AmeriCorps Impact Evaluation

Sacramento Family Support Collaborative

Birth and Beyond Home Visitation Program

2013 – 2015

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ACKNOWLEDGEMENTS

This evaluation was made possible by an ongoing collaboration among a number of agencies and individuals who have a demonstrated commitment to understanding and improving the lives of families in Sacramento County.

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CONTENTS

LIST OF ACRONYMS

AAPI-2	Adolescent and Adult Parenting Index
B&B	Birth & Beyond Program
CAPC	Child Abuse Prevention Center
CPS	Child Protective Services
CWS/CMS	Child Welfare Service/Case Management System
FRC	Family Resource Center
FSC	Family Support Collaborative
HV	Home Visitation
NPP	Nurturing Parent™ Program

BIRTH AND BEYOND HOME VISITATION OUTCOME & IMPACT EVALUATION

Introduction

The Birth & Beyond Family Resource Center, Home Visitation Effective Parenting Continuum of Services Initiative (B&B HVEPI) is supported by the leader organization Family Support Collaborative (FSC). Created in 1998 by the Board of Supervisors and supported extensively by First 5 Sacramento and AmeriCorps, FSC is a broad-based public/private community collaborative focusing on child abuse and neglect prevention-to-early intervention-to-treatment services for families with children 0-5 years. Its purposes are to engage the community in developing strategies to address child abuse and neglect as well as to coordinate the implementation of six B&B services: 1) home visitation; 2) parenting education; 3) crisis intervention; 4) connection to resources; 5) school readiness; and 6) parent leadership.

The home visitation (HV) programming is coordinated through Family Resource Centers (FRCs) which are operated by eight community-based non-profit agencies in Sacramento County: Child Abuse Prevention Center; Folsom Cordova Community Partnership; La Familia Counseling Center; Mutual Assistance Network; River Oak Center for Children; Sacramento Children's Home, and WellSpace Health. These agencies are responsible for managing services, supervising staff, and collecting data. The Child Abuse Prevention Council of Sacramento (CAPC) houses the FSC and provides collaborative support, administers the Federal grant that provides AmeriCorps members who serve families, conducts training, coordinates program evaluation, and monitors program compliance. CAPC also staffs the Parent Cabinet.

[Insert here the role of AmeriCorps member in the Home Visitation Program]

The following study was generously supported by the AmeriCorps program of the National Cooperation for National and Community Serve (NCSC) and represents the desire of B&B to increase the level of evidence with which they demonstrate the impact of the B&B program in Sacramento County. LPC Consulting Associates, Inc. (LPC) has been working with the B&B program for X years, developing and managing their program database as well as conducting regular evaluation actives of the initiative. LPC subcontracted with JBS International, Inc. for analytical support in conducting the quasi-experimental comparison for measuring the impact of the home visitation program on CPS recidivism.

Description of Home Visitation Program Implementation

The Birth & Beyond (B&B) Home Visitation (HV) Program supports families with the ultimate goal of preventing child abuse and neglect in Sacramento County. The core component of the HV program is the evidence-based parenting program, Nurturing Parent Program™. Families enrolled in the program are also provided referrals and support for a wide range of services including health insurance enrollment, school readiness, crises intervention, and assistance with basic needs.

Participant Recruitment: Families served by the HV program have one or more risk factors for child maltreatment, ranging from inadequate financial resources, one-parent households, to prior history with Child Protective Services (CPS). Families can enter the program through a number of routes. First, CPS may

refer families into the B&B program who came to the attention of CPS, but upon further investigation, did not result in the suspension of parental custody (i.e., evaluated out, unfounded, or inconclusive referrals). Parents who have an open CPS case are not eligible for the program. Second, families may learn of the program through their local networks or community FRC and self-enroll. Finally, a small number of families are referred into the program after the conclusion of an open CPS case as a means of parental support throughout the reunification process with their children. Participation in the program is voluntary and families referred to B&B work with staff from the nearest FRC offering home visitation services.

Program Content: The Nurturing Parent™ Program (NPP) is a competency-based curriculum designed to meet a family's needs based on parenting strengths and weaknesses.[1] The curriculum content focuses on parents' attitudes and knowledge about topics such as child development, appropriate discipline, and empathy (positive bonding) in a one-to-one instructional model which is offered in the family home. Instructors are able to observe family dynamics within the home setting and provide coaching and immediate reinforcement with parents. The NPP curriculum is accompanied by an assessment tool, the Adult-Adolescent Parenting Inventory – 2 (AAPI), which measures parenting beliefs and practices known to result in child maltreatment. Based upon the APPI risk level assessed at intake, parents are assigned into a one of three program groups. All families in the B&B home visitation program component receive an initial six NPP lessons, with the total number of program lessons being determined by their risk level: Low Risk (Prevention Group) 16 lessons; Medium Risk (Intervention Group) 27 lessons; High Risk (Treatment Group) 55 Lessons.

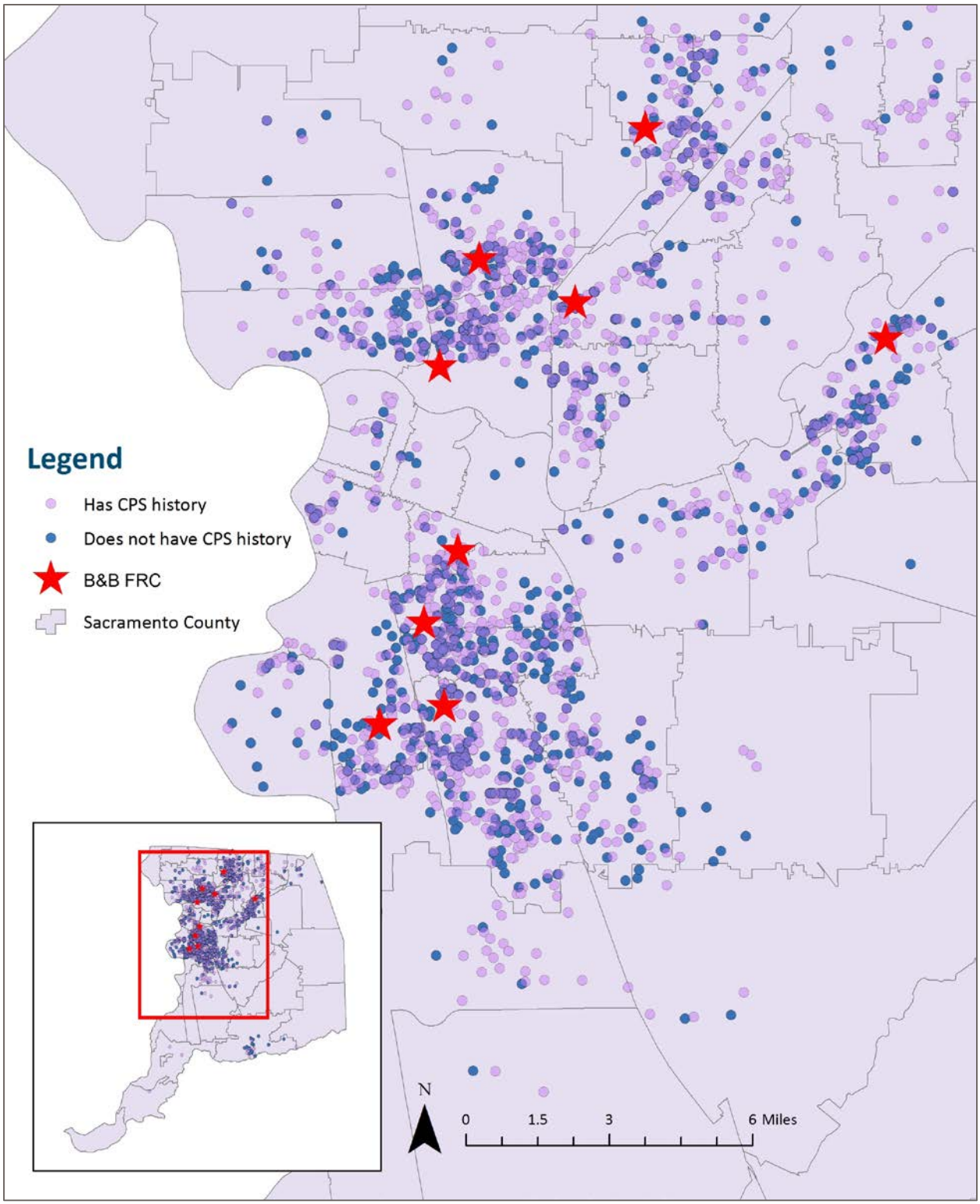
Program Delivery: Program services are delivered through the nine FRC sites, which are located in high-needs communities with concentrated risk for child maltreatment and CPS involvement:

- Arcade Community Center
- Firehouse Community Center
- Folsom Cordova Community Partnership
- La Familia Counseling Center
- Meadowview Family Resource Center
- North Sacramento Family Resource Center
- River Oak Family Resource Center at Dunlap House in Oak Park
- Valley Hi Family Resource Center
- WellSpace Health's North Highlands Multi-Service Center

Each FRC has a service deliver team, including up to eight home visitors, a team leader, a program manager, a crisis intervention specialist, a family resource center coordinator, and a multi-disciplinary team of professionals from county substance abuse treatment, mental health, child protective services, and welfare. Role of AmeriCorps members – home visitors, how are they assigned families, etc.

[1] To learn more about the NPP curricula, visit http://www.nurturingparenting.com/ .

Figure 1 | Map of Home Visitation Clients Served by AmeriCorps Members (2013-2015) and B&B Family Resource Centers in Sacramento County



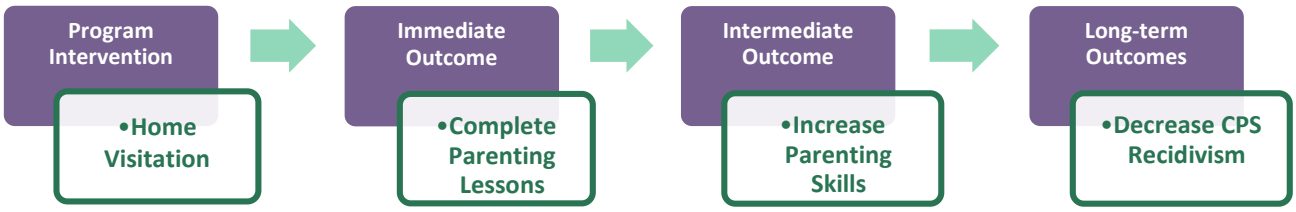
Evaluation Design

This evaluation incorporates measures of immediate, intermediate, and long-term outcomes for those families with children 0-5 years, who have been served by AmeriCorps members and have received HV program services between September 2013 to August 2015. A quasi-experimental design is used to measure recidivism into the Child Protective Services system and includes four primary research questions that address the continuum of desired program outcomes.

1. What proportion of HV program participants completed their assigned lesson plans based upon their initial risk levels? What proportion of the participants receive a minimum amount of program services (i.e., 8 hours)?
2. Do parents receiving at least eight hours of home visitation programming show significant improvement in their parenting attitudes and practices as measured by the AAPI?
3. Do parents with previous CPS referrals receiving *any home visitation services,* have lower rates of subsequent CPS involvement compared to similar parents who did not participate?
4. What is the *optimal range of HV program hours,* for parents with previous CPS referrals to have lower rates of subsequent CPS involvement compared to similar parents who did not participate?

The evaluation measures the degree in which these parents completed their program plans, experienced changes in their assessed parenting skills/risk for child maltreatment, and compares the rate of CPS referrals during and after program participation to non-B&B families.

Figure 2 | Continuum of B&B Home Visitation Outcomes Measured



B&B participant and case management records are used to report participant demographics and to measure program completion and average program dosage. Change in parenting skills are measured by a pre-post-comparison of participant AAPI scores.

Due to the constraints in developing a control group that significantly represents B&B participants, the rate of CPS recidivism is examined only for those B&B participants with at least one prior CPS referral. Over two-thirds of the HV participants (69%) had at least one prior CPS referral which may or may not have been substantiated, but were included in the referral if their role was the: a: 1.) perpetrator; 2.) non-perpetrator adult but residing in the household (e.g., non-perpetrating mother); or 3.) victim when a minor.

A control group was constructed from non-B&B participants from CPS referral records who had similar referral histories and demographic profiles using propensity score matching. CPS referrals between the

B&B participant group and the control group were compared for similar time periods to measure the impact of program participation on CPS recidivism.

SUMMARY OF EVALUATION RESULTS

Parenting Lesson Program Completion

The immediate desired outcome for HV program participants is the completion of their assigned NPP lesson plans at the time of their case closure. NPP lesson plans are based on assessed risk, with low risk participants assigned 16 lessons, the medium risk group assigned 27 lessons, and high risk group assigned 55 lessons. Figure 3 below shows the proportion of HV program participants assigned into the three program levels. Over half (57%) of the HV program participants were assigned to the medium risk group. About a quarter (24%) of the participants were in the high risk group and 19 percent were assigned to the low risk group.

Participants 'complete' their program, when they have received the full 'dosage' of lessons in their assigned group. Home visitation staff note at the closure of the case if a participant has completed their program goals as planned. Figure 4 below shows the proportion of participants who had completed their program plans at case closure as well as the percentage of each group that had received at least eight hours of home visitation programming.

Figure 3 | Percentage of Participants Receiving at Least 8 Hours of HV Program and Completing Program Plan by NPP Cohort Group

Overall, 28 percent of HV program participants completed the full series of lessons in their assigned group; however this proportion varied significantly between groups with only 13 percent of the High Risk Group completing the assigned 55 lessons. The proportion of HV program participants receiving a minimum of eight hours programming was more consistent across groups ranging from 70 percent for the Medium Risk Group and 59 percent for the High Risk Group.

Change in Parenting Skills | Pre-Post AAPI Comparison

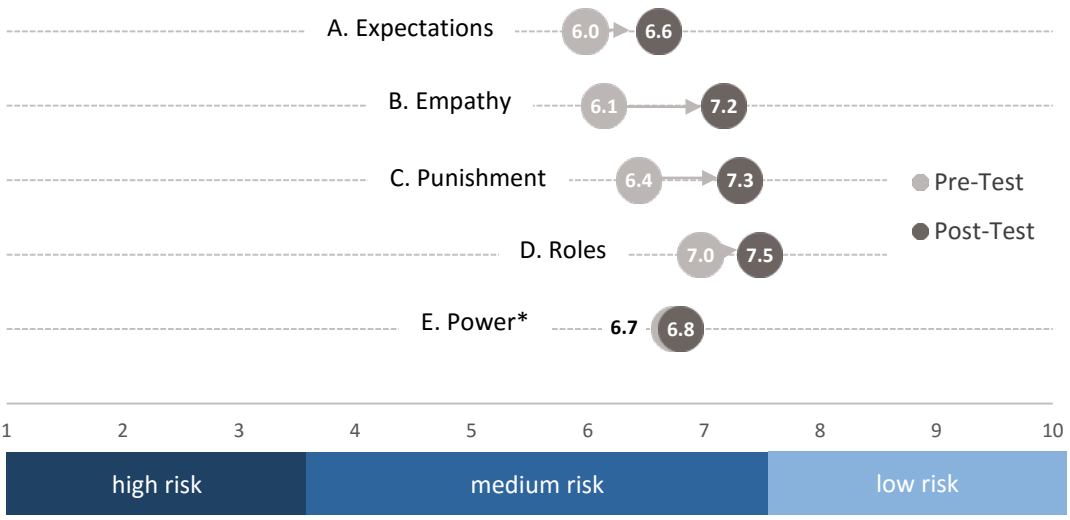
The AAPI assessment measures parent beliefs and practices along five dimensions known to contribute to child maltreatment:

A. Expectations of Children;
B. Parental Empathy towards Children's Needs;
C. Use of Corporal Punishment; and
D. Parent-Child Role.

Scores for each of the dimension are standardized on an index from 1 to 10. Scores ranging from 1-3 are considered "high risk", those ranging 4-7 are "medium risk" and scores 8-10 are considered "low risk". The pre and post program AAPI scores were compared for those participants with a closed case and receiving at least eight hours of HV program. With the exception of one[2], all dimensions across all three groups showed statistically significant improvement at the $p<0.001$ level.

Comparison of the average change across the three program groups demonstrates the average levels of risk in which participants entered the program and their relative improvement at their case closure. Figure 5 shows that participants in the low risk group began the program with the highest average AAPI pre-test scores and that each construct score increased by at least 0.5 points, except the *Power* construct which only increased by 0.1 points.

Figure 4 | Pre/Post Comparisons of AAPI Assessment Scores: Low Risk Group (n = 137)

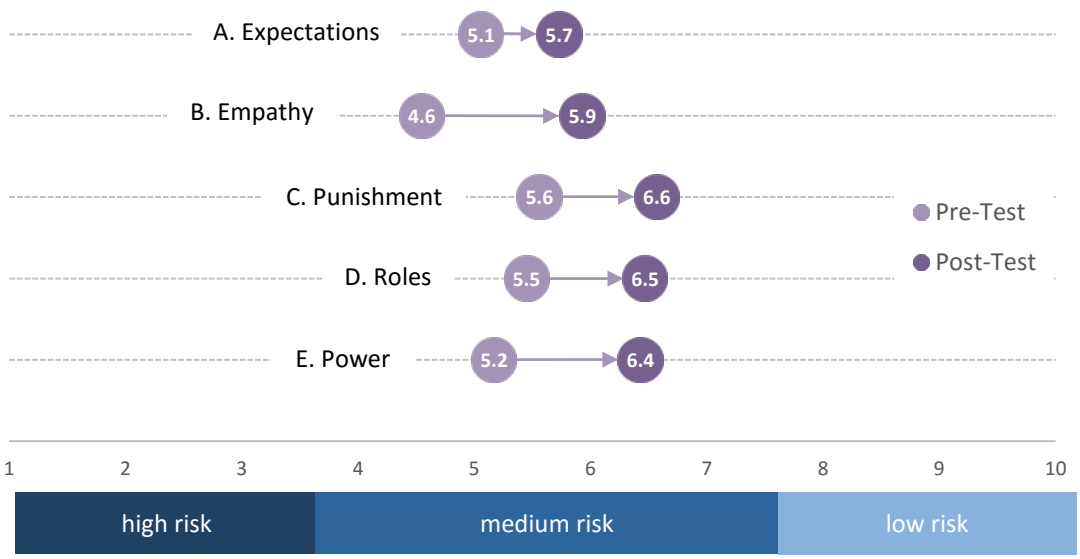


***Note**: The average change between pre/post scores among all domains are significant at the p<0.001 level (except for the Power construct).*

Parents in the medium risk group saw an average increase of at least 0.5 points from pre- to post-test. On average, the *Empathy* construct scored the lowest among the dimensions and accordingly, saw the greatest increase at 1.3 points (see Figure 6).

[2] See Figure 5 – The *Power* construct, related to placing high value on children's independence, for the low risk group was the only measure that did not show a statistically significant improvement.

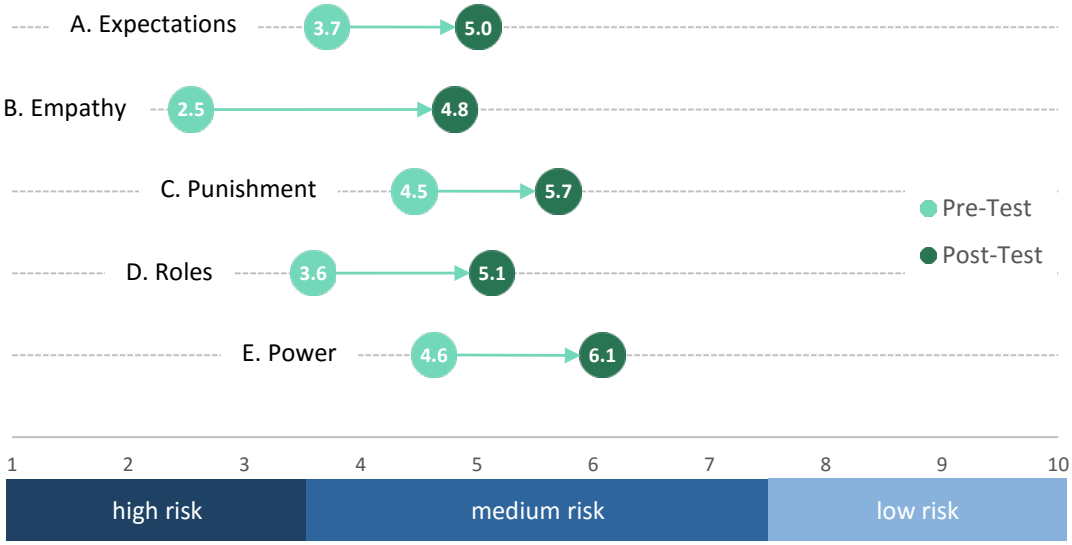
Figure 5 | Pre/Post Comparisons of AAPI Assessment Scores: Medium Risk Group (n = 330)



***Note**: The average change between pre/post scores among all domains are significant at the p<0.001 level.*

Finally, the parents in the high risk group had all scores increase the greatest amount, by at least 1.0 point, with the Empathy construct showing the largest average increase (2.3 points). Overall, the average risk levels from each of the five dimensions improved to the extent that the high risk parents left the program with AAPI risk scores within the medium risk range (see Figure 7).

Figure 6 | Pre/Post Comparisons of AAPI Assessment Scores: High Risk Group (n = 80)



***Note:** The average change between pre/post scores among all domains are significant at the p<0.001 level.*

In sum, all parents who participated in the HV program lessons for at least eight hours showed statistically significant gains in their parenting attitudes and practice. Improvement was see across all

risk groups, with the highest risk parents showing the greatest improvement and an overall reduction in their risk level.

CPS Recidivism | Quasi-Experimental Comparison

In order to estimate the effects of HV program participation on recidivism into the CPS system, a quasi-experimental comparison was conducted between program participants and other individuals with prior CPS referrals. The study used B&B program data and CPS referral records to match key demographic and CPS referral history variables between the HV program participants and a hypothetically eligible pool of non-participants. This process - propensity score matching - identifies individuals to be included in a control group who have a statistically equivalent likelihood to have participated in the HV program without using a random assignment.

In the process of constructing the control group, several interesting findings were identified. In comparison to a similar population of individuals (e.g., women with at least one child 0-5) with referrals in the same time period, HV program participants were more likely to be from a minority group (non-white), were an average of three years younger than comparison individuals, and were on average younger at the time of their first referral (i.e., 17 years old vs. 24 years old). In terms of past CPS referral history, HV program participants were more likely to have been a victim, with more severe victimization, and had overall more referral history than the comparison group. This indicates that B&B is successfully engaging a high-need population with their home visiting program.

After the matching process, these significant differences between the program group and the comparison group were eliminated, and any remaining variances were controlled for in the final analysis. This allowed for a comparison between the groups in terms of two outcome variables: 1) occurrence of any type of subsequent CPS referral (substantiated, inconclusive, unfounded, or pending), and b) occurrence of subsequent referrals that were substantiated. A survival analysis was used to determine the differences in CPS recidivism between the HPV and the control groups over time. This kind of analysis is particularly well suited to studying recidivism and can predict not only whether or not an event will occur, but the probability that the event will occur at a particular point in time.

A Cox Regression was then used to predict the probability of referral based on the number of days since the participant entered the program (for the HV program group) or became hypothetically eligible for the program (for the comparison group). This type of survival analysis accounts for the fact that each individual is entering the HV program (or becoming eligible for the HV program) at a different point in time and the probability of recidivism increases as time goes on. For example, an individual who entered the program in 2011, would have had significantly more time to have a referral than an individual who entered the program in 2015. To account for this, the model predicts the probability of having a referral as a function of time, program participation, and baseline characteristics (demographic and prior referral history variables). A detailed technical discussion of the propensity score matching process and analyses is included in Appendix X.

Analyses were conducted looking at the effect of any program participation on CPS referrals and also to identify the optimal dosage of program participation to predict significant impact. Each of these analyses are discussed below. All results are for mothers with children 0-5 years old during the program period, who had a prior history of CPS referrals, and who were directly served by an AmeriCorps member.

Table 1 | Summary of Cox Regression Analysis Results between HV Program Group & Comparison Group

Home Visiting Program Dosage *Independent Variables*	**Subsequent CPS Referrals** *Outcome/Dependent Variables*	
	Substantiated Referrals	**All Referrals** (pending, unfounded, inconclusive, substantiated)
Any participation (1+ hours)	HV Program Group 41% less likely to have a substantiated referral*	HV Program Group 18% less likely to have any referral
Optimal participation (identified at 25-34 hours)	HV Program Group 173% less likely to have a substantiated referral*	HV Program Group 57% less likely to have any referral*

*Finding is statistically significant to p<.05 level

Please see Appendix X for a more detailed description of each model and the full results of the Cox regression.

Effects of Any Program Participation (1+ Hours) on CPS Recidivism

Substantiated Referrals Only | Mothers who participated in at least one hour of the home visitation program were significantly less likely to have a substantiated CPS referral after they began the HV program than those who did not receive any program services. Specifically, being in the program group rather than the comparison group decreased the probability of having a substantiated referral by 41 percent when all other variables were held constant. Across both groups, the probability of having a substantiated referral is relatively low—only 15.4 percent of individuals in the sample have a subsequent substantiated referral and on average the first substantiated referral occurs about 529 days after the start of the program period. However, the probability of recidivism increases the more time passes, with the comparison group's risk for recidivism increasing to a larger extent over time than the HV program group.

All Referrals | A similar pattern emerges when predicting the number of days before any type of referral occurred (i.e., substantiated, inconclusive, unfounded, and pending/unknown dispositions) and where the client was the perpetrator or other adult; however, this difference was only marginally significant ($p < 0.10$). Mothers who received any home visitation were less likely to have a CPS referral after they began the program than those who did not receive any HV program services. Specifically, being in the program group rather than the comparison group decreased the probability of having a CPS referral by 18 percent when all other variables were held constant. Overall 48.5 percent of the entire sample had a CPS referral during the post-period, with the average person having their first CPS referral approximately 335 days after the start the program. CPS referrals with any dispositionoccur more frequently than only substantiated referrals, and occur earlier on average in the post-period. However, a similar pattern emerged over time with the probability of having a referral increasing as more days pass and increasing

more over time for the comparison group than the program group. Given that these results were only marginally significant they should be interpreted with caution, but they do provide preliminary evidence of the program's impact on all CPS referrals that could be explored further in future studies.

Effect of Optimal Program Participation on CPS Recidivism

Substantiated Referrals Only | Mothers who received between 25-34 hours of HV programming were significantly less likely to have a substantiated referral after they began the program than those who did not receive services. In particular, mothers who received 25-34 hours of home visiting were 2.73 times (173%) less likely to have a substantiated referral than those in the comparison group. However, there were no statistically significant differences between the comparison group and program group for those parents who received less than 25 hours of face-to-face service or for those who received more than 34 hours of service. This suggests that participants who receive between 25-34 hours of service receive the maximum benefit from the HV program in terms of preventing substantiated referrals.

All Referrals | When predicting the number of days before all types of CPS referrals, a similar pattern emerges. Once again, mothers who received between 25-34 hours of HV programming were significantly less likely to have any type of CPS referral after they began the program than those who did not receive HV services. In particular, mothers who received 25-34 hours of home visitation were 57 percent less likely to have any CPS referral than those in the comparison group. However, there were no statistically significant differences between the comparison group and HV participants who received less than 25 hours of face-to-face service and those who received more than 34 hours of service. This suggests that participants who receive between 25-32 hours of service receive the maximum benefit from the home visitation program in terms of preventing any type of CPS referral.

KEY FINDINGS & RECOMMENDATION

Since XX, the annual evaluations of the Birth and Beyond Home Visitation Program families served by AmeriCorps members have suggested the positive impacts of the program participation on desired individual outcomes. This evaluation was the first time these impacts were confirmed through the use of a quasi-experimental study. Key findings from study research questions provide evidence about the benefits received by program participants as well as help identify potential areas for future HV program modification.

Parents completing their assigned NPP dosage are in the minority. Less than one-third (28%) of the parents with closed cases completed their assigned dosage of NPP lessons. This number shrinks more than half (13%) when looking at those parents who came into the program at the highest risk levels. The NPP program is competency-based, which means that parents do not 'complete' a lesson until they demonstrate the skills, knowledge, and attitudes a lesson was intended to improve. It could be the case that the majority of the parents have far too many intervening factors in which to continue participating in the program and/or demonstrate improvement in their competency levels in order to advance along in their program schedule. The very low completion rate could also indicate that engaging high-risk parents, for example, in 55 hours of home visitation is an unrealistic programmatic goal. The level of programming may inadvertently discourage program participants as being too onerous of an objective to achieve, with

the result of producing a high attrition rate for the program (i.e., 55% either dropping out or no longer responsive to contact).

Parents receiving at least 8 hours of HV program services show significant improvement in their parenting attitudes and behaviors. Despite the high attrition rate, program participants are advancing in their parenting skills and attitudes as demonstrated by the average improvement in the AAPI constructs. This suggests that even though program participants may not be completing their program goals, they are benefiting from those NPP classes they do receive. Parents entering the program at the highest risk levels are showing the greatest gains in their AAPI scores.

As a result of any level of participation in the home visitation program, parents with previous CPS history reduce the likelihood of future substantiated referrals. This study suggests that being in the HV program group rather than the comparison group decreased the probability of having a substantiated referral by 41 percent and the probability of having any CPS referral by 18 percent when all other variables were held constant.

As a result of receiving 25-34 hours of HV program services, parents with previous CPS history demonstrated the greatest reduction in post-program referrals of any kind. In particular, mothers who received 25-34 hours of HV program were 173 percent less likely to have a substantiated referral and 57 percent less likely to have any CPS referral, than those in the comparison group. However, there were no statistically significant differences between the comparison group and HV participants who received less than 25 hours of face-to-face service and those who received more than 34 hours of service. This suggests that participants who receive between 25-34 hours of service receive the maximum benefit from participation in the program.

Note that the CPS recidivism study did not address HV program effect on subsequent CPS referrals for those families *without* a prior CPS referral history. However, these findings do confirm that any participation in the HV program makes a significant impact in preventing substantiated CPS referrals for those family with CPS history, and a low-level dosage of the program makes a significant improvement in parenting attitudes and practices across all parents. Thus we can confidently infer with the evidence from this evaluation, that participation in the B&B home visitation program resulted in a significant reduction in the maltreatment of children within these families.

Several recommendations are suggested based upon the above findings.

Recommendation #1 | Consider aligning the dosage of the home visitation program towards the 25-34 hour range. Mothers with previous CPS history show significant impacts in their CPS recidivism after receiving this identified dosage of HV program service. While identifying the optimal range of program dosage across all participants, this finding does not address the current NPP program model in which parents are assigned a scaled number of lessons according to their assessed risk levels. Given the finding that relatively few parents in the high risk group (and a minority of the other risk groups) actually complete their NPP lessons as prescribed, it is recommended that B&B recalibrate the assigned program to a more achievable and impactful level. That is, it may be the most effective for all participants to receive a core program dosage with the 25-34 hour target regardless of assessed risk level, noting that there was no significant effect on CPS recidivism for those participating in the HV program outside of this range. Looking at the current sample of parents who closed during the study period (including those without CPS history),

46 percent of the sample received 25-34 hours of the HV program. It should be noted that parents participating more than 34 hours in HV programming may continue to accrue other types of important benefits such as strengthening their parenting knowledge, skills, and beliefs and/or connecting to other types of program services and supports.

Recommendation #2 | Explore strategies to address program attrition in order to ensure parents are receiving optimal level of HV program dosage. While this evaluation provides evidence of the effectiveness of the HV program, it equally underscores the need for participants to be engaged in the program for a considerable length of time. We recommend that B&B focus on their rates of participant attrition, in order to retain a higher proportion of those parents entering the program. High drop-out rates are a given when targeting highly vulnerable and at risk populations. B&B has already taken a significant step in addressing the surrounding vulnerabilities of the families it serves through their Crises Intervention Services. We recommend that B&B conducts research with their FRC sites and the HV participants to understand why approximately half of the participants drop out of the program after receiving some HV services.

Recommendation #3 | Consider additional research to explore remaining and emergent questions from this study about effectiveness and impact. The current study demonstrates that parents participating in the HV program are making significant gains in their parenting attitudes and practices, in addition to confirming the impact of the program in lowering probability of recidivism among HV participants. While these findings provide evidence of the HV program's overall impact, the study also generated more nuanced questions that remain to be explored.

Unpacking Dosage Effects. The current report examined dosage effects exclusively as a function of the number of hours of face-to-face home visitation services. While the current report notes that 25-34 hours seems to be the most effective dosage amount, it may be useful for future studies to narrow this dosage window and determine which activities (if any) are most essential to effective home visitation services. While home visitation is a primary intervention in the B&B program, it is not the only service in which parents participate. Future research is needed to determine how recidivism varies as a function of participation in other key program components such as group parenting classes, crises intervention services, personal development classes, and community supports.

Limiting Recidivism to Closed Cases. The present analysis looks at CPS recidivism from the point at which women enter the HV program after a triggering referral (i.e., before they complete their lessons or their case is closed). This may not be the ideal model for measuring recidivism because it does not take into account that the conditions around child endangerment often require a significant amount of time regardless of program participation (e.g., a mother leaving an abusing partner or relocating into a new environment/home). It may be more appropriate to model recidivism only after the HV program has been completed. The current timeframe was used because we were unable to identify a satisfactorily comparable date for the comparison group. The current model assumes that even if the program works as intended it may take time for benefits to emerge; however, once the program has been completed recidivism should be especially unlikely. One way to examine this effect in future research would be to measure referrals only after the HV case has closed and look at how these subsequent referrals differ as a function of dosage in the HV program group.

AAPI Risk Levels and Stratified Results. In addition to examining recidivism it would be helpful for future studies to examine the impact of program participation and program dosage on parenting attitudes and practices as measured by the AAPI. It would be useful to determine if there is a significant relationship between the initial assessed risk from the AAPI and subsequent CPS referrals, and the extent to which growth in the AAPI score can predicts CPS recidivism. To the extent that this information can be mapped onto program dosage information, it would be useful to determine if the positive findings for the 24-34 hour dosage group replicate equally across AAPI risk cohorts (high, medium, and low risk groups).

Accounting for Case Information. One limitation of the current study is that some individuals with open CPS cases may have been included in the comparison group even though the HV program is not available to families who have an open case. For this evaluation, it was not feasible to map the multiple dates in the CPS case data set which is organized by child records, onto the comparison CPS referral dataset which is organized by adult record (there are no clear linkages); however, in future studies this information could be used to model the exact periods during which individuals would or would not be eligible for the program as a result of their family case status.

Additional Demographic and History Variables. Given the limited number of shared demographic variables available across the program and comparison groups, the current evaluation was limited to modeling and controlling for demographic differences according to race (white vs. non-white), age, and primary language. It would be useful to control for and analyze other important demographic covariates such as educational background and socio-economic status in future. This report uses CPS referral history as a proxy for each individual's history of abuse, however CPS data rarely includes all the incidents of abuse in an individual's past. To get a better sense of the actual abuse history of each individual it would be useful for future studies to include any additional abuse history information that might be available-- such as the results of any Structured Decision Making (SDM) child abuse and neglect risk assessments which may have been performed.

Findings for Non-AmeriCorps Volunteers. Finally, the current study focused exclusively on outcomes for mothers who were served by AmeriCorps members. In future work it will be important to replicate these findings with a non-AmeriCorps population in order to determine the unique impact of the HV program.

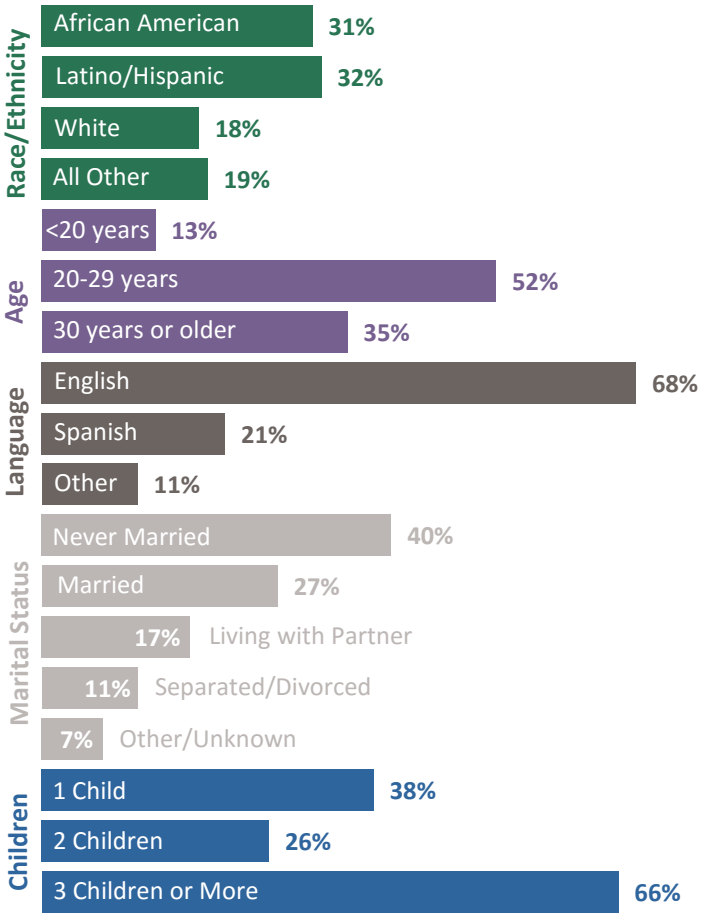
APPENDIX I | PROGRAM DATA ANALYSIS OVERVIEW

Participant Demographics & Sample

Detailed participant information is collected during the intake of all families. These data as well as program participation information are recorded into a central Birth and Beyond database which is regularly updated and cleaned by LPC.

Between September 1, 2012 and July 31, 2015, AmeriCorps members served 1,614 families with at least one home visit through the B&B program. This represents a total of 1,758 individual cases. A number of these cases were removed from the sample population for the purposes of this report to allow for comparability across measures and results: cases assigned to the Father's Group (n=45 men); the Prenatal Group (n=50 women); had yet to be assigned (n=102); or those in the school aged-program or unknown (n=5). Families with multiple entries into the program were also filtered (n=383). The resulting base sample includes 1,312 parents who were enrolled in one of three program groups in the home visitation program. Individual demographic data reported are related specifically to the primary parent. The sample primarily included people who identified as African American or Hispanic/Latino, with the majority of participants identifying English as their primary language. Additional demographic information is presented in Figure 8.

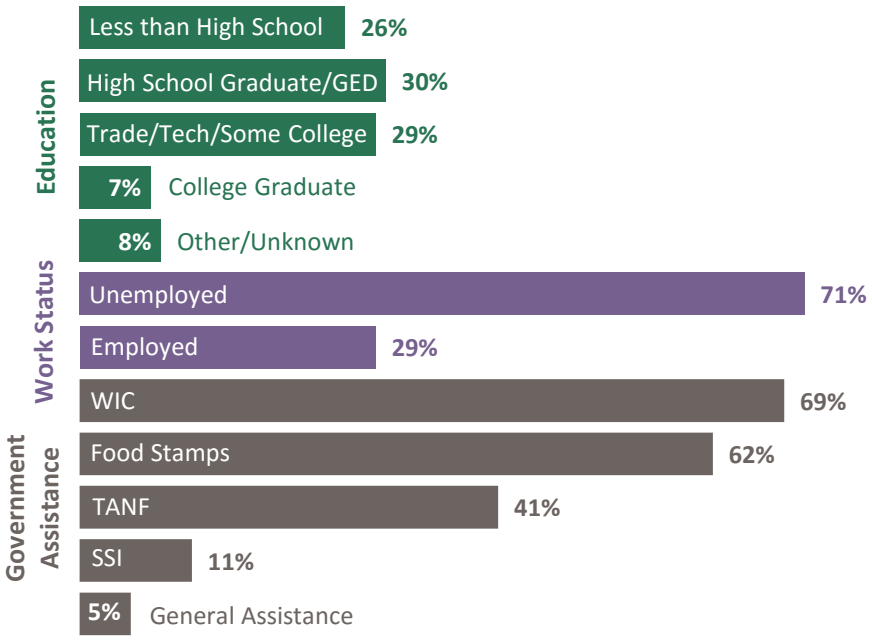
Figure 7 | Demographics of HV Program Participants Served by AmeriCorps (n=1,312)



Two-thirds of the families (64%) have two or more children at home, and 40 percent reported never being married or living with a partner suggesting that many B&B participants parent alone.

While most participants had at least a high school education, the majority of participants were unemployed at the time they participated in the program, and utilized governmental assistance programs, such as WIC or food stamps. Figure 9 presents employment status and the usage of governmental assistance programs of HV program participants served by AmeriCorps.

Figure 8 | Characteristics of HV Participants Served by AmeriCorps (n=1,312)



Rates of Program Completion

During the course of the study period, 82 percent of the cases served by AmeriCorps members closed (n=1042). The status of the program lessons and reasons for closure from the case records are noted below in Table 2.

Table 2 | Case Status at Closure by NPP Cohort Group

	Low Risk		Medium Risk		High Risk		All Groups	
Status at Case Closure	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Completed program as planned	**115**	**44%**	**180**	**30%**	**23**	**13%**	**318**	**31%**
No contact per contact policy	61	23%	212	35%	79	44%	352	34%
Declined further service	52	20%	128	21%	40	22%	220	21%
Moved out of service area, no longer eligible	31	12%	66	11%	28	16%	125	12%
CPS case, child safety	4	2%	13	2%	10	6%	27	3%
Total	*263*	*100%*	*599*	*100%*	*180*	*100%*	*1042*	*100%*

Parents enrolled in the low risk group had the highest rate of completion at 44 percent, which is somewhat expected given their lesson dosage is the lowest (16 lessons). In contrast, only 13 percent of the high risk group completed their program as planned. Looking at those who did not complete their program lesson, the majority of all participants across all groups (55%) were closed due to no longer being able to contact participants or because they declined further service.

Overall, participants served by AmeriCorps members received an average of 19.4 hours of home visitation programming. As expected, participants in the low risk group received the least amount of service at 16.0 hours on average, while the medium and high risk groups received the most (20.5 hours).

Table 3 | Average Participation in HV Program by NPP Cohorts (Closed Cases n=1,075)

	Low Risk 16 Lessons	Medium Risk 27 Lessons	High Risk 55 Lessons	All Groups
Average Visits	12.7	16.9	16.7	15.8
Average Hours	16.0	20.5	20.5	19.4
Received 8+ Hours	*180 (67%)*	*432 (70%)*	*113 (59%)*	*725 (67%)*

Two-thirds (67%) of all cases closed after receiving at least eight hours of lessons, with the high risk group having the lowest proportion of participants receiving the minimum dosage.

While two-thirds of all participants closing a case during the study period received a minimum of eight hours HV programming, only about a third of all participants stayed with the program long enough to complete their program goals. The group with both the highest risk and the greatest number of prescribed lessons, had the lowest rates of program completion and proportion of participants receiving at least eight hours of HV programming.

Pre-Post Comparison of AAPI Assessment

Adult-Adolescent Parenting Inventory - 2 (AAPI) is a 40 item, norm-referenced, Likert scale designed to assess the parenting beliefs and practices of adult and adolescent parent and non-parent populations. The AAPI is designed to assess the beliefs for parenting children from infancy to 12 years of age. Responses to the AAPI provide an index of risk for child maltreatment in five parenting practices known to result in child maltreatment. The AAPI measures attitudes and behaviors along five constructs of parenting to assess change in the parents' risk for practicing behaviors known to be attributable to child abuse and neglect. These five constructs are described in Table 4 below.

The AAPI provides a level of risk for child maltreatment on three levels: High, Moderate and Low. It is administered by a Home Visitor during one of the first home visits. Parents are assigned a program group (i.e., Prevention, Treatment, or Intervention) based upon their initial AAPI risk level. The AAPI is re-administered to parents during their participation in the home visitation program, with the last assessment completed serving as their "post" score. Because of client attrition, B&B periodically administers the assessment to ensure the likelihood that there will be a comparison assessment for the high proportion of families who do not finish their parenting lessons. A comparison of a pre- and post-AAPI scores provided an understanding of how participants' knowledge and practices changed throughout the HV program.

Table 4 | Description of AAPI Constructs

CONSTRUCT	High Risk Low AAPI Score Description	Low Risk High AAPI Score Description
A. Expectations of Children	• Expectations exceed developmental capabilities of children. • Lacks understanding of normal child growth and development. • Self-concept as a parent is weak and easily threatened. • Tends to be demanding and controlling	• Understands growth and development. • Children are allowed to exhibit normal developmental behaviors. • Self-concept as a caregiver and provider is positive. • Tends to be supportive of children
B. Parental Empathy towards Children's Needs	• Fears spoiling children. • Children's normal development needs not understood or valued. • Children must act right and be good. • Lacks nurturing skills. • May be unable to handle parenting stresses.	• Understands and values children's needs. • Children are allowed to display normal developmental behaviors. • Nurtures children and encourage positive growth. • Communicates with children. • Recognizes feelings for children.
C. Use of Corporal Punishment	• Hitting, spanking, slapping children is appropriate and required. • Lacks knowledge of alternatives to corporal punishment. • Lacks ability to use alternatives to corporal punishment. • Strong disciplinarian, rigid. • Tends to be controlling, authoritarian.	• Understands alternatives to physical force. • Utilizes alternatives to corporal punishment. • Tends to be democratic in rule making. • Rules for family, not just for children. • Tends to have respect for children and their needs. • Values mutual parent-child relationship.
D. Parent-Child Family Roles	• Tends to use children to meet self-needs. • Children perceived as objects for adult gratification. • Tends to treat children as confidant and peer. • Expects children to make life better by providing love, assurance, and comfort. • Tends to exhibit low self-esteem, poor self-awareness, and poor social life.	• Tends to have needs met appropriately. • Finds comfort, support, companionship from peers. • Children are allowed to express developmental needs. • Takes ownership of behavior. • Tends to feel worthwhile as a person, good awareness of self.
E. Children's Power and Independence	• Tends to view children with power as threatening. • Expects strict obedience to demands. • Devalues negotiation and compromise as a means of solving problems. • Tends to view independent thinking as disrespectful.	• Places high-value on children's ability to problem solve. • Encourages children to express views but expects cooperation. • Empowers children to make good choices.

Scores from the earliest and latest administrations of the AAPI were matched for those HV participants who had closed after receiving at least 8 hours of programming. A total of 547 pairs were available for analysis (see Table 4 below).

Table 5 | Closed HV Participants Receiving at Least 8 Hours of Programming with Match Pre and Post AAPI Assessments

	Low Risk # (% group)	Medium Risk # (% group)	High Risk # (% group)	Total # (% group)
Matched Pre-Post AAPI Score	*137 (80%)*	*330 (82%)*	*80 (73%)*	*547 (80%)*

A paired-samples t-test was conducted to compare pre-program and post-program AAPI scores, within the five parenting domains and among each of the three program groups (see Table 5). Overall, participants' average scores increased between the pre and post tests, across all the five domains and these increases were found to be statistically significant at the $p<0.001$ level; one exception was the increase in the Power Domain within the low risk group which was not statistically significant.

Table 6 | Pre-Post Comparison of AAPI Assessment Scores for NPP Cohorts

AAPI DOMAINS	Pre Test Mean	Pre Test Standard Deviation	Post Test Mean	Post Test Standard Deviation	Paired t *p <.001
Low Risk Group n = 137					
A. Expectation	5.98	2.15	6.61	2.05	-3.55*
B. Empathy	6.14	2.46	7.17	2.52	-4.63*
C. Punishment	6.44	2.02	7.31	2.16	-4.78*
D. Roles	6.97	2.66	7.48	2.23	-2.68*
E. Power	6.74	2.21	6.80	2.39	-0.22
Medium Risk Group n = 330					
A. Expectation	5.06	1.84	5.73	1.96	-5.54*
B. Empathy	4.55	2.15	5.93	2.40	-9.48*
C. Punishment	5.56	1.78	6.57	2.01	-8.61*
D. Roles	5.45	2.20	6.47	2.29	-8.25*
E. Power	5.17	2.42	6.43	2.46	-7.86*
High Risk Group n = 80					
A. Expectation	3.71	1.82	5.01	2.17	-4.67*
B. Empathy	2.54	1.86	4.81	2.40	-8.19*
C. Punishment	4.46	1.83	5.70	2.39	-4.70*
D. Roles	3.59	2.31	5.13	2.61	-5.79*
E. Power	4.63	2.34	6.08	2.75	-4.01*

The results suggest that parenting skills and attitudes improved over the course of their participation in the HV program as measured by the AAPI. Similar gains were seen across the five parenting constructs of the assessment. The high risk group had the highest total gains in their pre/post scores, showing an average increase of 7.8 points.

APPENDIX II | QUASI-EXPERIMENTAL COMPARISON OF CPS RECIDIVISM

Prepared by JBS International
Authored by: Nicole Vicinanza PhD, Peter Lovegrove PhD, Rebecca Frazier PhD, and Stacey Houston MA
Report Date: December 18, 2015

Methods

The current report describes findings based on Child Protective Services (CPS) child abuse allegation data and internal data on participation in the Birth and Beyond (B&B) Family Resource Center AmeriCorps[4] Program. To be included in the analysis, participants had to meet the following three criteria:

1. Be born between January 1, 1970 and December 31, 1999 (approximately 16-45 years old);
2. Have at least one child born between 9/1/2008 and 7/30/2015; and
3. Have at least one CPS referral (or have entered the B&B program) after January 1, 2011.

Data Aggregation and Variables

To estimate the effects of B&B participation on CPS referrals, JBS International created an aggregated dataset predicting CPS outcomes at the individual level for B&B participants and a comparison group. This dataset consisted of prior referral history data (pre-data) and outcome data (post-data) for each participant. For the B&B group, all CPS allegations up to and including the start date of B&B were considered pre-data, while all referrals after that were considered post-data. For the comparison group, all referrals up to and including their first referral post-2011 were considered pre-data, and all subsequent referrals were considered post-data. This pre/post cut-off was selected for the comparison group since the first post-2011 referral represents the date at which each individual would have become eligible for the B&B program.

***Demographic and Program Participation Variables*.** Basic demographic variables included: date of birth, gender, ethnicity, and primary language (see Appendix A for baseline equivalency results for all variables). B&B participation variables included: the intake date, the date they ended the program, whether or not they received services from an AmeriCorps volunteer, and the number of hours of face-to-face home visitation services they received.

***CPS Allegation History Variables*.** Researchers used a data construction procedure that resulted in a series of scores to describe each individual's CPS allegation history. Each allegation was

[4] The current report pertains only to the B&B AmeriCorps program; the terms "B&B" and "B&B AmeriCorps" are used interchangeably.

classified based on five categories of abuse (sexual, physical, severe neglect, general neglect, and emotional) and three categories describing the individual's role in the allegation (victim, perpetrator, or other). This information was then aggregated to give each individual a score on a total of 15 types of abuse (e.g. Sexual Victimization, Sexual Perpetration, etc.). These scores indicated the extent to which each individual had perpetrated, witnessed, and/or been victimized in a particular category during their pre- and post-program/eligibility period. Scores ranged from 0-3 and were based on whether the individual had no allegations within that category of abuse (0), only missing or unfounded allegations (1), only inconclusive allegations (2), or at least one substantiated allegation (3). In addition to calculating summary scores for each type of abuse, JBS also recorded the date of the first and last allegation, the number of unique referrals, and the age of the individual at the date of their first referral. This information was presented separately for each period (pre- and post-program/eligibility), and was also broken down by role category (victimization, perpetration, and other) and for all referrals and substantiated referrals only. For a more detailed description of these data cleaning procedures, please see Appendix B.

Primary Outcome Variables. The primary outcomes analysis was constructed from CPS-allegations during the post-program/eligibility period for B&B and comparison individuals. As described in greater detail below, a survival analysis was used to measure recidivism[5]. To model these effects, researchers created variables measuring the number of:

- Days to the first CPS referral during the post-period, regardless of disposition (substantiated, inconclusive, unfounded, or pending), where the individual is identified as the perpetrator or other adult[6] (Any CPS Referral); and
- Days to the first referral during the post-period where the disposition was substantiated (Substantiated Referral).

Propensity Score Matching

To assess the impact of participation in the B&B program, this evaluation used propensity score matching. This process allows the JBS team to compare the outcomes of two groups – one of which received services and the other which did not – in a statistically robust manner that provides more plausible evidence that program participation is the likely reason for any observed changes on key outcome measures (rather than other possible causes). Given the retrospective

[5] Operationalized as CPS-referrals in the post-period.

[6] This category includes referrals where the role of the individual was listed as "Other" and was 17 or older at the date of the referral. This composite variable was selected as an outcome because it represents the key actions that the B&B program is designed to prevent—the perpetration and adult witnessing of abuse (based on the assumption that when the individual is an adult witness of abuse they have a responsibility to intervene or remove the child from the abusive situation).

nature of this study, random assignment was not possible and as such propensity score matching was selected as a way of simulating an experimental design[7].

In a propensity score matched design, the group that participates in the program and the comparison group are not randomly assigned or selected. Because of this, the two groups may differ in both observed and unobserved ways prior to matching that could be the explanation for any changes observed in the outcomes. Propensity score matching minimizes these differences between the two groups statistically. The statistical procedure used in propensity score matching matches program participants with non-participants based on an array of characteristics (see Figure 7 below for the characteristics used in this evaluation), without necessitating a one-to-one match on all factors. For this study, each program participant is matched with two non-participants based on a constructed score using the characteristics outlined in Table 1.

Table 1: List of Characteristics Used in Propensity Score Matching

Demographic Characteristics	• Race (White vs. Non-White) • Primary Language (English vs. Not) • Age in 2015
Number of Referrals[8] and Age at First Referral	• Number of Unique Perpetrator or Adult Other Referrals[9] • Number of Unique Victimization Referrals • Age at First Referral
Referral Severity ***(Ranging from 0-9)[10]***	• Most Serious Victimization Referral • Most Serious Perpetration Referral • Most Serious Other Referral
Referral History ***(Scored from 0-3 with 0 = no referrals, 1 = only pending/missing referrals, 2 = only inconclusive referrals, and 3 = at least one substantiated referral*)**	• Sexual Victimization History • Physical Victimization History • Severe Neglect Victimization History • General Neglect Victimization History • Emotional Neglect Victimization History • Sexual Perpetration History • Physical Perpetration History • Severe Neglect Perpetration History • General Neglect Perpetration History • Emotional Neglect Perpetration History • Sexual Other History • Physical Other History • Severe Neglect Other History

[7] See Guo and Fraser (2009) for an introduction on PSM and its applications.

[8] All referral history information used in the propensity score matching was based on the referrals that occurred before each individual began B&B or became eligible for B&B (for comparison individuals).

[9] This category includes referrals where the individual was listed as the "Perpetrator" at any age or "Other" and was 17 or older at the date of the referral. Perpetration referrals and referrals where the individual was an adult listed as "Other" were combined.

[10] Each type of abuse was ranked based on the demonstrated severity of the abuse shown in prior literature. Scores ranged from 0-9 where: 0 = No abuse at all, 1 = At Risk, Sibling Abused, 2 = Caretaker Absence/Incapacity, 3 = Substantial Risk, 4 = Emotional Abuse, 5 = General Neglect, 6= Severe Neglect, 7 = Physical Abuse, 8 = Exploitation, and 9 = Sexual Abuse.

	• General Neglect Other History • Emotional Neglect Other History

***Matching Procedures*.** The propensity scores were generated in SPSS using a logistic regression model, and an R plug-in for SPSS (MatchIt[11]) was used to perform a nearest neighbor 1:2 matching technique with calipers of one quarter of a standard deviation. The initial sample included 496 B&B participants and 9,210 comparison participants. The propensity score matching process yielded matches for 493 B&B participants and 985 comparison participants.

***Baseline Equivalency Prior to the Match*.** Prior to matching, B&B participants appeared to be more at-risk for perpetrating abuse and had more severe abuse histories than comparison individuals. In terms of demographics, B&B participants were more likely to be minorities, were an average of three years younger than comparison individuals, and were on average younger at the time of their first referral (17 years old vs. 24 years old). In terms of referral history, B&B participants had a larger number of victimization referrals, a larger number of perpetration or adult other referrals, and more severe victimization and other referrals. Furthermore, B&B participants were more likely to have had a substantiated victimization referral (across all abuse types), were more likely to have had a substantiated physical and general neglect perpetration referral, and were more likely to have had a substantiated other referral (across all abuse types). Please see Appendix A for a full listing of baseline equivalency results.

***Baseline Equivalency After the Match*.** After the matching, almost all of these significant differences between the B&B and comparison group were eliminated. The only remaining difference after the match was that B&B participants were still slightly more likely to have had a substantiated general neglect perpetration referral. To address this, researchers included the full set of propensity score variables (listed in Table 1 above) in the final analysis models as covariates. This strategy allows the analysis to limit the influence of any covariates that were not fully equalized through the propensity score matching process.

Survival Analysis

A survival analysis was used to determine the unique effects of B&B participation on referrals into CPS (either referrals with a substantiated disposition regardless of the individual role,[12] or referrals regardless of disposition where the individual's role was as the perpetrator or other adult) over time. Survival analysis models are well-suited to predicting recidivism (in this case,, referrals to CPS) because they allow researchers to investigate the effect of several variables (e.g., program participation and referral history) on the time that recidivism takes to occur (as

[11] See Ho, Imai, King, & Stuart (2007) for more details on MatchIt.
[12] Substantiated referrals include referrals of any role—victim, perpetrator, and other.

measured by the number of days before a referral). This kind of analysis can predict not only whether or not an event will occur, but the probability that the event will occur at a particular point in time.

In this case, a Cox Regression (or Proportional Hazards Regression) was used to predict the probability of referral based on the number of days since the participant entered B&B (for the B&B group) or became hypothetically eligible for B&B (for the comparison group). This type of survival analysis accounts for the fact that each individual is entering B&B (or becoming eligible for B&B) at a different point in time and the probability of recidivism increases as time goes on. For example, an individual who entered the program in 2011 would have had significantly more time to have a referral than an individual who entered the program in 2015. To account for this, the model predicts the probability of having a referral as a function of time, program participation, and baseline characteristics (demographic and prior referral history variables).

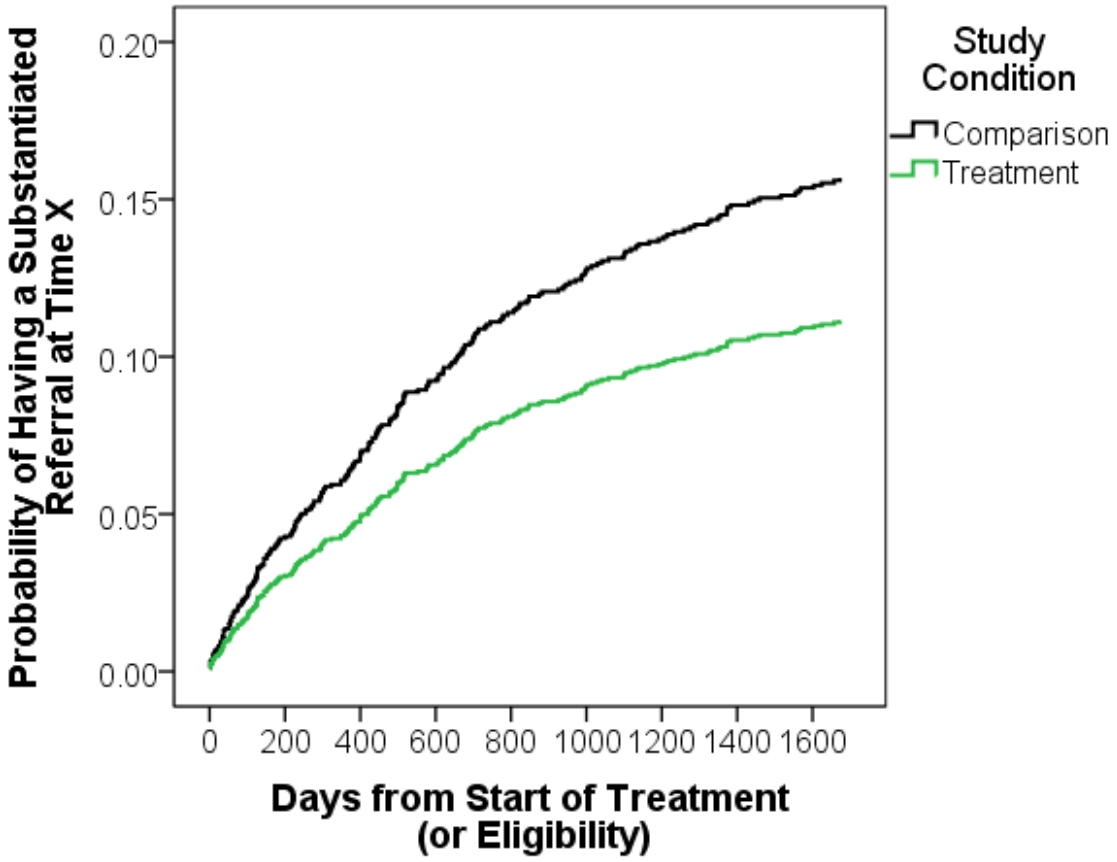
Results from Analyses

Do families of children 0-5 who received (any) home visitation from B&B AmeriCorps members have lower rates of subsequent CPS involvement after starting the program than those who do not receive B&B services?

***Effects for Substantiated Referrals*.** Mothers of children 0-5 who received any home visitation from B&B AmeriCorps members were significantly less likely to have a substantiated CPS referral after they began the program than those who did not receive any B&B services. Specifically, being in the B&B AmeriCorps group rather than the comparison group decreased the probability of having a substantiated referral by 41% when all other variables were held constant. Please see Appendix C for a more detailed description of the model and the full results of the Cox regression.

Figure 1 below shows the predicted probability of having a substantiated referral (shown on the y-axis) as a function of program participation (as indicated by green and blue lines) and the number of days from when an individual began B&B or became eligible for B&B (shown on the x-axis). This figure shows that overall the probability of having a substantiated referral is relatively low—only 15.4% of individuals in the sample have a substantiated referral in the post-period, and on average, the first substantiated referral occurs about 529 days after the start of B&B. However, the probability of having a referral increases as more days pass and increases even more over time for the comparison group than the B&B group. For example, at zero days there is almost no probability of having a substantiated referral, but by 1000 days there is roughly a 9% predicted probability of having a substantiated referral in the B&B group and a 12% predicted probability in the comparison group. This gap widens over time, suggesting that over time B&B AmeriCorps participants have a lower probability of having substantiated referrals than those who did not receive these services.

Figure 1. B&B participants who receive home visitation services from a B&B AmeriCorps volunteer have a lower probability of having a substantiated referral after B&B (or B&B eligibility)



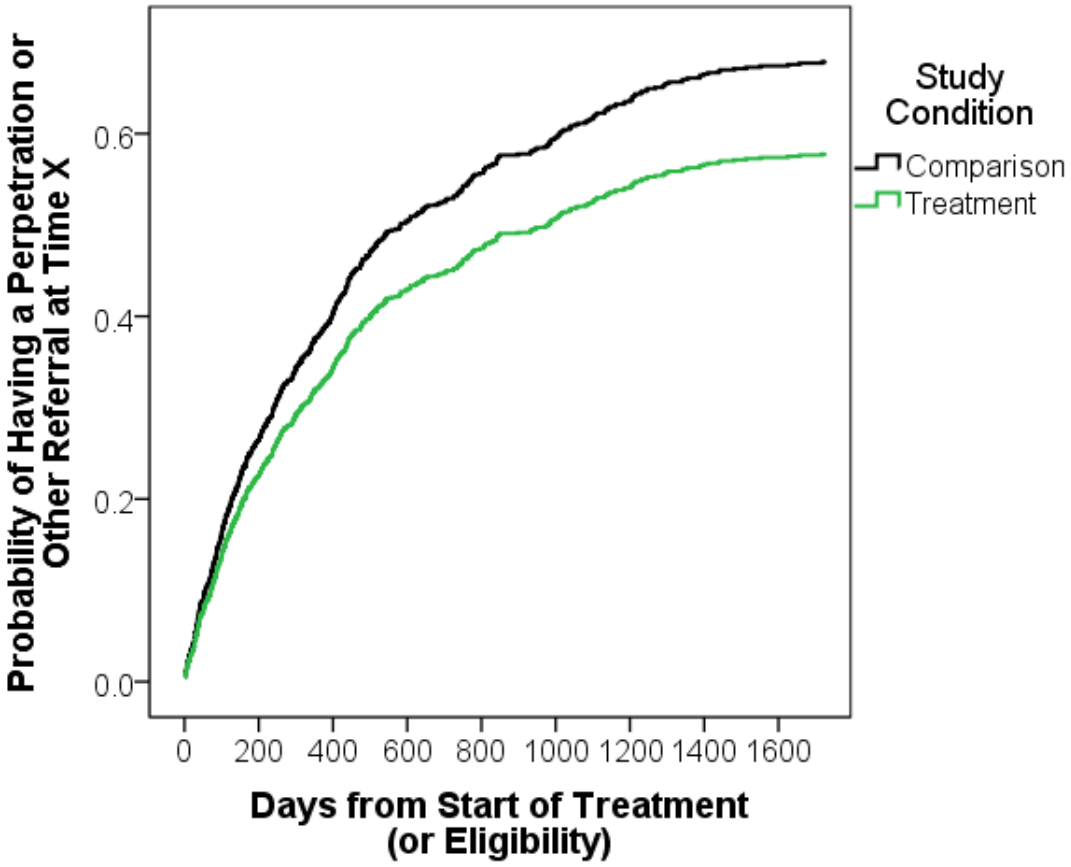
Effects for Any CPS Referrals. A similar pattern emerges when predicting the number of days before any referrals where the client was the perpetrator or other adult[13], however this difference was only marginally significant[14]. Mothers of children 0-5 who received any home visitation from a B&B AmeriCorps member were less likely to have a CPS referral after they began the program than those who did not receive any B&B services. Specifically, being in the B&B AmeriCorps group rather than the comparison group decreased the probability of having a CPS referral by 18% when all other variables were held constant. Given that these results were only marginally significant, they should be interpreted with caution, but they do provide

[13] Note. This measure includes both substantiated, inconclusive, unfounded, and pending/unknown dispositions.
[14] Marginal significance indicates p-values less than 0.10.

preliminary evidence that could be expanded upon in future studies. Please see Appendix C for a more detailed description of the model and the full results of the Cox regression.

Figure 2 below models the predicted probability of having any CPS referral (shown on the y-axis) as a function of program participation (as indicated by green and blue lines) and the number of days from when individual began B&B or became eligible for B&B (shown on the x-axis). Overall, 48.5% of the sample had a CPS referral during the post-period, with the average person having their first CPS referral approximately 335 days after the start of B&B. This suggests that CPS referrals are more common than substantiated referrals, and occur earlier on average in the post-period. However, a similar pattern emerged over time, with the probability of having a referral increasing as more days pass and increasing more over time for the comparison group than the B&B group. For example, at zero days there is almost no probability of having a CPS referral, but by 1000 days there is roughly a 50% predicted probability of having a CPS referral in the B&B group (compared to a 60% predicted probability in the comparison group). This gap widens over time suggesting that B&B AmeriCorps participants have a lower probability of having perpetration or adult other referrals than those who did not receive these services the longer they are out of the program.

Figure 2. B&B participants who receive home visitation services from B&B AmeriCorps volunteers have a lower probability of having a substantiated referral after B&B (or B&B eligibility)


Probability of Having a Perpetration or Other Referral at Time X
0.0
0.2
0.4
0.6
0
200
400
600
800
1000
1200
1400
1600
Days from Start of Treatment (or Eligibility)
Study Condition
Comparison
Treatment

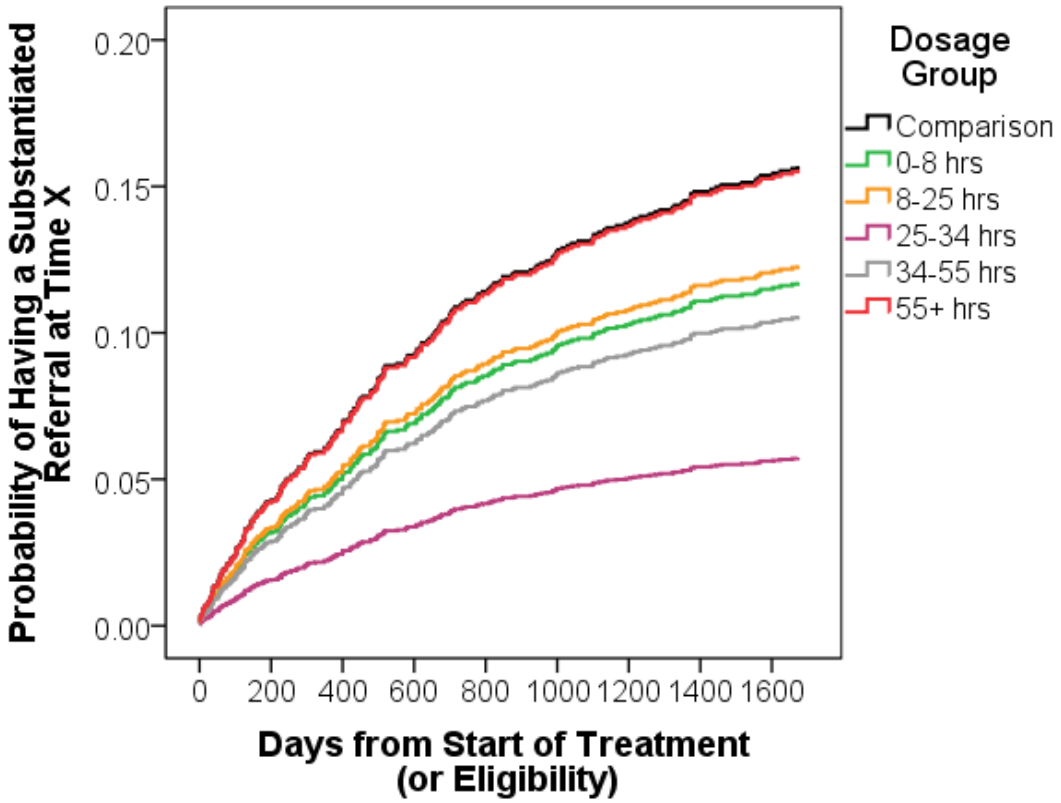
Do families of children 0-5 who received eight or more hours of home visitation from B&B AmeriCorps members have lower rates of subsequent CPS involvement after beginning services than those who do not receive B&B services?

Dosage Effects on Substantiated Referrals. Mothers who received between 25-34 hours of home visitation from B&B AmeriCorps volunteers were significantly less likely to have a substantiated referral after they began the program than those who did not receive B&B services. In particular, mothers who received 25-34 hours of home visitation from B&B AmeriCorps volunteers were 2.73 times (173%) less likely to have a substantiated referral than those in the comparison group. However, there were no statistically significant differences between the comparison group and B&B participants who received less than 25 hours of face-to-face service and those who received more than 34 hours of service. This suggests that participants who receive between 25-34 hours of service receive the maximum benefit from participation. Please see Appendix D for a more detailed description of the model and the full results of the Cox regression.

Figure 3 below models the predicted probability of having a substantiated referral (shown on the y-axis) as a function of program dosage (as indicated by the lines labeled on the right) and the number of days from when an individual began B&B or became eligible for B&B (shown on the x-axis). This figure shows that the probability of having a referral increases as more days pass. However, this increase is generally largest in the comparison group (illustrated with the black line below) and in the B&B group who received more than 55 hours of home visitation services (illustrated with the red line below)[15]. Although there are no statistically significant differences between the comparison group and B&B participants receiving 0-25 hours and 34-55 hours of home visitation, there does seem to be a trend suggesting that these groups may have a slightly lower probability of recidivism than the comparison group. That said, the only B&B dosage group which was significantly different from the comparison group (shown in the black line below) was the 25-34 hour group (indicated by the purple line below). By the end of the B&B period, there is roughly a 4% predicted probability of having a substantiated referral in the B&B group and a 15% predicted probability in the comparison group. This gap shows that B&B AmeriCorps participants who receive 25-34 hours of home visitation services have a significantly lower probability of having substantiated referrals than those who did not receive these services.

[15] Note. Here the findings for the comparison group (in black) and the 55+ hours of B&B group (in red) appear to be very similar and are not significantly different from one another. However, findings for the B&B group who received more than 55 hours of face-to-face home visitation services should be interpreted with caution given the low sample sizes (N=15) and the wide range of hours encompassed (55-78 hours).

Figure 3. B&B participants who receive 25-34 hours of face-to-face home visitation services have a lower predicted probability of having a substantiated referral after B&B (or B&B eligibility)



Dosage Effects on Any CPS Referrals. A similar pattern emerges when predicting the number of days before any CPS referral[16]. Once again, mothers who received between 25-34 hours of home visitation from B&B AmeriCorps volunteers were significantly less likely[17] to have a CPS referral after they began the program than those who did not receive B&B services. In particular, mothers who received 25-34 hours of home visitation from B&B AmeriCorps volunteers were 57% less likely to have a CPS referral than those in the comparison group. However, there were no statistically significant differences between the comparison group and B&B participants who received less than 25 hours of face-to-face service and those who received more than 34 hours of service. This suggests that participants who receive between 25-34 hours of service receive the maximum benefit from participation. Please see Appendix D for a more detailed description of the model and the full results of the Cox regression.

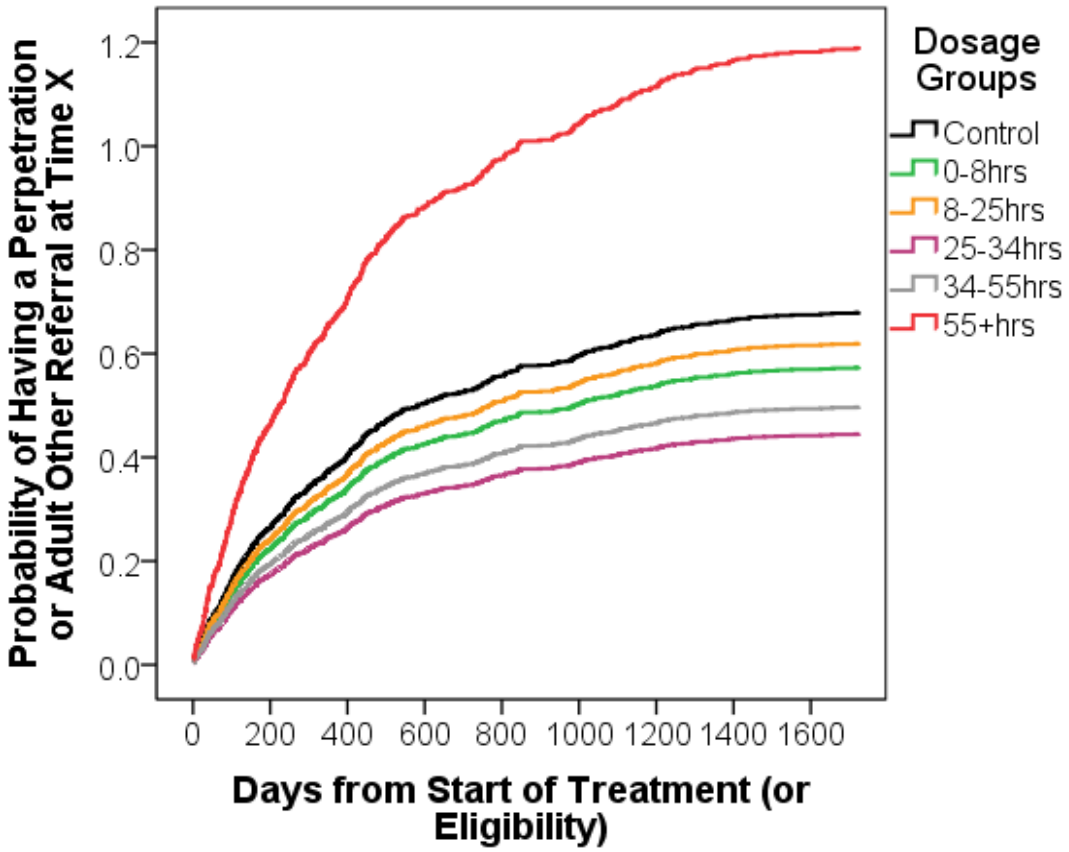
Figure 4 below models the predicted probability of having any CPS referral (shown on the y-axis) as a function of program dosage (as indicated by the lines labeled on the right) and the number of days from when individual began B&B or became eligible for B&B (shown on the x-axis). This figure shows that the probability of having a referral increases as more days pass. However, this increase is generally largest in

[16] Note. This measure includes both substantiated and unsubstantiated referrals.
[17] These results are marginally significant, p=0.055.

the comparison group (shown in the black line below) and in the B&B group who received more than 55 hours of home visitation services (shown in the red line below)[18]. Although there were no statistically significant differences between the comparison group and B&B participants receiving 0-25 hours and 34-55 hours of home visitation, there did seem to be a trend suggesting that these groups may have a slightly lower probability of having a CPS referral than the comparison group. That being said, the only B&B group which was significantly different from the comparison group (shown in the black line below) was the 25-34 hour group (indicated by the purple line below). By the end of the B&B period there was roughly a 40% predicted probability of having a CPS referral in the 25-34 hour B&B group (shown in the purple line below) and a 65% predicted probability in the comparison group (shown in the black line below). This gap shows that B&B AmeriCorps participants who receive 25-34 hours of home visitation services have a significantly lower probability of having CPS referrals than those who did not receive these services.

[18] Note. Findings for the B&B group who received more than 55 hours of face-to-face home visitation services should be interpreted with caution given the low sample sizes (N=15) and the wide range of hours encompassed (55-78 hours). Also, please note that there are no statistically significant differences between participants in the 55+ hours B&B group and the comparison group. The results presented are Hazards Ratios, which can be above 1.

Figure 4. B&B participants who receive 25-34 hours of face-to-face home visitation services have a lower probability of having a CPS referral after B&B (or B&B eligibility)



Conclusions

This study suggests that being in the B&B AmeriCorps group rather than the comparison group decreased the probability of having a substantiated referral by 41% and the probability of having any CPS referral by 18% when all other variables were held constant. In particular, mothers who received 25-34 hours of home visitation from B&B AmeriCorps volunteers were 173% less likely to have a substantiated referral and 57% less likely to have any CPS referral than those in the comparison group. However, there were no statistically significant differences between the comparison group and B&B participants who received less than 25 hours of face-to-face service and those who received more than 34 hours of service. This suggests that participants who receive between 25-34 hours of service receive the maximum benefit from participation in the program and the program may want to target this level of service in the future.

Table A1. Means, Percentages, and Standard Deviations (SD) for All Study Variables

	Unmatched					Matched 2:1			
	Treatment (N=496)		Control (N=9,210)			Treatment (N=493)		Control (N=985)	
Variables	Mean/ Percent	SD	Mean/ Percent		SD	Mean/ Percent	SD	Mean/ Percent	SD
Demographics									
Person was White (versus nonwhite)	29.20	-	36.70	***	-	29.40	-	30.60	-
Person's primary language was English (versus any other)	83.70	-	82.90		-	83.60	-	87.00	-
Age in 2015	27.46	6.28	30.39	***	6.11	27.48	6.28	27.54	5.41
Unique Referrals at/Before Point of Eligibility for the Program									
Number of Unique Perpetrator or Other (restricted to those when person was 17 or older) Referrals	2.94	4.43	1.92	***	2.52	2.87	3.80	2.61	3.71
Number of Unique Victim Referrals	2.41	3.74	0.70	***	2.04	2.35	3.61	2.35	3.53
Age of Person's First Referral	16.56	10.14	23.67	***	9.61	16.63	10.12	16.62	9.76
Most Serious Type of Referral At/Before Point of Eligibility for the Program									
Most Serious Victimization Referral (Range 0 to 9[1])	3.71	3.79	1.41	***	2.88	3.69	3.78	3.89	3.82
Most Serious Perpetration Referral (Range 0 to 9)	3.54	2.83	3.59		2.70	3.54	2.84	3.49	2.77
Most Serious Other Referral (Range 0 to 9)	6.97	1.64	6.56	***	1.44	6.96	1.64	6.98	1.53

Presence of Specific Referral Dispositions at/before Point of Eligibility for the Program										
Victim										
Sexual[2] Victimization (Range 0-3[3])	0.34	0.80	0.11	***	0.47	0.34	0.80	0.37		0.82
Physical Victimization (Range 0-3)	0.62	0.99	0.21	***	0.63	0.60	0.98	0.53		0.99
Severe Neglect Victimization (Range 0-3)	0.25	0.77	0.07	***	0.43	0.25	0.77	0.25		0.76
General Neglect Victimization (Range 0-3)	0.84	1.11	0.29	***	0.77	0.84	1.11	0.83		1.13
Emotional Neglect Victimization (Range 0-3)	0.21	0.68	0.09	***	0.43	0.21	0.67	0.27		0.73
Perpetrator										
Sexual Perpetration (Range 0-3)	0.02	0.17	0.01		0.12	0.02	0.17	0.01		0.13
Physical Perpetration (Range 0-3)	0.28	0.68	0.21	*	0.59	0.28	0.69	0.21		0.58
Severe Neglect Perpetration (Range 0-3)	0.17	0.64	0.14		0.58	0.17	0.64	0.16		0.62
General Neglect Perpetration (Range 0-3)	1.14	1.17	0.95	**	1.03	1.13	1.16	0.95	**	1.04
Emotional Neglect Perpetration (Range 0-3)	0.08	0.39	0.05		0.30	0.08	0.39	0.50		0.90
Other										
Sexual Other (Range 0-3)	0.49	0.88	0.26	***	0.67	0.48	0.88	0.50		0.90
Physical Other (Range 0-3)	1.40	1.11	0.99	***	1.04	1.39	1.10	1.28		1.09
Severe Neglect Other (Range 0-3)	0.64	1.14	0.37	***	0.91	0.64	1.14	0.66		1.15
General Neglect Other (Range 0-3)	1.88	1.04	1.48	***	1.04	1.87	1.04	1.80		1.05
Emotional Neglect Other (Range 0-3)	0.51	0.94	0.31	***	0.75	0.50	0.93	0.57		0.97

*p<.05; **p<.01; ***p<.001 (treatment compared to control group).

[1] See item 1c in Appendix B for details of the 0-9 scoring

[2] See item 2a in Appendix B for details of the allegation type groupings

[3] See item 2b in Appendix B for details of the 0-3 scoring

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Table A2. Cox Regression for Hazard of Recidivism as a Function of Treatment (N=1,478)

	Substantiated Referral				Perpetrator/Other Referral			
Independent Variable	O.R.	se	*B*		O.R.	Se	*B*	
Treatment	0.71	0.15	0.34	*	0.85	0.08	0.16	+
Demographics								
Person was White (versus nonwhite)	1.37	0.14	0.31	*	1.25	0.08	0.22	**
Person's primary language was English (versus any other)	1.09	0.25	0.08		1.62	1.41	0.48	**
Age in 2015	1.02	0.02	0.02		1.03	0.01	0.03	*
Unique Referrals at/Before Point of Eligibility for the Program								
Number of Unique Perpetrator or Other (restricted to those when person was 17 or older) Referrals	1.06	0.02	0.06	**	1.06	0.01	0.06	***
Number of Unique Victim Referrals	1.01	0.03	0.01		1.02	0.02	0.02	
Age at Person's First Referral	0.98	0.02	-0.02		0.98	0.01	-0.02	*
Most Serious Type of Referral at/Before Point of Eligibility for the Program								
Most Serious Victimization Referral (Range 0 to 9)	1.00	0.04	0.00		0.98	0.02	-0.02	
Most Serious Perpetration Referral (Range 0 to 9)	0.89	0.04	-0.11	**	0.95	0.02	-0.05	*
Most Serious Other Referral (Range 0 to 9)	0.94	0.08	-0.06		0.91	0.04	-0.10	*

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Presence of Specific Referral Dispositions At/Before Point of Eligibility for the Program							
Victim							
Sexual Victimization (Range 0-3)	1.05	0.10	0.05		0.98	0.06	-0.02 *
Physical Victimization (Range 0-3)	1.10	0.09	0.10		1.01	0.06	0.01
Severe Neglect Victimization (Range 0-3)	0.94	0.10	-0.06		1.01	0.06	0.01
General Neglect Victimization (Range 0-3)	0.99	0.09	-0.01		0.98	0.06	-0.02
Emotional Neglect Victimization (Range 0-3)	0.92	0.11	-0.09		1.00	0.06	-0.01
Perpetrator							
Sexual Perpetration (Range 0-3)	1.50	0.33	0.41		1.50	0.19	0.40
Physical Perpetration (Range 0-3)	0.97	0.14	-0.03		1.11	0.08	0.11
Severe Neglect Perpetration (Range 0-3)	0.94	0.12	-0.07		0.92	0.07	-0.09
General Neglect Perpetration (Range 0-3)	1.12	0.11	0.11		1.01	0.06	-0.01
Emotional Neglect Perpetration (Range 0-3)	1.27	0.16	0.24		1.03	0.11	0.03
Other							
Sexual Other (Range 0-3)	1.10	0.11	0.09		1.27	0.06	0.24 ***
Physical Other (Range 0-3)	1.20	0.09	0.18	*	1.01	0.05	0.01
Severe Neglect Other (Range 0-3)	0.96	0.07	-0.04		1.06	0.04	0.06
General Neglect Other (Range 0-3)	1.09	0.10	0.09		1.01	0.06	0.01
Emotional Neglect Other (Range 0-3)	1.07	0.08	0.07		1.03	0.05	0.03
Overall Percent Recidivism	15.40	-	-		48.50	-	-
Average Time to Recidivism (Days)	529.96				335.77		

+p<.10; *p<.05; **p<.01; ***p<.001

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Table A3. Cox Regression for Hazard of Recidivism as a Function of Dosage (N=1,478)

	Substantiated Referral				Perpetrator/Other Referral			
Independent Variable	O.R.	se	*B*		O.R.	se	*B*	
Dosage[1]								
0-8 Hours of Face to Face Visits	0.747	0.22	-0.29		.844	.118	-.170	
8-25 Hours of Face to Face Visits	0.78	0.23	-0.24		.912	.131	-.092	
25-34 Hours of Face to Face Visits	0.37	0.51	-1.01	*	.655	.221	-.423	+
34-55 Hours of Face to Face Visits	0.67	0.42	-0.40		.731	.225	-.313	
55+ Hours of Face to Face Visits	0.99	0.59	-0.01		1.751	.297	.560	
Demographics								
Person was White (versus nonwhite)	1.37	.143	.313	*	1.249	.082	.222	**
Person's primary language was English (versus any other)	1.07	.251	.064		1.621	.142	.483	**
Age in 2015	1.03	.024	.024		1.026	.013	.026	*
Unique Referrals At/Before Point of Eligibility for the Program								
Number of Unique Perpetrator or Other (restricted to those when person was 17 or older) Referrals	1.059	0.02	.057	**	1.060	.012	.059	***
Number of Unique Victim Referrals	1.003	0.03	.003		1.015	.019	.015	
Age at Person's First Referral	.976	0.02	-.025		.977	.010	-.023	*
Most Serious Type of Referral At/Before Point of Eligibility for the Program								
Most Serious Victimization Referral (Range 0 to 9)	.998	.039	0.00		.979	.022	-.021	
Most Serious Perpetration Referral (Range 0 to 9)	.893	.043	-0.11	**	.952	.023	-.049	*
Most Serious Other Referral (Range 0 to 9)	.940	.077	-0.06		.904	.041	-.101	*
Presence of Specific Referral Dispositions At/Before Point of Eligibility for the Program								

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Victim								
Sexual Victimization (Range 0-3)	1.042	.104	.041		.981	.063	-.019	
Physical Victimization (Range 0-3)	1.114	.093	.108		1.012	.056	.012	
Severe Neglect Victimization (Range 0-3)	.946	.096	-.056		1.006	.055	.006	
General Neglect Victimization (Range 0-3)	.999	.094	-.001		.982	.057	-.018	
Emotional Neglect Victimization (Range 0-3)	.914	.106	-.090		.999	.063	-.001	
Perpetrator								
Sexual Perpetration (Range 0-3)	1.504	.332	.408		1.493	.190	.401	*
Physical Perpetration (Range 0-3)	.972	.137	-.029		1.123	.077	.116	
Severe Neglect Perpetration (Range 0-3)	.935	.120	-.067		.920	.068	-.084	
General Neglect Perpetration (Range 0-3)	1.116	.106	.110		1.019	.058	.019	
Emotional Neglect Perpetration (Range 0-3)	1.267	.156	.237		1.019	.110	.019	
Other								
Sexual Other (Range 0-3)	1.104	.107	.099		1.266	.063	.236	***
Physical Other (Range 0-3)	1.194	.088	.177	*	1.012	.050	.012	
Severe Neglect Other (Range 0-3)	.961	.074	-.040		1.071	.042	.068	
General Neglect Other (Range 0-3)	1.093	.098	.089		1.006	.055	.006	
Emotional Neglect Other (Range 0-3)	1.074	.079	.071		1.034	.049	.033	
Overall Percent Recidivism	15.40	-	-		48.50	-	-	
Average Time to Recidivsm (Days)	529.96				335.77			

[1] All dosage levels are compared to comparison group

+p<.10; *p<.05; **p<.01; ***p<.001

APPENDIX III | AMERICORPS LOGIC MODEL