PRENATAL-TO-3 POLICY CLEARINGHOUSE

EVIDENCE REVIEW

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ER 06C.0923

Comprehensive Screening and Connection Programs

Evidence Review Findings: Effective / Roadmap Strategy

Comprehensive screening and connection programs (CSCPs) are an effective strategy to increase families' knowledge and use of community resources and lead to better child health and development outcomes, such as higher vaccination rates and reduced emergency department use. Limited evidence suggests participation in comprehensive screening and connection programs also contributes to increased participation in higher quality child care. Evidence-based CSCPs have been rigorously studied as local interventions, and the current evidence base does not provide clear guidance for states on the most effective way to support and implement programs statewide.

Comprehensive screening and connection programs (CSCPs) assess children and parents for a range of factors that contribute to long-term child and family wellbeing, including physical development, behavioral issues, parental physical and mental health, and social predictors of health. Based on identified needs, families are referred to necessary services and supports to address risk factors early on. Programs provide coordinated care and follow up with families to ensure linkage and use of support services. Universal screening programs are intended to be available to all families in a community. Three rigorously studied evidence-based programs, DULCE, Family Connects, and HealthySteps, are included in this review. States can support the implementation of and access to CSCPs by enacting legislation to provide programs statewide (e.g., mandating Medicaid and/or private insurance coverage), by providing financial support to programs, or by implementing a home-grown program similar in design to one of the three evidence-based programs. The evidence base does not currently provide clear guidance for states on the most effective way to implement CSCPs at a statewide level.

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

Table 1: Impacts of Comprehensive Screening and Connection Programs on Policy Goals

Positive Impact	Policy Goal	Overall Findings
	Access to Needed Services	Positive impacts on connections to community resources
	Parents' Ability to Work	*(Policy goal outside the scope of this review)*
	Sufficient Household Resources	*(Policy goal outside the scope of this review)*
	Healthy and Equitable Births	*(Policy goal outside the scope of this review)*
	Parental Health and Emotional Wellbeing	Mostly null impacts on maternal physical and mental health
	Nurturing and Responsive Child-Parent Relationships	Mostly null impacts with positive findings in home environment quality
	Nurturing and Responsive Child Care in Safe Settings	Trending positive impacts on participation in quality child care
	Optimal Child Health and Development	Mixed impacts, with positive impacts for timely vaccinations, safe sleep, and emergency care use

What Are Comprehensive Screening and Connection Programs?

The perinatal period and early years of a child's life lay the foundation for healthy development and family functioning, and this age period provides a crucial window of opportunity for infants, toddlers, and their families.[2] Comprehensive screening and connection programs (CSCPs) conduct screenings of families throughout the first years of life to help identify needs early on and connect families to community resources that provide support during this important period of growth and development.

CSCPs are defined, in part, by the broad scope of their services: In addition to physical health screenings, families are screened for important factors that contribute to overall wellbeing, such as developmental delays, maternal depression, and social predictors of health that include exposure to violence, food insecurity, housing insecurity, financial resource strain, and substance use.[3,4] Identifying needs through screenings alone is not enough to substantially improve child outcomes; referrals to, and initiation of, effective services are key aspects of these approaches to address identified areas of need.[5] CSCPs facilitate a warm hand-off to the resources or services families need and follow up with families to verify the receipt of services or inquire about barriers to services. Local sites partner with health care providers, child care, and community-based organizations, among others, to address the needs of families.[5]

CSCPs are universal, a term that denotes the scope of who gets screened and linked to needed services. The universality of programs is intended to destigmatize the intervention and to reach families who may not otherwise get connected to local resources. Programs do not necessitate that families request help first,[4] and all families in the community the program serves have access to assistance.

Although many local and statewide programs have screening and referral components, they lack the rigorous evaluation of randomized controlled trials. This evidence review focuses on three rigorously studied CSCPs: Developmental Understanding and Legal Collaboration for Everyone (DULCE), Family Connects, and HealthySteps.[i] These three evidence-based models screen families for the social determinants of health, are universal to all families in the service area regardless of income or other eligibility criteria, and are low touch in service delivery, providing a limited number of home visits or meeting families during scheduled well-child visits.

DULCE takes an interdisciplinary, family-centered approach in pediatric care settings using a Medical-Legal Partnership that includes child development specialists and legal partners. The child development specialist joins pediatricians at well-child visits and helps connect parents to critical support in the community.[7] Legal partners screen families for any legal issues, such as eviction notices, and make referrals for families if needed. All providers associated with the DULCE Interdisciplinary Team meet weekly to discuss problems faced by their clients and to provide comprehensive and coordinated services to families. DULCE is available to families with children from birth to age 6 months.[6,7]

Family Connects is designed to connect new parents to resources following birth. All mothers in participating hospitals are offered a postpartum home visit by a nurse. Mothers who choose to participate receive one to three postpartum home visits, beginning within 3 weeks of birth, to assess any risks and needs. Families are offered services tailored to their specific needs, including connections to community resources. Family Connects then follows up with families 1 month after the last home visit, usually with a phone call, to ensure the connection was made to the referred agency.[8]

HealthySteps takes place in pediatric care settings. HealthySteps Specialists with expertise in child development join the pediatric primary care team at routine well-child visits. HealthySteps aims to improve parent knowledge and skills to promote optimal growth and development, which includes emotional development, literacy skills, cognitive skills, and physical development. Three tiers of short-term and continuous support are available to families, dependent on their identified needs and concerns with Tier 1 for all families and Tier 3 for families with the most significant risks. HealthySteps is available to families with children from birth to age 3.[8,43]

Because CSCPs are designed to address social predictors of health, they are theorized to reduce disparities in health and development. The outcome disparities experienced are caused by inequities in our health care and economic systems that have oppressed people of color for centuries.[6,G] Social predictors of health such as poverty, housing and food insecurity, and financial

[i] For a more detailed explanation of the scope of the literature search and a list of excluded programs, please refer to our Policy Clearinghouse Search Process and Parameters section of pn3policy.org.

resource strain are more likely to affect people of color and people with low incomes.[4] Universal CSCPs are designed to meet the needs of all families and are expected to reach these underserved families.[7] Limited critiques suggest that methods taught by a program may not be relevant to different parenting cultures.[H] This is discussed more in depth later in the review. More research is needed to understand how the three CSCPs highlighted in this review serve marginalized communities and work to reduce disparities.

Who Can Participate in Comprehensive Screening and Connection Programs?

CSCPs are implemented in settings nationwide. Because DULCE, Family Connects, and HealthySteps are universal programs, all children and families in participating settings are eligible for the initial screening assessment. However, families who give birth or receive care outside of participating hospitals and pediatric care settings are unable to access services.

Currently, 27 states have at least one DULCE, Family Connects, or HealthySteps program site. Program reach depends on the number and size of program sites, which varies between each evidence-based program model. For additional details on the location, number of sites, and number of families served by evidence-based program and state, see Tables 3a, 3b, and 3c: *State Variation in Comprehensive Screening and Connection Programs*.

What Are the Funding Options for Comprehensive Screening and Connection Programs?

CSCPs are funded through both public and private support including a combination of governmental resources (local, county, state, and federal), private foundation support, and reimbursement from health insurance plans (including Medicaid).[10,11,26] Across all site locations and the three evidence-based program models, there is substantial variation in the funding mechanisms used to support program implementation and adoption. Most funding options are used at the local and community site level.

Local CSCPs use numerous federal funding streams to support local sites. Several Family Connects and HealthySteps local sites are partially funded through the Title V Maternal and Child Health Services Block Grant Program[11] and the Preschool Development Grant.[14,26] The grants are first awarded to states that then determine which local sites receive funding.[12,14] Federal agencies, including Health Resources & Services Administration (HRSA) and Substance Abuse and Mental Health Service Administration (SAMHSA), also provide partial funding to HealthySteps sites through grants that sites can directly apply for.[25,17] The US Department of Defense (DOD) has funded pilot programs of HealthySteps at local sites since 2019.[15]

The 2021 American Rescue Plan Act (ARPA), allocated $150 million to supplement Maternal, Infant, and Early Childhood Home Visiting (MIECHV) dollars[30] which were given to state-level departments such as departments of health or family protective services to use as they see fit to support evidence-based home visiting programs.[18] Of the three evidence-based programs, only Family Connects is currently eligible for MIECHV along with other home visiting programs not considered in scope of this review.[47] Beneficiaries of these funding dollars included CSCPs. Some states have taken initiative to direct ARPA funds for the implementation of statewide programs; for example, Connecticut allocated $8 million from ARPA funds to establish a Family Connects program in the state.[27,31,33] Colorado has also used ARPA funding to start a Family Connects state program in late

2022.[28] City locations that received ARPA funding include Chicago, Austin, Boston, and Tacoma, among others.[42]

The three evidence-based programs have leveraged Medicaid financing to support site operations and services.[ii] State Medicaid agencies have the option to reimburse for preventive services from nonphysicians if approved in a State Plan Amendment (SPA). DULCE, Family Connects, and HealthySteps have all been able to bill Medicaid for preventive services through this mechanism. Both DULCE and HealthySteps have been able to secure Medicaid funding for the salaries of their specialists who perform preventive services for families.[31,34] DULCE has billed Medicaid for targeted case management, which is a Medicaid benefit that helps families access medical, social, and educational services. If states have a SPA to provide targeted case management benefits, CSCPs can bill Medicaid for the screenings and facilitation of referrals to services.[31] Both HealthySteps and Family Connects have Medicaid Managed Care Organization (MCO) contracts and bills providers for services such as psychosocial education and preventative services.[34]

DULCE, Family Connects, and HealthySteps programs can use state- and county-level funding to support the implementation of local sites as well. For example, individual program sites can access revenue generated from state-level taxes (e.g., tobacco or property taxes) dedicated to early childhood development and health programs.[11,25,26] Local CSCPs also receive funding from state agency departments. For instance, some HealthySteps program sites use funding from Family and Protective Services to support Prevention and Early Intervention programs at the county level.[10] Finally, all three evidence-based programs receive financial support from county public health funds and local departments of health and education, among others.[11,25,26]

Why Should Comprehensive Screening and Connection Programs Be Expected to Impact the Prenatal-to-3 Period?

The goal of comprehensive screening and connection programs (CSCPs) is to identify and address a wide range of potential risks and needs early in a child's life. In doing so, the child and family have a strong foundation to promote long-term optimal child development and family wellbeing.[2] Screening all families for indicators of wellbeing beyond physical development encourages providers to take a more holistic approach to the many factors that affect child health and wellbeing.[16]

The three evidence-based programs identify the needs of parents as well as children, recognizing that the health of the whole family affects child wellbeing and development (e.g., maternal mental health impacts parent-child interactions). Connections to and the initiation of effective services are key aspects of addressing identified areas of need.[19] By ensuring connections are made to effective services to address identified needs from screenings, program models may increase parenting knowledge, create support networks for parents, and improve parenting behaviors to promote healthy parent-child interactions which can all contribute to optimal child health and development. Increased parenting knowledge and support can increase parental awareness of the developmental needs of children such as proper nutrition, appropriate sleeping schedules, and the benefits of

[ii] DULCE program sites in California received Medicaid support from intergovernmental transfers, which are defined as "transfers of funds from local governments, including providers owned or operated by local governments to the state Medicaid agency to finance the nonfederal share of Medicaid payments (pg.9)."[29]

receiving parental affection. These parents are more likely to promote healthy behaviors and parent-child interactions that encourage intellectual, social, emotional, and moral development in children.[46]

What Impact Do Comprehensive Screening and Connection Programs Have, and for Whom?

The review of the evidence below is limited in scope to rigorous randomized controlled trials (RCTs) of universal, comprehensive screening and connection programs (CSCPs) serving families prenatally or in the first year of life. To date, CSCPs have not yet been studied as a statewide policy; as a result, RCTs of local settings form the evidence base for this review. Among CSCPs, only DULCE, Family Connects, and HealthySteps meet these criteria.

There is only one DULCE RCT, and it took place at Boston Medical Center in Massachusetts. Family Connects is also limited geographically because only two RCTs have been completed, both in Durham, North Carolina through Duke University, using separate populations at different time periods. The second RCT is a replication attempt of the first RCT. One national evaluation from 1996 to 1998 is the basis for the HealthySteps RCT samples. Subgroup analyses and long-term findings from follow-up interviews with the original RCT families in Family Connects and HealthySteps led to multiple publications on the same intervention.[iii] For the purposes of our assessment, studies that measure the impact of the same intervention on the same sample are treated as a single example of effectiveness, regardless of the number of distinct publications.

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

The Evidence of Effectiveness table displays the findings associated with CSCPs (beneficial, null,[iv] or detrimental) for each of the strong studies (A through M) in the causal studies reference list. Studies A through D and Studies K through M examine the impacts of Family Connects. Studies E through I focus on HealthySteps, and Study J is specific to DULCE. For each indicator, a study is categorized based on findings for the overall study population; subgroup findings are discussed in the narrative. The Evidence of Effectiveness table also includes our conclusions about the overall impact on each studied policy goal. The assessment of the overall impact of each studied policy goal weighs the timing of publication and relative strength of each study as well as the size and direction of all measured indicators.

[iii] Studies A, B, C, K, L, and M use a population from an evaluation of the first Family Connects RCT participants in Durham, North Carolina. Study D uses a population from a replication RCT of Family Connects in Durham, North Carolina. Studies E, F, G, H, and I use different samples of participants from a national survey of HealthySteps families.
[iv] An impact is considered statistically significant if $p \leq 0.05$. Results with p-values above this threshold are considered null or nonsignificant.

Of the 13 causal studies included in this review, five examined how outcomes differed by race or ethnicity (beyond presenting summary statistics or controlling for race/ethnicity). Where available, this review presents the analyses' causal findings for racial subgroups. A rigorous evaluation of a policy's effectiveness should consider whether the policy has equitable impacts and should assess the extent to which a policy reduces or exacerbates pre-existing disparities in economic and social wellbeing.

Table 2: Evidence of Effectiveness for Comprehensive Screening and Connection Programs by Policy Goal

Policy Goal	Indicator	Beneficial Impacts	Null Impacts	Detrimental Impacts	Overall Impact on Goal
Access to Needed Services	Knowledge of Community Resources	F			Positive
	Use of Community Resources	B, J			
	Timely Pediatric Appointments	F, J			
Parental Health and Emotional Wellbeing	Maternal Anxiety	B, L			Mixed
	Maternal Depression	L	B, L, M		
	Maternal Substance Use		B		
	Emergency Department Visits		D		
Nurturing and Responsive Child-Parent Relationships	Positive Parenting Behaviors and Caregiving	B, M	B, E, F, G, I, M		Mostly Null
	Discipline Practices	H	F, G, H		
	Home Environment Quality	B			
	Warmth and Nurturance	I	I		
	Child Attachment Scores		I		
	Father-Infant Relationship Quality		L, M		
Nurturing and Responsive Child Care in Safe Settings	Participation in Quality Child Care	B			Trending* Positive

Table 2: Evidence of Effectiveness for Comprehensive Screening and Connection Programs by Policy Goal (Continued)

Policy Goal	Indicator	Beneficial Impacts	Null Impacts	Detrimental Impacts	Overall Impact on Goal
Optimal Child Health and Development	Total Infant Emergency Care Use	A, B, C, J, K, L	F, G, J	D	Mixed
	Emergency Department Visits for Accidents, Injuries, or Maltreatment		C, D		
	Child Protective Services Investigations	L	K, L		
	Safety Practices^		E		
	Safe Sleep	E			
	Breastfeeding		E		
	Timely Vaccinations	F, J			
	Behavior Problems/Social Skills		F, G, I		

Studies A through D and Studies K through M examine the impacts of Family Connects. Studies E through I focus on HealthySteps and DULCE is Study J.
** Trending indicates that the evidence is from fewer than two strong causal studies or multiple studies that include only one location, author, or data set.*
^ Safety practices include lowering the water temperature on the water heater and the correct use of a car seat.
Notes: If a study is placed in multiple impact categories (beneficial, null, detrimental) for the same indicator, the studies include various ways of measuring similar indicators or vary across samples. Please see the text for greater detail.

Access to Needed Services

Findings from four RCTs across all three evidence-based program models show that CSCPs have a positive impact on families' awareness and use of community supports and resources.[F,J,B,D] A large evaluation of 15 HealthySteps sites nationwide examined families' knowledge of community resources and found that parents in the intervention had 3.5 times higher odds of being informed about community resources than their counterparts not enrolled in HealthySteps.[F] At both 6 and 12 months, the families who participated in DULCE at a site in Boston, Massachusetts received an average of 0.5 more community resources compared to the control group.[J] One RCT of a local Family Connects site found that families enrolled in the program accessed almost one more community resource at 6 months relative to their respective control group counterparts (0.9 more resources).[B]

DULCE and HealthySteps examined timeliness and adherence to the recommended schedule of well-child visits. DULCE and HealthySteps, both set in pediatric care settings, found beneficial impacts on this outcome. Participation in DULCE was associated with an 11 percentage point increase for families receiving five or more routine health care visits during the child's first year of

life.[J,v] Families participating in HealthySteps had approximately 2 times greater odds of attending the 1-month well-child visit and 2.3 greater odds of attending the 24-month visit, relative to the control group (null results were found for 2-, 4-, 6-, and 12-month visits).[F]

Parental Health and Emotional Wellbeing

Four Family Connects evaluations have mixed impacts on improving parental wellbeing; neither DULCE nor HealthySteps reported on indicators within this goal. Attention to parental health and emotional wellbeing can help parents respond warmly and sensitively to their children, promoting healthy childhood development.[45] Using a sample of over 500 families at a singular site, an RCT found at the 6-month follow-up, Family Connects led to a 35 percent reduction in reports of clinical anxiety among mothers, but no statistically significant differences in reported possible depression or in substance use.[B] Null results persisted in depression scores for mothers in the cohort at the 2-year follow-up.[M]

Study L takes the samples and data from the two RCT samples of Family Connects and checked for disparity reductions in five outcomes.[vi] The evaluation found a reduction in disparities for maternal anxiety between Black and White families by 48.3 percent in the initial RCT sample.[L] Disparities in maternal depression between Black and White families also decreased by 43.5 percent. The replication RCT sample had null results for disparity reduction in maternal depression.[L]

Mothers who participated in Family Connects in a replication study also experienced null impacts on total emergency medical care use at the 2-year follow-up.[D] Family Connects led to a small but significant decrease for mothers in the number of emergency department visits and number of total emergency medical episodes. However, the results were only significant between the 12-month through 24-month follow-up period and were not significant between birth and 12 months, indicating effects may not be immediate for mothers.

Nurturing and Responsive Child-Parent Relationships

Both Family Connects and HealthySteps examine indicators assessing the quality of child-parent relationship outcomes after participation in the intervention, however overall findings in the studies of both program models were mostly null.

Two RCTs of Family Connects examined indicators of nurturing and responsive child-parent relationships: home environment quality, positive parenting (e.g., comforts an infant), negative parenting (e.g., shouts at infant), and father-infant quality (e.g., shows affection toward child). Families participating in Family Connects had a small but statistically significant increase of 0.2 points on the 18-point responsivity and acceptance subscales of the Home Observation for Measurement of the Environment (HOME) assessment.[B] Family Connects had mixed impacts on positive parenting behaviors compared to the control group.[B,M] Families who received the Family Connects intervention had almost identical mean scores on measures of negative parenting behaviors, knowledge of infant

[v] The Bright Futures/American Academy of Pediatrics Periodicity Schedule recommends approximately 7 well-child visits from birth to 12 months occurring at the first week and then at 1, 2, 4, 6, 9, and 12 months. 10 visits are recommended for children up to 2.[13]

[vi] The first sample group refers to Studies A through C and Studies K through M and the second sample group refers to Study D.

development, or parenting competence compared to the control group at the 6-month follow-up[B] and the 2-year follow-up.[M] Positive parenting practices at the two follow-up points increased for Family Connects families (effect size 0.25[B] at 6-month and effect size 0.25[M] at 2-year). Finally, Family Connects did not lead to statistically significant changes in father-infant relationship quality[B,M] or a significant reduction in disparities between Black and White families.[L]

An evaluation of a subsample of over 600 families participating in a supplemental direct observation study at two HealthySteps sites taken from a larger national survey found that participants had higher scores on inductive discipline techniques (e.g., use of diversion or negotiation instead of coercion or threats), as measured by the Parental Responses to Child Misbehavior scale at child ages 16 to 18 months. However, when the use of inductive discipline techniques was assessed in children ages 34 – 37 months, the effect of the program was no longer statistically significant.[H] The increase in the use of inductive discipline techniques is beneficial because it is believed to have fewer negative long-term consequences to children's development compared to punitive discipline techniques (e.g., threatening or slapping).[24]

HealthySteps did not have a statistically significant change in the use of punitive discipline techniques at either time point, which may be due to the low overall use of punitive discipline practices by both the control and treatment group families, making an effect difficult to detect.[H] Two studies using the same large, nationwide sample of HealthySteps families determined there was no significant impact on discipline practices used by parents in response to child misbehavior at child ages 3 and 5.5 years.[F,G]

Another study using a similar subsample as the previously mentioned study found both beneficial and null impacts on warmth, nurturance, and positive parenting.[I,vii] HealthySteps did not lead to any statistically significant changes in warmth and nurturance scores when children were ages 16 to 18 months. HealthySteps families reported higher scores on the Nursing Child Assessment by Satellite Training (NCAST) assessment to measure warmth and nurturance at the second interview when children were ages 34 to 37 months.[I] The statistically significant beneficial impact at the second time point only may be because of skewed sample attrition (37% of the sample between interviews, due to refusal to participate or failure to be located).[I] NCAST scores were just one measurement of warmth and nurturance used in the study. Null impacts were found for the other two measures at both the first and second-time points.[I] An evaluation of HealthySteps found null impacts of program participation on positive parenting behaviors (e.g., adherence to routines or regular reading)[E,F,G,I] and child attachment scores.[I]

[vii] The authors used three scales to assess warmth and nurturance: Home Observation for Measurement of the Environment (HOME), the Parent/Caregiver Involvement Scale (P/CIS), and the Nursing Child Assessment by Satellite Training (NCAST). The HOME inventory assessed parenting practices as well as those aspects of the home environment that are relevant to promoting child development. The P/CIS is a behavioral rating scale of caregiver interaction with young children ages 3 to 36 months based on observations of the mother during a 15 min free play episode with her child. The NCAST assessment measures sensitive interactions and communication patterns between mothers and children.[I]

Nurturing and Responsive Child-Parent Relationships: Subgroup Findings by Race/ Ethnicity and Socioeconomic Status

Subgroup analyses at the 2-year follow-up of one Family Connects RCT of over 500 families in Durham, North Carolina found significant positive effects on parenting competence among Hispanic mothers.[M] There were not significant differences between subgroups in other outcomes such as positive or negative parenting behaviors.

Subgroup analyses from the HealthySteps RCT when children were ages 34 to 37 months found different treatment effects for families, based on race/ethnicity and socioeconomic status.[H,I] White mothers who participated in HealthySteps had higher adjusted mean scores of inductive discipline strategies (e.g., use of diversion or negotiation; considered more beneficial as compared to punitive techniques) relative to White mothers in the control group. Hispanic and Black mothers in the treatment group for HealthySteps had lower adjusted mean scores of inductive discipline techniques at the second time point (child ages 34 to 37 months) compared to their control group counterparts.[H]

In addition to conducting subgroup analyses based on race/ethnicity, the authors also examined the impact of HealthySteps by socioeconomic status. HealthySteps participation was associated with lower punitive/high power discipline scores for those mothers above 200 percent of the federal poverty level (FPL). Families below 200 percent of the FPL in HealthySteps had higher punitive/high power discipline scores relative to their respective control groups.[H] Overall, the program was beneficial for White families and families with higher incomes, but detrimental for Hispanic and Black families and families with lower incomes. The authors posited that the HealthySteps content may not have been culturally well-matched for all families, which may partially explain the differential impact on HealthySteps across groups by race, ethnicity, and socioeconomic status.[H] Additionally, the HealthySteps evaluation used data collected from 1996 to 1998. Analysis of the current program is needed to fully understand the impacts of the updated HealthySteps program on subgroups.

Another HealthySteps evaluation did not find statistically significant differences in interaction effects of warmth or nurturance by race/ethnicity.[I] Analyses by socioeconomic status found that HealthySteps families below 200 percent of the FPL had lower HOME Total and Lack of Negativity scores when children were ages 16 to 18 months. This finding was null at the second time point (child ages 34 to 37 months). According to the authors, "higher scores indicate a more optimal relationship between caregiver and child or a more optimal home environment" (p.318).[I] More research is needed to fully understand the effect of CSCPs on different subgroups.

Nurturing and Responsive Child Care in Safe Settings

Limited evidence suggests Family Connects may have positive impacts on the quality of non-parental childcare that families use. The original RCT of Family Connects found that among those parents who used nonparental care, out-of-home childcare quality was rated 0.66 points higher on North Carolina's 5-point quality rating and improvement system scale, compared to the quality rating of care used by families in the control group.[B] More research is needed to further explore how a family's connection to community resources can have positive impacts in other areas of family life such as childcare quality.

Optimal Child Health and Development

CSCPs have beneficial findings across some indicators related to optimal child health and development, most notably reducing emergency department visits and increasing vaccination rates for children in the programs. Findings were mixed on the impact of CSCPs on overall child health and development outcomes.

Emergency Care Use

All three evidence-based programs had at least one study that examined overnight hospital stays or emergency department (ED) visits. The use of emergency care relates to several evidence-based factors that impact child development. Less emergency care use suggests that families use their primary care providers instead of emergency departments for nonemergency medical needs.[19] If families are better able to access support and services in the community that can increase resources for parents (e.g., public assistance to better afford housing or knowledge of child care options) it may reduce the likelihood of childhood maltreatment such as neglect.[48] Additionally, families' participation in CSCPs may improve the likelihood that children live in safe environments through their home visits which often provide risk assessments (e.g., car seat use). As a result, accident or injury-related emergency care use may decrease because families are better able to keep children safe at home.

RCTs of DULCE and Family Connects found beneficial reductions in emergency department use for program participants, but the evaluations of HealthySteps[F,G] found no significant impact of participation. One study of the DULCE program found families were 13 percentage points less likely to have at least one visit to the emergency department compared to the control group at child age 6 months, but this finding was no longer statistically significant at 12 months.[J]

Multiple studies analyzing impacts of program participation of Family Connects in Durham, North Carolina found significant reductions in emergency department visits when compared to families who did not participate in Family Connects. Family Connects led to 0.91 fewer ED visits and 1.91 fewer overnight hospital stays among children at 6 months.[B] By child age 12 months, Family Connects was found to reduce ED visits by 50 percent, with larger effects among infants with more birth risks (e.g., birth complications or low birthweight).[A] Family Connects led to 37 and 33 percent less emergency care use among children from birth to 24 months[C] and birth to 5 years,[K] respectively. When the original RCT of Family Connects was replicated, this positive result was not observed. A small but significant increase in total emergency care episodes occurred for Family Connects children age birth to 24 months.[D] More evaluations of Family Connects are necessary to determine why the difference in outcomes between the listed studies occurred.

The RCTs of Family Connects also examined emergency care use specific to any episodes coded as accident or maltreatment related. Family Connects led to reductions in reports to Child Protective Services for maltreatment at 6 months and 5 years; in our review, the results are considered null because they were only significant at the lower threshold of $p \leq 0.10$ level and not at the $p \leq 0.05$ level.[K] Other RCTs of Family Connects found no significant impact on maltreatment-related injuries and total presentations for accidents and injuries.[C,D]

One study comparing disparity reductions between Black and White families in both Family Connects RCT samples found a significant reduction of disparities in child maltreatment investigations in one sample (60.5% reductions), but null results in the other sample.[L] Data used in the sample with significant findings was also used in the study that found a small increase in total emergency care episodes for Family Connects families.[D]

Child Safety

Evaluations of HealthySteps demonstrated mixed results on indicators related to child safety. Families in a large nationwide study of HealthySteps reported a beneficial 3 percentage point reduction in the likelihood of putting their infants in the wrong sleep position compared to the control group (11.4% in the intervention compared to 14.4% in the control group).[E] HealthySteps did not lead to statistically significant changes in safety practices (e.g., reduced the water heater temperature and correctly used the car seat).[E]

Physical Health and Behavior

RCTs of both DULCE and HealthySteps examined timely vaccinations and found beneficial impacts. Children who participated in DULCE were 15 percentage points more likely to have received immunizations on time at child age 6 months, although impacts of program participation were null on immunizations by 12 months.[J] Children in HealthySteps had 1.6 times greater odds of being up-to-date on vaccinations by 24 months compared to the control group.[F] Adhering to the immunization schedules provides children with protection against serious illnesses and prevents spread and outbreaks of preventable diseases.[21]

RCTs of HealthySteps also examined additional indicators of behavior and physical health. HealthySteps did not lead to statistically significant changes in mother-reported child behavioral problems[F,G,I] and breastfeeding initiation.[E] One study showed an increase in mother reports of behavior problems but authors believed this was because of increased knowledge of behavioral issues and willingness to report.[F] This study's conclusions were classified as null for the purposes of our evidence review because increased awareness of behavioral problems was hypothesized as the cause of the increase in reports, not participation in the HealthySteps program.

Optimal Child Health and Development: Subgroup Findings by Race/ Ethnicity and Health Insurance Status

Three evaluations of Family Connects showed differential impacts in emergency department use disaggregated by health insurance provider and race. The effects of Family Connects were more beneficial among families without health insurance coverage or families who used Medicaid compared to privately insured families when children were 12 months (effect size 0.27)[A] and 5 years old.[K] Family Connects had larger positive effects on infant emergency care use among families who were categorized by the authors as "nonminority."[viii] Nonminority families randomly assigned to Family Connects saw greater reductions in total emergency care use at age 12 months compared to minority families (effect size 0.36).[A] Finally, Family Connects only had a significant beneficial impact on lowering total emergency care use among nonminority children relative to minority children through age 24 months (effect size 0.34).[C]

[viii] "Nonminority" and "minority" reflects the authors' language; these terms are not defined in the study.

Is There Evidence That Comprehensive Screening and Connection Programs Reduce Disparities?

Comprehensive screening and connection programs (CSCPs) may reduce disparities because of their emphasis on addressing social predictors of health.[5,19] Healthcare is just one aspect of overall health and development and addressing social predictors of health, such as the environment or access to healthy food can decrease damaging stress and promote long-term health. Social predictors of health disproportionately affect people of color and people with low incomes.[19] The evidence surrounding the ways in which CSCPs reduce, or fail to reduce, disparities in outcomes is conflicting. More research is needed to determine if they do and in what ways disparities are reduced.

Two studies of the effects on parental discipline among HealthySteps participants found little evidence of a reduction in disparities and determined the program was more beneficial for White families and families with higher incomes. One study found more beneficial impacts for White mothers who participated in the program than White mothers who did not participate.[H] Black and Hispanic mothers in HealthySteps did not show the same beneficial impacts when compared to their nonparticipant counterparts. However, the findings may have been skewed by attrition rates because White mothers were more likely to complete the follow-up at the second time point.[H]

An additional HealthySteps study observed that mothers above 200 percent of the FPL had more improvement than mothers in the same income level who did not participate in the program.[I] Mothers below 200 percent of the FPL did not have similar benefits compared to their nonparticipant counterparts. The difference in outcomes for different groups may be influenced by different cultural views on parenting. Some families may not find the methods taught by HealthySteps to be culturally relevant. Additional research is needed to assess how CSCPs impact families across different racial or ethnic backgrounds.

RCTs of Family Connects found differential impacts in lowering emergency care use for participants dependent upon their insurance provider and race or ethnicity. Families who were uninsured or reported Medicaid insurance had a larger, beneficial impact on reducing emergency care use compared to privately insured families.[A,K] Two evaluations suggest that the intervention is more beneficial to nonminority families, and does not reduce disparities for minority families.[A,C] The evidence base would strongly benefit from targeted causal studies to better understand how comprehensive screening and programs can reduce disparities for families.

One study using two separate RCT samples of Family Connects observed disparity reduction between Black and White families.[L] In the first RCT sample fromover 500 families in Durham, North Carolina, disparities were reduced in maternal mental health and child emergency care. Disparities between Black and White families decreased by 48.3 percent in maternal anxiety, by 43.5 percent in maternal depression, and by 98.8 percent in child emergency medical care. Null results were found for father-infant relationship quality and child protective services investigations.

The second RCT sample from over 300 families in Durham, North Carolina, observed reduced disparities in child emergency care and child maltreatment investigations by 25.4 percent and 60.5 percent, respectively. Null results were found in maternal depression and father-infant relationship quality.[L] More research is needed to understand the difference in results between the two samples.

Has the Return on Investment for Comprehensive Screening and Connection Programs Been Studied?

Assessments of the return on investment or cost savings as a result of comprehensive screening and connection program (CSCPs) participation found beneficial impacts for DULCE, Family Connects, and HealthySteps. Manatt Health estimated that if five DULCE sites in California served approximately 600 families there would be between $308,000 to $540,000 in short-term cost savings for the state's Medi-Cal program.[ix,22]

The 6-month findings from studies of Family Connects estimated $3.02 in savings from emergency health care costs for every $1 invested in the program in Durham, North Carolina where the study took place,[B] and this estimated benefit-cost ratio increased to $3.17 in the study of the 24-month findings.[C]

A return on investment analyses conducted by the national HealthySteps office, in collaboration with Manatt Health, found an estimated $2.63 for every $1 invested in HealthySteps for state Medicaid agencies every year.[23] A more comprehensive analysis of the return on investment is forthcoming.

What Do We Know and What Do We Not Know?

A review of the experimental evidence on DULCE, Family Connects, and HealthySteps shows that comprehensive screening and connection programs (CSCPs), either postpartum home visits or in the pediatric setting, improve families' use and knowledge of community resources and services, including increased timely pediatric appointments. Additionally, limited evidence suggests that participation in a CSCP may lead families to use higher quality childcare when choosing non-parental care arrangements. All three of the evidence-based programs have beneficial impacts on improving child health and development outcomes, most notably in increasing vaccination rates and safe sleep practices, although the impact of comprehensive screening programs on this goal is mixed overall.

Limitations of Generalizability of Current Evidence

The evidence for CSCPs has a number of limitations that may restrict the generalizability of the evidence to other populations based on geography, years of data collection, gender, race, and socioeconomic status. The only RCT of DULCE took place at the Boston Medical Center in Massachusetts. In the case of Family Connects, the two main RCTs were set in the same geographic location in North Carolina. The statewide implementation of Family Connects in Colorado, Connecticut, New Jersey, and Oregon will provide an opportunity to study the program in different settings and at scale, which will strengthen the conclusions about its effectiveness, although no studies have been started yet. The implementation of Family Connects on a larger, statewide scale will also give insight into the relationship between state support and program efficacy because little is known about the impact of state-level investments on the three evidence-based programs. The RCTs of HealthySteps were multisite and spread across the country, but the original intervention took place over 20 years ago. The evidence base for CSCPs would be strengthened by additional RCTs or strong quasi-experimental studies in new, large, and diverse settings.

[ix] Medi-Cal is California's Medicaid health insurance program.

Additionally, studies of CSCPs have been largely focused on mothers, who constitute most of the study samples. Of the three evidence-based programs, only Family Connects examined father-infant relationship quality but found null results.[B,D] Further experimental research should explore the impacts of program participation on fathers and other caregivers, in addition to mothers.

The families in the RCTs varied in their self-identified race and samples are not representative of the larger US population. Study samples of DULCE and Family Connects programs are more diverse than the HealthySteps sample,[A,E,J] but none of the RCT samples reflect the US population.[44] The lack of representation within samples makes it difficult to interpret the full scope of impacts of the programs for all families. Families of different races and ethnicities may respond differently to program models because of their cultural values or beliefs that may affect parenting styles.[H] Families may also have differing needs due to higher rates of poverty and less neighborhood resources. More evidence is needed on which CSCPs may be the most culturally appropriate and responsive to families.

The samples in the three evidence-based programs included families with a range of socioeconomic and insurance statuses: 35 percent of HealthySteps families reported Medicaid as their health insurance plan,[E] compared to 83 percent[x] in DULCE.[J] Two Family Connects evaluations showed different effects for families who were on Medicaid or uninsured compared to privately insured families.[A,K] Additionally, more beneficial outcomes were observed for families above 200 percent of the FPL than for families below the threshold with limited understanding of why the differences occurred.[I] Limited subgroup analysis was done to determine whether insurance status or socioeconomic status was a significant variable. Therefore, future research is needed to assess the ability of CSCPs to improve outcomes between families across all income levels.

Are Comprehensive Screening and Connection Programs an Effective Policy for Improving Prenatal-to-3 Outcomes?

Comprehensive screening and connection programs (CSCPs) have been shown in strong studies to be an effective strategy to increase the use and knowledge of community resources and healthcare providers and increase child development outcomes such as increased vaccination rates, possible reduced emergency department use, and increased safe sleep practices. Limited evidence suggests participation also contributes to increased participation in higher quality child care although findings have been stronger for White families and families with higher incomes. Existing evidence is limited in generalizability, and rigorous causal research has not reached a conclusion regarding the best methods for statewide implementation or state support of CSCPs.

How Do Comprehensive Screening and Connection Programs Vary Across the States?[xi]

The current evidence base is not clear on the specific policy lever that states should use to adopt and implement comprehensive screening and connection programs (CSCPs) to serve all families across the state. States may take several approaches to increase the number of families who can

[x] The 83 percent includes Medicaid Managed Care and other state subsidized plans.
[xi] For details on state progress implementing comprehensive screening and connection programs, see the comprehensive screening and connection programs section of the US Prenatal-to-3 State Policy Roadmap: https://pn3policy.org/pn-3-state-policy-roadmap-2022/us/comprehensive-screenings

access evidence-based programs. Strategies include enacting legislation to expand one of the three evidence-based programs, or a similar model, across the state; establishing a home-grown program designed similarly to one of the three evidence-based programs; or billing Medicaid for health care services such as maternal depression screenings.

Only California offers all three evidence-based program models to families, although the programs are located in different communities across the state. 24 states do not have any of the three CSCPs.[xii,34,35] Table 3 summarizes state-level variation related to CSCPs.

DULCE is the newest evidence-based program and began in 2016.[19] DULCE site locations were fully implemented and adopted in California, Florida, and Vermont in 2022. Family Connects was first piloted in 2008 in North Carolina.[8] As of 2022, 16 states had at least one Family Connects site location. HealthySteps, which began in 1996, is the oldest of the three evidence-based programs and has expanded to 23 states as of 2022.[8,34] Site operations were affected by the COVID-19 pandemic and the challenges to care caused some program sites to shut down, serve less families, or pause expansion plans.[49]

States have taken different approaches to support evidence-based programs. Oregon was the first state to implement and adopt a statewide Family Connects program after legislation and appropriations were passed in 2019,[35] which provided $7.6 million to fund Family Connects, with $4.7 million of those funds from the state general reserves.[37,38] In 2021, New Jersey[39] passed statewide legislation to implement Family Connects. As mentioned previously, Colorado and Connecticut used ARPA funds to create a Family Connects program statewide.[27,28]

States may have alternative programs that align with the goals of the three rigorously studied evidence-based models included in this review. For example, California has an alternative CSCP, Welcome Baby, which has been implemented in 13 hospitals in Los Angeles County. Welcome Baby offers universal prenatal and postpartum home visits, as well as one hospital visit immediately following the birth, to facilitate support and service connection to all families.[40] States may also have state-run programs modeled after one of the three evidence-based programs. Massachusetts, for example, implemented Welcome Family (modeled after Family Connects) by leveraging funding from MIECHV. Welcome Family offers one free, universal postpartum home to approximately 500 parents in five cities.[4141] Future evaluations of the effectiveness of these programs would give valuable insight into implementation methods and best practices for CSCPs.

More systematic research would be valuable to determine how states can increase the accessibility of DULCE, Family Connects, and HealthySteps to all families. The percentage of all children under age 3 served varies across states with some program models reaching less than 1 percent of families. The expansion of site locations may lead to more families being able to access and participate in the evidence-based programs.

[xii] DULCE, Family Connects, and HealthySteps site data as of 2022.

Table 3a: State Variation in Comprehensive Screening and Connection Programs - DULCE

State	Number of Program Sites	Percent of Children Served
California	4	0.1%
Florida	1	0.1%
Vermont	5	16.5%

Program count does not include sites that are in implementation or exploration phases.
As of 2022. DULCE, Center for the Study of Social Policy.
For additional source and calculation information, please refer to the Methods and Sources section of pn3policy.org.

Table 3b: State Variation in Comprehensive Screening and Connection Programs – Family Connects

State	Number of Program Sites	Percent of Children Served
Arkansas	1	0.4%
California	1	0.0%
Colorado	2	0.1%
Illinois	3	2.4%
Iowa	1	2.6%
Maryland	3	0.7%
Minnesota	1	1.1%
New Jersey	1	0.4%
New Mexico	1	0.0%
North Carolina	6	4.5%
Oklahoma	1	2.4%
Oregon	4	1.7%
South Carolina	1	0.6%
Texas	7	0.9%
Washington	1	0.4%
Wisconsin	1	0.2%

Program count does not include sites that are in implementation or exploration phases.
As of 2022. Family Connects International, Duke University's Center for Child and Family Policy.
Note: In 2021, New Jersey passed statewide legislation to implement a program modeled after Family Connects and Connecticut allocated funding to a statewide program modeled after Family Connects. In 2022, Colorado also launched a statewide Family Connects program.
For additional source and calculation information, please refer to the Methods and Sources section of pn3policy.org.

Table 3c: State Variation in Comprehensive Screening and Connection Programs – HealthySteps

Program count does not include sites that are in implementation or exploration phases.

State	Number of Program Sites	Percent of Children Served
Alabama	1	0.3%
Arizona	13	3.2%
Arkansas	2	4.0%
California	15	1.8%
Colorado	24	19.4%
Connecticut	1	0.2%
Delaware	1	4.0%
District of Columbia	5	20.0%
Florida	13	1.3%
Illinois	6	3.2%
Maryland	3	1.3%
Massachusetts	2	1.5%
Minnesota	2	3.1%
Missouri	1	1.1%
New Jersey	4	0.4%
New York	50	9.3%
North Carolina	12	4.9%
Ohio	10	2.2%
Oklahoma	11	7.0%
Oregon	1	1.8%
South Carolina	5	2.8%
Texas	8	0.7%
Washington	1	0.4%

Program count does not include sites that are in implementation or exploration phases.

As of 2022. HealthySteps, ZERO TO THREE.

Note: 2022 data from HealthySteps does not include service data from Department of Defense (DOD) pilots that support military families with young children. Alabama, California, Mississippi, North Carolina, and Washington all had at least one HealthySteps site that received DOD funding in 2021. Hawaii had two HealthySteps sites that received DOD-funding in 2021.

For additional source and calculation information, please refer to the Methods and Sources section of pn3policy.org.

How Did We Reach Our Conclusions?

Method of Review

This evidence review began with a broad search of all literature related to the policy and its impacts on child and family wellbeing during the prenatal-to-3 period. First, we identified and collected relevant peer-reviewed academic studies as well as research briefs, government reports, and working papers, using predefined search parameters, keywords, and trusted search engines. From this large body of work, we then singled out for more careful review those studies that endeavored to identify causal links between the policy and our outcomes of interest, taking into consideration

characteristics such as the research designs put in place, the analytic methods used, and the relevance of the populations and outcomes studied.

We then subjected this literature to an in-depth critique and chose only the most methodologically rigorous research to inform our conclusions about policy effectiveness. All studies considered to date for this review were released on or before February 28, 2023.

Standards of Strong Causal Evidence

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

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

The strongest designs typically used for studying policy impacts are quasi-experimental designs (QEDs) and longitudinal studies with adequate controls for internal validity (for example, using statistical methods to ensure that the policy, rather than some other variable, is the most likely cause of any changes in the outcomes of interest). Our conclusions are informed largely by these types of studies, which employ sophisticated techniques to identify causal relationships between policies and outcomes. Rigorous meta-analyses with sufficient numbers of studies, when available, also inform our conclusions. Currently, the scope of this review is limited to only RCTs; quasi-experimental designs are not included.

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Evidence Review Citation:

Prenatal-to-3 Policy Impact Center. (2023). *Prenatal-to-3 policy clearinghouse evidence review: Comprehensive Screening and Connection Programs* (ER 06C.0923). Peabody College of Education and Human Development, Vanderbilt University. https://pn3policy.org/policy-clearinghouse/comprehensive-screening-and-connection-programs