Robert Wood Johnson Foundation

ISSUE BRIEF

ISSUE BRIEF: EARLY CHILDHOOD EXPERIENCES SHAPE HEALTH AND WELL-BEING THROUGHOUT LIFE

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Early Childhood Experiences Shape Health and Well-Being Throughout Life

The earliest years of our lives set us on paths leading toward—or away from—good health.

1. Overview

It may not be surprising to hear that the earliest years of our lives are important in many ways. It may, however, come as a surprise to most people to learn that one of those ways is how those early years set us on paths leading toward—or away from—good health. During the last 15 to 20 years, accumulated knowledge has revealed that family income and education, neighborhood resources, and other social and economic factors affect health at every stage of life, but the effects on young children are particularly dramatic.[1] While all parents want the best for their children, not all parents have the same resources to help their children grow up healthy. Parents' education and income levels can create—or limit—opportunities to provide their children with nurturing and stimulating environments and to model healthy behaviors. These opportunities and obstacles, along with their health impacts, accumulate over time and can be transmitted across generations as children grow up and become parents themselves.

"… for children experiencing severe adversity, environmental influences appear to be at least if not more powerful than genetic predisposition in their impact on the odds of having chronic health problems later in life."
–Center on the Developing Child, Harvard University, 2010[2]

RWJF Commission to Build a Healthier America

CSDH Center on Social Disparities in Health

A body of evidence now ties experiences in early childhood directly or indirectly with health and well-being throughout life. Adverse experiences in early childhood can set off a vicious cycle leading from social disadvantage in childhood to health disadvantage in adulthood, and then to more social disadvantage for the next generation, starting the cycle again. Despite this, evidence also shows that it is possible to turn potentially vicious cycles into paths toward health by intervening early. Although effects of early childhood interventions appear largest for the most socially disadvantaged children, children in families of all socioeconomic levels benefit from high-quality early childhood programs.

Although effects appear largest for disadvantaged children, children in families of all socioeconomic levels benefit from high-quality early childhood programs.

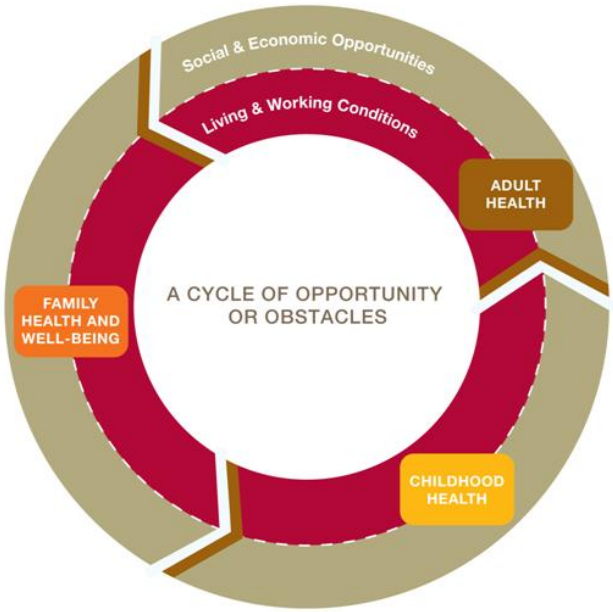


Figure 1. A cycle of opportunity or obstacles. *At every stage of our lives, social advantage—or disadvantage—is linked to health. It accumulates over time, creating favorable opportunities for, or daunting obstacles to, health. Opportunities or obstacles play out across individuals' lifetimes and across generations. Intervening early in life can interrupt a cycle that otherwise would lead to ill health, transforming it into a path to good health, and resulting in a healthy and productive adult workforce that benefits society as a whole.*[1]

Social advantage refers to opportunities and resources that make life easier or more comfortable, rewarding, or influential; for example, greater wealth, education, prestige, or acceptance in mainstream society.

2. How do economic and social conditions early in life shape children's health and development, affecting their health as adults?

CHILDREN'S ECONOMIC AND SOCIAL CONDITIONS CAN DIRECTLY AFFECT THEIR HEALTH

The association between socioeconomic factors and child health is evident from birth. Factors such as nutrition, housing quality, and safety at home and in the community—all linked with family resources—are strongly associated with child health. Research shows that children's nutrition varies with parents' income and education and can have lasting effects on health throughout life; for example, inadequate nutrition is linked with obesity during childhood, which in turn is a strong predictor of adult obesity and its accompanying risks of chronic disease, disability and shortened life. Similarly, children exposed to lead-based paint, most commonly found in lower-income neighborhoods, are more likely to suffer from lead-poisoning, which can lead to irreversible neurological damage. Children in impoverished families often face multiple physical and psychosocial hardships. The combined effects of these hardships can take a particularly heavy toll on children's health, partly by causing chronic stress that

overwhelms one's ability to cope,[3] sometimes referred to as "toxic stress."[2, 4] Physiologic effects of chronic stress in early childhood can include inflammation and altered immune function;[4] these may contribute to depression, anxiety, cancer, diabetes, hypertension, and cardiovascular disease later in life.[2, 4]

ECONOMIC AND SOCIAL CONDITIONS ALSO AFFECT CHILDREN'S DEVELOPMENT

Scientific advances in recent decades have demonstrated how economic and social experiences in the first few years of life shape infants' and toddlers' development, creating physiological as well as emotional and behavioral foundations—adverse or favorable—for health throughout life. Studies have tracked children's cognitive, behavioral, and physical development over time, along with environmental factors and parents' and other caregivers' interactions with children; some of these studies have followed children into adulthood. The results consistently link children's development with economic and social advantages in the home.[2-5]

Many low-income parents face a constant struggle to make ends meet. This can mean chronic stress at home, which is literally toxic to a developing child's brain; it also makes it more difficult for parents to interact as positively as they wish.

PARENTS' RESOURCES AFFECT PARENT-CHILD INTERACTIONS

Studies have repeatedly shown that parents' resources can affect the quality and stability of their relationships with their infants, and that parent-infant relationships affect the cognitive stimulation that children receive, as well as their emotional and behavioral development.[2-4] The effect of family socioeconomic circumstances on children's language development is evident as early as 18 months. Children in families of middle, as well as low socioeconomic status, are at a disadvantage compared with their better-off counterparts.[5] Results of a large national study of children entering kindergarten showed that family income is associated with children having the academic and social skills necessary for kindergarten. Compared to children in the highest-income families, children in the lowest-income families were least likely to have the needed skills, but children in middle-class families also performed less well, both socially and academically, than the most affluent children.[2, 6, 7]

What explains these socioeconomic gaps in child development? Maternal depression, which can inhibit mother-infant bonding and reduce maternal ability to cognitively stimulate an infant or young child, is more prevalent among low-income mothers.[8,9] Higher income and/or educational attainment of parents are associated with more stimulation of and responsiveness to infants and young children, which are directly linked to brain development.[2-4] Researchers have estimated that by age three, the average child in a professional family has heard 30 million more words than the average child in a family on public assistance.[10] Hearing more words leads to better brain development, which in turn predicts school performance and, ultimately, economic and social opportunities in adulthood. Educational differences in parents' awareness of early childhood developmental needs probably play a role. But research also shows that higher income generally means lower levels of chronic, overwhelming stress in the home, as well as greater resources to cope with stressors – both of which can affect how parents interact with their children.[3]

CHILDREN'S DEVELOPMENT SHAPES THEIR EDUCATIONAL SUCCESS AND THEREFORE THEIR ECONOMIC AND SOCIAL WELL-BEING AS ADULTS

The first few years of life are crucial in establishing the path—including the opportunities and obstacles along the way—that a child will follow toward well-being in adulthood. Without intervention, the gaps in cognitive and behavioral skills that are apparent when children enter school 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 showed that children at higher social risk (for example, because of poverty) not only had lower reading and math scores in kindergarten, but also experienced smaller gains in both these areas by the end of third grade than children with fewer family risk factors.[6] Poor academic performance in elementary school is linked to subsequently dropping out of high school, lower educational attainment, delinquency and, later in life, unemployment.

CHILDREN'S DEVELOPMENT SHAPES THEIR HEALTH THROUGHOUT LIFE

Our health as adults is powerfully influenced by how we developed—physically, cognitively, and emotionally—as children. Research has strongly linked brain, cognitive and behavioral development early in life to an array of important health outcomes later in life, including cardiovascular disease, hypertension, diabetes, obesity, smoking, drug use and depression[2, 4] —conditions that account for a major portion of preventable morbidity and premature mortality in the United States. Inadequate stimulation and nurturing by adults and toxic stress are thought to play important roles in suboptimal development, for example, by leading to changes in brain architecture and systems controlling response to stress. In addition to relatively direct connections between childhood development and health, childhood development also strongly influences factors such as educational attainment and health-related behaviors, which, in turn, strongly influence health; self-regulation—the capacity to control one's own emotions and behaviors—is thought to play a key role in these relationships.[2]

Brain, cognitive and behavioral development early in life are strongly linked to an array of important health outcomes later in life, including heart disease, hypertension, diabetes, obesity, smoking, drug use and depression.

3. How strong is the evidence connecting early childhood programs with health?

It is distressing to realize that social disadvantages experienced in childhood can limit children's opportunities for health throughout their entire lives. Fortunately, however, extensive evidence shows that it is possible to intervene in early childhood, interrupting a cycle that otherwise would lead from social disadvantage to health disadvantage, which would then lead to more social disadvantage. Knowledge accumulated over the past 40 years supports the conclusion that children who participate in high-quality early childhood programs experience a range of immediate and long-term health-related benefits.[2,7,11-13] **Table 1,** adapted from a 2005 RAND report,[11] summarizes findings from several of the most well-studied early childhood programs. Some studies have

By kindergarten or even earlier, children in both lower-income and middle-class families who did not participate in high-quality early childhood programs are at a developmental disadvantage compared with children in the most affluent families.

concluded that these programs' health benefits are also accompanied by cognitive gains, better academic achievement, and lower rates of delinquency and arrests later in adolescence—outcomes which themselves have strong health effects.[13] The impact appears universal, but is particularly great for socially disadvantaged children, for whom high-quality early child care, education, and family support programs can act as buffers, providing stability and stimulation to the children and strengthening parents' ability to meet children's developmental and health needs at home.

NEW BIOMEDICAL EVIDENCE LINKS EARLY CHILDHOOD EXPERIENCES WITH HEALTH

Because childhood is a time of generally good health, it has been challenging to directly demonstrate the health outcomes of early childhood programs. 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 the resources to follow program participants and comparison groups for that long. Most of the evidence, therefore, has not directly linked early childhood experiences with health; rather, the evidence requires connecting the dots between early childhood experiences and later social outcomes that are well known to influence health, such as educational attainment, being economically self-sufficient, or incarceration. Despite the challenges to directly linking early childhood experiences with health itself, a 2014 study has found compelling biomedical evidence that participants in a high-quality early childhood program have significantly lower risks for cardiovascular disease and diabetes in adulthood, compared with otherwise similar individuals who were not in that program.[12]

A 2014 study reveals compelling biomedical evidence that participants in a high-quality early childhood program have lower risks for heart disease and diabetes in adulthood.

THE EVIDENCE LINKING EARLY CHILDHOOD EXPERIENCES AND PROGRAMS WITH HEALTH

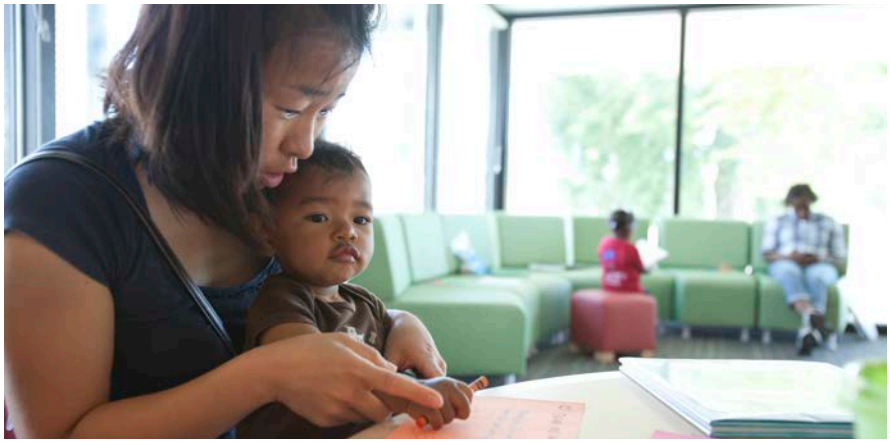
Recent evidence strongly links early childhood experiences and programs directly with health. The most direct and the strongest evidence to date linking early childhood programs with health comes from a 2014 study published in *Science.* This study followed participants in the Carolina Abecedarian Project and a similar number of comparable individuals who were not enrolled in that program, from early childhood to age 35. They collected biomedical data on the Abecedarian participants and the comparison group, which showed that the Abecedarian group had significantly lower prevalence of major risk factors for cardiovascular and metabolic disease, notably diabetes.[12] A number of other studies have also directly linked high-quality early childhood programs with important health outcomes, including child injuries, child abuse or maltreatment, and depressive symptoms. (Less direct evidence of health effects also comes from studies linking early childhood programs with later behaviors that influence health, such as improved eating habits and reduced use of marijuana,[13] and studies linking early childhood interventions with better use of health services, including timely health screening and immunizations, fewer hospital days, and fewer emergency room visits.)[11]

Strong evidence links early childhood experiences with health through effects on child development. Research findings have consistently shown that (a) social experiences in early childhood are linked to brain, cognitive and behavioral development; and (b) brain, cognitive and behavioral development are in turn strongly linked—often through effects on educational attainment—to an array of important health outcomes, particularly later in life. Examples of adult health outcomes linked to early child experiences by connecting the dots between these two bodies of knowledge include cardiovascular disease, hypertension, diabetes, obesity, smoking, drug use and depression;[2] these conditions account for a major portion of preventable illness, disability, and premature mortality in the United States.

Strong evidence links early childhood experiences and programs with health through effects on social outcomes, such as education, that strongly affect health. Experimental and observational studies have indirectly but convincingly linked particular early childhood interventions with health outcomes by demonstrating their impact on later social outcomes that have well-established and important health consequences.[14] These outcomes include teen pregnancy, school performance, IQ, placement in special education, educational attainment, employment (of the child's mother and of the child in adulthood), income, delinquency and criminal behavior, arrests, and/or incarceration.[2,11]

4. What works? Is it sufficient to provide services to children?

Even with full-time center-based services, preschool children spend most of their time at home. Persistent stress at home not only makes it difficult for parents to provide optimal stimulation and support to children; it also harms the developing brain and adversely affects multiple systems in the developing child's body, with potentially lifelong health consequences. Many parents with limited resources need assistance to reduce toxic stress in the home.[2] As noted earlier, lower-income parents generally face more obstacles to being optimally responsive and stimulating to their children. Even middle-class parents—especially those who are single—often face major obstacles to optimal parenting that cannot be overcome by providing information and training on parenting. Key elements of many successful early childhood programs therefore have included not only early education and stimulation for preschool children, but also support and training for their parents and caregivers to improve children's experiences at home.



SERVE CHILDREN BY SERVING FAMILIES

Awareness of the importance of services for parents as part of early childhood development programs has evolved considerably over time. Sometimes, services for parents have been afterthoughts, with the primary focus on services for children. Experience over time, however, has led some prominent leaders in the field of early childhood development to call for "two-generation" approaches.[2, 14] Some have concluded that equivalent resources should be put into services for parents of low-income children as are allocated for the children themselves. [14] The Robert Wood Johnson Foundation Commission to Build a Healthier America highlighted the importance of creating the conditions for optimal development in early childhood as the first of its three recommendations in 2014, explicitly noting the need to help struggling parents to provide adequate home environments and experiences for their young children.[15]

Two-generation approaches that enable parents to provide safe, secure, stimulating, and nurturing environments for young children at home are needed.

Services to parents often include involving them in center-based activities for the children to develop their parenting skills, and providing referrals for social services. Some programs, however, go considerably further, and provide intensive assistance to parents to help them find work or job training, or return to school. Other programs focus on developing parents' self-efficacy and life skills. Some policies to support parents' ability to create health-promoting environments for young children include income supplements for the working poor and paid maternity and parental leave.

The question is not whether early childhood programs can make a difference in children's development and life-long well-being,or whether child development has health consequences. It is: What are the most effective and efficient specific elements of successful early childhood development interventions?

5. What else is known about what works, apart from the need for services for parents?

An Institute of Medicine (IOM) report released in 2000 concluded that, with regard to children's development and lifelong well-being, "the general question of whether early childhood programs can make a difference has been asked and answered in the affirmative innumerable times." The report noted that the questions warranting investigation are about the most effective and efficient ways of intervening in early childhood to promote lifelong well-being, especially among "children and families who face differential opportunities and vulnerabilities."[16] This statement is no less true now than in 2000.[2,7]

Well-trained and responsive caregivers, small class sizes with high teacher-child ratios, safe and adequate physical environments and age-appropriate activities focused on enhancing the cognitive and socio-emotional development of the child are often cited as hallmarks of high-quality child development and day care centers; parental involvement and/or services for parents also have been considered important. There does not appear to be a wide consensus, however, on exact criteria, e.g., the number of years of participation needed, the intensity of services for parents, optimal adult-to-child ratios, and the optimal mix of fully qualified teachers (and relative advantages of master's versus bachelor's degree holders) with less qualified teacher aides, and what constitutes adequate training for both teachers and aides.[7]

There has been considerable debate about the effectiveness of Head Start as a national program.[7] Head Start was launched in 1965 with the goal of increasing the school readiness of low-income children. In the more than 40 years since its launch, a great deal of new knowledge about early childhood has emerged. Characteristics of Head Start programs, populations served, and community contexts vary across sites, making evaluation difficult. Nevertheless, considerable short-term benefits of Head Start have been observed. More intensive and prolonged services may be needed to achieve the long-term outcomes of more intensive programs. Furthermore, fewer than half of the children eligible for Head Start are able to access it. An even smaller percentage of at-risk children under age three—fewer than 4 percent—receive Early Head Start services.[17]

The children most in need of high-quality early childhood programs are least likely to experience them. While Head Start has produced important short-term benefits, fewer than half of eligible children are able to access it. An even smaller percentage of at-risk children under age three—fewer than 4 percent—receive Early Head Start services.

IS HEAD START EFFECTIVE?

Evaluations of Head Start have reached varying conclusions. The National Head Start Association has stated that Head Start has achieved important gains in children's cognitive skills and benefits for parents, and that Early Head Start has improved both cognitive and socio-emotional development.[18] Chase-Lansdale and Brooks-Gunn[14] concluded that Head Start's "effects include higher levels of cognitive development and social competence, lower mortality later in childhood, higher rates of high school graduation and college attendance, better health, higher earnings, and less involvement with the criminal justice system." Some critics have questioned these conclusions, however.[7,19]

A large national evaluation of Head Start was conducted in 2010-2012, comparing nearly 2,500 3- to 4-year-old low-income children randomly assigned to Head Start with a similar number of comparable children who were not assigned to Head Start but who could enroll in other early childhood programs at any time, and could apply to Head Start after the first year. Around 60 percent of the "control" group participated in child care or an early childhood program during the first year of the study, and many of the control group children ended up actually enrolling in Head Start during the first year, because it was considered unfeasible and unethical to prevent parents from enrolling their children in some form of early childhood services. The study followed the children through the spring of their first-grade year and then through third grade.

- Initially, they found significant improvements overall or in large subgroups of children who participated in Head Start in a number of cognitive skills, behavioral measures, health status and parenting.
- Some subgroups of children—generally those in higher-risk households and/or those who had lower cognitive skills at the outset—appeared to sustain some benefits through kindergarten or first grade.
- With some exceptions, however, these benefits generally did not persist through third grade.

Mixed results from this and other evaluations are not surprising, particularly given that in the national evaluation, more than half of the "control" group received early childhood services of one kind or another, including many children who ended up receiving the same number of hours of Head Start as the "treatment" group.[20] These kinds of "cross-over effects" have also been a problem in other studies.[14]

Other major challenges in evaluating Head Start nationally include the wide variation in services and needs across different Head Start sites. Also, even when early childhood programs have large short-term beneficial effects, additional support may be needed for disadvantaged children beyond preschool, making it unrealistic to expect sustained effects without subsequent reinforcement.

In addition, while some other early childhood programs have more clearly shown long-term effects,[11,12] the resources, intensity, and sometimes duration of services in those programs often has far exceeded the capacity of Head Start sites. For example, a lower proportion of Head Start teachers have bachelor's degrees, and Head Start teachers are often paid less than teachers with comparable credentials and roles in the best-known early childhood programs.[7]

6. What is the business case for investing in early childhood programs? Can we expect a favorable return on investment?

THE BUSINESS CASE FOR INVESTING IN EARLY CHILDHOOD PROGRAMS IS STRONG

National business organizations, including the Committee for Economic Development (CED), PNC Financial Services Group, and the Business Roundtable—as well as Nobel Prize-winning economist James J. Heckman and economists Arthur Rolnick and Rob Grunewald of the Federal Reserve Bank of Minneapolis—have called for universal

preschool as a wise financial investment for our nation, and an essential means of achieving a productive—both healthy and educated—U.S. workforce for the future.[21-24] While estimates of the rate of return on investment in early childhood programs have varied, multiple experts have concurred that it is significant and favorable. (See box below)

A larger investment in early child development would benefit the overall economy of the United States. Children who participate in early childhood programs are more likely to have the necessary skills—such as abstract reasoning, problem solving and communication – to meet the demands of tomorrow's workforce. Research has shown that children who participate in early childhood programs are more likely to, as adults, be healthy and have higher earnings, and be less likely to commit crime and receive public assistance.[7, 11,12] These benefits translate into tremendous savings for society.

Major business groups have called for universal high-quality preschool as a wise financial investment for our nation, and an essential means of achieving a productive—both healthy and educated—U.S. workforce for the future.

THE LONG-RANGE VIEW: INVESTING IN EARLY CHILDHOOD DEVELOPMENT TO REALIZE THE HEALTH POTENTIAL OF ALL AMERICANS

Based on current knowledge, we can expect large returns—in human and economic terms—on investment in high-quality early child development programs. At the same time, we must realize that this is a long-term investment, with benefits that may not be measurable for years. If we can take the long view, current knowledge tells us that investing in improving children's development at the beginning of life is indeed a wise business venture as well as a social imperative—probably the single most effective strategy for realizing the health potential of all Americans.

HOW HAVE EARLY CHILDHOOD PROGRAMS BEEN FINANCED?

A wide range of approaches have been taken to finance early childhood programs. Head Start is federally funded. Georgia's Pre-K Program is financed through lottery funds; it 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 Commonwealth of Pennsylvania but also receives support from a public-private partnership that includes leading foundations. Educare Schools rely on a blend of public sources with resources provided by philanthropic foundations. Minnesota provides state-funded scholarships for approximately 9 percent of eligible children; economists Art Rolnick and Rob Grunewald 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-kindergarten services essentially free for median-income households. In Salt Lake City, Goldman Sachs, the United Way, and the Pritzker Family Foundation partnered to create a social impact bond initiative to expand access to early childhood education.[15]

A HIGH RETURN ON INVESTMENT, ANY WAY YOU CALCULATE IT

Estimates of the dollars saved for every dollar spent on early childhood development programs have ranged from $2.88 for every $1.00 spent to $17.07 saved for every $1.00 spent, depending on the program and length of the follow-up.[11, 25] Grunewald and Rolnick have estimated overall annual returns from investment in high-quality early childhood programs to be potentially as high as 16 percent, adjusted for inflation.[21] A 2010 paper by Heckman and others estimated rates between 7 and 10 percent, concluding that returns are "above the historical return on equity," i.e., on capital investment.[22] Bartik and colleagues estimated benefit-to-cost ratios of 3- or 4-to-1 for the Tulsa, Oklahoma pre-kindergarten program.[26]

7. Examples of high-quality early childhood programs[15]

- **Abbott Preschool Program** in New Jersey provides children ages 3 and 4 in low-income 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 programs receive funding through a state school funding formula adopted in 2008: the School Funding Reform Act.

- **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 and protecting the child's brain from the stressful environment.

- **Crittenton Women's Union** helps low-income women and their families achieve financial stability and self-sufficiency. Created in 2006, CWU's direct service programs include transitional housing for more than 400 homeless families a year; supportive housing for young, high-risk parents and domestic violence survivors; job-readiness training; and mentoring services in self-sufficiency.

- **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 goal is to prepare children who are growing up in poverty to enter kindergarten on par with children from middle-income

Investing in improving children's development at the beginning of life is a crucial component of any effective strategy for realizing the health potential of all Americans.

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 strong social skills, including self-confidence, persistence, and ways to manage frustration.

- **Georgia's Pre-K Program** was the first state-offered pre-kindergarten, free of charge, beginning in 1993 under Governor Zell Miller. Financed through lottery funds, the program initially provided pre-kindergarten programs for at-risk 4-year-olds. In 1995, the program was expanded beyond at-risk children to include all eligible 4-year-olds in the state. In March 1996, the Georgia General Assembly created the Office of School Readiness, a one-stop children's department that administered the Pre-K Program, federal nutrition programs, and other early intervention services. This department became Bright from the Start: Georgia Department of Early Care and Learning in 2004. Currently, the program serves 84,000 children.

- **Head Start**, created in 1965, provides early learning services to preschoolers in low-income families through grants to nearly 1,600 local community organizations. In some areas, Early Head Start also serves infants, toddlers, pregnant women, and families with incomes below the federal poverty level. Head Start programs also provide comprehensive services, such as health, nutrition, and other services determined to be necessary by family needs assessments. 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 and Human Services implemented tougher rules for low-performing Head Start grantees. The new 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.

- **Head Start – Trauma Smart** is an early childhood trauma intervention model created by Crittenton Children's Center in Kansas City, MO. It's designed to support young children as well as their parents and teachers in Head Start communities. Head Start – Trauma Smart raises awareness of systemic trauma and teaches resiliency and practical lifelong coping skills. The program provides a series of training sessions for school staff—everyone from administrators to teachers to bus drivers—along with parents and caregivers. It also addresses three national priorities of Head Start: family engagement, mental health, and school readiness.

- **Nurse-Family Partnership** uses nurses to conduct ongoing home visits with low-income, first-time mothers from pregnancy until the child turns 2. Research indicates the program has significant effects on reducing: incidents of child abuse and neglect; arrests and convictions among participating children and mothers over time; and children's mental health problems. The Robert Wood Johnson Foundation has made major efforts to support the

Nurse-Family Partnership program and its replication in a wide range of settings.

- **Oklahoma's Universal Pre-K Program**, created in 1998, enrolls 74 percent of the state's 4-year-olds and is funded by the state's school finance formula. Public school districts may subcontract with other classroom providers, allowing the program to operate in a variety of settings, including private child-care centers and Head Start programs.

- **Pennsylvania Pre-K Counts**, established by the state Department of Education, makes pre-kindergarten opportunities available to children and families across the state, providing families with a choice of pre-kindergarten options in Head Start, a school, or child-care center. The program builds on the work of the Pre-K Counts Public-Private Partnership for Educational Success, a three-year, public-private 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.

- **Preschool without Walls** in Los Angeles employs a two-generation approach, teaching parents how to improve their children's school readiness. The program uses community spaces, such as parks and libraries, for learning. Teachers create lessons that incorporate the unique attributes of each setting. Bilingual lessons help parents and children explore core competencies such as colors, days, times, and specific themes like culture, art, and science. The program's "Child Development and Early Learning Pathway" works with prenatal care, delivery, and infancy programs to help families access preschool. Preschool without Walls also facilitates a hands-on approach to the kindergarten transition through field trips to local schools.

- **STRIVE Together** brings together educators, non-profit organizations, philanthropies, businesses, government agencies, political leaders, and others to pursue common goals for improving education from early childhood through early employment. Since 2006, Strive has helped communities in 34 states and the District of Columbia. In Cincinnati, Strive Partnership worked with the school department and a local United Way program to assess the readiness of every student entering kindergarten. Subsequent work led to a 9 percent increase in kindergarten readiness over four years in Cincinnati, where progress had been stagnant for years. Similar gains have been realized in Newport, KY, and Covington, KY.

TABLE 1: HOW DO EARLY CHILDHOOD PROGRAMS AFFECT HEALTH*?

HIGHLIGHTS FROM SEVERAL PROGRAMS – ADAPTED FROM KAROLY, KILBURN, & CANNON 2005[11]

Early childhood development programs	Health, health behaviors and health services	Social outcomes that affect health				
		Children's socio-emotional and/or cognitive development	Educational outcomes	Adult Employment and earnings	Adult social services use	\Crime
Nurse-Family Partnership	↓ Child abuse ↓ Sex partners (teen) ↓ Alcohol consumption (teen) ↓ Emergency room visits (child) ↓ Hospital days (child)	↑ Positive social/emotional behaviors ↑ Achievement test scores				↓ Arrests, convictions and violations of probation (teen)
Early Head Start		↑ Positive social/emotional behaviors				
Carolina Abecedarian Project	↓ Depressive symptoms[27] (adult) ↓ Teen pregnancy ↓ Marijuana use (adult) ↓ Risk for heart disease and diabetes[12]	↑ IQ scores ↑ Achievement test scores	↓ Special education placement (child/teen) ↓ Grade retention (child/teen) ↑Years of completed schooling (adult) ↑Ever attended four-year college (adult)	↑ Skilled employment		
High/Scope Perry Preschool Project	↓ Teen pregnancy	↑ IQ scores ↑ Achievement test scores	↓ Special education placement (child/teen) ↑ High school graduation (adult)	↑ Employment ↑ Earnings ↑ Income	↓ Use of social services	↓ Arrests (teen/adult) ↓ Arrests for violent crimes (adult) ↓Time in prison/jail (adult)
Chicago Child-Parent Center Program	↓ Child abuse ↓ Depressive symptoms[a,28] (adult)	↑ Social competence ↑ Achievement test scores	↓ Special education placement (child/teen) ↓ Grade retention (child/teen) ↑ High school graduation (adult) ↑ Highest grade completed (adult) ↑Ever attended four-year college (adults)			↓ Delinquency (teen) ↓ Felony arrests (adult) ↓ Incarcerations (adult)
Head Start	↑ Positive health behaviors (child) ↑ Immunizations (child) ↑ Health status[20] ↑ Dental care[20]	↑ IQ scores ↑ Language and literacy skills[20]	↓ Grade retention (child) ↑ High school graduation (white adults) ↑ College attendance (white adults)			↓ Booked or charged with crime (black adult)

*Impact on child participants in the programs, measured in childhood (including adolescents), and adulthood. Does not include impact on the children's parents. .

Except where another source is specified, this table is adapted from Tables S.2 and S.3 in Karoly LA, Kilburn MR and Cannon JS. *Early Childhood Interventions: Proven Results, Future Promise.* MG-341. Santa Monica, CA: The RAND Corporation, 2005.

↑ = The program was associated with an increase in the specified outcome. ↓ = The program was associated with a decrease in the specified outcome.

[a] p-value=0.06, all other results were statistically significant at the $p \leq 0.05$ level.

ABOUT THE ROBERT WOOD JOHNSON FOUNDATION

For more than 40 years the Robert Wood Johnson Foundation has worked to improve the health and health care of all Americans. We are striving to build a national Culture of Health that will enable all Americans to live longer, healthier lives now and for generations to come. For more information, visit *www.rwjf.org*. Follow the Foundation on Twitter at *www.rwjf.org/twitter* or on Facebook at *www.rwjf.org/facebook*.

ABOUT THE COMMISSION TO BUILD A HEALTHIER AMERICA

In 2009, the Robert Wood Johnson Foundation (RWJF) Commission to Build a Healthier America issued 10 sweeping recommendations for improving the health of all Americans. RWJF reconvened the Commission in 2013, asking Commissioners to look beyond health care for new solutions. Following months of examining evidence and successful initiatives from around the country, the Commission issued new recommendations in 2014 calling on the nation to take action. For more information, please visit www.rwjf.org/commission.

ABOUT THIS ISSUE BRIEF SERIES

This issue brief is one in a series on the social determinants of health. Others in the series include:

What Shapes Health-Related Behaviors?

Early Childhood Experiences and Health

Stress and Health

Income, Wealth and Health

Education and Health

Race, Socioeconomic Factors and Health

Housing and Health

Neighborhoods and Health

Work, Workplaces and Health

Violence, Social Disadvantages and Health

Health Impact Assessment: A Tool for Promoting Health in All Policies

Breaking through on the Social Determinants of Health: An Approach to Message Translation

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ADDITIONAL RESOURCES

- Center on the Developing Child, Harvard University: <http://developingchild.harvard.edu/> [Accessed 7/18/14] – *A rich source of materials by distinguished experts on a range of topics related to child development. Scientific reports and briefs, interactive materials, and videos prepared for general audiences*.
- Early Childhood Research Collaborative, <http://www.earlychildhoodcentral.org/node/266> [Accessed 7/18/14]
- National Institute for Early Education Research, <http://nieer.org/> [Accessed 7/18/14]