ACCESS TO AFFORDABLE, HIGH-QUALITY CHILDCARE

This paper explores strategies to increase access to affordable, high-quality childcare, as well as evidence for the strategies' potential impact on substance use, mental health issues, violence, and chronic disease at a community or societal level. It also examines the state of access to affordable, quality childcare in Colorado and efforts to improve it, including the role of the Child Care and Development Fund (CCDF), the Colorado Child Care Assistance Program (CCCAP), and related efforts.

Access to Affordable, High-Quality Childcare: A National Challenge

Families nationwide face a shortage of affordable, high-quality childcare. Nationally, 61 percent of the 20.4 million children under age five experience childcare weekly. The remaining 39 percent lack a single regular source of childcare, meaning their families use a variety of sources of childcare during any given week (See Table 1). Of those who have access to a single, regular source, almost 33 percent receive care from a non-relative source, including day care facilities, a friend or neighbor, a head start program, or some other arrangement.[1] Childcare provider types include licensed childcare centers, licensed family childcare homes, and a wide variety of un-licensed childcare providers, in addition to family, neighbor, or other individuals providing care. Of those who have access to a single, regular source, 42 percent receive care from a relative, while 32.9 percent receive care from a non-relative source, including day care facilities, a friend or neighbor, a head start program, or some other arrangement.[2]

Table 1. Childcare Arrangements Among Children Under Age Five, 2011

Arrangement type	Number of children (in thousands)	Percent in arrangement	
		Estimate	Margin of error
Total children under 5 years	**20,404**	**100 .0**	**Not applicable**
IN A REGULAR ARRANGEMENT	**12,499**	**61 .3**	**1 .2**
Relative care	8,585	42.1	1.2
Mother	723	3.5	0.5
Father	3,623	17.8	0.9
Sibling	520	2.6	0.4
Grandparent	4,834	23.7	1.0
Other relative	1,520	7.4	0.6
Nonrelative care	6,721	32.9	1.2
Organized care facility	4,797	23.5	1.0
Day care center	2,726	13.4	0.8
Nursery or preschool	1,231	6.0	0.6
Head Start/school	1,140	5.6	0.6
Other nonrelative care	2,286	11.2	0.8
In child's home.	750	3.7	0.5
In provider's home	1,554	7.6	0.7
Family day care	946	4.6	0.5
Other care arrangement	656	3.2	0.4
NO REGULAR ARRANGEMENT[4]	**7,905**	**38 .7**	**1 .2**

Source: "Who's minding the kids? Child care arrangements: Spring 2011," U.S. Census Bureau, 2013. http://www.census.gov/prod/2013pubs/p70-135.pdf.

[1] Lynda Laughlin, "Who's minding the kids? Child care arrangements: Spring 2011," *U.S. Census Bureau*, 2013, http://www.census.gov/prod/2013pubs/p70-135.pdf.
[2] Ibid.

In 2011, families with children under age five paid an average of $179 per week or over $9,300 a year for childcare, compared to median income of about $50,000.[3,4] The cost of childcare typically comprises a significant portion of family income or is out of reach for many families, and the quality of childcare is often inconsistent. Some advocates suggest that as little as 10 percent of childcare is of sufficiently high-quality to have a positive impact on developmental outcomes.[5] Childcare and early education can overlap significantly, as discussed below, but where possible, this analysis will attempt to distinguish childcare from preschool.

Childcare in Colorado

Costs and Affordability

Colorado is among the most expensive, least affordable states for most types of childcare, as measured by total cost as a percentage of median single-parent or family income. Capacity is lacking in many areas of the state, particularly for lower-income families. Lack of affordable childcare has affected employment choices, such as whether to work or which job to take, for almost one-in-five low-income families, and lack of availability is a particularly important factor in influencing labor force participation among women.[6] Childcare is an issue in both rural and urban areas, but families in urban areas tend to pay more for childcare than their non-resort area rural counterparts, largely due to differences in the cost of living. Costs can also vary widely within urban areas; for example, in 2013, childcare prices in downtown Denver were 42 percent higher than those neighborhoods just a few miles away.[7]

Table 2: Average Childcare Costs in Colorado, 2015

Colorado	Infant	4-year-old	School-age (for 9 months of care)
Full-time Center-Based Care	$14,950	$11,089	$4,707
Full-time Family care	$9,620	$8,626	$3,621

Source: Child Care Aware of America's February 2016 survey of Child Care Resource and Referral State Networks. Some states used the latest state market rate survey. From Parents and the High Cost of Child Care, 2016 Report: Appendices. *Child Care Aware of America, 2017.*

Colorado had the highest costs in the nation for center-based care for infants in 2015; and for other types of care for infants and four-year-olds Colorado ranked among the top five or 10 most costly states. The cost of care for an infant in a childcare center was nearly 50 percent of median income for a single parent and 16 percent of income for a family. The cost of center-based care for two children was more than 128 percent the average cost of rent in Colorado and just over 39 percent of the average mortgage.[8] In 2014, about 16 percent of Colorado children under the age of six—66,000 kids—lived in poverty, nearly half of whom (approximately 30,000 children) lived in extreme poverty with an annual income of less than $12,000 for a family of four. Childcare costs have also grown more quickly than income in recent years,

[3] Ibid.
[4] "Income, Poverty and Health Insurance Coverage in the United States: 2011," *United States Census Bureau*, 2012, https://www.census.gov/newsroom/releases/archives/income_wealth/cb12-172.html.
[5] "Parents and the High Cost of Child Care 2016 Report: Appendices," *Child Care Aware of America*, 2016, http://www.usa.childcareaware.org/wp-content/uploads/2016/12/CCA_High_Cost_Appendices_2016.pdf.
[6] "Colorado Cost of Child Care," *Child Care Aware of America*, 2016, http://www.usa.childcareaware.org/wp-content/uploads/2016/12/State-Fact-Sheets_Colorado.pdf.
[7] The Women's Foundation, Qualistar Colorado, Colorado Children's Campaign, "Child Care Affordability in Colorado: An investigation into child care costs and recommended strategies for improving affordability," December 2014. https://www.cpr.org/sites/default/files/colorado_cost_of_child_care_report_2014.pdf
[8] "Parents and the High Cost of Child Care," 2016.

with the fastest growth for infant care in a childcare center (21 percent) compared to median family income growth of 12 percent between 2007 and 2014.[9]

Table 3: Least Affordable Center-Based Infant Care, 2015

Rank	State	Annual cost of infant care in a center	Single-parent family		Married-couple family	
			Median income	Percentage of the median income	Median income	Percentage of the median income
1	Colorado	$14,950	$30,398	49.2%	$91,561	16.3%
2	Hawaii	$13,584	$30,001	45.3%	$86,609	15.7%
3	California	$13,343	$26,482	50.4%	$86,659	15.4%
4	Oregon	$11,964	$22,676	52.8%	$78,000	15.3%
5	New York	$14,144	$25,946	54.5%	$95,033	14.9%

Source: Child Care Aware of America's February 2016 survey of Child Care Resource and Referral State Networks.

Some states used the latest state market rate survey. From Parents and the High Cost of Child Care, 2016 Report: Appendices. *Child Care Aware of America, 2017.*

Table 4: Least Affordable Family-Based Infant Care, 2015

Rank	State	Annual cost of infant care in FCC	Single-parent family		Married-couple family	
			Median income	Percentage of the median income	Median income	Percentage of the median income
1	Nevada	$8,572	$28,573	30.0%	$71,860	11.9%
2	New York	$10,556	$25,946	40.7%	$95,033	11.1%
3	Washington	$9,741	$26,044	37.4%	$90,150	10.8%
4	Wisconsin	$9,263	$23,633	39.2%	$87,677	10.6%
5	Rhode Island	$10,052	$25,798	39.0%	$95,256	10.6%
6	Colorado	$9,620	$30,398	31.6%	$91,561	10.5%
7	Florida	$7,642	$24,463	31.2%	$73,152	10.4%
8	District of Columbia	$16,025	$25,194	63.6%	$156,438	10.2%
9	Virginia	$10,088	$26,732	37.7%	$100,305	10.1%
10	Oregon	$7,836	$22,676	34.6%	$78,000	10.0%

Source: Child Care Aware of America's February 2016 survey of Child Care Resource and Referral State Networks.

Some states used the latest state market rate survey. From Parents and the High Cost of Child Care, 2016 Report: Appendices. *Child Care Aware of America, 2017.*

Table 5: Least Affordable Center-Based Care for Four-year-olds, 2015

Rank	State	Annual cost of 4-year-old care in a center	Single-parent family		Married-couple family	
			Median income	Percentage of the median income	Median income	Percentage of the median income
1	Hawaii	$11,232	$30,001	37.4%	$86,609	13.0%
2	New York	$11,700	$25,946	45.1%	$95,033	12.3%
3	Nevada	$8,768	$28,573	30.7%	$71,860	12.2%
4	Colorado	$11,089	$30,398	36.5%	$91,561	12.1%
5	Vermont	$10,440	$24,346	42.9%	$87,743	11.9%

Source: Child Care Aware of America's February 2016 survey of Child Care Resource and Referral State Networks.

Some states used the latest state market rate survey. From Parents and the High Cost of Child Care, 2016 Report: Appendices. *Child Care Aware of America, 2017.*

[9] "Kids Count in Colorado! 2016," *Colorado Children's Campaign*, 2016, http://www.coloradokids.org/wp-content/uploads/2016/03/2016-Kids-Count-final-low-res.pdf.

Table 6: Least Affordable Family Childcare for Four-year-olds, 2015

Rank	State	Annual cost of 4-year-old care in FCC+	Single-parent family		Married-couple family	
			Median income++	Percentage of the median income	Median income++	Percentage of the median income
1	Nevada	$8,013	$28,573	28.0%	$71,860	11.2%
2	New York	$9,776	$25,946	37.7%	$95,033	10.3%
3	Rhode Island	$9,258	$25,798	35.9%	$95,256	9.7%
4	Alaska	$9,645	$31,724	30.4%	$102,102	9.4%
5	Wisconsin	$8,274	$23,633	35.0%	$87,677	9.4%
6	Colorado‡	$8,626	$30,398	28.4%	$91,561	9.4%
7	Montana	$7,017	$19,987	35.1%	$75,129	9.3%
8	Oregon	$7,248	$22,676	32.0%	$78,000	9.3%
9	Washington	$8,293	$26,044	31.8%	$90,150	9.2%
10	California	$7,859	$26,482	29.7%	$86,659	9.1%

Source: Child Care Aware of America's February 2016 survey of Child Care Resource and Referral State Networks.

Some states used the latest state market rate survey. From Parents and the High Cost of Child Care, 2016 Report: Appendices. *Child Care Aware of America, 2017.*

Table 7: Average Costs for Two Children in Center-Based Childcare vs. Median Housing Costs, 2015

State	Infant	4-year-old	School-age	Two children	Annualized rent	Percentage difference	Annualized mortgage	Percentage difference
District of Columbia	$22,658	$17,863	Not reported	$40,521	$15,168	167.10%	$27,744	46.10%
Massachusetts	$17,082	$12,796	Not reported	$29,878	$12,756	134.20%	$24,576	21.60%
Minnesota	$14,826	$11,420	$9,457	$26,246	$9,852	166.40%	$17,508	49.90%
Colorado	$14,950	$11,089	Not reported	$26,039	$11,400	128.40%	$18,696	39.30%
New York	$14,144	$11,700	$11,128	$25,844	$13,152	96.50%	$24,108	7.20%

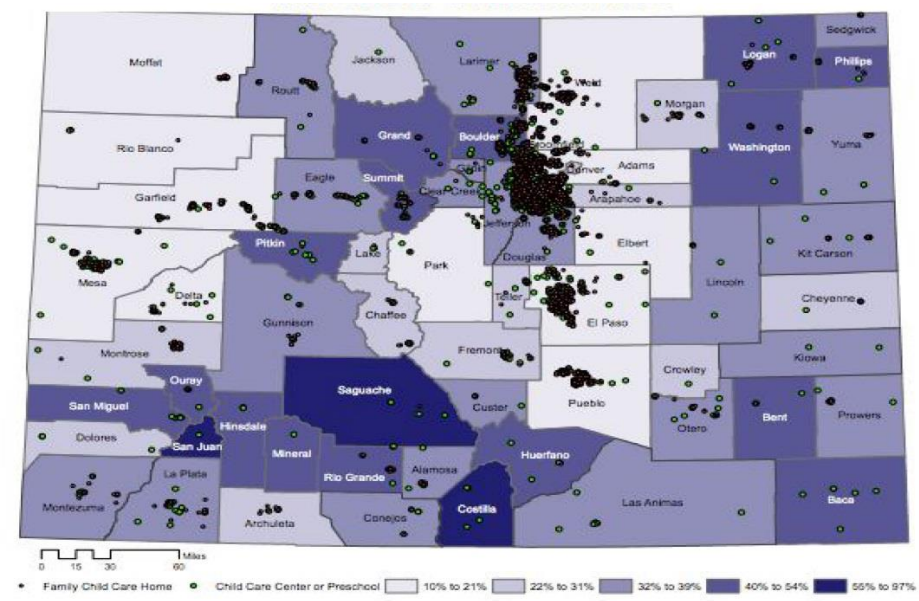
Source: Child Care Aware of America's February 2016 survey of Child Care Resource and Referral State Networks.

Some states used the latest state market rate survey. From Parents and the High Cost of Child Care, 2016 Report: Appendices. *Child Care Aware of America, 2017.*

In 2013, 240,000 Colorado children under age six were in households where both parents worked, but licensed care centers, family childcare homes and preschools had capacity for only 106,000 children – meeting just 44 percent of the need. In 2015, 21 counties had no licensed center-based providers for infants, and three had no licensed infant care in a childcare center or a family childcare home at all. The number of available slots declined from 2014 to 2015, particularly in rural areas.[10]

[10] Colorado Department of Public Health and Environment, "State of Childcare in Colorado," *Essentials for Childhood Project*, 2015.

Figure 1: Colorado Licensed Childcare Slots as a Percentage of Children Under Age Six



Source: Colorado Department of Public Health and Environment, "State of Childcare in Colorado," Essentials for Childhood Project, 2015. Map data from Qualistar Colorado.

Quality

The 2016 *Kids Count in Colorado* report summarized recent findings on the quality of childcare in the state, which suggested that, as in many other states, quality is likely low in many basic areas:

> In 2013, Colorado ranked 35th in the nation for its childcare center regulations and center oversight. The state earned 59 percent of the possible points for its childcare center regulations, receiving an F grade along with 19 other states…No state received an A, and the Department of Defense childcare system received a B. Ten states earned a C and 21 states received a D.
>
> As of 2013, Colorado fully met three of 11 program standards examined in the report: 1) requiring comprehensive background checks for employees; 2) following recommended health practices; and 3) adhering to recommended safety practices in 10 specific areas. The state partially met six standards but failed to meet two others entirely: 1) staff-to-child ratios that comply with the National Association for the Education of Young Children (NAEYC) accreditation standards for seven age groups and 2) group size requirements that comply with NAEYC standards.[11]

Improving Access to Affordable, High-Quality Childcare at Community and Societal Levels: Promising Models and Strategies

Potential Elements of Models to Increase Access

Programs to increase access to affordable, high-quality childcare can take a variety of approaches, as described below.

Increasing families' access to existing childcare options

Many programs in the United States seek to increase access to childcare by subsidizing parents to allow them to choose among a variety of existing community-based options for childcare in the community,

[11] "Kids Count in Colorado," 2016.

rather than establishing publicly funded childcare providers, as is done in some other countries. In theory, subsidies are also intended to support a larger supply of childcare providers and childcare slots, though this effect is highly dependent on the level, predictable availability, and distribution of the subsidies and the population, as well as workforce and facility factors.

Increasing the number of childcare slots available

States or counties can opt to fund development of the childcare workforce, fund providers to expand, or establish publicly funded childcare facilities. Areas where low-income children live and rural areas are particularly likely to have shortages of providers.

Improving the quality of childcare

Research suggests that the quality of the childcare provided determines whether it has benefits – and that poor-quality care may adversely affect achievement and behavior.[12,13,14,15,16] Though efforts to measure the quality of early childhood interventions have existed for decades, in recent years the federal government and states have placed increasing emphasis on improving the quality of care.[17] The United States Department of Health and Human Services (USDHHS) defines dimensions of quality measurement as follows:

> (1) process quality, involving interactions with children and structuring of the environment so that care is emotionally responsive, stimulating and safe; and
>
> (2) structural quality, involving "regulable" features of the environment, such as group size, ratio, and staff qualifications, that can increase the likelihood of positive process quality.

These two approaches to quality apply to both center-based care (including childcare centers, pre-kindergarten, preschools and Head Start), and home-based care (including licensed family childcare and family, friend and neighbor care), though the ways in which they are manifested and measured differ by setting, as well as by age of child (infants and toddlers; preschool-age children).[18]

There is no single definition or set of metrics for high-quality childcare, but there are a variety of quality-rating organizations, ratings systems and instruments. The Association for the Education of Young Children (NAEYC) and the American Academy of Pediatrics (AAP) provide descriptions of high-quality early childhood environments, but states and programs have significant latitude over quality measurement – and many children receive care in settings that fall outside these quality measurement efforts. Metrics can include: physical space and facilities, including health and safety requirements; curriculum and content of the childcare, including the amount of interaction, emphasis on personal care routines,

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[12] Stefania Maggi et al., "Community resilience, quality childcare, and preschoolers' mental health: A three-city comparison," *Social Science and Medicine* 73 (2011): 1080-1087, https://dx.doi.org/10.1016/j.socscimed.2011.06.052.
[13] C. Howes and C.E. Hamilton, "Child care for young children," in *Handbook of Research on the Education of Young Children*, ed. B. Spodek, (New York: Macmillan, 1993).
[14] D.S. Gomby and M.B. Larner, eds., "Long-term outcomes of early childhood programs," *The Future of Children* 5, no. 3 (1995): 1–224.
[15] Suzanne W. Helburn and Carollee Howes, "Child Care Cost and Quality," *The Future of Children FINANCING CHILD CARE* 6, no. 2 (1996): 62-82. https://www.princeton.edu/futureofchildren/publications/docs/06_02_03.pdf.
[16] C.M. Herbst and E. Tekin "The Impact of Child-Care Subsidies on Child Development: Evidence from Geographic Variation in the Distance to Social Service Agencies," *Journal of Policy Analysis and Management* 35 (2015): 94–116 https://dx.doi.org/10.1002/pam.21860.
[17] M. Zaslow, K. Tout, and I. Martinez-Beck, "Measuring the Quality of Early Care and Education Programs at the Intersection of Research, Policy, and Practice, OPRE Research-to Policy, Research-to-Practice Brief OPRE 2011-10a," *Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services*, 2010, https://www.acf.hhs.gov/sites/default/files/opre/quality_measures.pdf.
[18] Zaslow et al., "Measuring the Quality of Early Care," 2010.

emphasis on language development, use of evidence-based curricula and program structure; program duration; staffing (ratios, training and other variables); teacher effectiveness; and licensing and accreditation. Because of the widespread variability in program design, evaluation, and use of many types of childcare that are outside formal quality measurement efforts, evaluating the broader impact of childcare can be challenging. Because there are so many models of childcare with different characteristics, it is hard to interpret the research evidence to draw general conclusions that apply across the board.

National Programs

Child Care and Development Fund

The Child Care and Development Fund (CCDF) is the major federal program that subsidizes childcare for low-income families, supporting care for 1.4 million children nationally.[19] States have significant flexibility to tailor the program, determine which state or local agencies administer it, and set rates to subsidize childcare; the result is a wide variety of state models. To date, there appears to be limited evaluation of the quality of care provided. The federal 2014 Child Care Development Block Grant Act took steps to address this, making changes to the program to require all states to assess the need for childcare and invest in expanding capacity for high-quality care by implementing health, safety, licensing, training, and oversight standards established in the grant requirements.[20] However, since most states are in the early stages of implementing program changes required by the reauthorization, the impact of the additional emphasis on quality is not yet clear.

Early Head Start and Early Head Start-Childcare Partnerships

Early Head Start programs and providers that participate in the CCDF have substantial overlap in their missions and populations served. In five states, the District of Columbia, and the Mariana Islands, they partner and share funding as part of Early Head Start-Childcare Partnerships.[21] Early Head Start provides a variety of child development-focused services and supports to low-income families, including childcare. Through these partnerships, Early Head Start supports services in a variety of traditional and family care settings, with an emphasis on cultural competence and responsiveness to the needs of families and communities. Childcare providers participating in these partnerships are required to adhere to the research-based Head Start Program Performance Standards (for the Head Start program), which encourage the use of data to conduct continuous quality improvement. The Administration for Children and Families (ACF) released revised standards in 2016 for the first time since 1975, intended to strengthen and improve the quality of all Head Start programs. Evaluation over the past 50 years of the program has suggested quality varies substantially across programs.[22]

The childcare partnerships' desired outcomes include:

- Sustained, mutually respectful, and collaborative EHS-CCP.
- A more highly educated and fully qualified workforce to provide high-quality infant/toddler care and education.

[19] Administration for Children and Families, "Overview of 2016 Child Care and Development Fund Final Rule," *US Department of Health and Human Services,* 2016, https://www.acf.hhs.gov/sites/default/files/occ/ccdf_final_rule_fact_sheet.pdf.
[20] Ibid.
[21] Administration for Children and Families, "Early Head Start – Child Care Partnerships," *US Department of Health and Human Services,* 2017, https://www.acf.hhs.gov/ecd/early-learning/ehs-cc-partnerships.
[22] Administration for Children and Families, "Head Start Program Performance Standards Final Rule: General Fact Sheet," *US Department of Health and Human Services,* 2016, https://eclkc.ohs.acf.hhs.gov/hslc/hs/docs/hs-prog-pstandards-final-rule-factsheet.pdf.

- Increased community supply of high-quality early learning environments and infant/toddler care and education.
- Well-aligned early childhood policies, regulations, resources, and quality improvement support at national, state, and local levels.
- Improved family and child well-being and progress toward school readiness.[23]

Early Head Start settings are expected to provide "low teacher-to-child ratios and class sizes, qualified teachers receiving ongoing supervision and coaching to support implementation of curriculum and responsive caregiving, and broad-scale parent engagement activities."[24] Participating facilities and homes must be licensed and meet safety requirements.

Colorado Programs

Colorado Child Care Assistance Program

Colorado implements its federal CCDF grant through the Colorado Child Care Assistance Program (CCCAP), which subsidizes childcare for low-income families who are homeless, working, searching for work, in the Colorado Works Program, or in school.[25] It is administered by the Colorado Department of Human Services (CDHS) and by county departments of human services at the local level, which have substantial latitude to set sliding scale rates for subsidies and to oversee eligibility. Little information is available to evaluate the impact of the CCCAP, though the state is implementing enhanced quality improvement and monitoring because of new federal requirements established in 2014 and its subsequent state plan, and it conducts ongoing stakeholder engagement to gather input on the program. In fiscal year 2014-2015, 30,181 children used CCCAP subsidies. While official waitlists showed only 19 children in three counties who were waitlisted for the program in early 2016, the "Kids Count in Colorado" report suggested that "the true number of children in families who qualify and could benefit from CCCAP is likely much higher."[26]

In the FY 2016 to FY 2018 reauthorization of Colorado's program, federal officials expressed concern that low subsidy rates could contribute to the shortage of providers and childcare slots.[27] Earlier, in 2014, Colorado Public Radio reported on provider concerns that low CCCAP rates were contributing to childcare "deserts" where providers limit the number of CCCAP participants they accept or do not participate at all.[28] A 2015 market rate study assessing costs and the extent to which the CCCAP subsidy rates meet the federal definition of equal access found that rates in most counties did not meet the federal standard of the 75th percentile of market rates, and that they should be raised to promote better access. It also suggested that administrative barriers were discouraging provider participation.[29] Beyond Colorado, qualitative evaluations of childcare programs such as Early Head Start and a variety of local programs

[23] Administration, "Early Head Start," 2017.
[24] Ibid.
[25] Colorado Office of Early Childhood, "The Colorado Child Care Assistance Program: Information for Families," *Department of Human Services*, 2016, http://www.coloradoofficeofearlychildhood.com/cccap-parents.
[26] "Kids Count in Colorado," 2016.
[27] Administration for Children and Families, "Colorado Child Care Development Fund (CCDF) Plan with Conditional Approval Letter for FY 2016- 2018," *US Department of Health and Human Services*, 2016, https://www.acf.hhs.gov/sites/default/files/occ/colorado_stplan_pdf_2016.pdf.
[28] Megan Verlee, "State Subsidy Causes Some Of Colorado's 'Daycare Deserts,' Providers Say," *Colorado Public Radio*, 2014, http://www.cpr.org/news/story/state-subsidy-causes-some-colorados-daycare-deserts-providers-say.
[29] Ericka Moldow et al., "2015 Colorado Child Care Market Rate Study," *The Evaluation Center, University of Colorado Denver*, 2015, http://www.the-evaluation-center.org/wp-content/uploads/2016/01/FINAL-CCCAP-REPORT.pdf.

suggest that subsidy rates are key to increasing capacity and sustainability of providers and to enabling provider investments in training that promote quality of care and better experiences for families.[30]

The implementation of Colorado Shines is an important component of Colorado's childcare quality improvement efforts under its CCDF grant, though the state plan for FY 2016 to FY 2018 also includes a variety of other components intended to increase quality.[31]

Colorado Shines

Starting in 2013, Colorado began to implement a $45 million grant to improve early childhood education and link childcare quality assessment to licensing, using the Colorado Shines[32] Quality Rating & Improvement System (QRIS) run by the Colorado-based non-profit Qualistar,[33] which has developed quality rating systems for early childhood education programs in recent decades. Part of the purpose of this effort is to establish evidence linking childcare quality to school readiness. Unlike the previous Qualistar measurement efforts, Colorado Shines is mandatory. It assesses quality in five areas:

- Workforce Qualifications and Professional Development
- Family Partnerships
- Leadership, Management and Administration
- Learning Environment
- Child Health Promotion

However, a 2008 RAND evaluation of Qualistar's Quality Rating and Improvement Systems (QRIS) found limited evidence of impact on quality, concluding that it could not clearly attribute quality improvement to participation in a QRIS, though childcare centers that participated in the Qualistar Rating process improved their scores on the Early Childhood Environment Rating Scale (ECERS-R) by nearly one point on a seven point scale, and Family Child Care Homes that participated improved their Family Day Care Rating Scale (FDCRS) scores by more than one point on a seven point scale.[34] Future evaluation of Colorado Shines, which went into effect in early 2015, may shed more light on its effects on quality.[35]

Early Head Start-Childcare Partnerships

There are four Early Head Start partnership grantees in Colorado (and a larger number of Early Head Start providers), each of which has its own goals and strategies to improve quality and increase capacity for early learning placements for infants and toddlers. The partnership grants include both family childcare homes and centers. They have at least 25 percent shared enrollees with CCCAP.[36]

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[30] Diane Paulsell, Renee Nogales, and Julie Cohen, "Quality Child Care for Infants and Toddlers: Case Studies of Three Community Strategies," *Mathematica Policy Research, Inc. and Zero to Three Policy Center*, 2003, https://www.mathematica-mpr.com/our-publications-and-findings/publications/quality-child-care-for-infants-and-toddlers-case-studies-of-three-community-strategies.

[31] Administration for Children and Families "Colorado Child Care Development Fund (CCDF) Plan with Conditional Approval Letter for FY 2016-18," 2016.

[32] "Colorado Shines," *Colorado Department of Human Services, Colorado Department of Education*, 2015, http://coloradoshines.force.com/ColoradoShines/home.

[33] "Colorado's QRIS: Colorado Shines," *Qualistar.org*, 2017, https://www.qualistar.org/colorado-shines.html.

[34] Gail L. Zellman et al., *Assessing the Validity of the Qualistar Early Learning Quality Rating and Improvement System as a Tool for Improving Child-Care Quality* (Santa Monica, CA: RAND Corporation, 2008), available at http://www.rand.org/pubs/monographs/MG650/.

[35] Ann Schimke, "A year after new child care rating system rolls out, two centers nab top scores," *Chalkbeat*, 2016, http://www.chalkbeat.org/posts/co/2016/01/20/a-year-after-new-child-care-rating-system-rolls-out-two-centers-nab-top-scores/.

[36] Administration for Children and Families "Colorado Child Care Development Fund (CCDF) Plan with Conditional Approval Letter for FY 2016-18," 2016.

Mile High United Way/Rocky Mountain PBS Partnership to Support Childcare Providers

In an example of an innovative program to support family members and others who provide childcare informally, Mile High United Way partnered with Rocky Mountain PBS to do outreach for and implement a program that texts childcare tips to parents and other caregivers. Rocky Mountain PBS' daytime kids' programming includes advertising that encourages caregivers to sign up for a text message service provided by Bright By Three, a Colorado-based nonprofit childhood development organization. Bright By Three's Bright By Text program delivers tips and links to PBS programming to caregivers, with almost 6,000 subscribers across the state.[37]

Potential Impact on Health Outcomes

Potential Pathways for Childcare's Effects on Health

The research and policy literature on childcare is often vague in separating childcare from early childhood education interventions, and in practice—particularly where quality is high—these can overlap significantly. The annual national report "Parents and the High Cost of Childcare" by the advocacy organization Childcare Aware of America equates high-quality childcare with early education, although there is no single definition of these terms.[38] A broad base of U.S. and international literature supports positive long-term economic impacts of high-quality early childhood intervention with positive effects on children and parents –especially mothers—over time.[39] Major recent assessments of early childhood development interventions, such as the *White House Report on the Economics of Early Childhood Investments,*[40] identify several areas where evidence supports benefits of these early interventions, including:

- Increasing lifetime earnings, especially for mothers, by as much as $79,000 while reducing spending by social programs.[41]
- Remedial education savings, with some research estimating savings of more than $11,000 per student through grade 12.[42]
- Reduced criminal justice system involvement, which is sometimes estimated to be the largest driver of system-wide savings.[43] However, evidence on specific childcare interventions and crime at a community or broader level is mixed, as discussed further below.

Although estimates of cost savings vary widely, the White House report estimates that quality early childhood interventions result in a gain of $8.60 per every $1 spent over the life of the individual, including benefits realized by reduced crime and spending by anti-poverty programs, as well as educational savings.

Potential pathways for evidence-based strategies to increase access to affordable quality childcare to reduce substance abuse, mental health issues, violence, and chronic disease at a community level could take a variety of forms. Quality Childcare access could contribute to greater cognitive and social

[37] "Bright by Three: Engage, Develop, Learn," *Bright by Three*, 2017, http://brightbythree.org/.
[38] "Parents and the High Cost of Child Care," 2016.
[39] Maggi et al., "Community resilience," 2011.
[40] "The Economics of Early Childhood Investments," *Executive Office of the President*, 2015, https://obamawhitehouse.archives.gov/sites/default/files/docs/early_childhood_report_update_final_non-embargo.pdf.
[41] Leonard N. Masse and W. Steven Barnett, "Comparative Benefit-Cost Analysis of the Abecedarian Program and its Policy Implications," *Economics of Education Review* 26, no 1. (2007): 113–125.
[42] A. Campbell and Craig T. Ramey, "Cognitive and School Outcomes for High-Risk African-American Students at Middle Adolescence: Positive Effects of Early Intervention," *American Educational Research Journal* 32, no. 4 (1995): 743–772.
[43] Art Rolnick and Rob Grunewald, "Early Childhood Development: Economic Development with a High Public Return," *Federal Reserve Bank of Minneapolis*, 2003, https://www.minneapolisfed.org/publications_papers/studies/earlychild/abc-part2.pdf.

development and school readiness, translating to better educational, social, and economic outcomes. These, in turn, are associated with better health.[44]

Access to affordable childcare can also help parents maintain jobs, increase incomes, achieve economic security, and accumulate social capital, which reduces the risks of negative social and health outcomes for both parents and children and increases family resources to support better outcomes for children. Although there is evidence that childcare access increases mothers' labor force participation, and as a result, income, this analysis focuses on the effects of strategies to increase access to affordable, high-quality childcare on health outcomes.[45]

Evidence of Impact

There is evidence that a wide variety of investments in early childhood development are associated with positive outcomes later in life at the population level *if* they are high-quality; the positive effects include greater workforce productivity, higher income, and reduced economic inequality. There is also emerging evidence of reduced risk of experiencing chronic conditions and illness itself.[46] The literature examining these effects frequently focuses on income and labor force outcomes, without extrapolating further to health and social outcomes or attempting long-term assessment of these impacts. However, associations between income and health exist to support linkages between aspects of early childhood development and population health over a lifetime. Pagani and Fitzpatrick (2014) frame the role of early childhood development as setting the stage for not only later educational and economic achievement, but better lifetime health: "School-entry characteristics predict adult educational attainment, which forecasts dispositions toward disease prevention. Health and education risks can also be transmitted from one generation to the next."[47] Specific evidence on health effects is beginning to emerge, as discussed below.

The role of affordable, high-quality childcare specifically in improving these outcomes is less clear, but substantial evidence exists to support its benefits, though they can be difficult to distinguish from other factors that affect economic and social outcomes. Where evidence does exist, it suggests that the relationship between childcare access and health outcomes is complex and dependent on the quality of the childcare provided. Variation in program design and quality can produce counterintuitive results and challenge evaluation efforts. For example, one study (Herbst and Tekin, 2009) found an association between use of CCDF childcare subsidies and increased rates of childhood obesity among children who had participated in subsidized childcare during the year before kindergarten, particularly in center-based services.[48] The authors argue that this increased risk was related to the activities, setting, and nutrition changes that were more likely to be present in lower-quality childcare options. As is common across the U.S., subsidies allowed complete parental choice of childcare provider, regardless of quality. Research suggesting potential effects on population health from high-quality early intervention is summarized below.

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[44] Lori G. Irwin, Arjumand Siddiqi, and Clyde Hertzman, "Early Child Development: A Powerful Equalizer," *World Health Organization's Commission on the Social Determinants of Health*, 2007.
[45] Colleen Henry, Misha Werschkul, and Manita C. Rao, "Child Care Subsidies Promote Mothers' Employment and Children's Development," *Institute for Women's Policy Research*, 2003. https://iwpr.org/publications/child-care-subsidies-promote-mothers-employment-and-childrens-development/.
[46] Executive Office of the President, Council of Economic Advisers, "Economic Report of the President: Chapter 4: Inequality in Early Childhood and Effective Public Policy Interventions," 2016, https://www.gpo.gov/fdsys/pkg/ERP-2016/pdf/ERP-2016-chapter4.pdf.
[47] Linda S. Pagani and Caroline Fitzpatrick, "Children's School Readiness: Implications for Eliminating Future Disparities in Health and Education," *Health Education and Behavior* 41, no. 1 (2014): 25-33, https://dx.doi.org/10.1177/1090198113478818.
[48] C.M. Herbst and E. Tekin, "Child care subsidies and childhood obesity," *Review of Economics of the Household* 9, no. 3 (2011): 349-378, https://dx.doi.org/10.1007/s11150-010-9087-0.

Chronic Conditions

The Carolina Abecedarian Project was a landmark study finding positive long-term effects of high-quality early childcare and education, with particular benefits to low-income children. In the study, a group of children born between 1972 and 1977 were randomly assigned as infants to either an early educational intervention group or a control group, with the experimental group receiving full-time educational intervention in a childcare setting through age five that included individualized curricula focused on social, emotional, and cognitive development, particularly language. Follow-up studies were done at ages 12, 15, 21, 30, and 35. The follow-up studies found improved school achievement and economic outcomes for participants, and the follow-up at age 35 identified health impacts, including:

> …lower rates of pre-hypertension in their mid-30s than those in the control group. They also have a significantly lower risk of experiencing total coronary heart disease (CHD)—defined as both stable and unstable angina, myocardial infarction, or CHD death—within the next 10 years. Compared to the control group, males treated in the Abecedarian program have lower incidences of hypertension in their mid-30s. In addition, treated men less frequently exhibit combinations of both obesity and hypertension, and none exhibited the cluster of conditions known as "metabolic syndrome," which is associated with greater risk of heart disease, stroke, and diabetes.[49,50]

This intervention also included nutrition and health care components, with children eating two meals and a snack during the program and being offered primary care, including periodic check-ups and daily screening.

Mental Health

Limited research identifies associations between higher-quality childcare and children's mental health, though longer-term evidence with links to clinical outcomes is lacking. Maggi et al (2011) examined associations between quality of childcare, community social capital, and the mental health of children from three communities in British Columbia, Canada. Notably, the study's definition of "mental health" extended beyond clinical diagnoses to broad categorization of "externalizing" and "internalizing" behaviors. The study found that higher-quality childcare, as measured by the Early Childhood Environment Rating Scale, Revised Edition (ECERS-R; Harms, Clifford & Cryer, 1998) was associated with better teacher-reported mental health among children. Provision of high quality childcare appeared to be linked to community social capital and resilience as reflected in coordinated community efforts to provide and continuously improve quality childcare, with the authors concluding that "cities indirectly influenced the mental health of children through the effects of childcare characteristics."[51]

Vandell et al found that the quality and quantity of childcare provided by non-relatives from birth to age 4.5 were linked to teens' social and educational functioning at age 15. Higher-quality care predicted higher academic achievement, with positive effects growing as quality increased. Higher-quality childcare

[49] Frank Porter Graham Child Development Institute, "Major New Findings from FPG's Abecedarian Project," *The University of North Carolina at Chapel Hill*, 2014, http://fpg.unc.edu/news/high-quality-early-education-and-care-bring-health-benefits-30-years-later.
[50] Frances Campbell et al., "Early childhood investments substantially boost adult health," *Science* 343, no. 6178 (2014) 1478-1485, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4028126/.
[51] Maggi et al., "Community resilience," 2011.

also predicted less self-reported externalizing behavior, though more hours of non-relative care also predicted greater risk-taking and impulsivity, which mediated some of the positive effects.[52]

Crime Rates

There is substantial but sometimes mixed evidence on the potential impact of access to affordable childcare on crime rates, and questions about the role that the quality of services plays in any effects on crime. The more distant the outcomes being measured from the delivery of the childcare services, the weaker the evidence appears. In addition, many early childhood and school-age interventions for which potential effects on crime have been studied involve interventions broader than childcare alone.[53]

Research on preschool access has identified positive effects on crime rates over the long term. For example, an analysis of the long term social and economic impacts of the High/Scope Perry Preschool Program in Ypsilanti, Michigan, identified reduced crime rates as being one of the most beneficial positive social and economic impacts of the intervention. The study followed two groups of three- and four-year-old children, some of whom received no intervention and some of whom attended the 2.5-hour daily preschool program, which included weekly home visits by teachers. The study then looked at a variety of variables including crime rates for each group through the participants' forties. However, this model is likely not comparable to many childcare settings or to typical use of childcare by working parents with full-time or even part-time jobs. [54,55]

A study of the introduction of affordable childcare in Quebec as part of a national Canadian program starting in 1997 for children ages birth to four found negative effects at the population level as time went on, including:

> …significant worsening in self-reported health and in life satisfaction among teens. Most strikingly, we find a sharp and contemporaneous increase in criminal behavior among the cohorts exposed to the Quebec program, relative to their peers in other provinces. We illustrate graphically a monotonic increase in crime rates among cohorts with their exposure to the child care program, and we show in regression analysis that exposure led to a significant rise in overall crime rates. We also find that these effects are concentrated in boys, who also see the largest deterioration in non-cognitive skills.[56]

This study's findings and methodology proved controversial because the study examined outcomes among all teens in the province, not just those who participated in the childcare program. The authors suggested that quality of the available childcare could be a factor, though the province was measuring and working to improve quality.

The conflicting results indicate the complexity of assessing childcare programs' quality and impact, as well as the potential pitfalls of expecting any single intervention to produce clear effects on long-term

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[52] Deborah Lowe Vandell et al., "Do Effects of Early Child Care Extend to Age 15 Years? Results From the NICHD Study of Early Child Care and Youth Development," *Child Development* 81, no. 3 (2010): 737-756, https://dx.doi.org/10.1111/j.1467-8624.2010.01431.x.

[53] Arthur J. Reynolds et al., "Long-term Effects of an Early Childhood Intervention on Educational Achievement and Juvenile Arrest: A 15-year Follow-up of Low-Income Children in Public Schools," *Journal of the American Medical Association* 285, no. 18 (2001): 2339-2346, https://dx.doi.org/10.1001/jama.285.18.2339.

[54] James J. Heckman et al., "The Rate of Return to the High/Scope Perry Preschool Program," *Journal of Public Economics* 94, no. 1-2 (2010): 114–128.

[55] Milagros Nores et al., "Updating the Economic Impacts of the High/Scope Perry Preschool Program," *Educational Evaluation and Policy Analysis* 27, no. 3 (2005): 245-261.

[56] Michael Baker, Jonathan Gruber, and Kevin Milligan, "Non-Cognitive Deficits and Young Adult Outcomes: The Long-Run Impacts of a Universal Child Care Program," *The National Bureau of Economic Research*, Working Paper No. 21571, http://www.nber.org/papers/w21571.pdf.

outcomes, especially when those interventions vary dramatically within a community, state, or nationwide.

Conclusion

While promising models of affordable childcare exist, defining and measuring "high quality" is challenging, as is ensuring that subsidy programs and other efforts to increase access promote quality. There is evidence that investment in high-quality early childhood development services—in which high-quality childcare is included—is linked to improved economic security, reduced inequality, and other outcomes associated with better health. There is also emerging evidence that some interventions can reduce the risk of chronic illness. The evidence of the effects on crime rates is conflicting. Further rigorous evaluation of efforts around the country and in Colorado could help better define the key determinants of quality and the effects of making these services affordable for families.