

Early Intervention Services

Evidence Review Findings: Effective / Roadmap Policy

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. Less causal evidence exists to support impacts on parent outcomes, but the research suggests mixed effects that lean in the beneficial direction. The current evidence base for Early Intervention focuses primarily on the developmental benefits that services can produce for infants and toddlers, rather than examining the impacts of a specific state-level policy.

Early Intervention (EI) services support the healthy development of infants and toddlers who have developmental delays, medical conditions or disabilities, or various environmental or social risk factors for delays. EI programs are implemented at the state level but are governed and partially funded by Part C of the federal Individuals with Disabilities Education Act (IDEA). Access to EI services, such as speech therapy to address language delays or physical therapy for motor challenges, can improve an infant’s or toddler’s developmental trajectory. These services may prevent further delays and reduce 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 foster healthy development.

State EI programs vary considerably in their eligibility criteria, the administrative agency managing the program, the funding mechanisms, and the percentage of children under age 3 who are served, among other aspects. The federal IDEA legislation requires that all children determined to be eligible for EI receive evidence-based services, but states continue to face challenges identifying and serving all children who may benefit from EI, largely as a result of insufficient funding and personnel shortages.

Peer-reviewed research does not currently offer clear guidance regarding the optimal funding mechanism or state policy lever for maximizing enrollment, but the evidence does support EI services as an effective strategy to improve child development and parent wellbeing, especially among children born premature or low birthweight. State innovations to maximize funding for EI services (e.g., coordinating closely with state Medicaid agencies or establishing private insurance mandates) have been shown to support greater enrollment in EI in some states.

Decades of research in the field of child development have made clear the conditions necessary for young children and their families to thrive.¹ These conditions are represented by our eight policy goals, shown in Table 1. The goals positively impacted by EI services are indicated with a filled circle, and the goals theoretically aligned (but without evidence of effectiveness from strong causal studies) are indicated with an unfilled circle.

Table 1: Impacts of Early Intervention Services on Policy Goals

Positive Impact	Policy Goal	Overall Findings
	Access to Needed Services	(Policy goal outside the scope of this review)
	Parents' Ability to Work	(Policy goal outside the scope of this review)
	Sufficient Household Resources	(Policy goal outside the scope of this review)
	Healthy and Equitable Births	(Policy goal outside the scope of this review)
●	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	Trending null for maternal sensitivity toward infants
	Nurturing and Responsive Child Care in Safe Settings	(Policy goal outside the scope of this review)
●	Optimal Child Health and Development	Positive impacts on cognitive, language, behavioral, and motor skills

What Are Early Intervention Services?

Part C of the Individuals with Disabilities Education Act (IDEA) provides federal grants to states to develop Early Intervention programs for infants and toddlers (ages birth to 3) with disabilities or developmental delays.⁵⁶ The federal IDEA law was first enacted in 1975, and its reauthorization in 1986 included the creation of a program focused on services for children under age 3 (then Part H, which became Part C in 1997).² Other sections of IDEA, such as Part B, focus on older children.

The Office of Special Education Programs (OSEP) within the US Department of Education oversees IDEA programs, and IDEA requires that services funded by Part C be evidence-based.⁴³ EI services are intended to support the development of infants and toddlers with a variety of delays and disabilities, not just the most severe impairments. A review of the Early Childhood Technical Assistance (ECTA) Center's database, as well as state policy documents and communication with

Part C coordinators in the spring and summer of 2023ⁱ, identified 33 states that qualify children born low birthweight for EI (states typically require very low or extremely low birthweightⁱⁱ) and 23 states that qualify children born preterm (often very or extremely pretermⁱⁱⁱ), either as part of a state's list of medically diagnosed/established conditions or as part of a state's criteria for children at risk for a later delay.⁶⁵ See Table 3 later in this review for details by state.

EI programs aim to support families caring for young children with special needs, reduce the need for special education services in grade school, and help children with delays and disabilities to develop independent living skills in the long term.³ 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.⁴ The only service that the federal government requires that participating states provide, however, is service coordination.⁵ State leaders sometimes describe the federal EI funding as “glue money” because it is meant to support the coordination of existing state programs and to supplement, not supplant, state funds for these programs.⁶

States are not required to participate in the Part C grant program, but by 1994, all states and eligible territories had opted in,⁷ and states have established their own EI programs with a variety of names (e.g., “Early Start,” “First Connections,” “Birth to Three”). States that accept federal funding must guarantee that every eligible child and family will be able to access services. To ensure access, 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.⁸ Children can be referred by a doctor or other professional, or parents can contact their state EI programs themselves to request an evaluation.

States are charged with developing eligibility rules and ensuring that children are evaluated for Part C eligibility in a timely manner.⁹ 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 and determine which screening and evaluation instruments to use.^{54,65} Children found 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.¹⁰

In 2004, Congress passed the current authorization of IDEA with a goal “to enhance the capacity of state and local agencies and service providers to identify, evaluate, and meet the needs of all

ⁱ Our Center used the ECTA Center's state eligibility pages and individual state policy manuals to collect these data, and we corresponded with Part C coordinators and ECTA Center staff to resolve discrepancies between sources to the extent possible.

ⁱⁱ Very low birthweight refers to infants born weighing less than 1,500 grams, and extremely low birthweight refers to infants born weighing less than 1,000 grams.

ⁱⁱⁱ Very preterm refers to infants born between 28 and 32 weeks of gestation, and extremely preterm refers to infants born earlier than 28 weeks.

children, particularly minority, low-income, inner city, and rural children, and infants and toddlers in foster care.”¹¹ However, recent data suggest inequitable access to EI services across groups by race and ethnicity. For example, Black children are substantially more likely to be born low birthweight (a rough proxy for need of EI services) than White or Hispanic children, so if access to EI services was equitable, a relatively higher percentage of Black children should receive EI services compared to their White or Hispanic counterparts. Yet, a smaller percentage of Black children actually receive EI services compared to White and Hispanic children (6% compared to 7% and 7.1%, respectively).⁷⁴ Analyzing data from 2020–2021, from the National Institute for Early Education Research discovered states with a higher percent of Black children had lower overall rates of percent served for EI programs.¹² Additionally, states with a higher percent of Hispanic/Latino children had lower rates of federal funding dollars per child. These stark differences highlight the ineffectiveness of some state EI programs to equitably reach all children in need of services, especially Black children.

Who Is Affected by Early Intervention Services?

According to the US Department of Education, Part C Early Intervention programs served 361,462 children (and their families) ages birth to 3 at any given point in 2021.⁴⁸ This number represents approximately 3.2 percent of the US and territories population under age 3 (estimated at over 11.3 million total).⁴⁸ Using a cumulative rather than point-in-time approach, recent national data show that 780,164 children (6.7% of children ages birth to 3) received *any* EI services over a 12-month period.⁷⁴ Nationally representative surveys (e.g., the Early Childhood Longitudinal Study, Birth Cohort, and estimates by the federal Maternal and Child Health Bureau) suggest that 13 to 20 percent of children under age 3 may have delays and disabilities that could improve with EI services, so many more children may benefit than are currently served in the EI program.⁷

Data suggest that the average child in EI is referred at approximately 13 months old and begins receiving services at 16 months old.¹⁵ 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.¹⁴ 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 delay or disability.⁹

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, and the federal Child Abuse Prevention and Treatment Act, or CAPTA (passed in 1974 and amended numerous times since then) requires that states develop processes and procedures to refer children who have experienced abuse or neglect to EI programs for an evaluation.⁷⁹ States have discretion to refer children directly to an EI evaluation, or to do a pre-screening to determine whether an evaluation is necessary.⁶² Data suggest that rates of EI service receipt remain low among this population relative to their need.¹⁷ A 2021 survey performed by the US Children’s Bureau found, of the 37 states reporting, 91,445 children were eligible for EI programs. From the 27 states that also reported referral data, there was a referral rate of 65.6 percent.⁶⁴ In contrast, a 2008 study using nationally representative data on children from birth 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.¹⁷ State implementation of

the CAPTA law also varies; some states refer 100 percent of eligible children in child welfare cases to EI programs, whereas others refer fewer than 30 percent of these children, and still others do not report these data to the federal government^{iv} even though CAPTA requires it.⁶⁴ States also do not report these data disaggregated by race and ethnicity, which would be valuable for examining equity in referrals.

What Are the Funding Options for Early Intervention Services?

Part C grants to states are not intended to be the primary funding source for EI, but are meant to supplement state and local resources and support states to coordinate their services.⁵⁶ The approved federal budget for FY 2023 nearly doubled funding for IDEA Part C grants to \$932 million.⁷⁹ In a 2021 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 51 percent coming from state sources and 13 percent from local revenue.¹⁸ The funding composition varies considerably by state.⁷³

The Part C federal grants awarded to each state are based on the number of children under age 3 in the population as compared to other states (not based on the number of children actually served in EI).⁵⁶ According to the ECTA Center and the First Five Years Fund, annual federal Part C funding per child has diminished in recent years.^{19,53,55} The ECTA Center's data reveal a peak of \$1,979 per child served in FY 1999, declining to \$1,222 in FY 2022.⁵³ Meanwhile, the number of children served has trended upwards, suggesting a shift toward fewer federal resources available for each child in EI services at any given time.^{20,48,56} States must therefore rely more heavily on their own investments and seek new funding streams to pay for services.

States access a variety of funding streams, including Medicaid, private insurance, and family fees, often on a sliding scale, to fund EI programs in addition to their federal allotment.²⁰ The reported state and local contributions have increased over time as the federal per-child amount has declined.^{18,50,51} 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 reimbursements, and implementing other measures that may negatively impact EI participation and service quality.^{20,21} In 2003, for example, Connecticut saved over \$600,000 by eliminating extremely 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.²² The state has since reinstated extremely low birthweight as a qualifying condition.^{23,24} IDEA requires that certain services be provided at no cost to families (Child Find, evaluations, developmental testing, and development and review of the Individualized Family Service Plan), but other services are eligible for cost-sharing, depending on the state (including speech, hearing, vision, occupational, and physical therapy services, among others).⁶⁶

States are increasingly turning to federal Medicaid matching dollars to serve children who qualify for both Medicaid and EI services, because the Medicaid matching funds are not capped in the way that Part C federal funds are. This approach means that Part C funds can be freed up for the

^{iv} See Table 6-9 on p. 95 of the [Child Maltreatment \(2019\) report](#). Appendix D of the Child Maltreatment report contains state-specific notes explaining reasons for missing data.

children who do not qualify for Medicaid. A total of 33 states report that Medicaid reimbursement rates are insufficient to cover the full cost of EI services, specifically services that target social-emotional and mental health needs.⁶²

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

The rationale for Part C EI programs is based on the best available brain science regarding the importance of development in the earliest years,⁵² 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.⁴⁹ EI 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. 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.⁵⁷ Research supports the theory that services that involve parents may produce better outcomes for children than services that only involve the child.^{A,F} The most common services provided through EI include speech therapy, physical therapy, occupational therapy, and behavioral therapy provided through developmental specialists.¹⁶

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,^{25,26} but very few studies examine outcomes using rigorous methodology sufficient for attributing causal impact to EI services. The vast majority of outcome studies do not have a control or comparison group to measure against the group receiving EI services, relying instead on a single group's pre-intervention and post-intervention data, and many studies use parent self-reports through surveys to understand child and family outcomes, rather than using direct assessments of children's progress by trained observers.¹⁶ 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).²⁷ 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.^{28,29} Another EI researcher has cited "a critical gap in the literature linking [EI] service use and functional outcomes" (p. 2),³⁰ and still others have acknowledged "intense professional debate surrounding claims of the effectiveness of [E]arly [I]ntervention" (p. 320).^G

Despite these limitations in the research, some consistent evidence has emerged from rigorous studies of EI programs, particularly those focused on children born premature or low birthweight, demonstrating that participation in services can boost children's developmental trajectories. 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 EI on more diverse groups of infants and toddlers.

The peer-reviewed research on EI to date does not generally 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 in terms of whether broader thresholds lead to more eligible children actually receiving services.^{39,44,45,46,47,63} Using a broad eligibility threshold means that a state may serve children with less severe delays than states that report moderately inclusive or narrow criteria, but states with broader eligibility do not necessarily serve more children than states with more restrictive criteria. The percentage of children ages birth to 3 served in any given state is tied more closely to states' efforts to marshal resources for EI (e.g., funding and personnel) and their investments in Child Find and outreach activities.

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 (Table 2) displays the findings associated with Early Intervention (beneficial, null,^v or detrimental) for each of the strong studies (A through G^{vi}) 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.

Of the seven causal studies included in this review, two studies^{B,C} examined how outcomes differed by race or ethnicity (beyond simply presenting summary statistics or controlling for race/ethnicity). Where available, this review presents the analyses' causal findings for subgroups by race/ethnicity and other aspects of variation, such as family socioeconomic status. A rigorous evaluation of a policy's effectiveness should consider whether the policy has equitable impacts and should assess the extent to which a policy reduces or exacerbates pre-existing disparities in economic and social wellbeing.

^v An impact is considered statistically significant if $p < 0.05$. Results with p -values above this threshold are considered null or nonsignificant.

^{vi} Studies H and I are longer-term analyses for Study C and are not included in Table 2.

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	B, D			Mixed
	Maternal Role Satisfaction	D			
	Maternal Anxiety		D		
	Caregiver Stress		E		
Nurturing and Responsive Child-Parent Relationships	Maternal Sensitivity Toward Infants		B		Trending* Null
Optimal Child Health and Development	Cognitive Assessment Scores	A, B, C, D, F, G			
	Motor Skills	F	A		
	Behavior Assessment Scores	C			
	Infant Temperament	D			
	Receptive Language Skills	E			
	Cognitive Assessment Scores	A, B, C, D, F, G			
	Motor Skills	F	A		

*Trending indicates that the evidence is from fewer than two strong causal studies or multiple studies that include only one location, author, or data set.

Parental Health and Emotional Wellbeing

Although many studies examine family and caregiver outcomes after participation in EI services for their infants and toddlers, most studies employ designs 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.^{31,41} Three strong studies measured some indicators of parent wellbeing.^{B,D,E}

A 1988 experimental study of infants born between 1980 and 1981 examined the long-term results of an 11-session EI program that sought to offer mothers support as they adjusted to parenting a low birthweight infant over the first 3 months of life.^D Mothers who 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) than the control group.^{vii} The study found no significant

^{vii} 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

differences in maternal anxiety between the groups. A randomized study^{viii} of 138 Black mothers and their low birthweight, premature infants (born between 2002 and 2004) found that after an 8-session, 20-week EI 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).^B

A 2015 study recruited toddlers between 2009 and 2013 to participate in a 28-session EI program focused on language development.^E The study focused on caregiver-implemented interventions for children with language delays, and although the study found significant impacts on child receptive language (discussed in the Optimal Child Health and Development section of this review), there were no significant findings for reducing caregiver stress.^E

Nurturing and Responsive Child-Parent Relationships

The 2009 study of Black infants and their mothers recruited between 2002 and 2004, introduced in the Parental Health section, examined maternal sensitivity using the Maternal Behavioral Q-Set (MBQ) instrument.^B Observers rated the sensitivity of mother-child interactions during a 2-hour period, and although the EI treatment group scored higher overall than the control group on maternal sensitivity, the difference was not statistically significant.

Optimal Child Health and Development

Strong causal studies have demonstrated the link between EI services and improvements in children's health and development. EI services enhance cognitive assessment scores, motor and language skills, infant temperament, behavior assessment scores, especially for infants born preterm or low birthweight.

Cognitive, Motor, and Behavioral Outcomes

Evidence from meta-analyses^{A,F,G} and randomized controlled trials^{B,C,D,E} (RCTs) 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 EI services.^F The authors considered this impact to be a "moderate, positive effect" (p. 652)^F 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.^F

A widely cited RCT 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.^C 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

competent as...five other potential caretakers (spouse, own mother, another experienced mother, a pediatric nurse, and a physician)" (p. 548).^D 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.^D

^{viii} Recruitment for this study took place between 2002 and 2004.

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.^H

The RCT involving infants born low birthweight between 1980 and 1981, discussed in the Parental Health section of this review, 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).^D 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.^D

The randomized intervention discussed previously, with 138 Black infants born low birthweight and premature, found that the extremely low birthweight infants (born weighing less than 1,000 grams) who were assigned to the EI 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.^B The study did not find significant effects for infants born weighing more than 1,000 grams. In addition, the study found that socioeconomic status mediated the intervention effects; the Bayley scores for infants living below the federal poverty threshold did not show a significant improvement based on the EI treatment.^B The authors hypothesized that mothers facing resource deficits may have experienced greater stress and may have had less time and less support from partners to successfully implement what they learned from the program. For example, the study found that “mothers living above poverty thresholds were significantly more sensitive during interactions with their infants than mothers living in poverty, and this finding may be a direct result of the former having more financial, material, and perhaps interpersonal resources at their disposal” (p. 160).^B Research should continue to investigate the impacts of poverty on the success of EI interventions to ensure that programs work for the most socially and economically disadvantaged infants and toddlers.

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.^G Finally, a 2009 meta-analysis of 25 RCTs that analyzed various EI programs for premature 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).^A Differences that were identified at 36 months were no longer detected at child age 5.^A

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 previously found the greatest effect size for language skills compared to other developmental domains, at 1.17.^F A RCT of families recruited between 2009 and 2013 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).^E

Is There Evidence That Early Intervention Services Reduce Disparities?

For programs like EI to reduce disparities in children's outcomes, the first step is ensuring equitable access for children of various racial, ethnic, and socioeconomic groups. Evidence suggests children from families with lower incomes 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.^{32,33} National data from 2021 to 2022 show that 6 percent of Black children in the US under age 3 received EI services over the most recent 12-month cumulative reporting period, compared to 7.1 percent of White children and 7 percent of Hispanic children, but these rates and the gaps between groups vary significantly by state and community.⁷⁴

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.³³ A 2011 study using nationally representative data from the Early Childhood Longitudinal Study following children born in 2001 found that no racial disparities in service receipt existed at 9 months, but by 24 months, Black children who were likely eligible for EI services were five to eight times less likely to receive services than White children, depending on the reason for eligibility.³³ A study using data from 2009–2010 also found that Black and Hispanic children were 78 percent more likely than White children to have unmet needs for EI therapy services; these children were identified as likely to need services based on parent responses to the National Survey of Children with Special Health Care Needs, but they were not receiving services.⁶⁹ Finally, a study of low birthweight infants born from 1998–2000 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.³⁴

Funding shortages in recent years have affected children's access to EI services,^{20,22} 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.³⁵

Research has shown that implementing family fees for EI services may reduce children with low incomes' participation in the program, even when sliding scales would preclude them from out-of-pocket costs, because parents may not be aware of the financial assistance available to them and may be deterred from pursuing services.²² In an April 2021 survey, 17 states reported using family

fees as a funding source, but Connecticut recently eliminated family fees through S.B. 2, effective July 1, 2021, bringing the total states to 16.⁷³

Of the strong causal studies reflected in Table 2, two studies explicitly examined impacts by race and ethnicity or socioeconomic status.^{B,C} One study examined a sample of Black low birthweight and premature infants and found that only infants whose families lived above the federal poverty level showed significant cognitive improvements on the Bayley Mental Development Index after participating in EI services.^B The second study found that EI services had greater impacts on children's cognitive scores for those who were White, Asian, and Other, compared to Black or Hispanic children, and for children with mothers with more education.^C These findings suggest that EI services may not always have equitable impacts, and the reasons for these disparities should continue to be studied and rectified in order to ensure all infants and toddlers can benefit and reach their developmental potential, regardless of race, ethnicity, or socioeconomic status.

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.³⁶ 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.^{36,42} A more comprehensive analysis of the return on investment is forthcoming.

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

Evidence from the seven strong studies in Table 2, including three meta-analyses, suggests that EI services 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. Two additional analyses examining follow-up outcomes from one of the studies^C found that the benefits of EI can be sustained through later childhood and adolescence.^{H,I} The causal research on outcomes is limited, and much of the EI research tends to focus on programs serving very specific populations, such as children born low birthweight or premature, or children with Autism in smaller studies.^{D,28,29} In addition, most rigorous studies with large sample sizes were conducted many years ago, and newer research is warranted.

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.¹⁶ 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.³⁷ Conducting RCTs for EI is difficult because all children with eligible needs must be served, preventing a true control group in

most cases. Because eligible conditions vary across states, future research may take advantage of this variation to conduct studies with quasi-experimental designs.

EI 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, to retain quality EI providers and ensure that financing is not a barrier to service provision. In addition, state leaders have raised the issue of staffing models (e.g., majority contractors versus majority salaried employees hired directly by state agencies) as another factor that can influence an EI program's success and cost-effectiveness. More systematic research on these implementation factors would be valuable.

Another area for continued research is how the COVID-19 pandemic has affected participation in EI and changed delivery of services in ways that may persist beyond 2021. Early in the crisis, in the spring of 2020, New York City saw an 82 percent decrease in referrals to EI programs, and in the summer of 2020, the City saw a 15 percent decrease from 2019 in the number of infants and toddlers participating in services.⁵⁸ A May 2021 survey on equity in EI (with responses from 29 states) found that referral rates dropped nationally during the pandemic, and in particular, “[r]eferral rates for Black and Latino families and families with limited English proficiency have dropped in five states [and] [r]eferral rates for families with low incomes also dropped in four states” (p. 5).⁷⁰ In addition, 10 states reported an increase in wait times for an evaluation after referral.⁷⁰

Part C federal guidance approved the use of modified services for EI sessions during the COVID-19 pandemic, allowing for therapy to take place over videoconference or telephone, for example.⁵⁹ Research has shown that telehealth is an effective medium for delivering EI services, with small studies demonstrating that in some cases, children who received EI virtually achieved better outcomes on language assessments compared to those receiving in-person services.⁶⁰ Other studies suggest that parents prefer in-person services when possible, but feel that telehealth may serve as a supplement to regular visits or could offer a temporary replacement when in-person visits are infeasible or when specialized providers are geographically distant.⁶¹

Finally, more disaggregated data on access to EI services by race and ethnicity, especially for children involved in the child welfare system, would be valuable to ensure children receive necessary evaluations and services. Only 28 states were able to provide data on referrals to EI from the child welfare system in the most recent federal report (2021).⁶⁴

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. Rigorous causal research has not reached a consensus, however, regarding the most effective statewide policies to enact related to EI services to improve children's outcomes or maximize enrollment. A review of state variation in

implementation decisions offers some insight into which factors may lead to serving greater numbers of children in EI.

How Does Early Intervention Vary Across the States?^{ix}

Early Intervention programs are administered differently in each state, beginning with the agency overseeing the program. A survey conducted by the IDEA Infant & Toddler Coordinators Association found that some states house EI in their Department of Health, others in their Department of Education, and other states administer EI in agencies such as the Department of Disability and Rehabilitative Services or the Department of Children's Services.⁶⁸ One correlational study found that states that located EI within the Department of Health generally 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.⁴⁷ However, this pattern does not hold true across all states. Some states have found that housing both Part C and Part B in the Department of Education provides a more seamless transition for children who need special education after receiving EI.¹⁰ More systematic research would be valuable to guide states in this decision and determine whether the choice of lead agency has an impact on children's referrals, access, and participation.

Each state determines its own eligibility requirements within the federal guidelines, which means that the percentage of children ages birth 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^x required (typically 25%, 33%, and 50%, respectively), but specific eligibility criteria vary considerably.³⁸ A 2013 study following children born in 2001 found that states with the narrowest eligibility policies (those requiring a 50% or greater delay) may qualify less than 5 percent of their infants and toddlers 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.²⁶ The percentage of all children under age 3 who are served by Part C (using a point-in-time approach^{xi}) also varies across the states; in the most recent federal data, this percentage ranged from 0.8 percent in Hawaii to over 10.5 percent in Massachusetts (or from 2% in Arkansas to over 20.1% in Massachusetts using a cumulative approach over the course of a 12-month period).^{48,74}

A 2019 study examining the diagnosed/established 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.⁴⁰ The number of medical 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 noted that this wide variation in eligibility may lead to inequitable access to

^{ix} For details on state progress implementing Early Intervention programs, see the Early Intervention section of the US Prenatal-to-3 State Policy Roadmap: <https://pn3policy.org/pn-3-state-policy-roadmap-2023/us/early-intervention>

^x "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.

^{xi} The point-in-time approach counts all children in EI services on a specific day, out of the birth-to-3 population. The cumulative approach counts all children who came into the EI system at any point during a certain period, such as a full calendar year, out of the birth-to-3 population. The cumulative percentage is therefore higher.

services based solely on a child's state of residence.⁴⁰ As mentioned earlier, 33 states qualify children born low birthweight and 23 states qualify children born premature (at various thresholds in grams and weeks), either as part of the state's list of established conditions or as part of the state's criteria for children at risk for a later delay. Only six states are officially designated in federal data as states serving at-risk children: California, Massachusetts, New Hampshire, New Mexico, Florida, and West Virginia.^{65,71} These states serve children who are not yet presenting with delays or disabilities, but may be likely to in the future, based on a set of biological, environmental, or social risk factors that are unique to each state.⁶⁵ Other states serve children with risk factors based on state legislation, but they do not report these policies to the federal government in the same way that the six listed states do.^{75,76,77,78}

Five states (Iowa, Michigan, Maryland, Minnesota, and Nebraska) are designated as "birth mandate states" because they guarantee a "free appropriate public education" (FAPE) for children ages 0 to 21 rather than 3 to 21 (going beyond the minimum requirement for states in federal law).⁶⁷ These states offered services to infants and toddlers prior to the creation of the EI program in 1986, and they prohibit the use of family fees for EI services given that such services fall under the FAPE provision.

Rates of developmental screenings also vary considerably across the states, potentially leading to inequitable identification for EI services. For example, the most recent national data show a range from 50.6 percent of children (ages 9 months to 35 months) receiving recommended developmental screenings in Oregon, to only 19.2 percent receiving them in Indiana.⁷²

As discussed previously, funding mechanisms also vary across states. Ensuring sufficient Part C funding for all children and families in need of services remains a national concern, and a 2017 financing report concluded 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).¹⁸

The extent to which states have taken advantage of federal Medicaid matching funds to increase capacity in their EI programs is a key way that they differ.⁶² Researchers from the National Center for Children in Poverty (NCCP) and the Georgetown University Health Policy Institute's Center for Children and Families (CCF) wrote in a 2020 report that "The use of Medicaid for certain EI services may free up the more limited federal Part C funds for other costs, including those related to services for children in Part C who do not qualify for Medicaid."⁶² This observation is based on the fact that Part C funding to the states is capped and based on a state's infant/toddler population relative to other states, whereas federal Medicaid matching funds are not limited in the same way. The federal Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) Medicaid benefit requires that children ages 0 to 21 enrolled in Medicaid receive any and all medically necessary treatment that a provider finds that they need, so children enrolled in Medicaid are entitled to all EI services for which they are found to be eligible.³²

According to the 2020 report, states have taken a variety of steps in recent years to increase Medicaid funding for EI services, specifically in the realm of social-emotional and mental health

needs for infants and toddlers.⁶² For example, five states' EI programs reference Medicaid data to help identify Medicaid-enrolled children who may benefit from EI services (Illinois, Massachusetts, Michigan, Pennsylvania, and South Carolina) and 10 states cross-reference Medicaid and EI data to increase funding through federal Medicaid matching dollars (Arizona, Colorado, Illinois, Louisiana, Maryland, North Dakota, New York, Oregon, Pennsylvania, and South Carolina). Other states use data sharing in a variety of ways. Developing greater coordination between a state's Medicaid and EI programs can be particularly beneficial for maximizing available funding. For example, the 2020 report highlights that South Carolina's recent initiative to integrate its Medicaid and EI data systems led to "a more than 50 percent growth in enrolled children (from 4,500 at the end of 2016 to 6,819 in 2019)" (p. 15).⁶² Other states may see similar benefits from cross-referencing data on these overlapping populations.

Table 3: State Variation in Early Intervention Services

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
Alabama	25% or greater delay in one or more areas	Broad	4.5%	<1,000 g	<26 weeks
Alaska	50% or greater delay in one or more areas	Narrow	5.8%	NA	NA
Arizona	50% or greater delay in one or more areas	Narrow	4.5%	NA	NA
Arkansas	25% or greater delay in one or more areas	Broad	2.1%	NA	NA
California	25% or greater delay in one or more areas	Narrow	6.7%	<1,500 g**	<32 weeks**
Colorado	33% or greater delay in one or more areas	Moderate ⁺	6.4%	<=1,199 g	NA
Connecticut	2 SD below the mean in one area or 1.5 SD below the mean in two or more areas	Narrow	10.9%	<=1,499 g	<=31 weeks

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

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
Delaware	25% delay in one or more areas; or at least 1.66 SD below the mean in any area	Narrow	5.4%	<1,000 g	<28 weeks
District of Columbia	25% or greater delay in one or more areas	Broad	8.7%	<1,000 g	<=28 weeks
Florida	1.5 SD below the mean in two or more areas or 2 SD below the mean in one or more areas	Narrow	5.0%	<1,200 g as an established condition (or 1,200-1,500 g for at-risk)	NA
Georgia	2 SD below the mean in one or more areas; or at least 1.5 SD (moderate delay) below the mean in two or more areas	Narrow	4.7%	NA	NA
Hawaii	1.4 SD or more below the mean in at least one area or sub-area; or 1 SD or more below the mean in at least two or more areas or sub-areas	Broad	4.7%	NA	NA

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

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
Idaho	30% below age norm or exhibits a six-month delay, whichever is less; or at least 2 SD below the mean in one area; or at least 1.5 SD below the mean in two or more areas	Moderate	5.8%	<1,500 g	<=32 weeks
Illinois	30% or greater delay in one or more areas	Moderate	9.0%	<1,000 g	NA
Indiana	25% delay or 2 SD below the mean in one area; or 20% delay or 1.5 SD below the mean in two areas	Moderate	11.1%	<=1,500 g	NA
Iowa	25% or greater delay in one or more areas	Broad	5.0%	<1,500 g	<32 weeks
Kansas	25% delay in one area; or 20% delay in two areas	Broad	9.8%	<1,000 g	<27 weeks
Kentucky	2 SD below the mean in one area or at least 1.5 SD below the mean in two areas	Narrow	6.4%	NA	NA
Louisiana	1.5 SD below the mean in two areas	Narrow	5.5%	<1,500 g	<=32 weeks

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

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
Maine	2 or more SD below the mean in at least one area or 1.5 or more SD below the mean in at least two areas	Narrow	6.4%	<1,200 g	<29 weeks
Maryland	25% delay in at least one or more areas	Broad	NA	<1,200 g	NA
Massachusetts	1.5 SD below the mean in one or more areas	Broad	20.5%	<1,200 g**	<32 weeks**
Michigan	25% delay in at least one or more areas	Broad	6.7%	<1,500 g	NA
Minnesota	1.5 SD below the mean in one or more areas	Moderate	5.0%	<1,500 g	NA
Mississippi	33% delay in one area or a 25% delay in two or more areas; or 2 SD below the mean in one area or 1.5 SD below the mean in each of the two areas	Moderate	3.3%	<1,500 g	<32 weeks
Missouri	50% delay in one or more areas	Narrow	6.0%	<1,500 g	NA
Montana	50% delay in one area or 25% delay in two or more areas	Moderate	3.1%	NA	NA

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

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
Nebraska	2 SD below the mean in one area or 1.3 SD below the mean in two areas	Moderate	5.8%	NA	NA
Nevada	50% delay in one area or 25% delay in two areas	Moderate	6.1%	<=1,000 g	<=27 weeks
New Hampshire	33% delay in one or more areas	Moderate	11.5%	<1,814.37 g**	<27 weeks**
New Jersey	2 SD below the mean in one area or 1.5 SD below the mean in two or more of the areas	Moderate	9.6%	NA	NA
New Mexico	25% or greater delay in one or more areas	Broad	14.5%	<1,750 g as an established condition (or <1,700 g for at-risk)**	<28 weeks
New York	33% delay, 12-month delay, or 2 SD below the mean in one area; or 25% delay or 1.5 SD below the mean in two areas	Moderate	8.7%	<1,000 g	<28 weeks
North Carolina	30% delay or 2 SD below the mean in one area; or 25% delay or 1.5 SD below the mean in two areas	Moderate	5.2%	<1,000 g	<27 weeks
North Dakota	50% delay in one area or 25% delay in two areas	Narrow	9.7%	NA	NA

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

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
Ohio	1.5 SD below the mean in one area	Moderate	5.9%	<1,500 g	NA
Oklahoma	50% delay or 2 SD below the mean in one area; or 25% delay or 1.5 SD below the mean in two areas	Moderate	3.5%	<=1,200 g	NA
Oregon	2 SD or more below the mean in one or more areas, or 1.5 SD below the mean in two or more areas	Narrow	5.6%	<1,200 g	NA
Pennsylvania	25% delay or 1.5 SD below the mean in one area	Broad	10.6%	NA	NA
Rhode Island	2 SD below the mean in at least one area or 1.5 SD below the mean in two or more areas	Narrow	14.1%	<=1,500 g	NA
South Carolina	40% delay or 2 SD below the mean in one area; or 25% delay or 1.5 SD below the mean in two areas	Moderate	8.6%	<=1,200 g	<28 weeks
South Dakota	At least 1.5 SD below the mean in one or more areas	Moderate	5.5%	NA	<=28 weeks
Tennessee	40% delay in one area or 25% delay in two areas	Moderate	7.6%	NA	<30 weeks

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

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
Texas	25% delay in one area; if the only delay is expressive language development there must be a 33% delay	Broad	5.5%	<=999 g	NA
Utah	1.5 SD at or below the mean, or at or below the 7th percentile in one or more of the areas of development on approved instrument	Moderate	7.1%	NA	NA
Vermont	The child is experiencing any observable and measurable developmental delay, as measured by state-approved diagnostic instruments and procedures, in one or more areas	Broad	12.2%	NA	NA
Virginia	25% delay in one or more areas	Broad	7.4%	NA	<= 28 weeks
Washington	25% delay or 1.5 SD below the mean in at least one area	Broad	7.5%	NA	NA

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

State	Developmental Delay Threshold	State's Self-Declared Eligibility Category	% of All Children < 3 Receiving EI Services (Cumulative)	Low Birthweight Threshold for Qualifying Condition or Risk Factor*	Preterm Birth Threshold for Qualifying Condition or Risk Factor*
West Virginia	40% delay in one or more areas; or 25% delay in two or more areas	Moderate	14.2%	<=1,500 g**	<=32 weeks**
Wisconsin	25% or 1.3 SD below the mean in one or more areas	Broad	6.1%	<1,500 g	<32 weeks
Wyoming	25% delay or 1.5 standard deviations below the mean in one or more areas	Moderate	11.0%	NA	NA

Notes: *States have information in these columns if they serve infants born low birthweight or preterm either as part of their diagnosed/established conditions list OR as part of their at-risk eligibility criteria. Each state sets its own specific thresholds in grams and weeks for these two conditions, and most require very or extremely low birthweight to qualify, or very or extremely preterm birth to qualify. NA (Not Applicable) states do not include low birthweight or preterm birth in their diagnosed/established conditions or at-risk classification when determining eligibility for EI services.

**State serves children with this condition through the at-risk eligibility criteria but is not on the list of diagnosed conditions. Generally, low birthweight criteria refer to very low or extremely low values (i.e., less than 1,500 grams).

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For additional source and calculation information for each state, please refer to the [Methods and Sources](#) section of 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 causal studies considered to date for this review were released on or before February 28, 2023.

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 controlled 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, RCTs 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

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