Addendum to the Healthy Families Florida

Final Statewide Evaluation Report

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Mary Kay Falconer, Ph.D.
Ounce of Prevention Fund of Florida

Dan McGee, Ph.D.
Florida State University

Ounce of Prevention Fund of Florida

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This document is an addendum to the Healthy Families Florida (HFF) five year evaluation report released in February 2005. Several findings based on the impact analysis presented in the February 2005 report indicated that Healthy Families Florida is effective in preventing child maltreatment. The purpose of this addendum is to provide further confirmation of these findings by presenting additional analysis of the data used in the evaluation and technical clarification of the findings. The addendum begins with a review of the evaluation research design, including descriptions of each comparison and treatment group. Next, it provides detailed descriptions of the measurement of key variables in the analysis. As a final component, it covers an extension of the impact analysis used to determine the statistical significance of the program experience in preventing child abuse and neglect.

Review of the Research Design and the Comparison Groups

As described in the February 2005 evaluation report, the research design was a strong quasi-experimental design with five nonequivalent comparison groups. There was one "no service" group and several program participant groups. Consistent with approaches recommended to strengthen quasi-experimental designs by reducing threats to internal validity, the members of the nonequivalent comparison groups should have characteristics that are similar to the members in the treatment groups (Shadish, Cook, & Campbell, 2002, p. 159). The inclusion of "internal" groups that are taken from one pool of participants is an approach that can improve internal validity (Shadish, Cook, & Campbell, 2002, p. 159). In this design, all members in the comparison and treatment groups had very similar characteristics and were considered "internal" because all of them were assessed using the same assessment tool and determined eligible for Healthy Families Florida.

Four of the groups in the initial research design are described below and included in the analysis presented in this addendum:

Completers Group

The **Completers Group** includes children in families that completed the HFF program as of December 31, 2003. According to Healthy Families America (HFA), programs have the flexibility to define completion. The Healthy Families Florida guidelines state that for a family to complete the program the family has been on Level 4 for three months, the child is in a stable and nurturing environment, the child's growth and development are age appropriate, immunizations are up to date, and the project and family agree to end services.

High Fidelity Group

In order to examine dosage effects on outcome performance, the members of this group received a high dose of services over the course of the program. The program experience of those in the **High Fidelity Group** was consistent with the definition in Duggan et al.[1] as "(1) active in or

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[1] Duggan, A. et al. (2004). Randomized trial of a statewide home visiting program: impact in preventing child abuse and neglect. *Child Abuse and Neglect* 28(2004), 597-622.

graduated from the program at the end of the third year; (2) had > 75 percent of expected visits over the full period of enrollment; and (3) on Level X for < 3 months total."

Comparison Group

The **Comparison Group** consists of families whose files were closed as of December 31, 2003 and received less than three months of service. According to HFF, the first six months of enrollment are spent bonding with the Family Support Worker (FSW) and getting acquainted with program services making the less than 3 months of enrollment Comparison Group an appropriate analytical group to represent a very brief participation in home visiting services.

No HFF Service Group

The **No HFF Service Group** was created from a pool of families that were assessed as needing the program but did not enroll because a project was at capacity. A total of 955 families were assessed during the time period of January 1, 2000 to December 31, 2002 as needing the program, but did not enroll because of insufficient capacity.

For the HFF No Service Group families, only the demographic and initial contact information for the primary participants was obtained at assessment. In order to obtain information on the children born to these participants, vital statistics birth records from the Florida Department of Health were used. Mothers were matched by name, date of birth, city, zip code, social security number and target child's date of birth to vital statistics birth records. For the mothers with assessment records that did not include the target child's date of birth, a search in the vital statistics records was conducted to identify the target child's birth 6 months before and after the assessment date. Personal identifying information such as name, date of birth, social security number and race were obtained for each child from the vital statistics records. The initial match process resulted in a total of 965 children in 955 families.

The pairing of the groups and the number of children in each group are displayed in Table 1.

Table 1: Number of Children by Group Combination and Groups

Group Combinations	Total in Combination	Comparison Group	Program Group
No Service and Completers	Total	No Services	Completers
	1740 (100.0%)	965 (55.5%)	775 (44.5%)
No Service and High Fidelity	Total	No Services	High Fidelity
	1639 (100.0%)	965 (58.9%)	674 (41.1%)
Comparison and Completers	Total	Comparison	Completers
	1056 (100.0%)	281 (26.6%)	775 (73.4%)
Comparison and High Fidelity	Total	Comparison	High Fidelity
	955 (100.0%)	281 (29.4%)	674 (70.6%)

Descriptive statistics for key variables used in the analyses presented in the addendum are presented for each group in Tables 2 through 5.

Table 2: Descriptive Statistics for No Service Group

Variables	N	Minimum	Maximum	Mean	Std. Error	Std. Deviation
HFFAT Score	946	13.00	63.00	22.2178	.27402	8.42792
Age	964	13.26	42.84	23.0563	.17992	5.58628
White	942	0	1	.34	.015	.475
Black	942	0	1	.39	.016	.487
Hispanic	942	0	1	.27	.014	.445
Married	965	0	1	.24	.014	.426
Employed	0					
Less than High School	965	0	1	.37	.016	.482
Children at Intake	965	.00	10.00	1.0145	.04459	1.38524
Valid N (listwise)	0					

Table 3: Descriptive Statistics for Completers Group

Variables	N	Minimum	Maximum	Mean	Std. Error	Std. Deviation
HFFAT Score	603	13.00	66.00	23.4710	.39194	9.62453
Age	775	12.76	53.36	23.6290	.22826	6.35454
White	749	0	1	.25	.016	.434
Black	749	0	1	.44	.018	.497
Hispanic	749	0	1	.30	.017	.460
Married	769	0	1	.24	.015	.428
Employed	693	0	1	.25	.016	.433
Less than High School	769	0	1	.54	.018	.499
Children at Intake	775	.00	7.00	1.3213	.04781	1.33091
Valid N (listwise)	511					

Table 4: Descriptive Statistics for Comparison Group (< 3 months in program)

Variables	N	Minimum	Maximum	Mean	Std. Error	Std. Deviation
HFFAT Score	267	13.00	70.00	24.7491	.62454	10.20508
Age	281	14.99	79.24	23.9551	.43818	7.34531
White	275	0	1	.44	.030	.497
Black	275	0	1	.34	.029	.475
Hispanic	275	0	1	.22	.025	.416
Married	276	0	1	.19	.024	.392
Employed	269	0	1	.24	.026	.429
Less than High School	277	0	1	.54	.030	.499
Children at Intake	281	.00	8.00	1.5907	.07130	1.19513
Valid N (listwise)	241					

Table 5: Descriptive Statistics for High Fidelity Group

Variables	N	Minimum	Maximum	Mean	Std. Error	Std. Deviation
HFFAT Score	660	13.00	76.00	24.6197	.38638	9.92625
Age	673	13.25	43.54	23.4475	.24009	6.22859
White	653	0	1	.28	.018	.452
Black	653	0	1	.46	.020	.498
Hispanic	653	0	1	.26	.017	.438
Married	668	0	1	.25	.017	.436
Employed	605	0	1	.18	.016	.386
Less than High School	671	0	1	.58	.019	.495
Children at Intake	674	.00	9.00	1.3205	.05461	1.41777
Valid N (listwise)	563					

Descriptions of the Measurement of Key Variables

Measurement of Key Variables

As in any program evaluation, measurement of the key variables used for the outcomes or statistical controls in analytical models is a critical consideration. Measurement of the key variables in the evaluation of Healthy Families Florida was linked to program policies, procedures and information systems developed for monitoring the performance of the program since its early phase of implementation. Family information collected during an eligibility assessment indicates if the family is at risk of abuse and neglect and therefore, eligible for the program. The assessment tool is the Healthy Families Florida Assessment Tool (HFFAT) which contains 40 items or concerns. The family must score 13 or higher on the HFFAT to be eligible for the program. The assessment tool addresses the following the concerns:

- Inability to meet basic needs
- Social isolation
- Childhood experiences (witness to domestic violence, instability of care, stability of caregiver, experience with child abuse and neglect)
- Mental illness
- Substance abuse
- Criminal offenses
- Prenatal care and unhealthy habits during pregnancy
- Depression
- No medical home for child
- Child or family members at home with special needs
- Current experience with domestic violence
- Coping mechanisms
- Unrealistic expectations about child development
- Negative verbalization about their baby
- Lack of parenting skills
- Education
- Age (less than 18)
- Not married

If the family enrolls in the program, additional participant information is collected at intake. The participant items collected at program intake are date of birth of the primary participant, grade level achieved, race and ethnicity, marital status, number of children at intake, employment and whether they were pregnant at the time of the assessment. Dates of birth of the target and non-target children are also recorded at intake unless enrollment occurred during the pregnancy of the target child.

Child maltreatment is the outcome for the impact analysis. The most comprehensive source of child maltreatment information is the state abuse and neglect reporting system maintained by the Florida Department of Children and Families. This state reporting system was the source of information for the five year evaluation of Healthy Families Florida and has continued as the primary source for ongoing monitoring of the program. The state reporting systems operational during the time of the evaluation were the Florida Abuse Hotline Information System (FAHIS) which was replaced by HomeSafenet in 2002-2003.

For the five year evaluation, the definition of child maltreatment includes three of the major types of child maltreatment: physical abuse, neglect, and threatened harm. In the relevant family safety and preservation allegation matrix, the maltreatment categories were defined as follows:

1) Abuse: A willful action that resulted in the listed injury or harm. This category includes sexual abuse.
2) Neglect: An omission which is a serious disregard of parental responsibilities for the child's welfare including:
   a) prolonged or repeated lack of supervision or failure to exercise a minimum degree of care that resulted in the listed injury or harm.
   b) failure to make reasonable efforts to stop the actions of another person that resulted in the listed injury or harm.
3) Threatened Harm: Behavior which is not accidental and which is likely to result in harm to the child (CFOP 125-28, 1998).

In addition to the inclusion of all types of maltreatment in the child maltreatment outcome used in the five year evaluation of Healthy Families Florida, "verified" and "some indication" findings are included. A verified finding is when "a preponderance of the credible evidence results in a determination that the specific injury, harm or threatened harm was the result of abuse or neglect" (CFOP 175-28, 1998, p. 3). A "some indication" finding is when "there is credible evidence, which does not meet the standard of being a preponderance, to support that the specific injury, harm or threatened harm was the result of abuse or neglect" (CFOP 175-28, 1998, p. 3). Maltreatment findings that meet the above criteria are included for both target and non-target children in a family and maltreatment by any perpetrator, regardless of the relationship to the child. Maltreatment that occurs in an "institutional" setting is not included in the measure. This measure is the prevalence of child maltreatment with multiple occurrences of maltreatment with one child being counted as one occurrence.

Extension of the Impact Analysis

For quasi-experimental designs in which the comparison and treatment groups are non-equivalent and not randomized, multiple regression is an analytical technique used to improve internal validity. This technique is useful in nonexperimental designs because it can account or control for differences in characteristics across the members in each group that might affect the performance of a program participant (Langbein & Felbinger, 2006). The regression equations used for estimation of the impact of the program include factors that relate theoretically to the dependent variable or outcome and control for the expected confounding effects. Langbein and Felbinger (2006) present this technique in the form of an equation below:

$$Y_i = A + BX_i + CZ_i + u_i$$

In the above equation, the child maltreatment outcome is Y_i. X_i is the set of program indicators for which an impact is being estimated; and Z_i is the set of control variables (Langbein & Felbinger, 2006, p. 136). The key parameter in the equation for the impact analysis is B which is the measure of the impact of the treatment or comparison group. The direction of the impact depends on how X_i is coded or whether 1 is assigned to the treatment group or the no service or control group. The final value in the equation is u_i which is random error which may affect Y but is unrelated to X_i and Z_i. In most applications, the u_i term includes all of the factors that may affect an outcome but are not measured. In this case, the outcome is occurrence of child maltreatment.

Because the measure of Y_i or the occurrence of child maltreatment meeting the criteria in the measurement section is coded as a dichotomy, the relationships between the variables on the right side of the equation specified above and Y_i are not linear. In order to allow an estimation that identifies the statistical significance of the equation coefficients, a maximum likelihood estimation (MLE) technique is used (Langbein & Felbinger, 2006, p. 170). The MLE technique used for this extension of the impact analysis is binary logistic regression (Tabachnick & Fidell, 2001, pp. 517-581). According to Tabachnick and Fidell (2001), logistic regression is a flexible statistical technique that does not require adherence to assumptions regarding the normal distribution of the predictors.

The predictors can also be a combination of discrete, continuous or dichotomous variables. Another attribute of this technique is that the coefficients can be interpreted as an odds ratio or Exp(B). Despite its appeal, the technique still requires a high enough ratio of cases or records to variables and low multicollinearity among the predictors.

As an additional explanation of logistic regression, the logistic model assumes that the probability that Y=1 is related to the predictors X in a non-linear fashion:

$$\Pr(Y_i = 1 \text{ given } X_i = x_i) = \frac{\exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p)}{1 + \exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p)}$$

Given a sample with values of Y_i and x_i provided for each person in the sample, estimates of the β_i may be obtained using the method of maximum likelihood available in most modern statistical software. The method of maximum likelihood involves statistical theory that allows us to draw inferences about the β_i and the logistic equation provides an interpretation for them. In the logistic model, $\exp(\beta_i)$ may be interpreted as the odds ratio for two individuals who differ only by one unit of x_i. In other words, this value may be interpreted as the odds ratio after controlling for the addition of x variables included in the model.

If we let $p_i = \Pr(Y_i = 1 \text{ given } X_i = x_i)$ then we define the "logit" of p_i as:

$$\text{logit}(p_i) = \ln\left(\frac{p_i}{1 - p_i}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p$$

Using this notation, the models estimated were:

Univariate: $\text{logit}(p_i) = \beta_0 + \beta_1 x_1$

$x_1 =$ Group (No Service or Comparison Group = 1, other =0)

Model 1: $\text{logit}(p_i) = \beta_0 + \beta_1 x_1 + \beta_2 x_2$

$x_1 =$ Group (No Service or Comparison= 1, other = 0)

$x_2 =$ HFFAT Total Score

Model 2: $\text{logit}(p_i) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5$

$x_1 =$ Group (No Service or Comparison Group = 1, other = 0)

$x_2 =$ HFFAT Total Score

$x_3 =$ Age of Primary Participant

$x_4 =$ White (white = 1, other = 0)

$x_5 =$ Married (married = 1, other = 0)

Model 3: $\text{logit}(p_i) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7$

$x_1 =$ Group (No Service or Comparison Group = 1, other = 0)

$x_2 =$ HFFAT Total Score

$x_3 =$ Age of Primary Participant

$x_4 =$ White (white = 1, other = 0)

$x_5 =$ Married (married = 1, other = 0)

$x_6 =$ Less than High School Education (< high school = 1, other = 0)

$x_7 =$ Number of Children at Intake

Model 4: $\text{logit}(p_i) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8$

$x_1 =$ Group (No Service or Comparison Group = 1, other = 0)

$x_2 =$ HFFAT Total Score

$x_3 =$ Age of Primary Participant

$x_4 =$ White (white = 1, other = 0)

$x_5 =$ Married (married = 1, other = 0)

$x_6 =$ Less than High School Education (< high school = 1, other = 0)

$x_7 =$ Number of Children at Intake

$x_8 =$ Employed (employed = 1, other = 0)

Model 5: $\text{logit}(p_i) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7$

$x_1 =$ Group (Comparison Group = 1, other = 0)

$x_2 =$ White (white = 1)

$x_3 =$ Married (married = 1, other = 0)

$x_4 =$ Number of Children at Intake

$x_5 =$ Employed (employed = 1, other = 0)

$x_6 =$ History of Substance Abuse during Pregnancy (concern checked = 1, other = 0)

$x_7 =$ Smoking during Pregnancy (concern checked = 1, other = 0)

The extension of the impact analysis required the merging of primary participant information with the child records used in the original analysis. This was accomplished by matching primary participant record information collected during the five year evaluation with child records using family identification codes that are available in the HFF information management system.

Referring to the development of the models, research on child maltreatment has identified several categories of factors that are related to the occurrence of child maltreatment. Comprehensive theoretical models of child maltreatment have as their foundation the Bronfenbrenner (1979) theory of human development, an emphasis on the environment or the culture and community in which abuse and neglect occurs in Belsky (1980, 1993), and a transactional or dynamic nature with each level of the model impacting the others reciprocally (Cicchetti & Lynch, 1993). In Cicchetti & Valentino (2006), these categories of factors are identified as systems that encompass cultural beliefs and values, socioeconomic conditions in a neighborhood or community, family structure, and developmental characteristics of the parent and child. In most analyses, it is not feasible to obtain and incorporate all of these factors.

More parsimonious models explaining child maltreatment have been analyzed. These models are useful in identifying risk factors related to different types of child maltreatment and the confounding factors that might influence the statistical relationships between membership in a group and the occurrence of child maltreatment. Based on an analysis of children born in 1996 in Florida (Wu, et al., 2004), and additional analyses conducted in the U.S. (Brown, Cohen, Johnson, & Salzinger, 1998; Windham, Rosenberg, Fuddy, McFarlane, Sia, & Duggan, 2004; Hussey, Chang, & Kotch, 2006), one or more of the following factors are significantly related to child maltreatment; young maternal age, higher number of children or siblings, not married, less than high school education, inadequate prenatal care, and smoking during pregnancy. Additional factors significantly related to child maltreatment are substance abuse (Chaffin, Kelleher, & Hollenberg, 1996; Kelleher, Chaffin, Hollenberg, & Fischer, 1994), mental health or depression (Kelleher, et al., 1994; Kotch et al., 1995; Chaffin et al. 1996), social isolation or small number of contacts in social networks (Coohey, 1996; Brown et al., 1998), domestic violence (McKibben, De Vos, & Newberger, 1989; McGuigan & Pratt, 2001), and having a disabled child (Sullivan & Knutson, 2000; Brown et al., 1998). Several of the risk factors specified here are collected at the time of enrollment in Healthy Families Florida but most of them are identified during assessment and recorded on the Healthy Families Assessment Tool (HFFAT) prior to enrollment. The models developed for this analysis are a combination of several of the factors and while they do not include all of the factors, the majority of them are included.

All of the models developed for this analysis are not estimated for all group comparisons. Only the first three models are estimated for the "no service" and "completers" group comparison and the "no service" and "high fidelity" group comparison. Missing data in the "no service" group limited the number of variables and models that could be estimated in the comparisons that included the "no service" group. In addition, the comparisons that include the "no service" group include 4 child age groups; up to 3, up to 6, up to 12, and up to 24 months with no analysis for the children up to 36 months. Because of the timing of the formation of the "no service" group, there are no children older than 24 months of age in this group.

All five models were tested in the "comparison (less than 3 months of service)" and "completers" group analysis and the "comparison (less than 3 months of service)" and "high fidelity" group analysis. The five models are estimated in each of the five child age groups for these analyses.

Analysis Results by Groups, Models and Age of Child Subgroups

The following tables (Tables 6-9) display the results in the binary logistic regression. The odds ratios or Exp(*B)* for the appropriate comparison group in each model equation are presented along with the level of statistical significance to indicate impact ($p< .001$, $p< .01$, or $p< .05$). If the odds ratio is statistically significant, the differences in the outcome (child maltreatment), controlling for the other factors in the model, are significant. In addition to the tables displaying the Exp(*B*), there are additional tables (Tables 10-13) displaying the descriptive statistics for each group and the t-tests for determining whether the differences in those factors across the groups are statistically significant.

Table 6: No Service and Completers Group Comparison
Odds Ratios for Child Maltreatment Occurrence in No Service Group
by Model and Age of Child

Age of Child	Univariate	Model 1	Model 2	Model 3
Up to 3 months	N=1729 (35)	N=1538 (34)	N=1489 (32)	N=1483 (32)
Exp(B)	5.000 ***	5.853***	5.018**	5.335**
CI (95%)	1.931-12.949	2.021-16.948	1.721-14.630	1.818-15.657
Up to 6 months	N=1721 (54)	N=1531 (52)	N=1482 (50)	N=1476 (50)
Exp(B)	5.736***	7.333***	6.359***	6.858***
CI (95%)	2.578-12.764	2.869-18.745	2.480-16.307	2.650-17.750
Up to 12 months	N=1651 (86)	N=1462 (82)	N=1413(80)	N=1407 (80)
Exp(B)	4.469***	5.985***	5.3***	5.720***
CI (95%)	2.538-7.868	3.080-11.628	2.72-10.329	2.909-11.249
Up to 24 months	N=1045 (74)	N=866 (63)	N=831 (62)	N=825 (62)
Exp(B)	3.705***	3.998***	3.643***	3.886***
CI (95%)	2.292-5.990	2.333-6.853	2.097-6.328	2.195-6.878

Notes: *** $p < .001$; ** $p < .01$; * $p < .05$; N (Number of children maltreated in the group)

Table 7: No Service and High Fidelity Group Comparison
Odds Ratios for Child Maltreatment Occurrence in No Service Group
by Model and Age of Child

Age of Child	Univariate	Model 1	Model 2	Model 3
Up to 3 months	N=1628 (46)	N=1595 (46)	N=1544 (42)	N=1541 (42)
Exp(B)	1.334	1.623	1.564	1.739
CI (95%)	.722-2.470	.863-3.053	.799-3.061	.873-3.463
Up to 6 months	N=1620 (72)	N=1588 (71)	N=1537 (67)	N=1534 (67)
Exp(B)	1.357	1.663	1.572	1.743*
CI (95%)	.827-2.228	.994-2.783	.920-2.686	1.001-3.035
Up to 12 months	N=1550 (105)	N=1519 (104)	N=1468 (100)	N=1465 (100)
Exp(B)	1.660*	2.088***	1.954**	2.114**
CI (95%)	1.089-2.531	1.342-3.247	1.239-3.081	1.319-3.387
Up to 24 months	N=947 (102)	N=926 (97)	N=888 (92)	N=885 (92)
Exp(B)	1.685*	1.854**	1.815*	1.843*
CI (95%)	1.101-2.577	1.178-2.891	1.139-2.890	1.141-2.977

Notes: ***p < .001; ** p < .01; * p < .05; N (Number of children maltreated in the group)

Table 8: Less than 3 Months Participation in HFF Comparison Group and High Fidelity Group
Odds Ratios for Child Maltreatment Occurrence in Comparison Group
by Model and Age of Child

Age of Child	Univariate	Model 1	Model 2	Model 3	Model 4	Model 5
Up to 3 months	N= 952 (36)	N=924 (36)	N=885 (32)	N=878 (32)	N=801 (32)	N=584 (32)
Exp(B)	3.188***	3.373***	3.242***	3.188**	2.966**	2.370*
CI (95%)	1.626-6.249	1.7-6.693	1.551-6.778	1.518-6.698	1.407-6.249	1.123-5.001
Up to 6 months	N=932 (50)	N=905 (48)	N=867 (44)	N=860 (44)	N=784 (44)	N=569 (46)
Exp(B)	2.785***	2.934***	2.707**	2.672**	2.438**	2.022*
CI (95%)	1.569-4.946	1.616-5.325	1.437-5.098	1.411-5.063	1.285-4.628	1.077-3.797
Up to 12 months	N=879 (59)	N=852 (55)	N=815 (52)	N=809 (52)	N=734 (49)	N=526 (52)
Exp(B)	2.614***	2.659***	2.405**	2.346**	2.020*	1.814
CI (95%)	1.520-4.496	1.493-4.735	1.312-4.411	1.274-4.318	1.068-3.819	.982-3.352
Up to 24 months	N=817 (89)	N=792 (81)	N=756 (76)	N=750 (76)	N=675 (70)	N=475 (76)
Exp (B)	2.070**	1.914*	1.716	1.743	1.572	1.782
CI (95%)	1.251-3.428	1.113-3.290	.965-3.051	.976-3.112	.854-2.897	.987-3.220
Up to 36 Months	N=708 (90)	N=688 (85)	N=658 (81)	N=652 (81)	N=586 (72)	N=406 (75)
Exp (B)	1.826	1.987*	1.763	1.873	1.632	1.445
CI (95%)	.988-3.375	1.038-3.801	.887-3.504	.933-3.760	.770-3.461	.683-3.055

Notes: *** p < .001; ** p < .01; * p < .05; N (Number of children maltreated in the group)

Table 9: Less than 3 Months Participation in HFF Comparison Group and Completers Group
Odds Ratios for Child Maltreatment Occurrence in Comparison Group
by Model and Age of Child

Age of Child	Univariate	Model 1	Model 2	Model 3	Model 4	Model 5
Up to 3 months	N=1053 (25)	N=867 (24)	N=831 (22)	N=821 (22)	N=749 (21)	N=531 (20)
Exp(B)	11.938***	11.962***	11.002***	11.506***	14.255***	15.435***
CI (95%)	4.436-32.130	4.006-35.720	3.581-33.8	3.697-35.811	3.993-50.889	3.509
Up to 6 months	N=1033 (32)	N=848 (29)	N=813 (27)	N=803 (27)	N=732 (26)	N=516 (27)
Exp(B)	11.772***	12.783***	11.205***	11.619***	13.383***	10.882***
CI (95%)	5.027027.565	4.768-34.273	4.089-30.703	4.185-32.257	4.399-40.715	3.652-32.426
Up to 12 months	N=980 (40)	N=795 (33)	N=761 (32)	N=752 (32)	N=682 (28)	N=473 (30)
Exp(B)	7.037***	7.588***	6.862***	7.042***	7.158***	6.075***
CI (95%)	3.636-13.621	3.521-16.350	3.106-15.159	3.148-15.752	3.004-17.054	2.673-13.809
Up to 24 months	N=915 (59)	N=732 (47)	N=699 (46)	N=690 (46)	N=620 (42)	N=420 (48)
Exp (B)	4.554***	4.095***	3.323***	3.351***	3.029**	3.436***
CI (95%)	2.623-7.905	2.213-7.577	1.738-6.354	1.737-6.464	1.521-6.035	1.798-6.566
Up to 36 Months	N=764 (64)	N=588 (52)	N=559 (50)	N=550 (49)	N=493 (45)	N=329 (48)
Exp(B)	3.207***	3.191***	2.591**	2.854**	2.376*	2.009
CI (95%)	1.699-6.052	1.614-6.311	1.252-5.363	1.353-6.022	1.068-5.284	.913-4.423

Notes: *** p < .001; ** p < .01; * p < .05; N (Number of children maltreated in the group)

Table 10: Summary Statistics and Statistical Significance of Differences
No Service and Completers Groups

Explanatory Variables	No Service Group			Completers Group			T (level of significance)
	N	**Mean**	**SD**	**N**	**Mean**	**SD**	
HFFAT	946	22.2178	8.4279	603	23.4710	9.6245	2.621 (.009)
Age	964	23.0563	5.5813	775	23.6290	6.3545	1.970 (.049)
White	942	.34	.475	749	.25	.434	- 4.101 (.000)
Black	942	.39	.487	749	.44	.497	2.367 (.018)
Hispanic	942	.27	.445	749	.30	.460	1.518 (.129)
Married	965	.24	.426	769	.24	.428	.221 (.825)
Less than High School	965	.37	.482	769	.54	.499	7.386 (.000)
# of Children at Intake	965	1.0145	1.3852	775	1.3213	1.3309	4.693 (.000)
Employed*	*			693	.25	.433	*

* No members in the no service group had employment information.

Table 11: Summary Statistics and Statistical Significance of Differences
No Service and High Fidelity Groups

Explanatory Variables	No Service Group			High Fidelity Group			T (level of significance)
	N	Mean	SD	N	Mean	SD	
HFFAT	946	22.2178	8.4279	660	24.6197	9.92625	5.071 (.000)
Age	964	23.0563	5.5813	673	23.4475	6.2286	1.380 (.168)
White	942	.34	.475	653	.28	.452	- 2.427 (.015)
Black	942	.39	.487	653	.46	.498	2.738 (.006)
Hispanic	942	.27	.445	653	.26	.438	- .530 (.596)
Married	965	.24	.426	668	.25	.436	.791 (.429)
Less than High School	965	.37	.482	671	.58	.495	8.469 (.000)
# of Children at Intake	965	1.0145	1.3852	674	1.3205	1.4177	4.340 (.000)
Employed*	*			605	.18	.386	*

* No members in the no service group had employment information.

Explanatory Variables	Comparison Group			Completers Group			T (level of significance)
	N	Mean	SD	N	Mean	SD	
HFFAT	267	24.7491	10.2051	603	23.4710	9.6245	- 1.733 (.084)
Age	281	23.9551	7.3453	775	23.6290	6.3545	- .660 (.510)
White	275	.44	.497	749	.25	.434	- 5.468 (.000)
Black	275	.34	.475	749	.44	.497	3.029 (.003)
Hispanic	275	.22	.416	749	.30	.460	2.733 (.006)
Married	276	.19	.392	769	.24	.428	1.897 (.058)
Less than High School	277	.54	.499	769	.54	.499	.021 (.985)
# of Children at Intake	281	1.5907	1.1951	775	1.3213	1.3309	- 3.139 (.002)
Employed	269	.24	.429	693	.25	.433	.259 (.008)
Select HFFAT Items							
As child, Witnessed Violence (Items 4,7)	214	.46	.499	389	.40	.490	- 1.470 (.142)
History of Substance Abuse (Item 13)	214	.18	.387	389	.11	.307	- 2.503 (.013)
Smoking during Pregnancy (Item 19)	214	.19	.391	389	.11	.307	- 2.636 (.009)
Mental Illness (Items 12, 20)	214	.43	.497	389	.41	.492	- .674 (.500)
Current Domestic Violence (Items 24, 25, and 27)	214	.33	.470	389	.32	.469	- .080 (.936)

Table 13: Summary Statistics and Statistical Significance of Differences
Comparison (Less than 3 months Participation) and High Fidelity Groups

Explanatory Variables	Comparison Group			High Fidelity Group			T (level of significance)
	N	Mean	SD	N	Mean	SD	
HFFAT	267	24.7491	10.2051	660	24.6197	9.92625	- .176(.860)
Age	281	23.9551	7.3453	673	23.4475	6.2286	- 1.016 (.310)
White	275	.44	.497	653	.28	.452	- 4.356 (.000)
Black	275	.34	.475	653	.46	.498	3.304 (.001)
Hispanic	275	.22	.416	653	.26	.438	1.217 (.224)
Married	276	.19	.392	668	.25	.436	2.280 (.023)
Less than High School	277	.54	.499	671	.58	.495	.949 (.343)
# of Children at Intake	281	1.5907	1.1951	674	1.3205	1.4177	- 3.009 (.003)
Employed	269	.24	.429	605	.18	.386	- 1.961 (.050)
Select HFFAT Items							
As child, Witnessed Violence (Items 4,7)	214	.46	.499	461	.41	.492	- 1.272 (.204)
History of Substance Abuse (Item 13)	214	.18	.387	461	.08	.275	- 3.396 (.001)
Smoking during Pregnancy (Item 19)	214	.19	.391	461	.13	.342	- 1.686 (.093)
Mental Illness (Items 12, 20)	214	.43	.497	461	.41	.492	- .600 (.549)
Current Domestic Violence (Items 24, 25, and 27)	214	.33	.470	461	.34	.474	.290 (.772)

Discussion of Impact Analysis Results

In this extension of the impact analysis, several models for different group combinations were estimated using binary logistic regression. The objective was to statistically control for differences between members of the nonequivalent comparison groups while testing the impact of membership in a group on the outcome of interest, occurrence of child maltreatment.

No Service Group and Treatment Groups: In addition to the univariate estimation of impact, three models with multiple independent or explanatory variables were estimated. These model estimations indicated if membership in the "no service" group instead of one of the two treatment groups ("completers" or "high fidelity") was statistically related to the occurrence of child maltreatment. The estimation of these 3 models was conducted for each subgroup based on the age of the child (less than 3 months, less than 6 months, less than 12 months, less than 24 months). For the "no service" and "completers" group, all of the odds ratios ($Exp(B)$) were statistically significant. With the exception of two $Exp(B)$s, all of the odds ratios were significant at the $p<.001$. The other two odds ratios were significant at the $p<.01$. For the "no service" and "high fidelity" groups, the odds ratios were statistically significant for each model estimated in the 12 months and the 24 months child age subgroups (1 at $p< .001$, 3 at $p< .01$ and 2 at $p<.05$).

Finding 1: The odds ratios for the occurrence of child maltreatment were significantly higher in the group receiving no services compared to the group completing the program. The significant difference was observed for children less than 3 months of age, less than 6 months of age, less than 12 months of age, and less than 24 months of age.

Finding 2: The odds ratios for the occurrence of child maltreatment were significantly higher in the group receiving no services compared to the group receiving a high level of services. The significant difference was observed for children less than 12 months of age and less than 24 months of age.

Comparison (less than 3 months in the program) and Treatment Groups: For these group comparisons, five models were estimated with this estimation replicated in each child age subgroup. In the analysis of the "comparison" and "high fidelity" group differences in child maltreatment, the odds ratios for the occurrence of child maltreatment in the "comparison" group were significant in all but one model estimated in the child age subgroups up to 3 months, up to 6 months, and up to 12 months. The exception was model 5 for the up to 12 months age subgroup. For the up to 24 months age subgroup and the up to 36 months age subgroup, only $Exp(B)$ for Model 1 was statistically significant at $p <.05$. For the "comparison" group and "completer" group model estimations, most of the odds ratios for the occurrence of maltreatment in the "comparison" group were statistical significant at $p < .001$. The magnitude of these odds ratios were high (> 8.0) and raised concerns that the assumptions necessary for a robust estimate using this technique were compromised in the younger age subgroups (in particular, in the less than 3 months and less than 6 months subgroups). For the model estimations in the up to 24 months and the up to 36 months age subgroups, many of the

Exp(*B*)s were statistically significant at the *p*< .001 but all except one odds ratio is significant at the *p*<.05 level or higher.

Finding 3: The odds ratios for the occurrence of child maltreatment were significantly higher in the group receiving 3 months or less services compared to the group receiving a high level of services. The statistically significant differences were observed for children less than 3 months of age, less than 6 months of age, less than 12 months of age and less than 24 months of age.

Finding 4: The odds ratios for the occurrence of child maltreatment were significantly higher in the group receiving 3 months or less time in services compared to the group completing the program. The statistically significant differences were observed for children less than 12 months of age, less than 24 months of age, and less than 36 months of age.

A substantial drop in the number of records due to listwise deletion of cases in some of the model estimations was considered problematic in several of the group comparisons. In order to address this potential problem, a systematic analysis of the statistical impacts of these missing cases was conducted. Missing case variables were created in each group comparison and estimated as a univariate as well as in models with the group membership variables. With one exception, the missing case variables were not statistically significant in their relationship with the occurrence of child maltreatment. The exception was in the comparison between the "no service" and "completers" groups for the less than 12 months of age child subgroup. The statistical significance of only one of the missing case variables was *p* <.05. Based on this analysis, missing cases were not significant in impacting the odds ratios for the occurrence of child maltreatment in the group comparisons presented in this addendum.

This extension of the impact analysis presented in the HFF five year evaluation report confirms earlier findings of the effectiveness of HFF in preventing child maltreatment. With the number of models estimated and the replications of these model estimations within different subgroups based on the age of the child, the statistical impact of the program is significant.

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