediatrics*, *113*(4), 887–896. <https://doi.org/10.1542/peds.113.4.887>
14. Hebbeler, K., Spiker, D., Bailey, D., Scarborough, A., Mallik, S., Simeonsson, R., Singer, M., & Nelson, L. (2007). *Early Intervention for infants and toddlers with disabilities and their families: Participants, services, and outcomes*. Final Report of the National Early Intervention Longitudinal Study (NEILS). [https://archive.sri.com/sites/default/files/publications/neils\\_finalreport\\_200702.pdf](https://archive.sri.com/sites/default/files/publications/neils_finalreport_200702.pdf)
15. Casanueva, C., Cross, T., & Ringelsen, H. (2008). Developmental needs and Individualized Family Service Plans among infants and toddlers in the child welfare system. *Child Maltreatment*, *13*(3), 245–258. <https://doi.org/10.1177%2F1077559508318397>
16. IDEA Infant & Toddler Coordinators Association. (2017). *ITCA finance survey*. <https://www.ideainfanttoddler.org/pdf/2016-ITCA-Finance-Survey.pdf>
17. Johnson, J., Brown, S., Chang, C., Nelson, D., & Mrazek, S. (2011). The cost of serving infants and toddlers under Part C. *Infants & Young Children*, *24*(1), 101–113. <http://dx.doi.org/10.1097/IYC.Ob013e3182014c97>
18. Mendoza, L. (2019). *Bipartisan bill introduced to increase funding for IDEA early childhood services*. First Five Years Fund. <https://www.ffyf.org/bipartisan-bill-introduced-to-increase-funding-for-idea-early-childhood-services/>
19. Vail, C., Lieberman-Betz, R., & McCorkle, L. (2018). The impact of funding on Part C systems: Is the tail wagging the dog? *Journal of Early Intervention*, *40*(3), 229–245. <https://doi.org/10.1177%2F1053815118771388>
20. Infant & Toddler Coordinators Association. *State challenges and responses, 2017*. <https://www.ideainfanttoddler.org/pdf/2017-ITCA-State-Challenges-Report.pdf>
21. Grant, R. (2005). *State strategies to contain costs in the Early Intervention program: Policy and evidence*. *Topics in Early Childhood Special Education*, *25*(4), 243–250. <https://doi.org/10.1177%2F02711214050250040501>
22. Connecticut Birth to Three System. (2013). *Annual report, FY2013*. <https://www.birth23.org/files/ADR/AnnualReportFY13.pdf>
23. Connecticut Birth to Three System. (2016). *Medical referrals and diagnosed conditions*. <https://www.birth23.org/referral/eligibility/dxcond/>
24. IDEA Infant & Toddler Coordinators Association. (2005). *Medicaid resource and technical assistance paper*. [https://www.ideainfanttoddler.org/pdf/Medicaid\\_Paper05.pdf](https://www.ideainfanttoddler.org/pdf/Medicaid_Paper05.pdf)
25. Elbaum, B., & Celimli-Aksoy, S. (2017). Empirically identified subgroups of children served in Part C Early Intervention programs. *Journal of Developmental and Behavioral Pediatrics*, *38*(7), 510–520. <https://doi.org/10.1097/DBP.0000000000000475>
26. Rosenberg, S., Robinson, C., Shaw, E., & Ellison, M. (2013). Part C Early Intervention for infants and toddlers: Percentage eligible versus served. *Pediatrics*, *131*, 38–46. <https://doi.org/10.1542/peds.2012-1662>
27. Woodman, A., Demers, L., Crossman, M., Warfield, M., & Hauser-Cram, P. (2018). Part C early intervention dosage and growth in adaptive skills from early childhood through adolescence. *Early Childhood Research Quarterly*, *43*, 73–82. <https://doi.org/10.1016/j.ecresq.2018.01.007>
28. Dawson, G., Rogers, S., Munson, J., Smith, M., Winter, J., Greenson, J., Donaldson, A. & Varley, J. (2010). Randomized, controlled trial of an intervention for toddlers with autism: The Early Start Denver Model. *Pediatrics*, *125*(1), e17–e23. <https://doi.org/10.1542/peds.2009-0958>
29. McEachin, J.J. Smith, T., & Lovaas, O. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. *American Journal on Intellectual and Developmental Disabilities*, *97*(4), 359–372. <https://www.ncbi.nlm.nih.gov/pubmed/8427693>
30. McManus, B., Richardson, Z., Schenkman, M., Murphy, N., & Morrato, E. (2019). Timing and intensity of early intervention service use and outcomes among a safety-net population of children. *JAMA Network Open*, *2*(1), 1–10. <http://doi.org/10.1001/jamanetworkopen.2018.7529>
31. Crossman, M., Warfield, M., Kotelchuck, M., Hauser-Cram, P., & Parish, S. (2018). Associations between Early Intervention home visits, family relationships and competence for mothers of children with developmental disabilities. *Maternal and Child Health Journal*, *22*, 599–607. <https://doi.org/10.1007/s10995-018-2429-x>
32. Early Childhood Technical Assistance Center. (2011). *Accessing EPSDT for Part C services*. <https://ectacenter.org/~calls/2011/epsdt/epsdt.asp>
33. Greene, M., & Patra, K. (2016). Part C early intervention utilization in preterm infants: Opportunity for referral from a NICU follow-up clinic. *Research in Developmental Disabilities*, *53–54*, 287–295. <https://doi.org/10.1016/j.ridd.2016.02.016>
34. Advocates for Children of New York and Citizens' Committee for Children of New York, Inc. (2019). *Early inequities: How underfunding Early Intervention leaves low-income children of color behind*. <https://www.cccnewyork.org/wp-content/uploads/2019/12/EI-Report-FINAL-12-4-19.pdf>
35. Feinberg, E., Silverstein, M., Donahue, S., & Bliss, R. (2011). The impact of race on participation in Part C Early Intervention services. *Journal of Developmental & Behavioral Pediatrics*, *32*, 284–291. <https://dx.doi.org/10.1097%2FDBP.Ob013e3182142fbd>
36. Barfield, W., Clements, K., Lee, K., Kotelchuck, M., Wilber, N., & Wise, P. (2008). Using linked data to assess patterns of Early Intervention (EI) referral among very low birth weight infants. *Maternal and Child Health Journal*, *12*, 24–33. <https://doi.org/10.1007/s10995-007-0227-y>
37. Texans Care for Children. (November 2017). *Spotlight on Early Childhood Intervention (ECI) in the Texas Gulf Coast Region*. <https://static1.squarespace.com/static/5728d34462cd94b84dc567ed/t/5a1db459e4966b134273a845/1511896157404/ECI-HTX-Report-2017.pdf>

38. Emerald Consulting. (n.d.). Cost avoidance return on investment. Document provided to the Prenatal-to-3 Policy Impact Center by Maureen Greer, Executive Director at the IDEA Infant & Toddler Coordinators Association, via email on April 1, 2020.
39. Rosenberg, S., Elbaum, B., Rosenberg, C., Kellar-Guenther, Y., & McManus, B. (2018). From flawed design to misleading information: The US Dept. of Education's early intervention child outcomes evaluation. *American Journal of Education*, 39(3), 350–363. <https://doi.org/10.1177%2F1098214017732410>
40. IDEA Infant & Toddler Coordinators Association. (2018). *2018 ITCA finance survey*. <https://www.ideainfanttoddler.org/pdf/Finance-Survey-Report-Pt-2-public-private-insurance-family-fees.pdf>
41. McManus, B., McCormick, M., Acevedo-Garcia, D., Ganz, M., & Hauser-Cram, P. (2009). The effect of state early intervention eligibility policy on participation among a cohort of young children with special health care needs. *Pediatrics*, 124, Supplement 4, S368. <https://doi.org/10.1542/peds.2009-1255G>
42. IDEA Infant & Toddler Coordinators Association. (2020). Percentage of all children under the age of three receiving services by eligibility. (Single day count 10/1-12/1/2018). Prepared by the IDEA Infant & Toddler Coordinators Association in January 2020. Document provided to the Prenatal-to-3 Policy Impact Center by Maureen Greer, Executive Director at the IDEA Infant & Toddler Coordinators Association, via email on April 1, 2020.
43. Barger, B., Squires, J., Greer, M., Noyes-Grosser, D., Martin, J., Rice, C., Shaw, E., Surprenant, K., Twombly, E., London, S., Zubler, J., & Wolf, R. (2019). State variability in diagnosed conditions for IDEA Part C eligibility. *Infants & Young Children*, 32(4), 231–244. <http://doi.org/10.1097/IYC.0000000000000151>
44. Epley, P., Summers, J., & Turnbull, A. (2011). Family outcomes of early intervention: Families' perceptions of need, services, and outcomes. *Journal of Early Intervention*, 33(3), 201–219. <https://doi.org/10.1177%2F1053815111425929>
45. Greer, M., Kilpatrick, J., McCullough, K., & Reid, K. (2015). *Use of data for fiscal management of State Part C systems*. The DaSy Center. SRI International. [https://dasycenter.sri.com/downloads/DaSy\\_papers/FY301\\_Fiscal%20Management\\_Final\\_20151123.pdf](https://dasycenter.sri.com/downloads/DaSy_papers/FY301_Fiscal%20Management_Final_20151123.pdf)
46. US Dept. of Education, Individuals with Disabilities Education Act. *Section 1435 (a)(2)*. <https://sites.ed.gov/idea/statute-chapter-33/subchapter-iii/1435/a>
47. McManus, B., Magnusson, D., & Rosenberg, S. (2014). Restricting state Part C eligibility policy is associated with lower early intervention utilization. *Maternal and Child Health*, 18, 1031–1037. <https://link.springer.com/article/10.1007%2Fs10995-013-1332-8>
48. Elbaum, B., Celimli-Aksoy, S., Marshall, J., & Berkovitz, M. (2017). How does the narrowing of eligibility criteria affect enrollment in Part C early intervention? *Infants and Young Children*, 30(1), 28–40. <https://oce.ovid.com/article/00001163-201701000-00004/HTML>
49. Grant, R., & Isakson, E. (2013). Regional variations in early intervention utilization for children with developmental delay. *Journal of Early Intervention*, 17(7), 1252–1259. <https://www.ncbi.nlm.nih.gov/pubmed/22918713>
50. Twardzik, E., MacDonald, M., & Dixon-Ibarra, A. (2017). The relationship between state lead agency and enrollment into early intervention services. *Journal of Early Intervention*, 39(3), 253–263. <https://journals.sagepub.com/doi/pdf/10.1177/1053815117708999>
51. National Conference of State Legislatures. (2020). *Child poverty rates increased during the Great Recession*. <https://www.ncsl.org/research/human-services/child-poverty-rates.aspx>
52. US Dept. of Education (2020). *IDEA Section 618 Data Products: State Level Data Files. Part C Child Count and Settings, 2018-2019*. [https://www2.ed.gov/programs/osepidea/618-data/state-level-data-files/index.html?utm\\_content=&utm\\_medium=email&utm\\_name=&utm\\_source=govdelivery&utm\\_term=#bccee](https://www2.ed.gov/programs/osepidea/618-data/state-level-data-files/index.html?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=#bccee)
53. Bruner, C., & Johnson, K. (2018). *Federal spending on prenatal to three: Developing a public response to improving developmental trajectories and preventing inequities*. Center for the Study of Social Policy. <https://cssp.org/wp-content/uploads/2018/08/CSSP-Prenatal-to-Three.pdf>
54. National Early Childhood Technical Assistance Center (NECTAC). (2011). *The importance of Early Intervention for infants and toddlers with disabilities and their families*. <https://files.eric.ed.gov/fulltext/ED522123.pdf>
55. IDEA Infant & Toddler Coordinators Association. (2012). *2012 ITCA finance survey*. <https://www.ideainfanttoddler.org/pdf/2012-Finance-Survey-Report.pdf>
56. IDEA Infant & Toddler Coordinators Association. (2014). *2014 ITCA finance survey*. <https://www.ideainfanttoddler.org/pdf/2014-ITCA-Finance-Survey.pdf>
57. Shonkoff, J. (2017). Breakthrough impacts: What science teaches us about supporting early childhood development. *Young Children*, 72(2), 8–16. <https://www.jstor.org/stable/90004117?seq=1>
58. HealthyChildren.org, American Academy of Pediatrics. (2011). *Language delays in toddlers: Information for parents*. <https://www.healthychildren.org/English/ages-stages/toddler/Pages/Language-Delay.aspx>
59. Early Childhood Technical Assistance Center. (2019). *Part C infant and toddler program: Federal appropriations and national child count, 1987-2018*. <https://ectacenter.org/~pdfs/growthcompPartC-2019-05-20.pdf>

60. Moodie, S., Daneri, P., Goldhagen, S., Halle, T., Green, K., & LaMonte, L. (2014). *Early childhood developmental screening: A compendium of measures for children ages birth to five (OPRE Report 2014-11)*. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, US Department of Health and Human Services. <https://files.eric.ed.gov/fulltext/ED561406.pdf>
61. *Federal Part C appropriations per child*. (2020). Data provided to the Prenatal-to-3 Policy Impact Center via email on June 8, 2020 by Maureen Greer, IDEA Infant & Toddler Coordinators Association.
62. Medicaid.gov. (n.d.) *Early and Periodic Screening, Diagnostic, and Treatment*. <https://www.medicaid.gov/medicaid/benefits/early-and-periodic-screening-diagnostic-and-treatment/index.html>
63. US Dept. of Education, Individuals with Disabilities Education Act. *Sec. 303.13. Early Intervention services*. <https://sites.ed.gov/idea/regs/ca/303.13>
64. Louisiana Dept. of Health. (2013). *EPSDT health and IDEA-related services*. <https://www.lamedicaid.com/provweb1/Providermanuals/manuals/EPSDT/EPSDT.pdf>
65. IDEA Infant & Toddler Coordinators Association. (2010). *Options and considerations when accessing Medicaid Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) for Part C Services*. [https://www.ideainfanttoddler.org/pdf/EPSDT\\_Paper.pdf](https://www.ideainfanttoddler.org/pdf/EPSDT_Paper.pdf)
66. Idaho Medicaid State Plan Amendment #18-0006. (2019). <https://healthandwelfare.idaho.gov/Portals/O/Medical/MedicaidCHIP/BasicPlan.pdf>
67. Connecticut Medicaid State Plan Amendment #19-0010. <https://www.medicaid.gov/sites/default/files/State-resource-center/Medicaid-State-Plan-Amendments/Downloads/CT/CT-19-0010.pdf>
68. Drago, K. (2019). *The Individuals with Disabilities Education Act (IDEA), Part C: Early Intervention for infants and toddlers with disabilities*. Congressional Research Service. <https://fas.org/sgp/crs/misc/R43631.pdf>



Prenatal-to-3 Policy Impact Center  
The University of Texas at Austin | LBJ School of Public Affairs  
pn3policy.org | pn3policy@austin.utexas.edu | Twitter: @pn3policy #pn3policy

**Evidence Review Citation:**

Prenatal-to-3 Policy Impact Center. (2020). *Prenatal-to-3 policy clearinghouse evidence review: Early Intervention services* (ER O920.011A). Child and Family Research Partnership. Lyndon B. Johnson School of Public Affairs, University of Texas at Austin. <http://pn3policy.org/policy-clearinghouse/early-intervention-services/>