

Early Childhood Is Critical to Health Equity



Authors

Paula Braveman, University of California, San Francisco
Julia Acker, University of California, San Francisco
Elaine Arkin, Independent Consultant
Jamie Bussel, Robert Wood Johnson Foundation
Kathryn Wehr, Robert Wood Johnson Foundation
Dwayne Proctor, Robert Wood Johnson Foundation

Acknowledgments

We thank the following individuals who provided insightful and substantive comments on drafts:

Tracy Orleans, Robert Wood Johnson Foundation
Jack Shonkoff, Center on the Developing Child at Harvard University
Renee Boynton-Jarrett, Boston University School of Medicine/Boston Medical Center
Joanne Klevens, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention
Susan Egerter, University of California, San Francisco

Suggested Citation

Content from this publication may be reproduced without permission provided the following citation is referenced:
Braveman P, Acker J, Arkin E, Bussel J, Wehr K, and Proctor D. *Early Childhood Is Critical to Health Equity*.
Princeton, NJ: Robert Wood Johnson Foundation, 2018.

Foreword

This report is the second in a Robert Wood Johnson Foundation (RWJF) series on **health equity**. An [Executive Summary](#) is also available. The series aims to assist those working in public health, health care, and other fields that powerfully shape health—such as education, child care, housing, and community development—to build a world in which everyone can be as healthy as possible.

The first report in the RWJF health equity series, [What Is Health Equity? And What Difference Does a Definition Make?](#) defines health equity (below) and takes a deeper look at what it means and the implications for action.

Health equity means that everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health, such as poverty, discrimination, and their consequences—including powerlessness; lack of access to good jobs with fair pay; quality education and housing; safe environments; and health care. For the purposes of measurement, health equity means reducing and ultimately eliminating disparities in health and its determinants that adversely affect excluded or marginalized groups.

According to this definition, **health inequities** are produced by inequities in the resources and opportunities available to different groups of people based on their racial/ethnic group; socioeconomic, disability, or LGBTQ status; gender; and other characteristics closely tied to a history of being marginalized or excluded.

This report focuses on the first five years of life. Other periods of life also shape lifelong health. They are, however, beyond the scope of this report.

Contents

SECTION 1	2
Conditions in Early Childhood Shape Health Throughout Life	
<hr/>	
SECTION 2	10
Health Equity: We Can Set All Children on a Path Toward Lifelong Health	
<hr/>	
SECTION 3	17
The Business Case for Investing in Early Childhood	
<hr/>	
SECTION 4	20
A Call to Action: Investing in Early Childhood Is Key to Achieving Health Equity	
<hr/>	
SECTION 5	21
Examples of Promising Policies and Programs	
<hr/>	
RESOURCES	31
<hr/>	
REFERENCES	33

Conditions in Early Childhood Shape Health Throughout Life

Few people would doubt that childhood experiences are important, but it may surprise many that the social and economic conditions we experience in early childhood—defined here as the first five years of life—are among the most powerful forces that shape our health as adults. Scientists have learned that the first few years of life are crucial in establishing a child’s path toward—or away from—health and well-being across the entire lifespan.

While all parents want the best for their children, not all parents have the same resources to give their children the healthiest start in life.¹ Children in families with limited economic resources often face multiple physical and psychosocial hardships in early childhood that can dramatically damage their health, with lifelong consequences. Poverty¹ or low income and discrimination² can limit parents’ opportunities to provide their children with safe, nurturing, stimulating, and health-promoting environments,³ access to health care, and high-quality educational opportunities.

During the last 20 years, research has revealed that while family income and education, neighborhood characteristics, and other social and economic conditions affect health at every stage of life, their effects on young children are particularly dramatic.⁴ Hardships in early childhood can set off a vicious cycle of inequities—leading to disadvantage in adulthood, and then to more



i “Parent” is used in this report to refer to any primary guardian or caregiver, including a grandparent or foster parent when appropriate.

disadvantage for the next generation, continuing the cycle.⁵ Too many children are at risk: 19.5 percent of children under age 6 in the United States live in poverty⁶ and 16.5 percent live in impoverished neighborhoods.⁷ Among affluent democracies, we have the highest rates of both child and overall poverty. We also consistently rank at, or near the bottom among affluent democracies on a range of health outcomes in childhood and in adulthood up to age 75.⁸ Fortunately, current knowledge tells us that it is possible to turn potentially vicious cycles of social disadvantage into paths toward good health and health equity by intervening early.

The diagram on page 9, which is not intended to be comprehensive, highlights a few examples of important pathways through which poverty and racism—when they affect early childhood—can lead to poorer health in adulthood. Parents' past experiences of poverty and/or racism may have stronger effects on a young child than current experiences.⁹ (The diagram does not illustrate the synergistic effects of poverty and racism that put impoverished American Indians, blacks, and Latinos at particular disadvantage.) These pathways— involving influences of poverty and racism on living conditions, stress, and early childhood development—are discussed below.

Poverty and Racism Limit Families' Options for Healthy Living Conditions

Poverty limits where families can live. Living conditions, such as housing and air quality, home and community safety, and food environments powerfully affect young children's health. For example, children exposed to lead-based paint, which most often affects lower-income families residing in substandard housing, are more likely to suffer from lead poisoning, which can lead to irreversible neurological damage. Children living in lower-income neighborhoods are more likely to be exposed to air pollution and other toxic substances, crime, violence, and injury.¹⁰ Both household budget constraints and high concentrations of convenience stores and fast-food outlets in low-income neighborhoods can thwart parents' efforts to provide nutritious food to their children.¹¹ Inadequate nutrition in early childhood increases the likelihood of childhood obesity,¹¹ which strongly predicts obesity in adulthood and the accompanying risks of chronic disease, disability, and premature death.

Children disadvantaged by poverty not only experience more unhealthy conditions; they also are less likely to experience the benefits of positive health-promoting conditions, such as high-quality early care and education; safe streets and green spaces for physical activity; healthy foods; and role models who engage in healthy behaviors. Unhealthy living environments can lower children's resilience by compromising their immune and emotional regulation systems.¹²

Structural racism denies people of color equitable access to healthy living conditions. Children in black, American Indian, and Latino families of all economic levels are often disadvantaged by structural (also called institutional or systemic) racism—race-based unfair treatment built into institutions, policies, and practices—as a historical legacy of discrimination that not long ago was overt and legal. This legacy persists regardless of whether any particular individual now consciously intends to discriminate.

Although it is no longer legal to discriminate in housing, the United States remains starkly segregated residentially along racial lines.¹³ Discriminatory housing and banking practices historically have relegated residents of largely minority areas to poorer housing and environmental quality, inferior schools, and poorer access to transportation—which is needed to have decent employment opportunities. Because of this history, segregated areas with high concentrations of people of color are often under-resourced. These disadvantages can accumulate and constrain families’ near- and long-term socioeconomic opportunities, which in turn limit their access to healthy living conditions.

The inequitable opportunities for good health experienced by children of color reflect not only greater exposure to health hazards, but also more limited opportunities to benefit from the positive health-promoting conditions in more advantaged neighborhoods. The health consequences of unhealthy conditions can accumulate across lifetimes and generations;⁵ as a result, young children can suffer the effects of racism experienced by their parents years or even decades ago.⁵ For example, poverty experienced by young children often reflects parents’ lack of educational opportunities due to racial discrimination when they were children and young adults.⁹

Definitions

Health refers to health status or outcomes rather than health care (which is only one of many important influences on health).

Health Equity Although *health equity* has become a familiar term in public health, there are many different ideas about what it means, and lack of a common understanding can be a barrier to effective action. For that reason, the first report in this series focused on defining health equity:

Health equity means that everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health, such as poverty, discrimination, and their consequences, including powerlessness; lack of access to good jobs with fair pay; quality education and housing; safe environments; and health care. For the purposes of measurement, health equity means reducing and ultimately eliminating disparities in health and its determinants that adversely affect excluded or marginalized groups.

Health Disparities are differences in health that adversely affect groups of people who historically have been excluded or marginalized (for example, people of color; people living in poverty; people with disabilities; LGBTQ persons; and girls/women). Health disparities are used to measure progress toward health equity.

Racism and Racial Discrimination are often used interchangeably. Some experts reserve racism to refer to the underlying system of beliefs and structures that produce racial discrimination, which is prejudicial treatment of people based on their racial or ethnic group.

Social In this report, *social conditions* and *social advantage*, etc., include economic, as well as psychosocial, socioemotional, and other social factors.

Poverty and Racism Can Create Chronic Stress for Children and Parents

Sustained poverty can create chronic stress for children and parents, with adverse consequences for children’s lifelong health. Biomedical research has linked economic and other social disadvantages in early childhood with chronic disease later in life.^{14,15} Physiologic damages associated with chronic stress, including inflammation⁵ and altered immune function,¹⁶ have been identified as likely contributors to depression, anxiety, cancer, diabetes, hypertension, and cardiovascular disease in adulthood.¹⁷ Experiencing multiple chronic hardships can produce *toxic stress*, defined by child development expert Jack Shonkoff as “strong, frequent, and/or prolonged activation of the body’s stress-response systems in the absence of the buffering protection of adult support.”¹⁷⁻²¹ When experienced during early childhood, toxic stress can harm normal brain and immune system development, impairing the body’s systems that help to manage stress. These changes can have damaging lifelong health consequences.¹⁷⁻²¹

Compared with higher-income households, lower-income households have more chronic stress at home and fewer resources to cope, both of which can negatively affect how parents interact with their children.²¹ Chronic stress among parents may therefore result in chronic stress among young children, for example, by creating distress and interparental conflict.²² Financial hardship creates stress that can impede the ability of even highly motivated parents to provide the supportive and stimulating home environments needed for optimal health and development in early childhood.^{1,3,23} The chronic stress of facing ongoing demands with limited economic resources also can create cognitive overload for parents, making it even more difficult for them to cope with parenting challenges. All of these factors can have adverse health consequences for a child.²⁴⁻²⁷

Racism can create chronic stress for parents of color of all economic levels. Racial discrimination—including unconscious or “implicit” biases and discrimination built into institutions and policies—is a major stressor for parents of color across all income and education levels. Among people of color with limited schooling and/or economic resources, it can add to the health-harming effects of poverty.^{28,29} Experiences of racial discrimination have been shown to trigger physiologic mechanisms involved in the body’s response to stressors in general.²⁹ These mechanisms can be triggered not only by overt or dramatic incidents, but also by chronic experiences¹⁹ that some observers may view as unintentional, subtle or ambiguous. Camara Jones has described three major levels of racism: (1) structural racism, defined above; (2) interpersonal racism, that is, discrimination carried out between individuals; and (3) internalized racism, which occurs when members of an excluded or marginalized group adopt the negative beliefs about themselves held by those who are prejudiced.³⁰ Chronic stress due to any cause, including racial discrimination, may make it more difficult for parents to provide optimal stimulation and support.

When experienced during early childhood, toxic stress can harm normal brain and immune system development, impairing the body’s systems that help to manage stress.

Poverty and Racism Can Compromise Children’s Development

Damage to development sustained in early childhood can have lifelong health consequences. Children’s early physical, cognitive, and socioemotional development provides the foundation for physiological and psychological processes that shape health in both childhood and adulthood.^{9,11} The brain grows faster between birth and age 3 than at any other time of life.²⁰ Early cognitive and behavioral development provides a foundation for later health outcomes, including cardiovascular disease, hypertension, diabetes, obesity, smoking, drug use, violence, and depression.^{17,20} Early developmental damage related to toxic stress can lead to difficulties paying attention and poor impulse control, which can hamper educational success and subsequent economic and social well-being as an adult.³¹⁻³³ Poor academic performance in kindergarten is linked with increased high school dropout rates,³⁴ which can lead to higher rates of delinquency and unemployment later in life.³⁵ Damages to cognitive and socioemotional development in early childhood also increase the risks of engaging in unhealthy behaviors,^{32,33,36} which can adversely affect lifelong health. Development of self-regulation—a person’s capacity to control their own emotions and behaviors—is thought to play a key role in these relationships.^{1,20}

Parents’ economic resources can affect the quality and stability of their relationships with their infants, which affect the cognitive stimulation their infants receive, with implications for emotional and behavioral development.^{17,20,21} Parental education and income have been shown to correspond to structural variations in children’s brain regions that are associated with spatial skills, language, reading, executive functions, and memory.³⁷ Middle-class, as well as poor children are often at a developmental disadvantage compared with their economically better-off counterparts.³⁸ Results of a large national study of children entering kindergarten showed that children in the lowest-income families were least likely to have the cognitive skills necessary for kindergarten, but children in middle-class families also performed less well than the most affluent children.³⁹

While differences in parents’ awareness of and responses to children’s developmental needs likely contribute to socioeconomic gaps in child development, affluent families are relatively protected from the kinds of financial stressors faced daily by less well-off families. Their resources also make it easier for them to provide cognitive stimulation to their children,^{17,20,21} for example, by hiring a trained nanny or paying for high-quality preschool. Researchers have estimated that by age 3, the average child in a professional family has heard 30 million more words than the average child in a family on public assistance.⁴⁰ Hearing more words enhances brain development,⁴¹ which in turn predicts school performance and economic and social opportunities in adulthood. Many working parents—including those in middle-income families—lack the economic resources to place their young children in high-quality child care and preschool settings that nurture and provide cognitive stimulation from



Middle-class, as well as poor children are often at a developmental disadvantage compared with their economically better-off counterparts.

personnel trained in child development. Maternal depression, which can inhibit mother-infant bonding and reduce a mother's ability to cognitively stimulate her infant or young child, is more prevalent among low-income mothers.^{42,43}

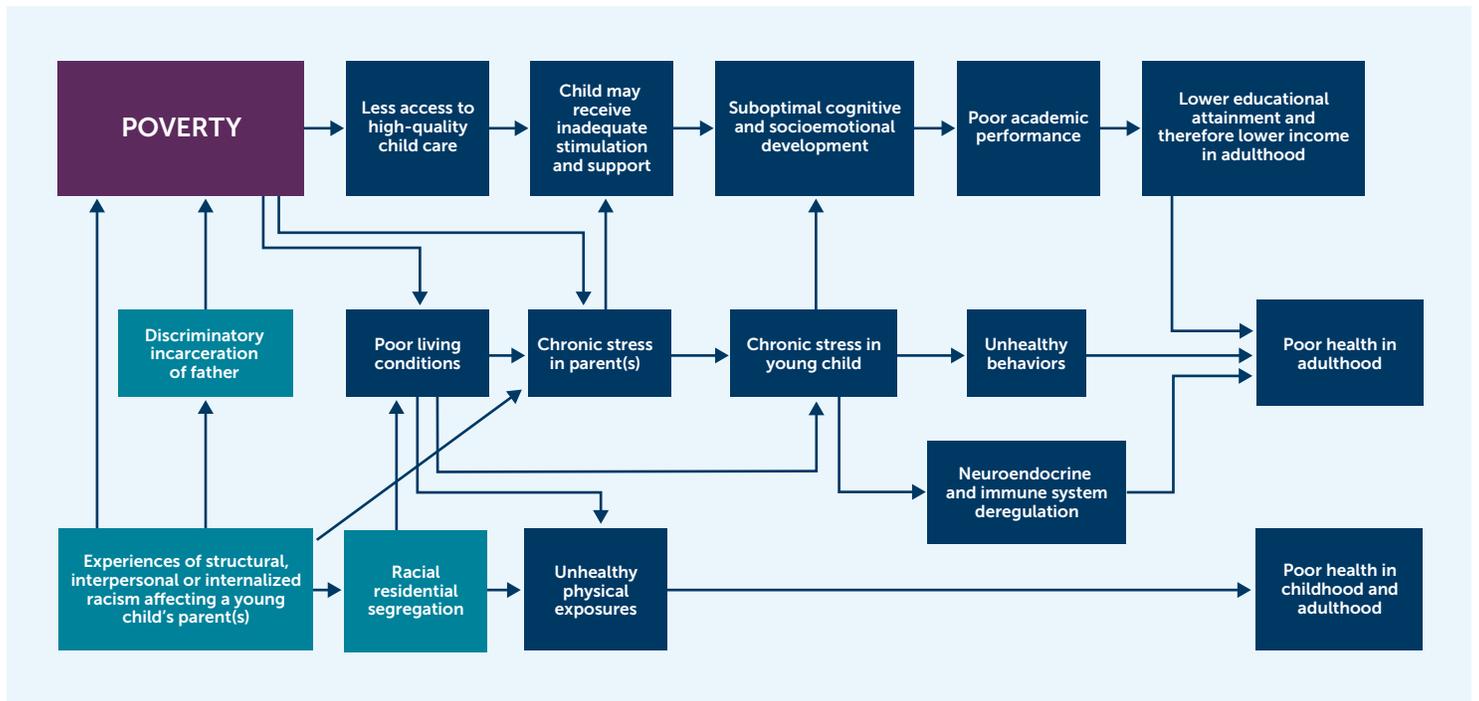
Without intervention, the socioeconomic gaps in cognitive and behavioral skills that are apparent when children enter kindergarten generally do not close. In fact, these gaps can grow even larger as disadvantaged children progress more slowly than children from higher-income and better-educated families. A large national study by the U.S. Department of Education of children who entered kindergarten in 2010 found that children from impoverished families not only had lower reading and math scores at the end of kindergarten than children at lower social risk, but also had experienced smaller gains in both these areas by the end of third grade.⁴⁴

Structural racism can negatively affect early childhood development in multiple ways. It can limit parents' wealth and educational attainment, for example, by relegating people of color to living in neighborhoods with little opportunity to escape poverty. In addition, as a result of implicit or structural bias, children of color are more likely than others to be expelled from preschool for behavioral issues—often arising from experiences of trauma—that warrant supportive social and mental health services rather than punishment.^{45,46} Excluding these very young children from preschool can compromise their cognitive and socioemotional development, limiting their future economic opportunities and affecting their health. Racially discriminatory criminal justice practices have deprived many children of their father's involvement in their early life and have had devastating economic consequences for families and communities.^{47,48}

Without intervention, the socioeconomic gaps in cognitive and behavioral skills that are apparent when children enter kindergarten generally do not close.



How Can Poverty and Racism Affecting Early Childhood Increase Risks of Worse Health Throughout Life?



Children living in poverty face increased risks of worse health throughout life. Experiences of racism often lead to poverty or low income, but can harm health in other ways as well. This diagram—not intended to be comprehensive—highlights examples of pathways through which the effects of poverty and racism, when those effects are experienced in early childhood, can lead to poor health in adulthood. (A limitation of the diagram is that it does not illustrate the synergistic effects of poverty and racism.)

Health Equity: We Can Set All Children on a Path Toward Lifelong Health

While social and developmental disadvantages in childhood can limit opportunities for good health across the lifespan, encouraging evidence points to multiple opportunities for intervention. Accumulated knowledge suggests the need to intervene at the policy level and in multiple domains, not simply with isolated programs. Intervening in early childhood has the potential to interrupt the inequitable cycle linking young children’s experiences of social and health disadvantage with social and health disadvantage throughout their lives.

Addressing Child Poverty and Structural Racism Is Crucial—and Possible

Poverty, discrimination, and their consequences are key obstacles to thriving in early childhood. The United States has the highest rates of both child and overall poverty among affluent nations. On average, we also have the worst health outcomes in childhood and until age 75.⁸ Other countries have seen declining child poverty rates and improved health outcomes across the life course after implementing deliberate social policies with a strong focus on early childhood. While keeping in mind unique features of the U.S. context, we can learn from the experiences of other countries with far less child poverty⁸—for example, through policies to provide a living wage or minimum income standard.^{49,50}

Although methodological limitations have been an issue, over 40 years of evidence links a range of early childhood interventions with both short- and long-term health and health-related outcomes.



To reduce child poverty and/or its deleterious consequences, we can also build on successful homegrown approaches. For example, policies intended to lift families with children out of poverty—such as the Earned Income Tax Credit (EITC) and the Child Tax Credit (CTC),^{51,52} show promise for advancing health equity across the lifespan.

While ensuring income support for struggling families is crucial, we should also strengthen an array of additional supports—including, for example, improved access to high-quality child care, housing, nutritional support, and medical and mental health care. Current knowledge about the links between housing and health indicates the crucial role that affordable housing initiatives can play in addressing the adverse health consequences of inadequate living conditions experienced by many children in low-income families. Research has documented many infant, child, and maternal health benefits of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)⁵³ and the Supplemental Nutrition Assistance Program (SNAP).⁵⁴ We can also consider how Medicare and Social Security have transformed the lives of the elderly—and their families—and ways in which those successes might inform interventions for young children.

Reducing poverty and strengthening supports and services for families will not be sufficient without committed efforts to end structural racism.

Structural (also called systemic or institutional) racism refers to structures—laws, other policies, and practices—that systematically and repeatedly put people of color at a disadvantage, even when no individual consciously intends to discriminate; racial residential segregation is a good example of this type of racial discrimination. Addressing structural racism requires multiple, reinforcing efforts focused on all of society, not just on young children and their families. While no single strategy can succeed on its own, there are many potentially worthwhile approaches to eliminating racism and building a more inclusive and just society—for example, criminal justice reform,⁵⁵ school desegregation,⁵⁶ and wealth-building investments in disadvantaged communities where many people of color reside⁵⁷—that should be tried and evaluated.⁵⁸⁻⁶²

Early Care and Education Can Also Help Narrow the Inequitable Gaps

More than 40 years of research links short- and long-term health and health-related outcomes with a range of early-care and education programs.⁶³⁻⁶⁷ Such programs are designed to provide young children with experiences that protect against the negative effects of the social and economic challenges they may face in their homes and neighborhoods. Some of the health benefits of these types of interventions include lower rates of negative outcomes, such as maternal and child mortality,⁶⁸ child injuries, child abuse/maltreatment, and later depression—as well as improved health-related behaviors, including better eating habits, reduced cigarette smoking⁶⁶ and marijuana use,⁶⁴ and better use of health services like screenings and immunizations.^{67,69}

Experimental and observational studies have also linked early care and education with favorable health outcomes by demonstrating their impact on later social outcomes that have well-established, important health consequences.⁷⁰ These outcomes include teen pregnancy; school performance; IQ; receipt of special education services; educational attainment; employment (of the child’s mother and of the child in adulthood); income; delinquency and criminal behavior; arrests; and incarceration.^{20,64,67,71,72}

The positive impacts of early care and education are apparent across social groups. Center-based programs that have included children from families of different income levels have shown favorable impacts among all participants, including middle-class children.⁷³ For disadvantaged children, high-quality child care, education, and family support programs appear to act as buffers against physical and psychosocial adversity by providing stability and stimulation for the children themselves and by strengthening their parents’ abilities to meet their developmental and health needs at home.⁷⁴

Despite greater need, access to promising interventions is often very limited among the socioeconomically disadvantaged families whose children would benefit most. For example, only 41 percent of children who are eligible for Head Start and only 4 percent of the infants and toddlers who are eligible for Early Head Start are enrolled, due to limited available slots.⁷⁵ There is a wide spectrum of child-care services, ranging from care provided by an untrained and unlicensed individual caregiver to care at licensed centers run by staff trained in promoting early childhood development. For low-income families, settings with unlicensed and untrained caregivers are often the only affordable and accessible option.

Although many positive health and health-related outcomes of center-based early care and education have been documented, more research is needed to identify the specific program components that are crucial to success. Current evidence suggests, however, that their effectiveness depends on a range of factors, including well-trained and responsive caregivers, small class sizes with high teacher-child ratios, safe and adequate physical environments, an age-appropriate curriculum focused on enhancing cognitive and socioemotional development, and comprehensive family engagement activities.



...high-quality child care, education, and family support programs appear to act as buffers against physical and psychosocial adversity...

Challenges in Evaluating Early-Care and Education Programs

Despite the promising findings, it should be noted that there are major methodological challenges in studying the health effects of early-care and education programs. Because childhood is a time of generally good health, the direct health benefits of such interventions can be difficult to demonstrate. The signs and symptoms of chronic disease—for example, heart disease, stroke, and diabetes—rarely become evident until middle to late adulthood, and few studies have had sufficient resources to follow program participants and comparison groups for that long. Much of the evidence, therefore, has not linked early childhood interventions directly with health; rather, it has required “connecting the dots” between early childhood interventions and later social outcomes—such as educational attainment, economic self-sufficiency, or incarceration—that are known to influence health.

In addition, while randomized, experimental studies are generally considered more rigorous than nonrandomized, observational studies, they usually

require more resources. Given both the expense and difficulty of studies that are both randomized and longitudinal, much of our knowledge about the effects of early care and education has been drawn from studies of a limited number of intensive programs.⁶³⁻⁶⁷ These studies have been limited by small sample sizes, participant attrition over time, and concerns about replicability.⁷⁶⁻⁷⁸ For example, a 2014 study found biomedical evidence that participants in a high-quality early-care and education program had lower risk for heart disease and diabetes as adults,⁶³ but its small sample size and high rate of loss-to-follow-up limit the conclusiveness of its findings.⁷⁸ Larger-scale programs, such as Head Start, have often had less consistent or dramatic results, particularly when participants are followed over time. Some Head Start programs, however, have shown both short- and long-term (although not necessarily intermediate-term) positive effects.⁷⁹ Overall, the results of these studies support a need to conduct larger and more rigorous longitudinal studies of outcomes from a wide range of promising programs.

Supporting Children Requires Supporting Families

Children live with adults. Addressing child poverty therefore requires reducing poverty in families (or households) with children, which may require different strategies than those that focus on services for children alone. Creating the political will to accomplish this will require changing the too-prevalent narrative that blames adult recipients of economic support for the adversity they face and how they cope with that adversity. It also will require recognizing that parents represent the most critical resource for ensuring that the next generation will be productive, prosper, and thrive.

While strategies to support families should include income support, other concerns must also be addressed. Even young children receiving full-time center-based services spend most of their time at home, where persistent stress can make it difficult for their parents to provide them with stable and nurturing care.²⁰ Although poverty is accompanied by particularly powerful stressors, even middle-class parents—especially those who are single—often face major challenges to optimal parenting.

Many successful early-care and education programs, therefore have included not only education and stimulation for children, but also support for parents to improve children’s experiences at home. Services for parents often include referrals to social services and center-based activities designed to help them develop or improve their parenting skills. Some programs do considerably more, such as helping parents continue with schooling, find work or job training, and enhance their self-efficacy and life skills.^{69,80,81} Some programs provide such support through home visits from paraprofessionals or registered nurses.^{67,80,81} In others, pediatric primary care sites serve as entry points for parental services that can benefit children, such as take-home play activities that facilitate positive parenting behaviors,⁸² dietary counseling,⁸³ and referrals to community resources.⁸⁴ The American Academy of Pediatrics has issued a policy statement urging providers to screen for maternal depression, parental substance abuse, domestic violence, and other family- and community-level factors that put children at risk for toxic stress, and to complement such screenings with “a greater focus on those interventions and community investments that reduce external threats to healthy brain growth.”⁸⁵ Similarly, a growing number of communities have coordinated early care and education with health and support services for children and families. While most programs target mothers, some also have recognized the need to provide more support for fathers, including providing access to mental health and social services and reducing institutional barriers (such as discriminatory criminal justice practices) to paternal involvement.⁸⁶⁻⁸⁸



Although poverty is accompanied by particularly powerful stressors, even middle-class parents—especially those who are single—often face major challenges to optimal parenting.

Although parental leave is not often considered to be an early childhood intervention, flexible and paid time off options for parents have been associated with significant reductions in adverse outcomes, including maternal stress and depression,⁸⁹ low birthweight, and post-neonatal and early childhood mortality.^{90,91} Parental leave may promote early childhood development by reducing obstacles to positive parent-child interactions and breastfeeding, both of which have been linked with improved neurocognitive development.^{92,93} Breastfeeding is also associated both with lower frequency and severity of childhood diseases, such as respiratory infections and asthma.⁹³ Parental leave can have long-term benefits for children, including higher educational attainment and earnings in adulthood, especially when mothers have limited schooling.⁹⁴ The United States is the only industrialized country that does not guarantee paid time off after a birth or adoption;⁹⁵ low-wage workers are far less likely to have paid parental leave than higher earners.⁹⁶

No Single Solution, But a Range of Promising Approaches

A range of knowledge-based policies and programs can help families with otherwise limited opportunities improve their children's prospects for lifelong health and well-being. Current knowledge tells us that no single strategy will be enough; multiple, mutually reinforcing efforts are needed. We know isolated programs are not enough, and that effective solutions will require changes at the structural and institutional levels. Even for programs and policies that have been studied extensively, more research is needed to determine how they can be most effectively and efficiently implemented, particularly on a large scale. Examples of the following types of policies and programs are briefly described in Section 5.ⁱⁱ

- **Center-based early-care and education programs** to improve children's cognitive, socioemotional, and physical development, particularly when accompanied by significant supports for parents;
- **Home-visiting programs** serving pregnant and/or postpartum mothers and their infants/toddlers through visits to the home by professionals and/or paraprofessionals that provide timely help with physical and cognitive development;
- **Initiatives to strengthen systems of care and education** for young children by promoting coordination across multiple programs and sectors;
- **Efforts at pediatric medical care sites** to refer parents to social services or to promote positive parent-child interaction and family stability; and

The United States is the only industrialized country that does not guarantee paid time off after a birth or adoption.

ii Child care (or "day care") is not included in this report's list of policies and programs because child-care settings that focus on promoting early childhood development would be categorized as center-based early-care and education programs.

-
- **Broad economic and social policies/programs**, such as tax credits, affordable and fair housing initiatives, community development, nutritional supports for low-income families, and initiatives to eliminate racial discrimination. Although not exclusively focused on early childhood, such efforts may substantially reduce the economic and social inequities that underlie inequities in health throughout life.

Many programs and policies that seek to promote early childhood health and development have been evaluated, although with varying levels of rigor. In late 2017, the RAND Corporation released a comprehensive 232-page report, *Investing Early: Taking Stock of Outcomes and Economic Returns from Early Childhood Programs*, that systematically assesses 115 programs for which suitable health data were available; economic outcomes also were formally evaluated for 25 of these programs.⁶⁹ That report is the most comprehensive and up-to-date assessment of early childhood programs to date.



The Business Case for Investing in Early Childhood

Investments in Early Childhood Will Likely Translate Into Long-Term Economic Savings and Security for Society

A larger investment in early childhood would benefit the overall U.S. economy by producing healthier, better-educated, and therefore more productive adults in the future. Without precisely quantifying the benefits, current knowledge tells us we can expect favorable returns—in both human and economic terms—on investments in evidence-informed programs and policies affecting young children and their families. Children who participate in high-quality early childhood programs are more likely to have the necessary skills—such as emotional regulation, abstract reasoning, problem solving and communication—to meet the demands of tomorrow’s workforce. Children who have participated in center-based early care and education are more likely as adults to be healthy and have higher earnings and less likely to commit crime and receive public assistance.^{63,97,98} These benefits translate into tremendous savings for society. Several major national business organizations [for example, the Committee for Economic Development (CED), PNC Financial Services Group, and the Business Roundtable] and prominent economists (for example, Arthur Rolnick and Rob Grunewald of the Federal Reserve Bank of Minneapolis and Nobel Laureate James Heckman of the University of Chicago) have called for universal preschool as a wise financial investment and an essential means of achieving a productive—that is, healthy and educated—U.S. workforce for the future.⁹⁹⁻¹⁰²

Costs of early-care and education programs vary according to many factors, including program design, duration, location, and children’s age; younger children require higher staff-child ratios. The average annual cost per family of evidence-based home-visiting programs is \$6,583, but ranges from \$2,122 to \$13,963.¹⁰³ Annual per-child spending for Early Head Start and Head Start programs averages \$12,757 and \$8,038, respectively.¹⁰⁴ The Educare program has an average cost of \$4,000 per child per year of participation,¹⁰⁵ while estimates for the universal Pre-K program in Tulsa, Okla., range from \$8,255 to \$9,838.¹⁰⁶ The more important consideration, however, should be the return on the investment.

While estimates have varied, many experts have concurred that the rate of return on investment in early-care and education programs is significant and favorable. Even without considering the impact of reducing child poverty, estimates of the expected rate of return on investment in preschool programs have ranged from \$2.88 to \$17.07 for every \$1 spent, depending on the program and the length of follow-up.^{67,107} These returns result from savings due, for example, to “less need for special education services, improved high school graduation rates, higher earnings, and less criminal activity in adulthood.”¹⁰⁸ A 2010 paper by Heckman and others estimated rates of return between 7 and 10 percent, which is “above the historical return on equity,” that is, capital investment.¹⁰⁰ RAND senior economist Lynn Karoly recently stated that such estimates might be too high. Consistent with Timothy Bartik and colleagues who estimated benefit-to-cost ratios for the Tulsa, Okla., Pre-K program,¹⁰⁹ Karoly argues that expected returns of \$3 to \$4 for every dollar spent may be more realistic.¹⁰⁸ The Nurse-Family Partnership (NFP), a nationwide home visiting program, was estimated to have prevented 684,000 crimes committed by youth and 36,000 youth arrests, and to have reduced Temporary Assistance for Needy Families (TANF), SNAP, and Medicaid spending by \$3 billion from 1996–2013; by comparison, the program costs for that timespan totaled \$1.6 billion.¹¹⁰

Investments in early childhood must focus not only on providing early-care and education services, but also on ensuring that children grow up in health-promoting homes, schools, and neighborhoods.

Investments in early childhood must focus not only on providing early-care and education services, but also on ensuring that children grow up in health-promoting homes, schools, and neighborhoods, which requires addressing poverty and structural racism. Although difficult to quantify, the lifelong health impacts of strategies to reduce (and/or buffer the effects of) childhood poverty are likely to be substantial. Low-income children whose families benefit from expanded state or federal EITCs are more likely to attend college. In addition, “for each \$3,000 a year in added income that children in a poor family receive before age 6 ... that their working hours rise by 135 hours a year between ages 25 and 37, and their annual earnings rise by 17 percent.”⁵² Each dollar spent on a pregnant woman in WIC is estimated to save up to \$4.21 in Medicaid costs for her and her newborn.¹¹¹

Investments in early childhood living conditions, care, and education also may have significant national security benefits. Currently, 71 percent of Americans between the ages of 17 and 24 do not qualify for military service because they are too overweight, lack a high school diploma, and/or have a criminal record or drug abuse history.¹¹² By helping children maintain a healthy weight, succeed in school, avoid crime, and refrain from drug abuse, effective early childhood interventions may increase the military recruitment pool—ultimately enhancing our military readiness and boosting national security.¹¹²

How Have Early-Care and Education Programs Been Financed?

A wide range of approaches have been used to finance early care and education. Head Start is federally funded. Georgia's Pre-K Program is financed through lottery funds, and now offers preschool free of charge to all 4-year-olds. Oklahoma's Universal Pre-K Program is funded through the state's school finance formula, as is the Abbott Preschool Program in New Jersey. Pennsylvania's Pre-K Counts program is supported primarily by the state but also receives support from a public-private partnership that includes leading foundations. Educare schools rely on a blend of city and state sources with additional resources from philanthropies. Minnesota awards approximately 8,000 state-funded Early Learning Scholarships annually to eligible 3- and 4-year-olds; economists of the Minneapolis Federal Reserve Bank have advocated

for blended public-private funding of scholarships to expand coverage. Denver sets aside a percentage of sales tax revenue to help low-income families pay for preschool and to improve preschool quality. San Antonio also enacted a sales tax increase to make Pre-K services essentially free for households at or below median income. In Salt Lake City, Goldman Sachs, the United Way, and the Pritzker Family Foundation created a social impact bond initiative to expand access to early care and education.¹¹³ The Nurse-Family Partnership receives federal support, including Medicaid, Title IV-B Child Welfare Services, Title V, and IDEA Part C. The Affordable Care Act allocated \$1.5 billion over five years to aid states in the implementation of evidence-based home visiting programs.¹¹⁴

A Call to Action: Investing in Early Childhood Is Key to Achieving Health Equity

Based on current knowledge, we can expect large returns—in both human and economic terms—on investment in effective early childhood policies and programs. We must, however, be willing to accept that this represents long-term investments, with benefits that may not be measurable for years or even decades—a reality that can be politically problematic for policymakers facing pressure to demonstrate short-term “accountability” for spending.

If we can take the long view, current knowledge tells us that investing in improving children’s health, well-being, and development at the beginning of life is a wise business decision as well as a social and ethical imperative. The evidence is clear that we need systematic national, state, and local investments and policies to give all children the chance to reach their full potential for health and well-being. These efforts must focus attention on not only providing early-care and education services, but also more broadly on achieving equity in the social and economic resources and opportunities that powerfully shape health in early childhood and throughout life.

Reducing child poverty, eliminating structural racism, and providing universal high-quality early care and education nationwide will be essential for breaking the cycles of disadvantage that create and perpetuate enormous health disparities across lifetimes and generations.

Although many examples of promising interventions have been identified in the United States and other countries, the availability of such interventions is limited—particularly for the socioeconomically disadvantaged families whose children would benefit most. We also must invest in research to determine the most effective and efficient methods for implementing approaches under diverse conditions and on a larger scale in the United States. Unanswered questions remain, and the only way to fill in current gaps in knowledge and practice is by rigorously testing the most promising approaches and then using the results to inform policies. Our children’s futures, and our nation’s future, are at stake.

We also must invest in research to determine the most effective and efficient methods for implementing approaches under diverse conditions and on a larger scale in the United States. Unanswered questions remain, and the only way to fill in current gaps in knowledge and practice is by rigorously testing the most promising approaches and then using the results to inform policies.

Examples of Promising Policies and Programs

Note: The descriptions of policies and programs presented here are largely drawn from the relevant agencies' own descriptions; the content has not been independently verified by the authors.

Early Care and Education: Center-Based

- **The High/Scope Perry Preschool Project** in Ypsilanti, Mich., was an experiment from 1963 to 1967 that provided high-quality preschool education to 58 low-income black children at risk for school failure. The intervention consisted of daily classroom instruction by certified public school teachers and weekly home visits to every mother and child. Data were collected annually on the participants and a control group from ages 3 through 11 and then later at ages 14, 15, 19, 27, and 40. The robust longitudinal data showed that High/Scope participants consistently outperformed controls on numerous measures of educational attainment, economic performance, family relationships, and health, and were significantly less likely to be involved in criminal activity. High/Scope remains well known for its small child-teacher ratios (averaging 6:1) and heavy emphasis on active learning; its curriculum is still implemented in many preschools across the country today.



-
- **The Carolina Abecedarian Project** was a preschool intervention experiment targeting disadvantaged children in North Carolina from 1972 to 1985. Fifty-seven children from low-income households were randomly assigned to receive high-quality, full-time early education from infancy through age 5. In addition to a game-based educational curriculum focused predominantly on cognitive and language development, children and their families received on-site pediatric health care, nutritional supplements, disposable diapers, and social work services. Follow-up studies conducted through age 35 demonstrated numerous long-lasting advantages compared with a control group. For example, Abecedarian participants were more likely to obtain university degrees, maintain employment, report fewer depressive symptoms, and have better physical health than those assigned to the control group.^{63,115}
 - **The Child-Parent Centers (CPC)** program in Chicago was created in 1967 through funding from the Elementary and Secondary Education Act of 1965. The program coordinates education with intensive family support services for low-income children and their families from preschool through early elementary school. After Head Start, the CPC program is the second oldest federally funded early childhood program in the country. Eligibility is based primarily on neighborhood poverty and the degree of educational need as determined through screening interviews with CPC staff. The key elements of the program include early intervention; a systematic approach to learning language and basic skills; program continuity from preschool through the early school years; and parent involvement. A hallmark of the program is that parents must commit to spending one half day per week in the classroom.¹¹⁶ Many studies conducted over the last three decades have documented positive outcomes associated with CPC participation, such as improved school readiness, test scores, and economic well-being; and reduced rates of parental depression, child abuse, special education placements, grade retention, delinquency, and high school dropout.^{67,98}
 - **Head Start**, created in 1965, provides low-income families with early learning and other support, such as health, nutrition, and other services determined by family needs assessments. The program is funded through federal grants to nearly 1,600 local community organizations. Head Start encompasses Head Start center-based preschool programs as well as **Early Head Start** programs, which serve infants, toddlers, pregnant women, and families through home visiting, center-based care, and family child care. The goal of Head Start is to promote children's development, good parenting, and parental self-sufficiency. In 2010, an assessment released by the federal government found the quality of Head Start programs to be inconsistent. As a result, in November 2011 the U.S. Department of Health & Human Services implemented tougher rules for low-performing Head Start grantees. These rules require grantees that fail to meet benchmarks to re-compete for continued federal funding if deficiencies are discovered in their onsite

reviews; if they fail to establish and use school-readiness goals for children; or if children perform poorly in the classroom. Recent research has linked Head Start participation with numerous benefits known to predict better health, including lower high school dropout, crime, and teen birth rates.⁶⁹

- **Educare** is a network of state-of-the-art, full-day, year-round schools across the country providing at-risk children from birth to age 5 with comprehensive programs and instructional support that build skills and the foundation for successful learning. The program is funded through public-private partnerships and currently operates 20 sites serving 140–200 children each.¹¹⁷ The goal is to prepare children who are growing up in poverty to enter kindergarten on par with children from middle-income families. Program evaluations show that Educare children have more extensive vocabularies and are better at recognizing letters, numbers, and colors than non-Educare peers. Educare-enrolled children also develop stronger social skills, including self-confidence, persistence, and acceptable ways to manage frustration. The Educare Chicago Follow-up Study found that children’s socioemotional and concept-development gains had not faded out or diminished at the end of 3rd grade.¹¹⁸
- **The Abbott Preschool Program** in New Jersey provides children ages 3 and 4 in 31 high-poverty urban school districts with high-quality early childhood education. The program operates in a variety of settings, including public schools; private child-care centers; and Head Start agencies, and meets quality benchmarks, including certified teachers; low child-teacher ratios; and research-based curricula. Abbott Preschool sites receive funding through a state initiative adopted in 2008. Abbott programs operating in Head Start classrooms receive Abbott resources to supplement their federal funding in order to meet the Abbott quality benchmarks. While the program serves approximately a quarter of New Jersey’s children, recent data show that enrollment numbers are falling behind the growing number of eligible children in the Abbott districts; the number of eligible children not enrolled rose from 4,000 in the 2010–2011 school year to over 5,700 in 2013–2014.¹¹⁹ A 5th-grade follow-up study found lasting results: the program was linked to significant improvements in language arts and literacy, math, and science performance, and reduced rates of grade retention and special education placement.¹²⁰
- **Pennsylvania’s Pre-K Counts Program**, established by the state Department of Education, makes pre-kindergarten opportunities available to approximately 19,000 children and families across the state, providing families with a choice of pre-kindergarten options in a Head Start center, school, or child-care center that meets specified criteria. Eligible families earn less than 300 percent of the federal poverty line.¹²¹ The program builds on the work of the Pre-K Counts Public-Private Partnership for Educational Success, a three-year project funded by leading Pennsylvania foundations and supported by



the Commonwealth of Pennsylvania. Early results from the Pre-K Counts public-private initiative found that children’s early learning improved. At the beginning of the 2010–2011 school year, fewer than one in four of the 11,500 children in Pennsylvania Pre-K Counts classrooms had age-appropriate skills; by the end of the year, approximately three in four Pre-K Counts children showed age-appropriate language, math, and social skills.

- **Oklahoma’s Universal Pre-K Program**, created in 1998, enrolls 74 percent of the state’s 4-year-olds. The program is funded by state and local dollars and is offered in 99 percent of school districts statewide.¹²² Districts are also permitted to (and often do) use their Title I funds to pay for the program. Public schools may operate classrooms themselves or subcontract with other classroom providers, allowing the program to also operate in private child-care centers and Head Start centers. A rigorous evaluation of Universal Pre-K in Tulsa (Oklahoma’s largest school district) found that children in the program experience, on average, a 16 percent increase in language and cognitive test scores. Hispanic children reap the greatest benefit from the program, with an average 54 percent increase in these domains.¹²³
- **New York City’s Pre-K for All** initiative used funds from the New York State budget to expand the city’s universal pre-kindergarten (UPK) beginning in the 2014–2015 school year. The city spends approximately \$10,000 per child. The expansion nearly tripled the number of pre-kindergarten seats in just two years. Currently about 70,000—or 60 percent of the city’s 4-year-olds—attend full-day, high-quality UPK programs free of charge. Children are matched to classrooms in public schools and New York City Early Education Centers based on parental preferences and geographic proximity. Almost two-thirds of Pre-K for All enrollees come from households at or below the city’s median income. Data from the 2015–2016 school year show that UPK classrooms in district schools meet classroom quality benchmarks associated with improved student outcomes, and UPK classroom quality scores are higher than the National Head Start average.¹²⁴ Building on the success of Pre-K for All, the city now plans to offer free, full-day pre-kindergarten to all 3-year-olds within the next 4 years.¹²⁵



Early Care and Education: Home Visiting

- **The Nurse-Family Partnership** uses nurses to conduct ongoing home visits with low-income, first-time mothers from pregnancy until the child is 2 years old. Visits focus on the health of both mothers and infants and on addressing social and psychological needs. Research indicates the program has significant effects on reducing very preterm births (23–31 weeks);⁸¹ child abuse and neglect; arrests and convictions; and improving children’s test scores.⁶⁷ The Nurse-Family Partnership is supported by numerous federal, state, and local agencies, as well as by some of the nation’s leading philanthropic organizations. The program currently serves 33,476 families nationwide and has worked with 256,751 families since replication began in 1996.¹²⁶
- **Child First** uses home visits and a network of community services to prevent and repair the effects of early childhood adversity. The program targets vulnerable children up to age 6 who exhibit developmental or emotional problems or who have parents facing multiple serious challenges. The program model is based on the latest research on brain development, which shows that extremely high-stress environments, such as those marked by poverty, domestic violence, or substance abuse, can harm the developing brain of a young child. The program offers services and supports aimed at strengthening the parent-child relationship, reducing maternal depression and stress, and improving children’s socioemotional and language development. Data from 2010–2016 revealed that 87 percent of children and families improved in at least one of these domains; 70 percent in at least two of these domains; and 53 percent in at least three of these domains.¹²⁷ Child First currently operates out of 23 affiliate not-for-profit agencies throughout Connecticut, North Carolina, and Florida, and the program has received replication inquiries from 25 U.S. states. It receives funding from state and local government and philanthropic foundations.
- **Healthy Families America (HFA)**, launched in 1992, is a voluntary, evidence-based, nationally recognized home visiting program for families at risk of child maltreatment, such as those with low income; a history of child abuse; or current or previous substance abuse; mental health; or domestic violence problems. Families are offered one home visit per week until their child is 6 months old; from then on visit frequency is determined by the individual family’s needs and progress over time.¹²⁸ HFA currently serves around 100,000 families in over 550 sites in 37 states, Washington, D.C., American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the U.S. Virgin Islands, and Canada.¹²⁹ Evaluations link HFA participation with mothers furthering their education; reducing their alcohol consumption; reducing their likelihood of having a low birthweight infant; and being less likely to perpetrate child abuse; and with children in HFA having improved cognitive and behavioral development.¹³⁰



-
- **Parents as Teachers (PAT)** is a nonprofit organization that provides parenting support and information through home visits by certified parent educators from pregnancy through kindergarten entry. Participating families also have access to group meetings, developmental, health, hearing and vision screenings, and connections to community resources. Over 1,000 PAT affiliate organizations currently operate in a range of settings—such as child-care centers, hospitals, health departments, and government agencies across the United States and six other countries. The program is estimated to have served more than 160,000 U.S. children and families. Evaluations have linked PAT with earlier diagnosis of developmental delays and health issues; improved school readiness; and increased parental knowledge, skills, and involvement in children’s schooling.¹³¹
 - **Family Spirit** is a home visiting program specifically designed for pregnant women and families in American Indian communities with children younger than age 3. The model incorporates traditional tribal teachings throughout its curriculum, and intends to promote parenting, coping, and problem-solving skills. Paraprofessional health educators who are from the participating community and are familiar with the tribal culture, traditions, and language conduct visits. The program has been associated with significant improvements in children’s development and school readiness, maternal health, and positive parenting practices.¹³²

Initiatives to Strengthen Systems of Care and Education

- **The Early Childhood Comprehensive Systems (ECCS) Impact Collaborative Innovation and Improvement Network (CollIN)**, funded by the Maternal and Child Health Bureau of the Health Resources and Services Administration (HRSA) in the Department of Health & Human Services, is a multiyear effort to improve early childhood systems in 12 states. The grant program utilizes a CollIN strategy to “enhance early childhood systems building and demonstrate improved outcomes in population-based children’s developmental health and family well-being indicators.” Up to five communities within each state are chosen to participate. The ECCS CollIN’s coordination center uses “collaborative learning; identification of core indicators/benchmarks; implementation of coordinated strategies; rapid tests of change; and real-time data and collective impact principles” to improve results for families.¹³³
- **The Early Childhood Learning and Innovation Network for Communities (EC-LINC)** is dedicated to creating and strengthening coordinated community-based networks of health, education, and family support services. With philanthropic support, the initiative creates opportunities for local leaders and policymakers to collaborate on aligning family and child services through 6- to 8-month-long Learning Labs. In 2016, EC-LINC coordinated four “Research to Action” projects with support from an anonymous donor. See [summaries of these projects](#). There are currently 10 EC-LINC communities in seven states that have developed exemplary early childhood systems; information about each of these communities is available through links on the [EC-LINC website](#).

-
- **The Cradle to K Cabinet in Minneapolis** was established in 2014 to develop an action plan to eliminate racial and geographic disparities among the cities' children prenatally to age 3. The Cabinet was charged with determining expansion opportunities and gaps and with assisting in coordinating the city's early childhood system so that services would be better aligned and more widely accessible to families in need. Following a series of meetings and community forums, the plan was finalized in 2015; it called for improvements to housing stability and safety; access to high-quality, center-based child care; child mental health screening and treatment; and job counseling for young parents. The Cabinet is currently working on an Implementation Plan to determine funding estimates and to align key stakeholders that have already been working to enhance early childhood development, including community partners, parents, businesses, nonprofits and health care providers.¹³⁴
 - **The Early Childhood Leadership Commission (ECLC) of Colorado**, established in 2010, is comprised of 20 individuals representing a range of early childhood advocates and leaders—including parents; early childhood professionals; staff of Head Start; school districts; local municipalities; foundations; other nonprofits; businesses; and numerous state agencies. The Commission aims to assist with and monitor the alignment of programs and services for young children and their families, make policy recommendations, and develop and monitor efforts to improve access to and quality of supports for pregnant women and children ages 0 to 8. The ECLC released its fifth annual report in 2016, which highlighted achievements—including (among many others) developing an online tool for early childhood professionals to share and coordinate their work; measuring the scope and reach of early childhood provider messages targeting parents and caregivers; and raising funds to support the implementation of a children's mental health initiative.¹³⁵



Efforts at Pediatric Medical Care Sites

- **HealthySteps** is transforming pediatric primary care by promoting the well-being of parents, as well as children. During visits to participating pediatric primary care sites, HealthySteps specialists are available to answer parents' questions about developmental milestones and parenting challenges. They also provide home visiting support when needed, referrals to community resources, information about parent support groups, and helpful written materials. Every year, HealthySteps serves over 30,000 children across more than 100 pediatric and family care sites in 15 states. HealthySteps sites receive a mix of public and private funding, including from Medicaid, Children's Health Insurance Program (CHIP), private payer reimbursements, and local foundations. Participation has been linked with children being more likely to receive vaccinations and screenings on time, and parents being more likely to provide infants with age-appropriate nutrition, follow recommended child-safety guidelines, use positive parenting practices, and engage in early literacy-enhancing activities with their children.¹⁴⁰ HealthySteps was judged effective on many outcomes in a meta-analysis evaluating 48 studies.¹⁴¹
- **Reach Out and Read** is an intervention in which pediatricians prescribe books and reading aloud to promote language-rich parent-child interactions; it is currently utilized in more than 5,800 sites across the country. The intervention is estimated to reach 4.7 million young children and their families every year, including 25 percent of the nation's children living in poverty. The program is funded through charitable contributions and governmental agencies. Reach Out and Read has been linked with parents being more likely to read to their children and at greater frequency; and with increased brain stimulation and vocabulary growth among children,¹⁴² with children's language development improving by 3–6 months.¹⁴³ Elizabeth Peacock-Chambers and others concluded that pediatric practice-based literacy interventions in general were "consistently associated with more [parental] reading out loud and better child language outcomes."¹⁴¹
- A meta-analysis of pediatric practice-based interventions for early childhood development concluded that several **group-based behavioral interventions** (Incredible Years, Positive Parenting Program, Parent-Child Interaction Therapy, and PriCare) were associated with improved child behaviors and more positive parenting" (but other behavioral interventions were ineffective).¹⁴¹



Economic and Social Policies/Programs

- **The Child Tax Credit (CTC)**, enacted in 1997 and expanded in 2001, is a federal tax credit that aims to help working families who earn at least \$3,000 annually offset the costs of raising children. The CTC phases out at higher levels of income than the EITC, helping not only low- and moderate-income families but also most middle- and upper-middle-income families. CTC enrollees are refunded 15 percent of their earnings up to the maximum value of \$1,000 for each child under the age of 17. Although the CTC is much more recent than the EITC and has not been rigorously evaluated, it is credited with lifting 1.6 million children out of poverty and lessening poverty for an additional 6.6 million children in 2015.^{51,136}
- **The Earned Income Tax Credit (EITC)**, enacted in 1975 and expanded periodically since 1986, is a federal tax credit for low- and moderate-income working Americans. The EITC, which increases for each additional dollar of earnings until hitting a maximum value, has lifted millions of families and individuals out of poverty by creating an incentive to leave welfare for work and encouraging low-wage workers to work more hours. In 2015, more than 26 million working individuals and families received the EITC. In addition to the federal credit, 26 states and the District of Columbia have established their own EITCs. While EITC is not restricted to families with young children, research indicates that the EITC supports children's development; specifically, increased EITCs have been linked with improved infant birthweight; reductions in premature births; higher test scores in elementary and middle school; and increased college enrollment.⁵¹
- **The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)**, created in 1972 by an amendment to the Child Nutrition Act of 1996, provides federal grants for supplemental food and nutrition education, as well as screening and referrals to health, welfare, and other social services for low-income pregnant women, breastfeeding and non-breastfeeding postpartum women, infants, and children up to age 5. To qualify for the program, applicants must have at least one medical or dietary condition that meets WIC's criteria for nutritional risk—such as anemia, underweight, history of pregnancy complications, or an unhealthy diet. The program is currently administered in approximately 47,000 local agencies such as schools, hospitals, public housing sites, and community centers. WIC served 7.7 million people each month in 2016, including 3.98 million children and 1.88 million infants.¹³⁷ WIC has been associated with enhancements in child food security¹³⁸ and in receipt of important preventive medical services among at-risk children up to age 5.⁵³

-
- **The Supplemental Nutrition Assistance Program (SNAP)**, formerly the Food Stamp Program, provides nutrition supplements to low- and no-income individuals and families, and currently provides greater nutrition assistance to low-income children than any other federal program. SNAP benefits are accessed through a specialized debit card system that can be used at food retailers, including supermarkets, convenience stores, and farmers' markets. The program has strict requirements for applicants to prove their eligibility and utilizes a benefit structure that ensures that the greatest assistance is concentrated among those with the greatest need. Approximately 32 percent of children in the United States participate in SNAP and the majority (69 percent) of SNAP beneficiaries are families with children. SNAP was credited with reducing the child poverty rate by 6 percent in the average year from 2000–2011, and with keeping approximately 4.9 million children out of poverty in 2012.⁵⁴ A recent study found that, compared with similar children who did not have access to SNAP during early childhood, children enrolled in SNAP in early childhood had a lower prevalence of stunted growth, heart disease, and obesity, and a nearly 20 percent increase in high school completion.¹³⁹ Like the EITC, SNAP is not directed exclusively at families with young children, but benefits 32 percent of U.S. children ages 0–4 and 30 percent of children ages 5–11.⁵⁴

Resources

The following organizations—and many others—have produced practical tools and resources designed to help decision-makers, service providers, and/or families design, implement, and evaluate initiatives to achieve greater health equity in early childhood. (Relevant resources can generally be found by searching for an organization’s name and adding “early childhood” and/or “equity” as a search term.)



- **Alliance for Early Success** provides helpful data and communications resources for improving state early childhood policies. www.earlysuccess.org (Accessed October 12, 2017)
- **BUILD Initiative** helps state leaders create early childhood development systems with a focus on “equity, quality and the connections between systems.” It provides practical toolkits for community systems and for promoting diversity-equity and family engagement. www.buildinitiative.org (Accessed October 11, 2017)
- **Center on the Developing Child at Harvard University** provides a range of resources (including both scientific material and nontechnical material for the general public and decision-makers)—including briefs, reports, multimedia resources, presentations, and tools and guides for science-based innovation in early childhood policy and practice. www.developingchild.harvard.edu (Accessed October 11, 2017)
- **Center for Education Innovations** provides a database of early childhood development programs, as well as early childhood development blogs and an Early Learning Toolkit with practical resources for working in early childhood settings, schools, and communities. www.educationinnovations.org (Accessed October 11, 2017)
- **CDC’s Community Guide** has produced reviews of interventions to reduce socioeconomic and racial/ethnic health inequalities, including center-based early care and education. www.thecommunityguide.org (Accessed October 12, 2017)

-
- **Docs for Tots**, a pediatrician-led nonprofit organization, “creates linkages between doctors, policymakers, early childhood practitioners, and other stakeholders to ensure that children grow up healthy” and offers numerous resources for doctors, advocates, early childhood providers, and parents. www.docsfortots.org (Accessed October 11, 2017)
 - **The Early Childhood Data Collaborative** “supports state policymakers’ development and use of coordinated state early-care and education (ECE) data systems” so that they can “improve the quality of early-care and education (ECE) programs; improve the training and quality of the early childhood workforce; increase access to high-quality ECE programs for all families; and improve child outcomes.” www.ecedata.org (Accessed October 11, 2017)
 - **The Heckman Equation**, a project by Nobel Laureate economist James J. Heckman, provides graphics, academic papers, research summaries, and presentations useful for making the case for investing in quality early childhood education for disadvantaged children. www.heckmanequation.org (Accessed October 11, 2017)
 - **The Ounce of Prevention Fund** provides resources for advocates and parents, such as an Early Childhood Advocacy Toolkit and a Quality Early Learning Program Checklist. www.theounce.org (Accessed October 12, 2017)
 - **The Raising of America** is a five-part documentary series with accompanying tools, including an Action Toolkit, to “illustrate how a strong start for all our kids can lead to better individual outcomes AND a healthier, safer, more prosperous and equitable America.” www.raisingofamerica.org (Accessed October 12, 2017)
 - **ZERO TO THREE** provides a range of practical resources and tools for parents to foster positive relationships with their children, and for policymakers and advocates to advance policies that strengthen and support families, caregivers, and early childhood professionals. www.zerotothree.org (Accessed October 12, 2017)

References

1. Blair C, Raver CC. Poverty, stress, and brain development: New directions for prevention and intervention. *Acad Pediatr*. 2016;16(3):S30-S36.
2. Priest N, Paradies Y, Trener B, Truong M, Karlsen S, Kelly Y. A systematic review of studies examining the relationship between reported racism and health and wellbeing for children and young people. *Social Science & Medicine*. 2013;95:115-127.
3. Hsu HC, Wickrama KAS. Linking family economic hardship to early childhood health: an investigation of mediating pathways. *Matern Child Hlth J*. 2015;19(12):2636-2645.
4. Braveman P, Egerter S. *Overcoming Obstacles to Health in 2013 and Beyond*. Princeton, NJ: Robert Wood Johnson Foundation, 2013.
5. Friedman EM, Karlamangla AS, Gruenewald TL, Koretz B, Seeman TE. Early life adversity and adult biological risk profiles. *Psychosom Med*. 2015;77(2):176-185.
6. Semega JL, Fontenot KR, Kollar MA. *Income and Poverty in the United States: 2016*. Washington, DC: United States Census Bureau; Sep 2017. P60-P259.
7. Shapiro I, Murray C, Sard B. *Basic Facts on Concentrated Poverty*. Washington, DC: Center on Budget and Policy Priorities; Nov 3, 2015.
8. Woolf SH, Aron LY. The US health disadvantage relative to other high-income countries: Findings from a National Research Council/Institute of Medicine report. *JAMA*. 2013;309(8):771-772.
9. Gee GC, Walsemann KM, Brondolo E. A life course perspective on how racism may be related to health inequities. *Am J Public Health*. 2012;102(5):967-974.
10. Evans GW. The environment of childhood poverty. *Am Psychol*. 2004;59(2):77-92.
11. Larson K, Halfon N. Family income gradients in the health and health care access of US children. *Matern Child Hlth J*. 2010;14(3):332-342.
12. Evans GW, Kim P. Childhood poverty and health: cumulative risk exposure and stress dysregulation. *Psychol Sci*. 2007;18(11):953-957.
13. Iceland J, Weinberg DH, Steinmetz E. *Racial and Ethnic Residential Segregation in the United States: 1980-2000*. Washington, DC: U.S. Census Bureau; 2002.
14. Non AL, Rewak M, Kawachi I, et al. Childhood social disadvantage, cardiometabolic risk, and chronic disease in adulthood. *Am J Epidemiol*. 2014;180(3):263-271.
15. Monnat SM, Chandler RF. Long term physical health consequences of adverse childhood experiences. *Sociol Q*. 2015;56(4):723-752.
16. Fagundes CP, Glaser R, Kiecolt-Glaser JK. Stressful early life experiences and immune dysregulation across the lifespan. *Brain Behav Immun*. 2013;27:8-12.
17. Shonkoff JP GA. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*. 2012;129(1):e232-e246.
18. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *JAMA*. 2009;301(21):2252-2259.
19. McEwen BS. Physiology and neurobiology of stress and adaptation: Central role of the brain. *Physiol Rev*. 2007;87(3):873-904.
20. Center on the Developing Child at Harvard University. *The Foundations of Lifelong Health are Built in Early Childhood*. 2010.
21. Evans GW, Kim P. Childhood poverty, chronic stress, self-regulation, and coping. *Child Dev Perspect*. 2013;7(1):43-48.
22. Wadsworth ME, Rienks SL. Stress as a mechanism of poverty's ill effects on children: Making a case for family strengthening interventions that counteract poverty-related stress. *American Psychological Association*. 2012.
23. Schmeer KK, Yoon A. Socioeconomic status inequalities in low-grade inflammation during childhood. *Arch Dis Child*. 2016;101(11):1043-1047.
24. Mani A, Mullainathan S, Shafrir E, Zhao J. Poverty impedes cognitive function. *Science*. 2013;341(6149):976-980.
25. Vasquez EA. Cognitive load, trigger salience, and the facilitation of triggered displaced aggression. *Eur J Soc Psychol*. 2009;39(5):684-693.
26. Vasquez EA, Howard-Field J. Too (mentally) busy to chill: Cognitive load and inhibitory cues interact to moderate triggered displaced aggression. *Aggress Behav*. 2016;42(6):598-604.
27. Hinson JM, Jameson TL, Whitney P. Impulsive decision making and working memory. *J Exp Psychol Learn Mem Cogn*. 2003;29(2):298-306.
28. Williams DR. Race, socioeconomic status, and health—the added effects of racism and discrimination. *Ann Ny Acad Sci*. 1999;896:173-188.
29. Clark R, Anderson NB, Clark VR, Williams DR. Racism as a stressor for African Americans: a biopsychosocial model. *Am Psychol*. 1999;54(10):805-816.
30. Jones CP. Levels of racism: A theoretic framework and a gardener's tale. *Am J Public Health*. 2000;90(8):1212-1215.
31. Conti G, Hansman C. Personality and the education-health gradient: A note on "Understanding differences in health behaviors by education". *J Health Econ*. 2013;32(2):480-485.
32. Jones DE, Greenberg M, Crowley M. Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *Am J Public Health*. 2015;105(11):2283-2290.
33. Moffitt TE, Arseneault L, Belsky D, et al. Childhood self-control and substance dependence at age 32. *Proc Natl Acad Sci U S A*. 2011;108(7):2693-2698.
34. Hickman GP, Bartholomew M, Mathwig J, Heinrich RS. Differential developmental pathways of high school dropouts and graduates. *J Educ Res*. 2008;102(1):3-14.
35. Sweeten G, Bushway SD, Paternoster R. Does dropping out of school mean dropping into delinquency? *Criminology*. 2009;47(1):47-91.
36. Conti G, Heckman JJ. Understanding the early origins of the education-health gradient: A framework that can also be applied to analyze gene-environment interactions. *Perspect Psychol Sci*. 2010;5(5):585-605.
37. Noble KG, Houston SM, Brito NH, et al. Family income, parental education and brain structure in children and adolescents. *Nat Neurosci*. 2015;18(5):773-778.
38. Fernald A, Marchman VA, Weisleder A. SES differences in language processing skill and vocabulary are evident at 18 months. *Dev Sci*. 2013;16(2):234-248.
39. Larson K, Russ SA, Nelson BB, Olson LM, Halfon N. Cognitive ability at kindergarten entry and socioeconomic status. *Pediatrics*. 2015;135(2):E440-E448.
40. Hindman AH, Wasik BA, Snell EK. Closing the 30 million word gap: Next steps in designing research to inform practice. *Child Dev Perspect*. 2016;10(2):134-139.
41. Weisleder A, Fernald A. Talking to children matters: Early language experience strengthens processing and builds vocabulary. *Psychol Sci*. 2013;24(11):2143-2152.
42. Ertel KA, Rich-Edwards JW, Koenen KC. Maternal depression in the United States: Nationally representative rates and risks. *J Womens Health*. 2011;20(11):1609-1617.
43. Conners-Burrow NA, Bokony P, Whiteside-Mansell L, et al. Low-level depressive symptoms reduce maternal support for child cognitive development. *J Pediatr Health Care*. 2014;28(5):404-412.
44. McFarland J, Hussar B, de Brey C, et al. *The Condition of Education 2017 (NCES Report # 2017-144)*. Washington, DC: U.S. Department of Education; 2017.
45. Gilliam WS. *Prekindergartners Left Behind: Expulsion Rates in State Prekindergarten Programs*. May 2005. FCD Policy Brief Series No. 3.
46. Meek SE, Gilliam WS. *Expulsion and Suspension in Early Education as Matters of Social Justice and Health Equity*. National Academy of Medicine; Oct 31, 2016.
47. Banks C. Racial discrimination in the criminal justice system. In: *Criminal Justice Ethics: Theory and Practice*. 4th ed. Thousand Oaks, CA: SAGE Publications, Inc.; 2017:98-125.
48. Nellis A. *The Color of Justice: Racial and Ethnic Disparity in State Prisons*. Washington, DC: The Sentencing Project. Jun 14, 2016.
49. Komro KA, Livingston MD, Markowitz S, Wagenaar AC. The effect of an increased minimum wage on infant mortality and birth weight. *Am J Public Health*. 2016;106(8):1514-1516.
50. Tsao TY, Konty KJ, Van Wye G, et al. Estimating potential reductions in premature mortality in New York City from raising the minimum wage to \$15. *Am J Public Health*. 2016;106(6):1036-1041.
51. Center on Budget and Policy Priorities. *Chart Book: The Earned Income Tax Credit and Child Tax Credit*. www.cbpp.org/sites/default/files/atoms/files/1-7-15tax-chartbook.pdf. Accessed 8/13/17.
52. Marr C, Huang C, Sherman A, Debot B. *EITC and Child Tax Credit Promote Work, Reduce Poverty, and Support Children's Development, Research Finds*. Washington, DC: Center on Budget and Policy Priorities; Oct 2015.
53. Carlson S, Neuberger Z. *WIC Works: Addressing the Nutrition and Health Needs of Low-Income Families for 40 Years*. Washington, DC: Center on Budget and Policy Priorities; 2015.
54. Carlson S, Rosenbaum D, Keith-Jennings B, Nchako C. *SNAP Works for America's Children*. Washington, DC: Center on Budget and Policy Priorities. Sep 29 2016.
55. Cloud D. *On Life Support: Public Health in the Age of Mass Incarceration*. New York, NY: Vera Institute of Justice. Nov 2014.
56. Johnson RC. Long-run impacts of school desegregation & school quality on adult attainments. 2011;1-40. Cambridge, MA: NBER Working Paper Series.
57. Federal Reserve Community Development Resources. *Federal Reserve Community Development Perspectives: A Summary Of Activities, Insights, and Future Opportunities*. 2014.
58. PolicyLink. 2014-2017; www.policylink.org/. Accessed 12/11, 2017.
59. Center for Global Policy Solutions. 2017; <http://globalpolicysolutions.org/>. Accessed 12/11, 2017.
60. Race Forward: The Center for Racial Justice Innovation. www.raceforward.org/.
61. Build Healthy Places Network. 2017; www.buildhealthyplaces.org/. Accessed 12/11, 2017.
62. National Collaborative for Health Equity. 2017; www.nationalcollaborative.org/. Accessed 12/11, 2017.
63. Campbell F, Conti G, Heckman JJ, et al. Early childhood investments substantially boost adult health. *Science*. 2014;343(6178):1478-1485.
64. Muennig P, Robertson D, Johnson G, Campbell F, Pungello EP, Neidell M. The effect of an early education program on adult health: The Carolina Abecedarian Project randomized controlled trial. *Am J Public Health*. 2011;101(3):512-516.

65. Englund MM, White B, Reynolds AJ, Schweinhart LJ, Campbell FA. Health outcomes of the Abecedarian, Child-Parent Center, and HighScope Perry Preschool programs. In: Reynolds AI, Rolnick AT, Temple JA, eds. *Health and Education in Early Childhood: Predictors, Interventions, and Policies*. Cambridge, UK: Cambridge University Press.
66. Conti G, Heckman J, Pinto R. The effects of two influential early childhood interventions on health and healthy behaviour. *Econ J*. 2016;126(596):F28-F65.
67. Karoly LA, Kilburn MR, Cannon JS. *Early Childhood Interventions: Proven Results, Future Promise*. Santa Monica, CA: The RAND Corporation; 2005.
68. Olds DL, Kitzman H, Knudtson MD, Anson E, Smith JA, Cole R. Effect of home visiting by nurses on maternal and child mortality: Results of a 2-decade follow-up of a randomized clinical trial. *Jama Pediatr*. 2014;168(9):800-806.
69. Cannon JS, Kilburn MR, Karoly LA, Mattox T, Muchow AN, Buenaventura M. *Investing Early: Taking Stock of Outcomes and Economic Returns from Early Childhood Programs*. Santa Monica, CA: The RAND Corporation; 2017.
70. Chase-Lansdale L, Brooks-Gunn J. Two-generation programs in the twenty-first century. *Future Child*. 2014;24(1):13-39.
71. De Haan M, Leuven E. Head Start and the distribution of long term education and labor market outcomes. *CEifo Working Paper No 5870, Category 5: Economics of Education*. 2016.
72. Reynolds AJ, Temple JA, Ou SR, et al. Effects of a school-based, early childhood intervention on adult health and well-being—a 19-year follow-up of low-income families. *Arch Pediatr Adolesc Med*. 2007;161(8):730-739.
73. Barnett WS. *Preschool Education and its Lasting Effects: Research and Policy Implications*. National Institute for Early Education Research; Sep 2008.
74. Wataura SE, Phillips DA, Morrissey TW, McCartney K, Bub K. Double jeopardy: Poorer social-emotional outcomes for children in the NICHD SECCYD experiencing home and child-care environments that confer risk. *Child Dev*. 2011;82(1):48-65.
75. Children's Defense Fund. *The State of America's Children 2014 Report*. 2014.
76. Shonkoff JP. Capitalizing on advances in science to reduce the health consequences of early childhood adversity. *Jama Pediatr*. 2016;170(10):1003-1007.
77. D'Onise K, Lynch JW, Sawyer MG, McDermott RA. Can preschool improve child health outcomes? A systematic review. *Soc Sci Med*. 2010;70(9):1423-1440.
78. Wilson FP. A Science Paper Gets It Wrong (IMHO). *The Methods Man*; 2017.
79. Duncan GJ, Magnuson K. Investing in preschool programs. *J Econ Perspect*. 2013;27(2):109-132.
80. Olds DL, Holmberg JR, Donelan-McCall N, Luckey DW, Knudtson MD, Robinson J. Effects of home visits by paraprofessionals and by nurses on children: Follow-up of a randomized trial at ages 6 and 9 years. *Jama Pediatr*. 2014;168(2):114-121.
81. Holmes M, Rutledge R. *Evaluation of the Nurse Family Partnership in North Carolina*. Mar 2016.
82. Shah R, DeFrino D, Kim Y, Atkins M. Sit down and play: A preventive primary care-based program to enhance parenting practices. *J Child Fam Stud* 2017;26(2):540-547.
83. Resnicow K, McMaster F, Bocian A, et al. Motivational interviewing and dietary counseling for obesity in primary care: An RCT. *Pediatrics*. 2015;135(4):649-657.
84. Garg A, Toy S, Tripodis Y, Silverstein M, Freeman E. Addressing social determinants of health at well child care visits: A cluster RCT. *Pediatrics*. 2015;135(2):E296-E304.
85. American Academy of Pediatrics. Early childhood adversity, toxic stress, and the role of the pediatrician: Translating developmental science into lifelong health. *Pediatrics*. 2012;129(1):e224-e231.
86. Lu MC, Jones L, Bond MJ, et al. Where is the F in MCH? Father involvement in African American families. *Ethnic Dis*. 2010;20(1):49-61.
87. Yogman M, Garfield CF. Fathers' roles in the care and development of their children: the role of pediatricians. *Pediatrics*. 2016;138(1).
88. Vallas R, Boteach M, West R, Odum J. *Removing Barriers to Opportunity For Parents With Criminal Records and Their Children: A Two-Generation Approach*. Washington, DC: Center for American Progress; Dec 10, 2015.
89. Dagher RK, McGovern PM, Dowd BE. Maternity leave duration and postpartum mental and physical health: Implications for leave policies. *J Health Polit Polic*. 2014;39(2):369-416.
90. Ruhm CJ. Parental leave and child health. *Am J Health Econ*. 2000;19(6):931-960.
91. Heymann J, Raub A, Earle A. Creating and using new data sources to analyze the relationship between social policy and global health: The case of maternal leave. *Public Health Rep*. 2011;126:127-134.
92. Takeuchi H, Taki Y, Hashizume H, et al. The impact of parent-child interaction on brain structures: Cross-sectional and longitudinal analyses. *J Neurosci*. 2015;35(5):2233-2245.
93. Eidelman AI, Schanler RJ, Johnston M, et al. Breastfeeding and the use of human milk. *Pediatrics*. 2012;129(3):e827-e841.
94. Carneiro P, Løken KV, Salvanes KG. A flying start? Maternity leave benefits and long-run outcomes of children. *J Political Econ*. 2015;123(2):365-412.
95. OECD Social Policy Division. *Parental Leave Systems*. OECD, Social Policy Division, Directorate of Employment, Labour and Social Affairs; Mar 15, 2017.
96. Glynn SJ. *Working Parents' Lack of Access to Paid Leave and Workplace Flexibility*. Washington, DC: Center for American Progress; Nov 20, 2012.
97. Barnett WS. Effectiveness of early educational intervention. *Science*. 2011;333(6045):975-978.
98. Reynolds AJ, Ou SR, Mondri CF, Hayakawa M. Processes of early childhood interventions to adult well-being. *Child Dev*. 2017;88(2):378-387.
99. Grunewald R, Rolnick A. *A Proposal For Achieving High Returns on Early Childhood Development*. Washington, DC: Prepared for "Building the Economic Case for Investments in Preschool," convened by the Committee for Economic Development with support from The Pew Charitable Trusts and PNC Financial Services Group; Mar 2006.
100. Heckman JJ, Moon SH, Pinto R, Saveliev PA, Yavitz A. The rate of return to the High/Scope Perry Preschool program. *J Public Econ*. 2010;94(1-2):114-128.
101. The PNC Financial Services Group I. PNC Grow Up Great. www.pnc.com/en/about-pnc/corporate-responsibility/grow-up-great.html. Accessed 8/13/17.
102. Policy and Impact Committee of The Committee for Economic Development. *Unfinished Business: Continued Investment in Child Care and Early Education is Critical to Business and America's Future*. Washington, DC: Committee for Economic Development. 2012.
103. Caronongan P, Kirby G, Boller K, Modlin E, Lyskawa J. *Assessing the Implementation and Cost of High Quality Early Care and Education: A Review of the Literature*. OPRE Report 2016-31. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research and Evaluation, 2016.
104. Barnett WS, Friedman-Krauss AH. *State(s) of Head Start*. National Institute for Early Education Research;2016.
105. Center for High Impact Philanthropy at the University of Pennsylvania. *Invest in a Strong Start for Children: Educare*. Philadelphia, PA: Center for High Impact Philanthropy; 2015.
106. Bartik TJ, Belford JA, Gormley WT, Anderson SA. *A Benefit-Cost Analysis of the Tulsa Universal Pre-K Program*. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research; 2017.
107. Schweinhart LJ. *The High/Scope Perry Preschool Study Through Age 40: Summary, Conclusions, and Frequently Asked Questions*. Ypsilanti, MI: High/Scope Educational Research Foundation. 2011.
108. Karoly LA. The economic returns to early childhood education. *Future Child*. 2016;26(2):37-55.
109. Bartik TJ, Gormley W, Adelstein S. Earnings benefits of Tulsa's Pre-K program for different income groups. *Econ Educ Rev*. 2012;31(6):1145-1161.
110. Miller TR. Projected outcomes of Nurse-Family Partnership home visitation during 1996-2013, USA. *Prev Sci*. 2015;16(6):765-777.
111. National WIC Association. *WIC: Solid Returns on Investment While Reducing the Deficit*. Jun 2015.
112. Billings K, Bishop-Josef S. *Early Care and Education: A National Security Imperative*. Council for a Strong America. 2017.
113. Robert Wood Johnson Foundation Commission to Build a Healthier America. *Time to Act: Investing in The Health of Our Children and Communities*. Princeton, NJ: Robert Wood Johnson Foundation, 2014.
114. Blueprints for Healthy Youth Development. Nurse-Family Partnership. 2017; www.blueprintsprograms.com/funding/nurse-family-partnership. Accessed 12/04/17.
115. Frank Porter Graham Child Development Institute at the University of North Carolina at Chapel Hill. The Carolina Abecedarian Project. <http://abc.fpg.unc.edu/groudbreaking-follow-studies>. Accessed 7/24/17.
116. Chicago Longitudinal Study. Chapter 2: The Child-Parent Center Program and Study. 2013; www.cehd.umn.edu/icd/research/CLS/ch2.html. Accessed 7/21/17.
117. The Center for High Impact Philanthropy at the University of Pennsylvania. Invest in a Strong Start for Children: A Toolkit for Donors on Early Childhood. 2017; www.impact.upenn.edu/our-analysis/opportunities-to-achieve-impact/early-childhood-toolkit/strategies-for-donors/provide-great-places-to-learn/educare/. Accessed 7/20/17.
118. Educare Learning Network. Educare Learning Network Research and Evaluation Summary. www.socialimpactexchange.org/sites/www.socialimpactexchange.org/files/Educare%20Research%20and%20Evaluation%20Summary_9%2028%2012.pdf. Accessed 8/13/17.
119. Farrie D. *The Abbott Preschool Program: A 15-Year Progress Report*. Education Law Center; May 2014.
120. Barnett WS, Jung K, Youn M, Frede EC. *Abbott Preschool Program Longitudinal Effects Study: Fifth Grade Follow-Up*. New Brunswick, NJ: National Institute for Early Education Research;2015.
121. Pennsylvania Pre-K Counts. 2016; http://papromiseforchildren.com/wp-content/uploads/2013/04/parent_outreach_flyer_fina_4-6-16.pdf. Accessed 9/11/17.
122. National Institute for Early Education Research. State of Preschool Yearbooks: Oklahoma 2016; <http://nieer.org/state-preschool-yearbooks/yearbook2016#profiles>. Accessed 8/18/17.
123. Gormley WT, Phillips D. The effects of universal Pre-K in Oklahoma: research highlights and policy implications. *Policy Stud J*. 2005;33(1):65-82.

-
124. NYC Department of Education. Pre-K Program Assessments: Early Childhood Environmental Rating Scare (ECERS-R) and Classroom Assessment Scoring System (CLASS). Jan 2017; <http://schools.nyc.gov/Academics/EarlyChildhood/educators/ProgramAssessments.htm>. Accessed 7/20/17.
 125. Tarylor K. New York City Will Offer Free Preschool for All 3-Year-Olds. *The New York Times*. Apr 24, 2017.
 126. Nurse-Family Partnership. Nurse-Family Partnership Snapshot. 2017; www.nursefamilypartnership.org/wp-content/uploads/2017/07/NFP_Snapshot_Mar2017.pdf. Accessed 8/13/17.
 127. Child First. Child First Impact: Highlights of Outcome Data Analysis, August 2010 Through December 2016. 2017; www.childfirst.org/our-impact/evaluation. Accessed 7/20/2017.
 128. Healthy Families America. The Healthy Families America Strategy. 2015; www.healthyfamiliesamerica.org/the-hfa-strategy-1/. Accessed 9/09/17.
 129. Healthy Families America. An Overview. 2017; <https://static1.squarespace.com/static/55ccef2ae4b0fc9c2b64f3a1/t/589ceaf9f74569b7ba19570/1486678767941/HFA+Overview.r20170209.pdf>. Accessed 9/9/17.
 130. Healthy Families America. Healthy Families America: Rigorous Evidence. 2015; <https://static1.squarespace.com/static/55ccef2ae4b0fc9c2b64f3a1/t/589ce970e6f2e1bd3c82696a/1486678385338/HFA%2BRigorous%2BEvidence.r2.9.16.pdf>. Accessed 9/18/17.
 131. Parents as Teachers National Center. Parents as Teachers. 2017; <http://parentsasteachers.org>. Accessed 8/18/17.
 132. U.S. Department of Health & Human Services. Family Spirit. *Home Visiting Evidence of Effectiveness*. 2016; <https://homvee.acf.hhs.gov/Model/1/Family-Spirit-sup---sup-/60/1>. Accessed 9/5/17.
 133. HRSA Maternal & Child Health HRSA. Collaborative Improvement & Innovation Networks (CoIINs). <https://mchb.hrsa.gov/maternal-child-health-initiatives/collaborative-improvement-innovation-networks-coiins>. Accessed 10/17/16.
 134. Cradle to K Cabinet plan to address early childhood disparities in Minneapolis [press release]. City of Minneapolis Cradle to K Plan, May 2015.
 135. Early Childhood Leadership Commission. *2016 Annual Report*. Feb 9, 2017; www.coloradoece.org/news/early-childhood-leadership-commission-2016-annual-report. Accessed 10/17/17.
 136. Center on Budget and Policy Priorities. Policy basics: The Child Tax Credit. 2016; www.cbpp.org/research/federal-tax/policy-basics-the-child-tax-credit. Accessed 8/13/17.
 137. U.S. Department of Agriculture Food and Nutrition Service. Women, Infants, and Children (WIC): Frequently Asked Questions About WIC. 2017; www.fns.usda.gov/wic/frequently-asked-questions-about-wic. Accessed 8/02/17.
 138. Kreider B, Pepper JV, Roy M. Identifying the effects of WIC on food insecurity among infants and children. *South Econ J*. 2016;82(4):1106-1122.
 139. Hoynes H, Schanzenbach DW, Almond D. Long-run impacts of childhood access to the safety net. *Am Econ Rev*. 2016;106(4):903-934.
 140. ZERO TO THREE. HealthySteps. 2017; www.healthysteps.org/the-model. Accessed 9/9/17.
 141. Peacock-Chambers E, Ivy K, Bair-Merritt M. Primary care interventions for early childhood development: a systematic review. *Pediatrics*. 2017;140(6):e20171661.
 142. Reach Out and Read. About Reach Out and Read: Giving Young Children a Foundation For Success. 2014; www.reachoutandread.org/about-us/. Accessed 8/3/17.
 143. Reach Out and Read. 2014; www.reachoutandread.org/. Accessed 9/9/17.



University of California
San Francisco

ucsf.edu



Robert Wood Johnson
Foundation

rwjf.org
