RESOURCE | September 2020

Planning for a Pay for Outcomes Approach in Home Visiting

A Review of Research to Inform Maternal, Infant, and Early Childhood Home Visiting Outcome Selection, Projected Savings, and Pricing

Module 1: Overview of Outcomes Demonstrated in Home Visiting Studies

OPRE Report 2020-90

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OPRE Report 2020-90

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Disclaimer

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Introduction

Pay for outcomes (PFO) is a payment model that promotes innovative financing for social initiatives, connecting funding to outcomes and cost savings. The Bipartisan Budget Act of 2018 (Public Law 115–123, Section 50605) allows Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program awardees to pursue PFO arrangements. PFO can help awardees expand services, improve outcomes, reach new or underserved populations, and/or engage new stakeholders. This resource provides information to inform PFO feasibility studies and PFO project development including outcome selection, projected savings, and outcome payment pricing for financial agreements. **Module 1 presents an in-depth scan of home visiting outcomes achieved by model.**

Purpose of this resource

One of the first steps in a PFO feasibility study (see Introduction) is to identify outcomes to be monetized. This resource provides information about existing studies and reports to inform decisions about outcomes, but does not walk through how to conduct a PFO project.

- *Introduction* provides background information on PFO and feasibility studies.
- *Module 1: Overview of Outcomes Demonstrated in Home Visiting Studies* presents an in-depth scan of home visiting outcomes achieved by model.
- *Module 2: Economic Value of Home Visiting Outcomes* details monetary values researchers have used to establish savings in home visiting return on investment analyses.
- *Module 3: Economic Value of Outcomes in Non-Home Visiting Research* summarizes monetary values researchers have used for similar outcomes beyond home visiting studies.
- *Module 4: Administrative and Government Cost Data Sources* collates the administrative data sources used in the return on investment calculations.

Module 1 Overview

An important component of pay for outcomes initiatives is identifying measurable outcomes to assess whether a program is successful and payments should be made (U.S. Department of Education, 2017). MIECHV awardees considering a PFO approach should first seek out evidence that a home visiting model is likely to improve specific, measurable outcomes for a target population. Module 1 summarizes demonstrated impacts on outcomes from home visiting studies spanning 19 models deemed eligible for implementation as of June 2020.[1] Study outcomes are organized across the eight domains used by the Home Visiting Evidence of Effectiveness (HomVEE) review.[2]

Eight Home Visiting Outcome Domains Reviewed in Module 1

- Child development and school readiness
- Child health
- Family economic self-sufficiency
- Linkages and referrals
- Maternal health
- Positive parenting practices
- Reductions in child maltreatment
- Reductions in juvenile delinquency, family violence, and crime

The following sections present information on favorable, statistically significant[3] impacts on outcomes from home visiting research studies and highlight outcomes with the strongest effect sizes. The study profiles by model then detail individual studies, including their research design, target population, study location, outcomes(s) demonstrated to have a statistically significant impact, and average impact/range of impact estimates. The mean difference between program and comparison groups is also captured in summary tables for each outcome domain. Study profiles are organized by model.

[1] Additional promising approach models undergoing rigorous implementation and evaluation by awardees as of June 2020 are not included in Module 1. For the most up-to-date list of models eligible for implementation through MIECHV, please visit here.

[2] HomVEE is funded by the U.S. Department of Health and Human Services (HHS) and assesses the quality of the research evidence for home visiting models using a standard review protocol (Sama-Miller et al., 2019). The review is conducted on an annual basis to ensure newer studies are included in the assessment.

[3] All impacts presented in Module 1 are favorable toward the group receiving home visiting services and are statistically significant at the $p \leq 0.05$ level.

Key terms used in Module 1

- An **outcome** is a specific, measurable construct expected as a result of participation in the home visiting program.
- **Impact** is a demonstrated improvement on an outcome of interest that is attributable to the intervention.
- **Statistical significance** means the differences between the program and comparison groups are unlikely to have occurred by chance in the absence of a genuine effect.
- **Effect size** measures the degree of difference between program and comparison groups. A larger effect size within a statistically significant finding suggests a stronger impact.

How to Use Module 1

During the PFO feasibility stage, awardees should carefully select one or more meaningful outcomes that local implementing agencies (LIAs) are likely to improve. Module 1 summarizes results from rigorous local evaluation or research literature. Awardees can use this information to inform outcome selection in multiple ways:

1. **Decide whether to review the module by outcome domain or by model.**

- *By Outcome Domain* – Select a particular outcome domain of interest and review results across models within that domain. The outcome domain of interest is typically aligned with priorities emerging from a needs assessment.
- *By Model* – Awardees interested in focusing on a particular home visiting model can review previous results for that model. Use the search feature in Adobe to locate outcomes addressed by the model of interest throughout the module.

2. **Review the range of impacts on outcomes.** Each domain and model have a variety of demonstrated impacts on outcomes. Awardees should consider which align most closely with state/territory and local interests and needs.
3. **Identify size of impact.** Knowledge about the expected size of an effect is important information when planning a PFO project. Effect size provides information about the magnitude of the reported impact (i.e., *Does the current home visiting research have a larger or smaller impact on a specific outcome?*). This can help inform awardees about the practical significance of the outcome selected for a financial model.
4. **Understand length of time to reach outcome.** In selecting outcomes for a PFO model, awardees might consider the short-, medium-, and long-term outcomes that can be tracked and feasibly achieved. Short-term outcomes (e.g., positive parenting practices) may be difficult to

quantify from a financial benefits perspective, but once strong evaluations show a link between these and more monetizable, long-term outcomes (e.g., reduced child maltreatment), awardees can confer with their PFO partners (including financial investors) about including them in a PFO model as a proxy. When an outcome of interest cannot be directly measured (due to a variety of issues, including award period funding duration, data accessibility, challenges in tracking participants for an extended period of time), a proxy variable is a measurable outcome that can be used as an indicator of success toward the outcome of interest.

5. **Consult study profiles for additional context.** There are many factors that should be considered when interpreting the effect size, as studies of home visiting have been conducted in varying contexts. The study profiles specify additional factors that awardees should consider when determining which outcomes to select, such as the model implemented, target population for whom the model was effective, and intervention study design. These factors can influence the strength of the effect size estimated.

After completing this review, awardees may develop a list of potential outcomes to be considered for PFO. Modules 2 and 3 provide a review of cost data related to home visiting outcomes.

Methods

The study team authors examined studies from the HomVEE database and developed a consolidated list of favorable demonstrated home visiting outcomes across a total of 92 studies that met criteria for inclusion in our review. We included studies in our review if they—

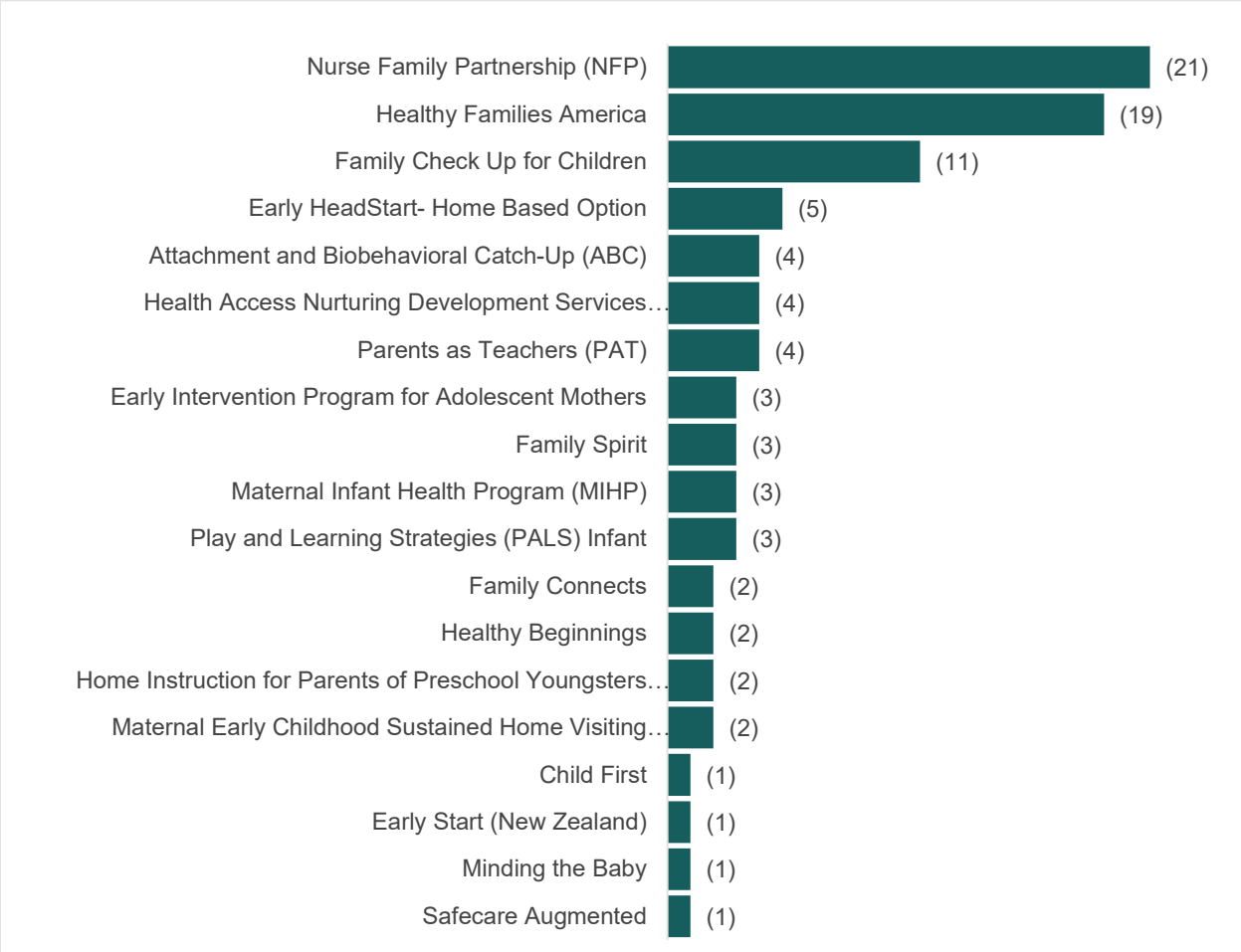
1. Focused on at least 1 of the 19 home visiting models deemed eligible for MIECHV implementation by HHS as of June 2020.
2. Earned a “high” or “moderate” quality rating from HomVEE based on how well the study design could provide unbiased estimates of model impacts.
    a. Two scenarios may qualify for a “high” rating: (1) random assignment studies with low attrition of sample members and no reassignment of sample members after the original random assignment and (2) single case and regression discontinuity designs meeting design standards from the What Works Clearinghouse (WWC).[4]
    b. Three scenarios may qualify for a “moderate” rating: (1) random assignment studies that did not meet all the criteria for a “high” rating because of flaws in the study design or analysis (for example, high sample attrition), (2) matched comparison group designs, and (3) single case and regression discontinuity designs meeting WWC design standards with reservations.

[4] The WWC reviews education research and was established by the Institute of Education Sciences in the U.S. Department of Education. More information on WWC design standards can be found here.

3. Presented one or more favorable impacts with a *p*-value less than or equal to 0.05.
    a. The direction of a favorable impact could statistically be positive or negative, depending on the outcome of interest (for example, an improvement in academic self-image from baseline to follow-up or a lower proportion of preterm births compared to a comparison group). Favorable findings are documented in study profiles.

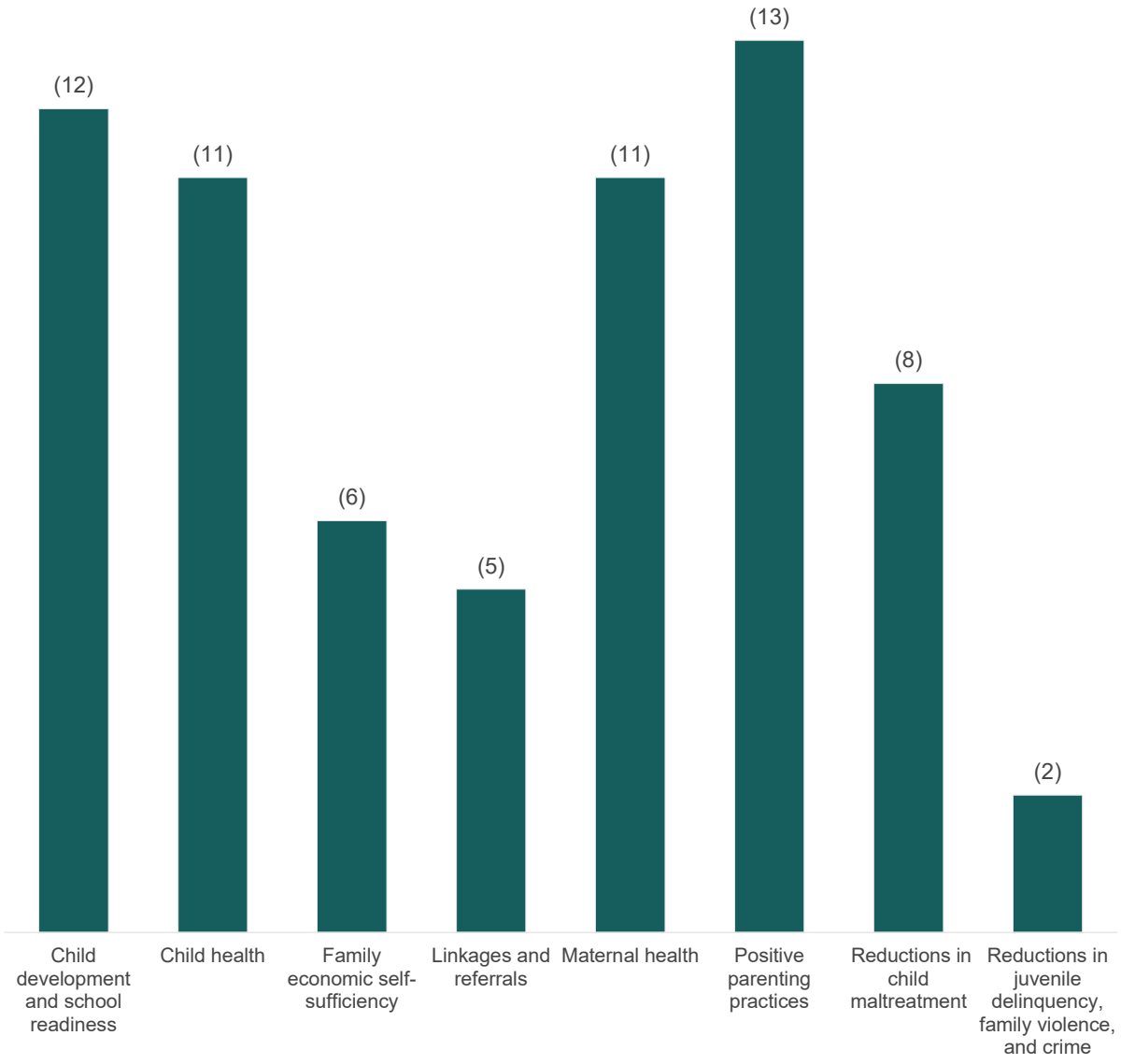
A total of 92 studies that demonstrated favorable impacts were included in the review. Exhibit 1 lists the 19 models deemed eligible for MIECHV funding as of June 2020 and the number of studies within each.

Exhibit 1. MIECHV-eligible models and number of high or moderate quality studies demonstrating favorable impacts (total count)



Studies of the MIECHV-eligible models reviewed demonstrated impacts in eight HomVEE outcome domains, which are presented in Exhibit 2. As indicated in the exhibit, most models have studies that have demonstrated favorable impacts in positive parenting practices (13 models), child development and school readiness (12 models), child health (11 models), and maternal health (11 models).

Exhibit 2. Outcome domains with demonstrated impacts across the 19 MIECHV-eligible models (model count)



Child Development and School Readiness

Favorable impacts on outcomes within this domain address the child's—

1. Socio-emotional or psychological development
2. Academic achievement and developmental milestones

Twelve models demonstrated positive child development and school readiness impacts that are statistically significant. Across models, the most common outcomes with statistically significant results are: reductions in externalizing behaviors (6 models), reductions in internalizing behaviors (5 models), cognitive development (5 models), and language development (5 models).

Models With Demonstrated Child Development and School Readiness Impacts

- Attachment and Biobehavioral Catch-Up (ABC) Intervention
- Child First
- Early Head Start–Home-Based Option (EHS)
- Early Start (New Zealand)
- Family Check-Up For Children
- Family Spirit
- Healthy Beginnings
- Healthy Families America (HFA)
- Home Instruction for Parents of Preschool Youngsters (HIPPY)
- Nurse-Family Partnership (NFP)
- Play and Learning Strategies (PALS) Infant
- Parents as Teachers (PAT)

1. Social-Emotional or Psychological Development

Outcomes include measures of attachment, behavior regulation, internalizing and externalizing behaviors, and social-emotional behavior problems. The specific outcome areas with demonstrated impacts are listed below.

- **Attachment:** attachment security, as well as reductions in disorganized attachment (behavioral disorganization or disorientation in the form of wandering, confused expressions, freezing, undirected movements, or contradictory patterns of interaction with a caregiver);
- **Behavior Regulation:** child's ability to regulate their behavior and emotions, as well as reductions in negative affect (signs of irritation) and dysregulated aggressive behavior

- **Internalizing Behaviors:** reductions in inhibition/separation problems, depression/withdrawal, somatic problems (physiological symptoms that may relate to anxiety)
- **Externalizing Behaviors:** reductions in physical aggression, activity/impulsivity
- **Social-emotional Behavior Problems:** child is cooperative and responsive to mother's requests and positive engagement with mother using verbal and nonverbal communication, as well as reductions in the degree to which a behavior is a problem for caregivers

2. Academic Achievement and Developmental Milestones

Outcomes include measures of academic development or achievement, involvement in early education or intervention, and developmental milestones. The specific outcome areas with demonstrated impacts are listed below.

- **Academic Development or Achievement:** academic self-image, excelling academically, motivation, adaption to the classroom, and interest in learning, grade placement at beginning of year, GPA, achievement test scores in math and reading, participating in a gifted program, as well as reductions in receiving special education, delayed entry into school, and being retained in first grade;
- **Involvement in Early Education or Intervention:** child attended Head Start, preschool, child care, or early intervention and duration of attendance (months)
- **Development:**
    - **Physical Development:** child use of cup at 12 months, self-help skills, gross motor skills
    - **Language Development:** language development, expressive vocabulary skills, receptive vocabulary (the collection of words that is understood), receptive language (ability to understand information), coherence in completing stories, use of words
    - **Mental Development:** mental processing abilities, active engagement in activities, child asks mother sophisticated questions

Child Development And School Readiness Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 3 summarizes child development and school readiness outcomes for the studies that have estimated a statistically significant and substantial relationship with home visiting, as indicated by medium-to-large effect sizes. Engagement of the caregiver during parent-child semistructured play had a very large effect

size. Other outcomes with large effect sizes include reading and math GPA (based on long-term follow-up), achievement test scores in reading and math (based on long-term follow-up), mental processing, language development, and reductions in gross motor delays.

Exhibit 3. Child development and school readiness impacts that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group[3,4]
ABC		
Disorganized attachment; Follow-up at approx. 1 month after program end or longer if child not yet old enough to measure outcome	.67[a]	-.25
Child First		
Child language (clinically concerning problems); Follow-up at 12 months after random assignment	-.80[b]	OR = 4.40
EHS		
Engagement of parent during parent-child semi structured play; Follow-up at age 3	19.20[a]	.20
Early Start (New Zealand)		
Internalizing behavior; Follow-up at 36 months after random assignment	-.57[b]	-.57
PALS		
Negative affect; Follow-up at 12 months	.70[a]	Not reported
Family Spirit		
General externalizing behaviors; Follow-up at 12 months postpartum	-.63[a]	Coeff = -.17
Externalizing behaviors: activity/impulsivity; Follow-up at 12 months postpartum	-.65[a]	Coeff = -.27
Externalizing behaviors: peer aggression; Follow-up at 12 months postpartum	-.68[a]	Coeff = -.23
Externalizing behaviors: separation distress; Follow-up at 12 months postpartum	-.52[a]	Coeff = -.17

HIPPY		
Academic self-image measure; Follow-up at 1-year after assignment	.62[a]	.42
Child classroom adaptation index; Follow-up at 1-year after assignment	.59[a]	.51
Child classroom adaptation index; Follow-up at end of program	.76[a]	.96
NFP		
GPA (reading and math) (grades 1-6); Follow-up at age 12	3.32[b]	.20
GPA (reading and math) (grades 4-6); Follow-up at age 12	2.83[b]	.19
Reading and math scores (from the Peabody Individual Achievement Test); Follow-up at age 12	3.91[b]	3.07
Group achievement test scores (reading and math) (grades 1-6), percentile; Follow-up at age 12	3.39[b]	5.67
Child language delay; Follow-up at 21 months of age	-.65[b]	OR = .32
Any therapeutic services, treatment 1 vs. 3; Follow-up at age 6	-.63[b]	-.19
Percent incoherent stories, treatment 1 vs. 2; Follow-up at age 6	-.50[a]	-15.69
GPA (reading and math) (grades 1-6); Follow-up at age 12	3.32[b]	.20
PAT		
Gross motor delays; Follow-up at age 4-5	-.77[b]	-.80
Gross motor delays (% below age level); Follow-up at age 4-5	1.05[b]	-.35
Language acquisition quotient at 4-5 years; Follow-up at age 4-5	.57[b]	7.00
Language acquisition quotient (% below age level); Follow-up at age 4-5	-.80[b]	-.35
Mental processing (% scoring below 90); Follow-up at age 4-5	-1.27[b]	-.20

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome (such as cigarette use) and results for the home visiting group were more favorable compared to the comparison group (i.e. the home visiting group decreased more than the comparison group).

[a] Effect size reported by study author(s).

[b] Effect size calculated by HomVEE.

[3] Odds ratio (OR) is an unstandardized effect size statistic that represents the chances that an outcome will occur given participation in home visiting, compared to the chances of the outcome occurring for the comparison group. Stronger associations are represented by odds ratios above 4.3, and weaker associations below 1.5 (Cohen, 1988).

[4] Coefficient (beta) represents the difference in the outcome of interest between study participants in the home visiting group and the comparison group, holding constant other characteristics included in a regression analysis

Child Health

Favorable impacts on outcomes within this domain address the child's—

1. Physical health
2. Use of health services

Eleven models demonstrated positive child health impacts that are statistically significant. Across models, the most common outcomes with statistically significant results are: birth weight (4 models), breastfeeding (4 models), reductions in hospitalizations/emergency room (ER) visits (3 models), well-child visits and immunizations (3 models), and reductions in infant mortality (3 models).

Models With Demonstrated Child Health Impacts

- Attachment Biobehavioral Catch-Up (ABC)
- Early Intervention Program for Adolescent Mothers
- Early Start (New Zealand)
- Family Connects
- Health Access Nurturing Development Services (HANDS) Program
- Healthy Beginnings
- Healthy Families America (HFA)
- Maternal Early Childhood Sustained Home-Visiting Program (MECSH)
- Maternal Infant Health Program (MIHP)
- Minding the Baby
- Nurse-Family Partnership (NFP)

1. Physical Health

Outcomes included measures of child growth, healthy feeding practices, maternal health knowledge and behaviors, as well as reductions in infant/child mortality and preterm birth. The specific outcome areas with demonstrated impacts are listed below.

- **Child Growth:** birth weight (i.e., reductions in low birth weight, very low birth weight), body mass index, telomere length (a proxy for child adversity)[5]
- **Healthy Feeding Practices:** introduction of solids, child vegetable servings (at 24 months), breastfeeding duration and attempts

[5] The researchers collected DNA samples from children using buccal swabs to measure telomere length. Telomere shortening is linked to childhood adversity but can be buffered by sensitive parenting (Hoye et al., ND).

- **Infant/Child Mortality:** reductions in infant deaths in hospital at birth, infant death, and 20-year child mortality rate from preventable causes (sudden infant death syndrome (SIDS), unintentional injury, homicide)
- **Preterm Birth:** reductions in preterm and very preterm birth
- **Maternal Health Knowledge and Behaviors:** SIDS risk knowledge, and reductions in mother's use of cigarettes, alcohol, or marijuana

2. Use of Health Services

Child-specific outcomes include measures of routine health care services use, hospitalizations or emergency department visits, and access to health care. The specific outcome areas with demonstrated impacts are listed below.

- **Use of Routine Health Care Services:** received dental service, received developmental screening in the first year of life, completed well-child visits (i.e., visits made to family doctor, children up to date with well-child checks, child has a primary care provider who knows family's concerns about child, immunizations up to date)
- **Hospitalizations or Emergency Department Visits:** reductions in emergency department visits and hospitalizations for birth-related and nonbirth-related problems, overnight stays in the hospital
- **Access to Health Care:** child has health insurance coverage

Child Health Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 4 summarizes child health outcomes for the studies that have estimated a statistically significant, substantial relationship with home visiting, as indicated by medium-to-large effect sizes. Four outcomes had medium or large effect sizes: reductions in preterm birth, never using the ER for child's health problems, adequate child immunizations, and reductions in infant death at the hospital at birth.

Exhibit 4. Child health impacts that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group[3]
ABC		
Telomere length (a proxy for childhood adversity); Follow-up at age 5	.58[a]	Not reported
Early Intervention Program for Adolescent Mothers		
Child adequately immunized; Follow-up at 1 year postpartum	.83[b]	.10
Never used the emergency room for child's health problems; Follow-up at 2 years postpartum	.92[b]	.25
Family Connects		
Three or more emergency medical care episodes; Follow-up at 6 months of age	-.65[b]	-.05
MECSH		
Breastfeeding duration (weeks); Follow-up at 12 months postpartum	.52[b]	7.88
NFP		
Child used cigarettes, alcohol, or marijuana in the past 30 days: Follow-up at age 12	-.69[b]	OR = .31
Subsequent low birth weight newborns among paraprofessional home visitor sample; Follow-up at age 4	-.64[b]	OR = .34
HANDS		
Infant deceased in hospital at birth; Secondary data review of live birth records	-1.70[b]	OR = .06
Preterm birth; Secondary data review of live birth records	-.95[b]	OR = .21

Low birth weight; Secondary data review of live birth records	-.50[b]	OR = .44
HFA		
Low birth weight; Secondary review of birth certificate data	-.51[b]	OR = .43

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome and results for the home visiting group were more favorable compared to the comparison group.

[a] Effect size reported by study author(s).

[b] Effect size calculated by HomVEE.

[3] Odds ratio (OR) is an unstandardized effect size statistic that represents the chances that an outcome will occur given participation in home visiting, compared to the chances of the outcome occurring for the comparison group. Stronger associations are represented by odds ratios above 4.3, and weaker associations below 1.5 (Cohen, 1988).

Family Economic Self-Sufficiency

Favorable impacts on outcomes within this domain address the family's economic well-being, including—

1. Caregiver income
2. Use of public assistance and community resources
3. Employment and educational enrollment or attainment
4. Other sources of support

Six models demonstrated positive family economic self-sufficiency impacts that are statistically significant. Across models, the most common outcomes with statistically significant results are: use of resources (3 models), adult education services (2 models), and child education (2 models).

Models With Demonstrated Family Economic Self-Sufficiency Impacts

- Early Head Start–Home-Based Option (EHS)
- Early Intervention Program for Adolescent Mothers
- Health Access Nurturing Development Services (HANDS) Program
- Healthy Families America (HFA)
- Nurse-Family Partnership (NFP)
- Parents as Teachers (PAT)

1. Caregiver Income

This outcome focuses on caregiver or parent incomes as reported in U.S. dollars.

2. Use of Public Assistance and Community Resources

Outcomes include measures of social and community service use. The specific outcome areas address whether a mother and/or child received Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); Aid to Families with Dependent Children (AFDC); nutritional supplementation vouchers; food stamps/ Supplemental Nutrition Assistance Program (SNAP); Temporary Assistance for Needy Families (TANF); and used other community services.

3. Employment and Educational Enrollment or Attainment

Outcomes include measures of the caregiver's involvement in educational or vocational training and the caregiver's employment status. The specific outcome areas with demonstrated impacts are listed below.

- **Educational or Vocational Training:** displayed a positive education outcome, increased education by 1 year or more, completed at least 1 year of college enrolled in an English as a Second Language (ESL) class, enrolled in high school or vocational program, receiving education or training
- **Employment:** current employment status

4. Other Sources of Support

Outcomes include measures of the caregiver's current relationship with a partner as a proxy for economic support. The specific outcome areas address living with the father of child, living with a partner, duration of current partner relationship, and employment of current partner.

Family Economic Self-Sufficiency Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 5 summarizes family economic self-sufficiency outcomes for the studies that have estimated a statistically significant substantial relationship with home visiting, as indicated by medium-to-large effect sizes. Three long-term follow-up outcomes had large effect sizes after long-term follow-up: duration of current partner relationship, as well as reductions in the use of AFDC-TANF and food stamps. Mother involvement in school or training at 12-month follow-up also had a large effect size.

Exhibit 5. Family economic self-sufficiency impacts that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group[3]
NFP		
Duration of current partner relationship at 6, 9, 12-years; Follow-up at age 12	3.55[a]	6.91
Use of food stamps; Follow-up at age 12	-3.90[a]	-.59
Use of AFDC-TANF; Follow-up at age 12	-3.03[a]	-.50
HFA		
School or training for mother; Follow-up at 12 months of age	1.19[a]	.28
Mother increased education by year or more since baseline; Follow-up at 24 months of age	.63[a]	OR = 2.50
HANDS		
Maternal receipt of WIC; Secondary data review of live birth records	.72[a]	OR = 3.31

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome and results for the home visiting group were more favorable compared to the comparison group.

[a] Effect size calculated by HomVEE.

[3] Odds ratio (OR) is an unstandardized effect size statistic that represents the chances that an outcome will occur given participation in home visiting, compared to the chances of the outcome occurring for the comparison group. Stronger associations are represented by odds ratios above 4.3, and weaker associations below 1.5 (Cohen, 1988).

Linkages and Referrals

Favorable impacts on outcomes within this domain address the family's—

1. Identification of needs and referrals to services
2. Receipt of services

Five models demonstrated positive linkages and referrals impacts that are statistically significant. Across models, the most common outcomes with statistically significant results are: use of resources (3 models), adult education services (2 models), and child education (2 models).

Models With Demonstrated Linkages and Referrals Impacts

- Child First
- Early Head Start–Home-Based Option (EHS)
- Family Connects
- Healthy Families America (HFA)
- SafeCare Augmented

1. Identification of Needs and Referrals to Services

Outcomes include measures of identification and referrals to needed services. The specific outcome areas address identification of a child's disability, referral to family planning, and a more general outcome of referrals/linkages to any additional services.

2. Receipt of Services

Outcomes include measures of service use. The specific outcome areas address receipt of services for child development, child disability, adult education, early education, employment, family support, medical needs, adult and child mental health, social services, and transportation.

Linkages and Referrals Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 6 summarizes linkages and referrals outcomes for the studies that have estimated a statistically significant substantial relationship with home visiting, as indicated by medium-to-large effect sizes. Outcomes related to service receipt had the largest effect sizes, specifically services for child mental health, child development, and adult mental health.

Exhibit 6. Linkages and referrals outcomes that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group
Child First		
Child development services received; Follow-up at 12 months after random assignment	3.89[b]	85.00
Family service needs received; Follow-up at 6 months after random assignment	3.79 [b]	56.30
Family service needs received; Follow-up at 12 months after random assignment	3.93 [b]	58.00
Child mental health services received; Follow-up at 12 months after random assignment	3.93 [b]	91.00
Early education services received; Follow-up at 12 months after random assignment	1.84 [b]	62.00
Adult education services received; Follow-up at 12 months after random assignment	1.70 [b]	53.00
Adult mental health services received; Follow-up at 12 months after random assignment	3.05 [b]	85.00
Services received for concrete needs; Follow-up at 12 months after random assignment	2.27 [b]	73.00
Family support services received; Follow-up at 12 months after random assignment	2.36 [b]	74.00
Medical services received; Follow-up at 12 months after random assignment	1.59 [b]	20.00
Social services received; Follow-up at 12 months after random assignment	1.42 [b]	37.00
EHS		
Services for child with disability; Follow-up at 7 to 16 months after assignment	.50[a]	2.10
Any education-related services; Follow-up at 7 to 16 months after assignment	1.09[a]	38.20
Any employment-related services; Follow-up at 7 to 16 months after assignment	1.00[a]	39.00
Any education-related services; Follow-up 28 months after assignment	1.13 [b]	36.10

Any employment-related services; Follow-up 28 months after assignment	.81 [b]	30.02
HFA		
Referral to family planning; Follow-up at 24 months postpartum	0.67 [b]	15.00
Use of resources; Follow-up at 6 months of age	4.32 [b]	.65

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome and results for the home visiting group were more favorable compared to the comparison group.

[a] Effect size reported by study author(s).

[b] Effect size calculated by HomVEE.

Maternal Health

Favorable impacts on outcomes reviewed within this domain address the mother's health status during or after pregnancy, including—

1. Mental health
2. Physical health
3. Use of services

Eleven models demonstrated positive maternal health outcomes that are statistically significant. Across models, the most common outcomes with statistically significant results are: mother's mental health and psychological well-being (5 models). Three models demonstrated favorable outcomes in the mother's diet, receipt of prenatal care, and reductions in substance use.

Models With Demonstrated Maternal Health Impacts

- Child First
- Family Check-Up For Children
- Family Connects
- Family Spirit
- Health Access Nurturing Development Services (HANDS) Program
- Healthy Beginnings
- Healthy Families America (HFA)
- Maternal Early Childhood Sustained Home-Visiting Program (MECSH)
- Maternal Infant Health Program (MIHP)
- Minding the Baby
- Nurse-Family Partnership (NFP)

1. Mental Health

Outcomes focus on the caregiver's psychological well-being and parenting-related stress. The specific outcome areas with demonstrated impacts address sense of mastery or control over life, as well as reductions in anxiety, depression or depressive symptoms, externalizing behaviors, parent distress, parent-child systems that are under stress and are at risk for dysfunctional parenting practices, and perceptions of difficult child behavior.

2. Physical Health

Outcomes include measures of substance use, mortality, subsequent childbearing, complications during pregnancy, and general health practices. The specific outcome areas with demonstrated impacts are listed below.

- **Substance Use:** reductions in mother's use of alcohol or drugs
- **Maternal Mortality:** reductions in death of the mother while enrolled in the program
- **Subsequent Childbearing:** reductions in subsequent (closely spaced) pregnancy, miscarriage, or childbirth
- **Complications During Pregnancy:** reductions in maternal weight gain during pregnancy and birth, maternal complications during delivery, pregnancy-induced hypertension
- **General Health Practices:** mother activity time (minutes per week), mother's diet (consuming processed meat, vegetables)

3. Use of Services

Outcomes include measures of the caregiver's use of services to address mental and physical well-being needs. The specific outcome areas with demonstrated impacts address prenatal care, postnatal visits, use of mental health counseling, financial counseling, center-based family assistance, and the mother having a primary care provider.

Maternal Health Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 7 summarizes maternal health outcomes for the studies that have estimated a statistically significant substantial relationship with home visiting, as indicated by medium-to-large effect sizes. Outcomes with the largest effect sizes include the mother's ability to cope, as well as reductions in use of resources, rapid subsequent childbearing, and 21-year maternal mortality rate from external causes.

Exhibit 7. Maternal health impacts that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group[3]
Child First		
Global psychiatric symptoms (proportion with clinically concerning problems); Follow-up at 12 months after random assignment	-.83[a]	-25.00
Difficult child (proportion with clinically concerning problems); Follow-up at 6 months after random assignment	-.96[a]	-14.90
HANDS		
Adequate prenatal care; Secondary data review of live birth records	.87[a]	OR = 4.23
HFA		
Use of resources; Follow-up at 12 months of age	1.58[a]	.58
MIHP		
Any prenatal care; Follow-up at 12 months postpartum	.65[a]	OR = 2.94
Minding the Baby		
Rapid subsequent childbearing - birth of second child within 24 months of the index birth; Follow-up at 24 months postpartum	-1.42[a]	-13.40
NFP		
Extent to which a caregiver regards their life chances as being under their personal control; Follow-up at age 12	4.30[a]	1.44
21-year maternal mortality rate - external cause; Secondary data review of administrative records	-1.22[a]	-.01

21-year maternal mortality rate - all causes; Secondary data review of administrative records	-1.41[a]	-.04
21-year maternal mortality rate - all causes; Secondary data review of administrative records	-.69[a]	-.03

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome and results for the home visiting group were more favorable compared to the comparison group.

[a] Effect size calculated by HomVEE.

[3] Odds ratio (OR) is an unstandardized effect size statistic that represents the chances that an outcome will occur given participation in home visiting, compared to the chances of the outcome occurring for the comparison group. Stronger associations are represented by odds ratios above 4.3, and weaker associations below 1.5 (Cohen, 1988).

Positive Parenting Practices

Favorable impacts on outcomes within this domain address the parent/caregivers'—

1. Supportive behavior and engagement with the child
2. Promotion of learning and child development
3. Disciplinary practices
4. General parenting practices
5. Parenting knowledge and attitudes

Thirteen models demonstrated positive parenting practices outcomes that are statistically significant. Across models, the most common outcomes with statistically significant results are: parental responsivity (8 models), disciplinary behaviors and attitudes (5 models), engaging in activities to promote early language and literacy (4 models), home safety practices (3 models), and providing a positive, stimulating home environment for the child (3 models).

Models With Demonstrated Positive Parenting Practices Impacts

- Attachment Biobehavioral Catch-Up (ABC)
- Early Head Start–Home-Based Option (EHS)
- Early Start (New Zealand)
- Family Check-Up For Children
- Family Connects
- Family Spirit
- Healthy Beginnings
- Healthy Families America (HFA)
- Home Instruction for Parents of Preschool Youngsters (HIPPY)
- Maternal Early Childhood Sustained Home-Visiting Program (MECSH)
- Nurse-Family Partnership (NFP)
- Parents as Teachers (PAT)
- Play and Learning Strategies (PALS) Infant

1. Supportive Behavior and Engagement with the Child

Outcomes include measures of parental interaction styles. The specific outcome areas demonstrated address parental responsivity, mother-infant responsive interaction (mother responded promptly and appropriately to her infant's cues), parent-provided emotional/cognitive stimulation, mutually positive engagement between parents and children, parent involvement (parent keeps child in visual range, parent talks to child while doing housework, parent structures child's play), caregiver supporting child's positive

behaviors, ability to anticipate problems or prevent children from becoming upset, supportiveness during parent-child semistructured play, parental sensitivity, redirecting infant focus of attention, warm sensitivity in interactions with the infant, positive parent regard, and reductions in parental intrusiveness (abruptness in physical interactions).

2. Promotion of Learning and Child Development

Outcomes include measures of the home environment and promotion of early language and literacy activities. The specific outcomes addressed are listed below.

- **Positive Home Environment:** appropriate play materials in the home; quality and quantity of stimulation and support available to a child in the home environment
- **Early Language and Literacy Promotion:** parent engagement in activities with the child that stimulate cognitive and language development (e.g., use of home-based supports for children like oral language-based activities, print-based activities, literacy exposure, and book reading), parent read to child, 26 or more children's books in the home at age 5, parent reading daily to child at age 5, parent teaching activities with the child at age 5, parent labeling actions and objects, verbal encouragement, verbal scaffolding (mother provided verbal hints and prompts), mother asked open-ended questions or made requests that required the child to think more generally about what was happening in a story

3. Disciplinary Practices

Outcomes include measures of nonviolent discipline styles. The specific outcome areas with demonstrated impacts address non-punitive attitudes, never shouted or yelled at child, never slapped child's hand, harshness of voice tone, beliefs associated with child abuse, and reductions in hostile parenting practices.

4. General Parenting Practices

Outcomes include measures of feeding practices, child development and stimulation, education, and child safety. The specific outcomes addressed are listed below.

- **Feeding Practices:** reductions in parent feeding practices that are associated with poor outcomes (i.e., bottle at bedtime at 12 months, food used as reward, child eats dinner in front of the television)

- **Child Development and Stimulation:** tummy time started at ages 4 to 8 weeks, reductions in child watching television for more than 60 minutes/day
- **Education:** school days the child attended
- **Child Safety:** reductions in hazardous exposures observed in home

5. Parenting Knowledge and Attitudes

Outcomes include measures of knowledge and attitudes toward parenting, safety, and child development. The specific outcome areas with demonstrated impacts address positive parenting attitudes, parental self-efficacy, home safety attitudes, parenting locus of control, and knowledge of child development.

Positive Parenting Practices Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 8 summarizes positive parenting practices outcomes for the studies that have estimated a statistically significant substantial relationship with home visiting, as indicated by medium-to-large effect sizes. Parent involvement had a medium-to-very large effect size ranging from .87 to 30.27. Safety practices (demonstrated by reduced hazardous exposures observed in the home), redirection of infants' foci of attention, and parenting practices (demonstrated by less hostile parenting) also had large effect sizes.

Exhibit 8. Positive parenting practices impacts that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group[3]
ABC		
Positive parent regard; Follow-up at 0-6 months post-intervention	.70[b]	.56
Parent sensitivity; Follow-up at 0-6 months post-intervention	.62[b]	.63
Growth in parental sensitivity; Follow-up at 16 to 19 weeks	.70[a]	.71
Growth in parental intrusiveness; Follow-up at 16 to 19 weeks	.81[a]	-.96
NFP		
Hostile parenting practices; Follow-up at age 15	-1.22[b]	-.61
PALS		
Contingent responsiveness; Follow-up at 12 months	.93[a]	Not reported
Contingent responsiveness; Follow-up at 3 months after program end	.51[a]	Not reported
Labeling actions; Follow-up at 12 months	.63[a]	Not reported
Labeling objects; Follow-up at 12 months	.71[a]	Not reported
Physical intrusiveness; Follow-up at 12 months	.50[a]	Not reported
Redirecting infant foci of attention; Follow-up at 12 months	1.31[a]	Not reported
Verbal encouragement; Follow-up at 12 months	.71[a]	Not reported
Verbal scaffolding; Follow-up at 12 months	.79[a]	Not reported

Family Check-Up		
Parent involvement (parent keeps child in visual range, parent talks to child while doing housework, and parent structures child's play); Follow-up at ages 3 and 4	30.27[b]	.82
Family Spirit		
Change in parenting knowledge; Follow-up at 12 months postpartum	.86[b]	Coeff = 13.92
Change in parenting knowledge; Follow-up at 6 months postpartum	.81[b]	Coeff = 13.46
HFA		
Safety practices; Follow-up at 6 months of age	3.00[b]	1.90
HIPPY		
Parents' use of home-based supports for children like oral language-based activities, print-based activities, literacy exposure, and parent book reading; Follow-up at 16 weeks after assignment	.87[a]	8.94

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome and results for the home visiting group were more favorable compared to the comparison group.

[a] Effect size reported by study author(s).

[b] Effect size calculated by HomVEE.

[3] Coefficient (beta) represents the difference in the outcome of interest between study participants in the home visiting group and the comparison group, holding constant other characteristics included in a regression analysis

Reductions in Child Maltreatment

Favorable impacts on outcomes reviewed within this domain address reductions in child maltreatment, including—

1. Child abuse and neglect[6]
2. Encounters with health care providers[7]

Eight models demonstrated reductions in child maltreatment outcomes that are statistically significant. Across models, the most common outcomes with statistically significant results are: reductions in substantiated child abuse/neglect or involvement in child protective services (CPS, 5 models), reductions in harsh discipline behaviors and attitudes (4 models), engagement in activities to promote early language and literacy (3 models), and reductions in child hospitalizations (2 models).

Models With Demonstrated Reductions in Child Maltreatment Outcomes

- Child First
- Early Head Start–Home-Based Option (EHS)
- Early Start (New Zealand)
- Health Access Nurturing Development Services (HANDS) Program
- Healthy Families America (HFA)
- Nurse-Family Partnership (NFP)
- Parents as Teachers (PAT)
- SafeCare Augmented

1. Child Abuse and Neglect

Outcomes include measures of physical and psychological child maltreatment. The specific outcome areas with demonstrated impacts address

[6] In order to address concerns regarding surveillance effects (i.e., participation in home visiting programs may increase surveillance of families, resulting in potentially increased reports of child maltreatment), the HomVEE review includes only substantiated reports of child maltreatment as an outcome measure; outcome measures based on unsubstantiated reports are excluded. More information can be found here.

[7] Encounters with health care providers may include physician visits, emergency room visits, or hospitalizations. Parents in home visiting programs may be encouraged to use health care services more often, such as for well-child visits. Patterns in using health care may also change after enrolling in home visiting programs (e.g., families connected to primary care physicians may reduce their use of the emergency room for health care). Therefore, the HomVEE review only includes health care encounters that may stem from child maltreatment in the child maltreatment domain. More information can be found here.

nonviolent discipline tactics, as well as reductions in substantiated reports of child abuse and neglect, substantiated physical or sexual abuse, biological mother is a confirmed subject for sexual abuse, serious or very serious physical abuse, mild physical assault, family involvement with CPS, severe/very severe assault by any parent, psychological aggression, harsh parenting in the past week, minor physical aggression, and physical punishment.

2. Encounters with Health Care Providers

Outcomes assess interactions with health care providers for child maltreatment. The specific outcomes with demonstrated impacts address reductions in the child being hospitalized or admitted to an emergency department for injuries or ingestions.

Reductions in Child Maltreatment Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 9 summarizes reductions in child maltreatment outcomes for the studies that have estimated a statistically significant substantial relationship with home visiting, as indicated by medium-to-large effect sizes. Among the outcomes reported, reductions in severe/very severe assault by any parent at 36 months had a strong effect.

Exhibit 9. Reductions in child maltreatment outcomes that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group
PAT		
Abuse and/or neglect- current suspected cases; Follow-up at ages 4-5	-.65[a]	-.25
Early Start (New Zealand)		
Percent severe/very severe assault by any parent; Follow-up at 36 months after random assignment	-.98[a]	-9.40

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome and results for the home visiting group were more favorable compared to the comparison group.

[a] Effect size calculated by HomVEE.

Reductions in Juvenile Delinquency, Family Violence, and Crime

Favorable impacts on outcomes reviewed within this domain address reductions in —

1. Maternal involvement in intimate partner violence
2. Youth involvement in delinquency, family violence, and crime

Two models demonstrated reductions in juvenile delinquency, family violence, and crime outcomes that were statistically significant. Studies from the two models did not address the same outcomes. One model demonstrated outcomes specific to the mother, while another model's outcomes were focused on long-term follow-up of the youth.

Models With Demonstrated Reductions in Juvenile Delinquency, Family Violence, and Crime Outcomes

- Healthy Families America (HFA)
- Nurse-Family Partnership (NFP)

1. Maternal Involvement in Intimate Partner Violence

This outcome captures maternal victimization and perpetration related to reductions in intimate partner violence and maltreatment.

2. Youth Involvement in Delinquency, Family Violence, and Crime

Outcomes include measures of youth (ages 5 and older) engagement in delinquency, family violence, and crime. Specific outcome areas with demonstrated impacts address age at onset of neglect, as well as reductions in child internalizing disorders, convictions, arrests, probation violations, and domestic violence.

Reductions in Juvenile Delinquency, Family Violence, and Crime Outcomes With The Strongest Effects

As described earlier in the module, awardees may be interested in selecting outcomes that have been shown to have a strong relationship with home visiting participation. Exhibit 10 summarizes reductions in juvenile delinquency, family violence, and crime outcomes for which studies have estimated a statistically significant substantial relationship with home visiting, as indicated by medium-to-large effect sizes. One outcome, lifetime convictions for youth, had a medium effect size. No outcomes had a large effect size.

Exhibit 10. Reductions in juvenile delinquency, family violence and crime outcomes that are statistically significant with medium to large effect sizes

Outcomes, effect sizes, and mean group differences by model

Outcome[1]	Effect Size[2]	Mean Difference Between Program and Comparison Group
NFP		
Any convictions during lifetime; Follow-up at age 19	-.64[a]	-.16

[1] The outcomes presented in the table reflect the terminology used in the studies cited.

[2] Effect size is generally interpreted as: .2 = small effect; .5 = medium effect; .8 = large effect. Negative effect sizes and mean differences indicate that the study assessed an unfavorable outcome and results for the home visiting group were more favorable compared to the comparison group.

[a] Effect size calculated by HomVEE.

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