
Best Start in Metro LA Pilot Community Evaluation

Estimating the Cost Effectiveness of Welcome Baby Home Visiting

Prepared for:



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EXECUTIVE SUMMARY

National focus on the effectiveness of home visiting programs has increased in recent years, but considerable knowledge gaps remain regarding the relationship between program costs and outcomes. With a wide range of home visiting program designs being implemented nationally, program costs can vary considerably, as do the benefits. It remains a challenge to assess how much more beneficial high cost and, potentially, more intensive programs are compared to lower cost and less intensive programs.

This report takes a step toward contributing to the field by considering the cost of a locally designed home visiting program for mothers and their newborns in Los Angeles County, and exploring the cost effectiveness of the program with regard to specific child and family outcomes. The Welcome Baby home visiting program was developed and piloted as part of First 5 LA's place-based community investment supporting low-income families with children ages 0-5—known as Best Start.

Based on data from a variety of sources, we determined that the average cost per woman in Welcome Baby is estimated to be \$1,486. While this cost is less than many other evidence-based home visiting programs, the program is also less intensive. Using findings from the Child and Family survey—a longitudinal survey of women who received Welcome Baby and a comparison group of women designed to evaluate the impacts of the program—we use the incremental benefits associated with Welcome Baby to estimate cost effectiveness ratios for women who received Welcome Baby compared with women who did not receive home visiting (Benatar et al. 2013 and Benatar et al. 2014). We find that an approximately \$20,000 investment is associated with one additional woman breastfeeding exclusively for 4 months, a \$14,000 investment is associated with one additional child growing with decreased risk of developmental delay, and a nearly \$50,000 investment is associated with an increase in referrals to early intervention services for speech and language delays.

There are a number of limitations to this analysis that should be taken into account. For one, the time parameters we utilized for the cost determinations differ from the time parameters utilized for determining the outcomes associated with Welcome Baby. This is significant because the cohort included in the Child and Family Survey may have received more care than prescribed by the standard protocol as a result of the fact that the program was not yet at capacity, so parent coaches had extra time to devote to participants (see Hill et al. 2011). Furthermore, the weighted average cost per visit is based on engagement point participation from a different cohort of women receiving Welcome Baby. This cohort, we know, had a particularly low rate of prenatal engagement. Additionally, the Child and Family Survey results study a cohort of women that received services when the program was still in its early years of implementation, and thus may not have yet reached peak effectiveness or efficiency. This may

be offset, however, by the fact that women likely received more visits than the protocol specifies.

These findings provide additional information with which First 5 LA and its Commissioners can consider the sustainability of Welcome Baby. Such sustainability could require the infusion of reimbursement from Medi-Cal or financial support from programs of the Department of Child and Family Services, whose stakeholders could envision programmatic and/or financial benefits from an expanded Welcome Baby program. However, it is important to consider that the costs and outcomes presented here are specific to Welcome Baby as piloted in the Metro LA community.

I. INTRODUCTION

National focus on the effectiveness of home visiting programs has increased in recent years, but considerable knowledge gaps remain regarding the relationship between program costs and outcomes. With a wide range of home visiting program designs being implemented nationally, program costs can vary considerably, as do the benefits. It remains a challenge to assess how much more beneficial high cost and, potentially, more intensive programs are compared to lower cost and less intensive programs.

This report takes a step toward contributing to the field by considering the cost of a locally designed home visiting program for mothers and their newborns in Los Angeles County, and exploring the cost effectiveness of the program with regard to specific child and family outcomes. The Welcome Baby home visiting program was developed and piloted as part of First 5 LA's place-based community investment supporting low-income families with children ages 0-5—known as Best Start.¹

This cost analysis is one facet of a comprehensive evaluation effort designed to characterize the effects of the Welcome Baby program—and the broader Best Start LA investment—as it was piloted in one downtown Los Angeles community (referred to as *Metro LA*). With funding from First 5 LA, the Urban Institute and its partner the University of California, Los Angeles (UCLA) have conducted a multi-year mixed methods evaluation that has included the following components:

- In-depth case studies of implementation in the pilot Metro LA community and in the expanded Best Start communities
- Focus groups with Welcome Baby clients and parent coaches;
- A quasi-experimental longitudinal survey of Welcome Baby clients and a comparison group; and
- A study to determine the average cost and incremental cost-effectiveness ratios of salient and significant outcomes associated with the home visiting program;

Welcome Baby has been in place in Metro LA since 2009, and began rolling out in 2013 in additional Best Start communities. The pilot program offers an opportunity to look at costs of the program while at capacity and in advance of expansion to other Best Start communities. Additional cost analyses could be done in future years that might compare the different ways in which Welcome Baby is being deployed throughout Los Angeles County, their costs and resulting impacts.

¹ Best Start is First 5 LA's place-based initiative focusing community capacity building through mobilizing parents and other community members to support young children and families in 14 low income communities in LA County.

To better understand the relationship between the cost inputs and effectiveness of Welcome Baby and to begin to inform considerations for future sustainability, the Urban Institute has evaluated the overall costs associated with Welcome Baby in the pilot community, and conducted cost effectiveness analyses with three of the known benefits of the program based on the Child and Family Survey. For the cost effectiveness exercise, we look at the average program costs per woman and calculate the incremental cost-effectiveness ratios² of select outcomes found to be impacted by Welcome Baby. We consider the context of these results with regard to larger societal benefits associated with child and family outcomes that are impacted by Welcome Baby home visiting, and the limitations of this analysis. Lastly, in this report we discuss the implications of these findings in light of considerations about the sustainability of the Welcome Baby beyond direct financial support from First 5 LA.

It is important to stress that the analyses presented in this report are derived from a cost effectiveness calculation, and not a cost benefit analysis. The key difference between the two approaches is that, while a cost effectiveness analysis relates costs of the program to key outcomes, cost benefit analyses assign a dollar value to the benefits. Monetizing the benefits of the outcomes of significance associated with the Welcome Baby program is especially challenging given that several outcomes are intangible, or effects are incremental but meaningful over time; such a study was beyond the scope of this exercise. We do, however, provide context for these outcomes where possible, relying on existing literature. In addition, cost effectiveness analyses can consider just one outcome of the Welcome Baby program at a time. Since a constellation of outcomes have been found to be impacted by Welcome Baby home visiting in Metro LA, this method therefore, likely overestimates the costs attributable to any single, specific outcome. The methods we use to determine the costs and calculate the cost effectiveness ratios are described further in Section III, and the constraints of this analysis are describe in greater detail in Section IV.

The long-term sustainability of Welcome Baby is currently a considerable focus for First 5 LA. Understanding the impacts of the home visiting program on child and family outcomes and the costs associated with those outcomes can be useful in informing decisions regarding the future of Welcome Baby.

In the remainder of this report we present the following:

- A brief background on the Welcome Baby program;

² An incremental cost effectiveness ratio is the ratio of the change in costs to incremental benefits of an intervention or treatment. This approach suggests that the value is defined as the extra value realized by choosing one intervention over another. The term incremental is important because the opportunity cost of not taking an action must be evaluated against those actions that will be taken.

- A discussion of the methods used to determine child and family outcomes impacted by the home visiting intervention;
- A discussion of the methods used to calculate the cost effectiveness results;
- A presentation of the findings; and
- A discussion of the potential implications of the cost effectiveness findings for the sustainability of the Welcome Baby model.

II. OVERVIEW OF WELCOME BABY

Welcome Baby is a free and voluntary home visiting program focused on supporting breastfeeding, promoting a positive and secure parent-child relationship and maximizing the health and safety of the baby. This family-centered, strength-based model provides education and support to pregnant women and mothers of newborns. Women are recruited into the program either prenatally (by outreach specialists) or in the hospital after giving birth (by hospital liaisons). Though more women have typically enrolled in the hospital, great emphasis has been placed on the importance of prenatal recruitment, which is associated with improved retention (Hill et al. 2011, Benatar et al. 2012). In addition, reaching mothers prenatally increases the possibility of affecting behaviors that could result in improved maternal and infant outcomes—such as prenatal nutrition, birth preparedness, breastfeeding initiation and mother-infant bonding.

The Welcome Baby program includes up to nine contacts or “engagement points” for women who enter prenatally and up to six engagement points for women who enter postpartum, offering breastfeeding support, guidance on infant health and development and referrals to needed resources and services (see Figure 1).³

Most of the Welcome Baby engagement points are conducted by parent coaches. The two exceptions are the hospital visit following delivery—which is conducted by hospital liaison staff—who have varying levels of expertise, and the 72-hour home visit—which is conducted by a pediatric nurse. All parent coaches are certified lactation educators and most are bi-lingual English/Spanish speakers.

The content of each engagement point is designed to focus on developmentally appropriate topics. For instance, prenatal Welcome Baby engagements focus on strategies for a healthy pregnancy (including prenatal care, nutrition, health education, preparation for child birth, labor and delivery, breastfeeding intentions and warning signs of pre-term labor). Breastfeeding instruction and support begin at the hospital, as well as emphasis on the importance of mother-infant bonding. The 72-hour nurse visit focuses on the health of the mother and infant and presents an additional opportunity to reinforce the benefits of breastfeeding. The nurse assesses the infant’s health and weight and the mother’s post-delivery healing, provides breastfeeding assistance if needed, discusses family planning strategies, screens for maternal depression and confirms the mother has a source of health care for herself and her baby. Postpartum engagements then continue to provide education,

³ With the roll-out to subsequent Best Start communities, an abridged version—commonly referred to as Welcome Baby Lite—is being offered to women who are identified as “high risk” (based on a standardized risk screener) but live outside of a Best Start community. Women who qualify for Welcome Baby Lite can receive up to 3 postpartum visits, including the hospital visit, the 72 hour visit and the 1-2 week visit.

guidance and support on a broad range of issues, such as health and dental care, breastfeeding, child health and development, home safety, baby sleeping positions, maternal depression and referrals to community resources. Parent coaches also administer a developmental screener at both the three to four month and nine month visits, utilizing the *Ages and Stages Questionnaires* (ASQ) (Hill et al. 2011).

Figure 1. Welcome Baby Overview^{4,5}



Welcome Baby was first launched in 2009 in one hospital serving the pilot Best Start community—designated Metro LA. Beginning in the fall of 2013, the program was expanded to an additional 13 hospitals serving all 14 Best Start communities throughout Los Angeles County. Building on lessons from the pilot community, decisions were made during the intervening years to implement a few changes to the program. Perhaps most significantly, a new universal

⁴ Previously, the schedule included a two-week phone call and a one to two month home visit but the order of these was reversed as of spring 2012.

⁵ When first launched, prior to the program reaching capacity in the pilot community, Welcome Baby parent coaches would sometimes visit families in great need more often than the protocol specifies (see our case study report from 2011, Hill et al.). Our understanding is that these practices abated by 2012.

risk screening on family strengths, needs and risks (Bridges for Newborns⁶) is now being administered to all women who give birth in Best Start-designated hospitals. Based on results from the screening, women who live within the Best Start community boundaries that are identified to be low or medium risk are offered Welcome Baby, while women who live within the Best Start community and are identified as high risk are referred to a more intensive “Select Home Visiting” program chosen by the community partnerships (either Healthy Families America, Parents as Teacher, or “Triple P” – Positive Parenting Program). Finally, women who are determined high risk but do not reside in a Best Start community are offered an abridged version of the Welcome Baby program, which includes up to three postpartum home engagements. These changes in the program went into effect after the period covered by this study and are not reflected in the cost estimates.

⁶ The Bridges for Newborns screening tool was adapted from the Bridges Maternal Child Health Network, which is funded by Proposition 10 Tobacco Tax revenues and managed by Children and Families Commission of Orange County.

III. METHODS

This methods section will cover the costs of the Welcome Baby program, background on how the Welcome Baby outcomes have been measured, and a description of the cost effectiveness calculation that was conducted.

To determine the cost of Welcome Baby as it has been implemented in Metro LA, we draw on two data sources (invoices and key informant interviews). Information used to determine the component and total costs associated with operating Welcome Baby include invoices to First 5 LA from the Welcome Baby contractors in the pilot community. We conducted key informant interviews to understand other costs not captured and to determine the period that should be included in the study. Findings from case studies conducted over four years of evaluating Welcome Baby in Metro LA inform these analyses as well.

The number of women served during the specific time period was provided by Maternal Child Health Access (MCH Access), a community based organization hired to run the Welcome Baby program in Metro LA. All women ever enrolled during 2012, two years after the program was first implemented, were considered for inclusion. After consultation with First 5 LA and MCH Access, we made the decision to include all women enrolled during the year, regardless of how long they were retained in the program. This approach presumes that enrollment flow is stable over time, and therefore accounts for engagements that occur for women who enrolled during the prior year but continued to have engagements during 2012 as well as women who enrolled late in 2012 and therefore had few engagements during that calendar year. This has administrative advantages, and should closely match the number of actual engagements that would occur during a given year. The year 2012 was chosen because it represents a time during which the program was up and running fully, parent coaches had full caseloads, and other external activities related to the roll-out of Welcome Baby county-wide, had not ramped up. The processes for determining the costs of Welcome Baby are presented in detail below.

Throughout, we also draw on findings from the Child and Family Survey—a longitudinal survey of women in the pilot community who received Welcome Baby services and a comparison group. Data from the Child and Family Survey are used to evaluate the impacts of receiving the home visiting service compared with not receiving the home visiting service. The methods utilized to collect and analyze the data from the Child and Family Survey are summarized here, but discussed in greater detail elsewhere (Benatar et al. 2013, Benatar et al. 2014). Together, the cost and outcomes data are used to calculate the incremental cost effectiveness ratios for select findings. Cost effectiveness findings presented here are being evaluated from the program perspective.

A. Determining the Costs of Welcome Baby

To better understand what components should be included in the calculation of Welcome Baby costs, we held several phone interviews with First 5 LA staff and staff at the organizations responsible for implementing Welcome Baby in Metro LA, including California Hospital Medical Center (CHMC)—the birthing hospital and fiscal agent for the program, and Maternal and Child Health Access (MCH Access)—the subcontractor administering the Welcome Baby program. Start-up costs are treated as “sunk costs”—in other words, costs invested in designing the program that are not recoverable. These costs are therefore not included in the cost determinations. Instead, only ongoing program costs are included for a full calendar year during which Welcome Baby was at full capacity—as agreed upon between Urban and MCH Access—based on reaching enrollment targets, the program being fully staffed, and parent coaches having full caseloads (as defined by MCH Access). We chose to look at the year during which the program reached full capacity since it would be most reflective of the true costs of running the program on an ongoing basis.

The components of the cost calculation include the grant to CHMC from First 5 LA (includes funding for hospital liaisons, supervision of hospital liaisons by hospital staff, hospital administration of the program, the subcontract to MCH Access) and costs for maintaining the Welcome Baby program database (DCAR). Total annual program costs for 2012 equaled just over \$2 million. A breakdown of the costs is presented in Table 1 and include personnel costs for CHMC— specifically salaries and benefits for hospital liaisons, the costs associated with clinical staff time spent supervising the hospital liaisons, and time for administrative staff responsible for overseeing the grant at the hospital. Contracted services comprise all costs incurred by MCH Access for running the Welcome Baby program. Specifically, this includes salaries and benefits for all Welcome Baby staff, including the program director, clinical supervisor, parent coaches, outreach specialists, and data and administrative staff. In addition, all staff travel expenses and program materials are included here.⁷

During conversations with MCH Access and First 5 LA, we established criteria for how to count women enrolled in the program. As mentioned above, women can enroll in Welcome Baby at different times (prenatally or postpartum) and, therefore, receive a different number of visits or phone calls. Additionally, some women miss engagements or drop out before the program is completed (see Figure 2). In certain cases, though less frequently once the program

⁷ In the new Welcome Baby communities, certain costs are not included in program expenses, but are covered by the Welcome Baby oversight entity (L.A. Best Babies Network (LABBN)) hired to oversee the roll-out of Welcome Baby county wide. For instance, costs for gifts distributed throughout the program, such as boppy pillows, toys, and other items were covered by MCH Access during the pilot, but are now purchased by LABBN. Additionally, some of the new Welcome Baby communities have pursued similar financing structures—with a hospital serving as the fiscal agent and subcontracting with a community based organization to run the program—while others are being run directly out of the hospital. In one case, there is minimal hospital involvement.

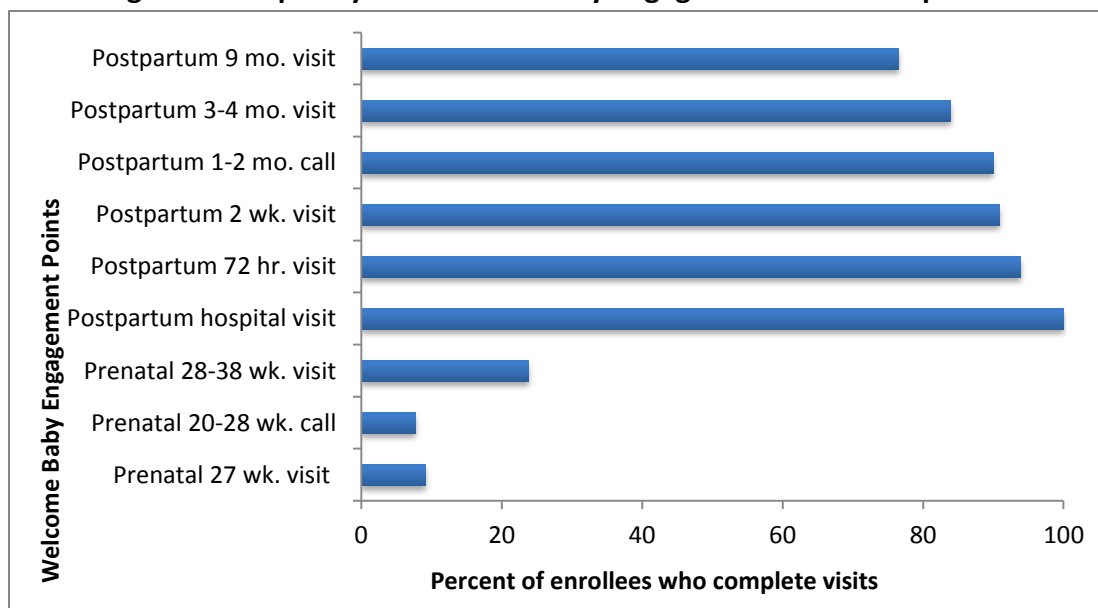
reached capacity, extra phone calls or interactions sometimes occur. Lastly, in addition to pre-specified engagement points, a substantial effort goes into the recruitment of women. In light of this variation, and our interest in calculating an “average cost” per woman served, we decided to include any woman who consented to be in the program during calendar year 2012. This resulted in a total of 1,398 women included in this analysis.

Table 1. Costs of Welcome Baby (Calendar Year 2012)

| Cost Components | Totals |
|----------------------------|--------------------|
| CHMC Personnel | \$162,161 |
| Contracted Services | \$1,888,578 |
| Staff Development Training | \$905 |
| Supplies | \$1,321 |
| Employee Mileage/Travel | \$255 |
| Indirect Costs | \$13,120 |
| Database Costs | \$7,344 |
| Total | \$2,072,779 |

Based on the cohort of women who were surveyed for the Child and Family Survey referenced above, we know that not all women participate in all nine engagement points. Certain engagement points have been historically underutilized—particularly the prenatal engagements, since most recruitment happens in the hospital. Utilization trends are presented in Figure 2.

Figure 2. Frequency of Welcome Baby Engagement Point Completion



Note: These data are based on the cohort recruited for the Child and Family Survey and are likely a conservative estimate of engagement point completion rates since they represent a cohort recruited early in the program’s history.

Using these data from the Child and Family Survey, we project the total number of engagement points that we can expect would have occurred during the calendar year 2012 and present these calculations in Table 2.⁸ Dividing the total cost of Welcome Baby in 2012 (\$2,072,779) by the projected total number of visits that occurred that year (8,049), yields an average cost per visit of \$258. Calculating an average cost per visit based on the projected number of engagements you might expect to occur during a given year also accounts for the fact that some women have more visits than others.

The following table presents the average cost per participant. Again these estimates are based on the frequency with which we would expect each engagement to be completed based on engagement point completion data from the Child and Family Survey. This analysis assumes that all engagements cost the same. While we might expect that the nurse visits are more costly than an engagement conducted by a parent coach, we do not have that level of detail, and salary levels are likely to be inconsistent depending on experience and other responsibilities. Furthermore, since it is artificial to presume that any one engagement point can exist without the others, we believe that it is best to view the cost as an average. Given that 1,398 women were estimated to complete 8,049 engagements, we can calculate that women completed 5.76 visits on average. This results in an average cost per woman of \$1,486 or 5.76 engagements * \$258 per engagement.

Table 2. Welcome Baby Cost Estimation

| | |
|--|--------------------|
| Total cost of all engagements | \$2,072,779 |
| Total number of engagements that occurred | 8,049 |
| Total number of participants (2012) | 1,398 |
| Average cost per engagement | \$258 |
| Average cost per participant | \$1,486 |

Overall, the average cost of Welcome Baby per participant is considerably lower than the average cost of select home visiting models implemented in Best Start communities for higher risk women, according to a national evaluation of evidence-based home visiting models (Boller et al. 2014). The average cost of these other home visiting models is presented for context in Table 3. In most cases, the Welcome Baby intervention is less intensive, with fewer visits, which may account for the lower cost. But there is considerable variability in some of the other

⁸ We do not have data on the actual engagements by engagement point completed in 2012 and therefore use projected engagements from the cohort included in the Child and Family Survey. While these data may be available from MCH Access, the administrative burden that would have been required was outside the scope of this task .

home visiting programs being implemented, with the number of visits and duration of the program varying depending on family need or the choice of the implementing agencies.

Table 3: Average Cost of Welcome Baby and Evidence-Based Home Visiting Programs Being Implemented in Best Start Communities⁹

| Program Name | Average Cost Per Woman/Family | Target Population | Number of Engagement Points |
|--|-------------------------------|---------------------------------|---|
| Welcome Baby | \$1,486/woman | Birth or prenatally to 9 months | 6-9 engagement points depending on timing of entry into program |
| Healthy Families America | \$5,615/family | Birth or prenatally to age 5 | For the first six months, visits are weekly, after which the number and frequency of visits varies by location |
| Positive Parenting Program (Triple P) | \$5,306/family | Birth to age 12 | Variation among implementing agencies; the program can be delivered in home or group settings over varying time periods |
| Parents as Teachers | \$2,372/family | Birth to age 5 | Home visits can be weekly, biweekly, or monthly; also includes group meetings |

Notes: Average cost per family was calculated by multiplying the cost per family week of enrollment (total cost/total number of weeks of family enrollment) and the average number of weeks for exiting family. The average cost shown for all programs (except Welcome Baby) presented here represents the weighted average cost, based on the number of families that exited each implementing agency's program during the cost study period.

B. Welcome Baby Outcomes

To measure impacts of the Welcome Baby program in Metro LA, the evaluation team developed a longitudinal quasi-experimental study to assess domains of interest at 12, 24 and 36 months postpartum, referred to earlier as the Child and Family Survey. Women enrolled in Welcome Baby between June 2010 and August 2011 were recruited to participate in the evaluation when their babies turned 12 months old. Simultaneously, women who had not been offered Welcome Baby were recruited for a comparison group. The pool for the comparison group was pulled from women who gave birth at CHMC just prior to Welcome Baby implementation and from the local Women, Infants and Children (WIC) agency—screening to ensure that women included in this comparison groups had not been offered Welcome Baby.

⁹Source for data on programs other than Welcome Baby: Boller, Kimberly, Deborah Daro, Andrew Burwick, and Heather Zaveri. "Making Replication Work: Building Infrastructure to Implement, Scale Up and Sustain Evidence-Based Home Early Childhood Home Visiting Programs." January 15, 2014. Mathematica Policy Research, Children's Bureau, and Chapin Hall at the University of Chicago

Response rates and sample sizes for the Welcome Baby and Comparison Groups are presented in Table 4, and some descriptive statistics for the two groups are included in Appendix A. Recruitment methods and descriptive statistics on the intervention and comparison group samples are presented in greater detail in other reports prepared for this evaluation (Benatar et al. 2013, Benatar et al. 2014).

Table 4. Response Rates for Welcome Baby and Comparison Groups

| | Total Women Contacted | Completed Interviews | Response Rate Removing Ineligibles * |
|--|------------------------------|-----------------------------|---|
| Welcome Baby – Intervention Group | | | |
| 12-Month Survey | 827 | 454 | 62.4% |
| 24-Month Survey | 763 | 447 | 61.5% |
| Received 12-Month Survey Only | | 70 | n/a |
| Received 12- and 24-Month Survey | | 384 | n/a |
| Received 24-Month Survey Only | | 63 | n/a |
| Comparison Group | | | |
| 12-Month Survey | 1,964 | 286 | 14.9% |
| 24-Month Survey | 366 | 278 | 14.5% |
| Received 12-Month Survey Only | | 48 | n/a |
| Received 12- and 24-Month Survey | | 240 | n/a |
| Received 24-Month Survey Only | | 38 | n/a |

* A woman was classified as ineligible if she was under the age of 18, if she no longer had custody of her child, if her child was too old for the survey, or if the family had moved outside the LA area.

To date we have collected and analyzed data from the 12 and 24 month Child and Family Surveys. The survey is composed of several parts:

- 1) A 90-minute parent interview that utilizes several validated scales to measure key aspects of parental well-being, the home environment and children's health and development;
- 2) A 10-minute observational assessment of a semi-structured parent-child play session designed to measure developmental parenting;
- 3) A home observation checklist that assesses the quality of the internal and external home environment; and
- 4) At 24 months, a direct assessment of child health and weight.

The survey is conducted by two trained assessment specialists who are bilingual in English and Spanish; responses are recorded using Computer-Assisted Personal Interviewing (CAPI) technology. Families receive a \$100 gift card incentive for their participation.

At 12-months, we observe six statistically significant outcomes that are positively associated with Welcome Baby participation, with at least one significant finding in each of the domains hypothesized to be impacted by the program. As discussed in greater detail in Benatar et al. 2013 and Benatar et al. 2014, these findings are consistent with the stated goals of Welcome Baby, and while the impacts are small in some cases, they are consistent at both 12 and 24 months. These outcomes are summarized in Table 5. Specifically, mothers that participated in Welcome Baby report having perceived stronger social support systems compared with those who do not receive home visiting. Welcome Baby participants have higher rates of attempted breastfeeding and also higher rates of exclusive breastfeeding for four months. These findings provide evidence that parent coaches and nurses are effectively supporting mothers in their efforts to breastfeed their babies. In addition, we find that Welcome Baby participants have higher quality home learning environments at 12 months, as evidenced by the presence of more learning materials in the home and greater engagement by mothers in learning activities such as reading books and singing songs. Potentially related, the children of mothers who participate in Welcome Baby demonstrate less risk of developmental delay than children in the comparison group, particularly in the area of social-emotional skills. No significant group differences, however, are found for outcomes in other areas we might have expected, including maternal mental health (Benatar et al. 2013). Additional measures were tested, but not found to be statistically significant (Appendix B). See Benatar et al. (2013) and Benatar et al. (2014) for further detail on the analyses conducted to assess the impacts of Welcome Baby in Metro LA.

Two years into the child's life we continue to find that Welcome Baby is significantly associated with several sustained positive outcomes (Table 6). At 24 months, eight statistically significant outcomes are associated with Welcome Baby participation, most of which are primarily focused on parenting quality and child development. Specifically, we observe higher quality home environments as measured by the HOME inventory and more frequent engagement in home learning activities among Welcome Baby participants when compared with mothers who did not receive home visiting. Welcome Baby mothers also scored significantly higher in observations of maternal responsiveness and encouragement. Children in the intervention group demonstrated improved social competence and communication skills compared to children in the comparison group.

Table 5. Welcome Baby Impacts at 12 months¹⁰

| Outcome | Welcome Baby Group (Percent or Mean) | Comparison Group (Percent or Mean) |
|--|---|---|
| Attempted Breastfeeding | 97% | 95% |
| Breastfed Exclusively for 4 months | 40% | 33% |
| Perceived level of Social Support; Quality Personal Relationships (<i>score range: 11 to 55</i>) | 35.7 | 34.0 |
| Quality Home Learning Environment (<i>score range: 0 to 10</i>) | 8.1 | 7.7 |
| Engagement in Home Learning Activities (<i>score range: 9 to 54</i>) | 44.0 | 42.6 |
| At Risk for Developmental Delay | 19% | 29% |

Table 6. Welcome Baby Impacts at 24 Months¹¹

| Outcome | Welcome Baby Group (Percent or Mean) | Comparison Group (Percent or Mean) |
|--|---|---|
| HOME Inventory Total Scale (<i>score range: 0 to 39</i>) | 32.0 | 31.5 |
| Engagement in Home Learning Activities (<i>score range: 5 to 30</i>) | 24.5 | 23.7 |
| PICCOLO Responsiveness (<i>score range: 0 to 14</i>) | 12.7 | 12.3 |
| PICCOLO Encouragement (<i>score range: 0 to 14</i>) | 12.8 | 12.5 |
| Communication Skills (<i>ASQ-3 score range: 0 to 60</i>) | 48.0 | 45.8 |
| Doctor Recommended Monitoring Speech and Language Development | 7% | 4% |
| BITSEA Competency Scale (<i>score range: 0 to 22</i>) | 17.8 | 17.3 |

Early benefits to child health and nutrition we expected to have been associated with positive breastfeeding outcomes, such as reduced overweight and obesity, are not present at 24 months. Furthermore, differences in the quality of parents' social support networks are no longer detectable. In sum, these findings indicate that Welcome Baby is having meaningful and positive impacts on women who are enrolled in the home visiting program, with evidence that increased exposure is associated with more significant impacts.

¹⁰ Impacts are significant at P<.01 for two tailed tests, and P<.05 for one-tailed tests.

¹¹ Impacts are significant at P<.01 for two tailed tests, and P<.05 for one-tailed tests.

C. Cost Effectiveness Calculations

Cost effectiveness calculations attempt to quantify the cost of a specified impact. For instance, cost effectiveness analysis allows one to make statements like: it would cost \$X to increase breastfeeding in Y number of people. These calculations rely on an ability to quantify both cost inputs and the incremental impacts attributable to an intervention. These calculations are included for three measures for which there is significant difference between the Welcome Baby and comparison groups, and the differences are quantified by percent difference rather than a difference in mean score. Specifically we look at: 1) exclusive breastfeeding for four months and 2) reduced risk of developmental delay in the area of social emotional skills, and 3) doctor recommended monitoring for speech and language development.

Table 7. Welcome Baby Impacts Considered for Cost Effectiveness Analysis¹²

| Outcome | Welcome Baby Group | Comparison Group |
|---|--------------------|------------------|
| Breastfed Exclusively for 4 months (12 month finding) | 40% | 33% |
| Risk of Developmental Delay in the Area of Social Emotional Skills (12 month finding) | 19% | 29% |
| Doctor Recommended Monitoring Speech and Language Development (24 month finding) | 7% | 4% |

In cases where a “mean score” is impacted—such as with levels of social support or engagement in home learning activities inventory—scores would have to be normalized for them to be interpretable. In other words, saying that a unit change in the mean scale used to measure social support is associated with X dollars is hard to interpret. For instance, what would that unit change translate to in real life? Many cost effectiveness studies in the health services research literature use quality adjusted life years (QALYs) for this reason; but the outcomes associated with Welcome Baby do not readily translate into QALYs.

The cost effectiveness calculations for this work are achieved by dividing the visit costs by the number of women impacted, whereby:

$$\text{Cost Effectiveness Ratio} = \frac{\text{Average cost per woman}}{[\text{Rate_Welcome Baby}] - [\text{Rate_Comparison Group}]}$$

¹² Impacts are significant at P<.01 for two tailed tests, and P<.05 for one-tailed tests.

For example, in the case of exclusive breastfeeding, we determine that six visits cover breastfeeding education and support. The numerator is the average cost per woman, which we've estimated to be \$1,486 (see earlier discussion and Table 2 for more information). The denominator (per unit impact) is calculated by subtracting the number of women in the comparison group who exclusively breastfeed (0.33) from the number of women in the intervention group who exclusively breastfeed (0.40), for incremental impact of 0.07. To standardize the cost effectiveness findings, we also report the impacts that can be achieved for every \$100,000 invested. This is done by dividing \$100,000 by the cost effectiveness ratio (\$100,000/cost per unit impact).

IV. FINDINGS

For \$2 million, or an investment of \$1,486 per woman on average, Welcome Baby results in a constellation of positive outcomes ranging from improved rates of exclusive breastfeeding to improved social support networks, and several important child development outcomes. While it can be argued that each visit contains the building blocks required to affect these outcomes, it can be a useful exercise to explore how the costs can be attributed to specific outcomes of interest.

In turn, this section presents the cost effectiveness estimates for three selected outcomes:

- 1) Exclusive breastfeeding for four months
- 2) Reduced risk of developmental delay in the area of social emotional skills, and
- 3) Increased referral for early intervention services to monitor speech and language delays.

As discussed in the methods section, costs are based on a consideration of the content of each visit as specified in the Welcome Baby protocol, multiplying the number of visits received by the weighted average cost per women per visit. The cost effectiveness ratios—allocating cost per additional outcome achieved—are presented for these three outcomes, and context regarding the potential benefits associated with each outcome are presented.

A. Cost of Exclusive Breastfeeding for 4 months.

Sustained breastfeeding has been shown in the literature to be associated with a number of positive outcomes including improved maternal-infant bonding and reduced risk of certain health conditions. Using the calculation specified above—an average cost per woman of \$1,486 divided by the incremental impact on breastfeeding (0.40-0.33), we find that an annual investment of approximately \$21,000 is associated with one additional woman breastfeeding exclusively for at least four months. In turn, an investment of \$100,000 would result in an additional 4.7 women breastfeeding exclusively for four months.

Table 8. Cost Effectiveness: Exclusive Breastfeeding

| Outcome: Breastfeeding | Cost of One Additional Woman Breastfeeding Exclusively for 4 Months | Number of Women Impacted by \$100,000 Investment |
|-----------------------------------|--|---|
| | \$21,000 | 4.7 |

To put this cost in context, it is important to look at the potential gains that are associated with breastfeeding. We do not have the data necessary to directly assign a monetary value to the benefits of the impact of Welcome Baby home visiting on breastfeeding, but we can

consider the cost effectiveness of Welcome Baby on exclusive breastfeeding given the literature on the benefits of breastfeeding.

Ball and Wright (1999), estimate that exclusive breastfeeding for three months is associated with per infant savings in medical costs for three conditions (lower respiratory illness, otitis media and gastrointestinal illness) ranging from \$331 to \$475 per infant compared to infants that were never breastfed. Our analyses compare babies exclusively breastfed for a longer period of time (four months) with all other babies, many of whom were breastfed for some amount of time (as opposed to never breastfed), so we might expect greater savings to be realized as a result of Welcome Baby. Furthermore, breastfeeding for four months is a critical milestone that predicts breastfeeding for even longer periods of time. And there is a good chance that the findings obscure other important breastfeeding milestones, including women who breastfed exclusively for less than four months, or women who continued to breastfeed while supplementing with formula.

Other studies have estimated even greater cost savings associated with breastfeeding's impact on reduced infant illnesses (e.g., ear infections, respiratory infections and gastrointestinal illnesses) and averted infant deaths e.g., SIDS, leukemia). For example, Bartick and Reinhold (2010) estimate that if 90 percent of women breastfeed for six months, the United States could save \$13 billion per year and prevent 911 deaths annually.

Additional economic benefits of breastfeeding have not been quantified, but breastfeeding has been shown to improve a wide range of social and emotional domains. For example, these effects include the cognitive development of children and secure maternal-infant attachment among others (Kramer et al. 2008, Britton 2006). Because the effects on infants can affect a lifetime, the potential benefits on school performance and later employment could be far reaching.

B. Cost of Reduced Risk of Developmental Delay

Welcome Baby home visiting affects several measures of child development. We have calculated cost effectiveness ratios for reduced risk of developmental delay in the area of social emotional skills. While we calculate a cost effectiveness ratio for this impact only, the outcome is related to other significant developmental impacts including several measures of parenting quality and a significant increase in early identification of potential speech and language delays. These findings, however, did not lend themselves to cost effectiveness analyses because they are measured by unstandardized mean scores—in turn, associating a dollar figure investment with a unit change in outcome cannot be done in an interpretable manner.

Using the average cost per woman of Welcome Baby divided by the incremental impact of 10 percentage point difference resulting in 140 fewer children in the Welcome Baby group who were identified as being at risk of developmental delay in social emotional skill development compared to those who did not receive the intervention, the cost per unit impact for this outcome is \$14,830. By extension, an investment of \$100,000 would result in 6.7 fewer children being at risk for delay.

For the finding that Welcome Baby is associated with increased early identification of potential speech and language delays, we find that the 3 percentage point difference between the Welcome Baby and Comparison group results in a cost per unit impact for this outcomes of \$49,500. Moreover, an investment of \$100,000 would result in 2 more children being recommended for early intervention for speech and language development.

Table 9. Cost Effectiveness: Child Development Outcomes

| <i>Outcomes</i> | Cost of One Fewer Child at Risk of Delay; Social Emotional Skills Development | Number of Children Impacted by \$100,000 Investment |
|---|--|--|
| <i>Reduced Risk of Developmental Delay</i> | \$14,800 | 6.7 |
| <i>Doctor Recommended Monitoring Speech and Language Development</i> | \$49,500 | 2.0 |

Children with developmental delay can experience a number of long term consequences, as can their parents—who can experience additional stress and financial strain (e.g., Baker et al. 2002). While the specific consequences are challenging to identify, and the extent and cause of the delay can vary dramatically, early developmental delays have been associated with school achievement problems (e.g., Sonnander and Claesson 1999) which in turn can be connected to reduced earning potential and other associated consequences. In addition, identifying and treating delays early in childhood, has been associated with a number of important long-term benefits including academic success (e.g., Karoly et al. 2005).

C. Limitations

There are a number of limitations to this analysis that should be taken into account. For one, the time parameters we utilized for the cost determinations differ from the time parameters utilized for determining the outcomes associated with Welcome Baby. This is significant because the cohort included in the Child and Family Survey may have received more than the standard protocol as a result of the fact that the program was not yet at capacity, so parent coaches had extra time to devote to participants (see Hill et al. 2011). Furthermore, the average cost per engagement is based on engagement point participation from a different

cohort—when we know, for instance, that prenatal engagement was particularly low. On the other hand, the program was still in its infancy, and may not have yet reached peak effectiveness or efficiency, so the child and family outcomes could be understated. Further, the costs and outcomes presented here are specific to Welcome Baby as piloted in the Metro LA community. These costs could potentially change after the expansion to more sites due to economies of scale related to specific costs, such as program expenses covered by the oversight entity, L.A. Best Babies Network, that were previously included in the Metro LA budget.

In addition, the quasi-experimental design of the outcomes analysis has certain shortcomings, particularly with regard to the comparison group. We recruited a comparison group from Metro LA, but the Welcome Baby program run by CHMC in partnership with MCH Access includes women from neighboring communities that differ demographically from residents of Metro LA and tend to be higher risk than the comparison group. The outcomes presented in this analysis thus potentially understate the impact that Welcome Baby. In turn, we expect that overall these cost estimates are conservative, since the program was just developing, participation was lower than desired, especially for the prenatal engagements and the impacts may be understated given the limitations of the selected comparison group.

Lastly, since Welcome Baby is a family-centered home visiting program that addresses the pressing needs of mothers enrolled, each engagement touches upon multiple topics, therefore having the potential to affect multiple domains. An early focus on breastfeeding is likely to affect breastfeeding outcomes, but may also involve discussions of self-care, support networks, and parenting quality. Additionally, we might expect that the greatest focus on engaging children in learning activities, like reading and singing to them, is concentrated during the later engagements when a focus shifts from sustaining infants (through feeding, safe sleep, etc.), to engaging with them. As noted earlier, the exercise of conducting a cost-effectiveness analysis is useful for associating a monetary investment with a particular outcome, but since a constellation of interconnected outcomes have been observed in Welcome Baby clients, these calculations likely overestimate the costs of affecting just one outcome. These calculations, while rough estimates of costs and cost effectiveness, help begin the conversation around possibilities for future sustainability for Welcome Baby.

V. DISCUSSION

Welcome Baby average program costs per participant are lower than other home visiting programs designed to affect similar outcomes, but Welcome Baby is also less intensive. The tradeoffs resulting from this design may be that Welcome Baby has less dramatic impacts on participating mothers. With regard to breastfeeding and reduced risk of developmental delay, Welcome Baby results are meaningful but modest. For an average cost of \$1,486 per woman, this locally designed home visiting program impacts several breastfeeding, parenting quality, and child development outcomes. While we have focused on three specific outcomes, which lend themselves to cost effectiveness analyses, it is critical to acknowledge that each dollar spent on affecting these outcomes also contributes to the constellation of related benefits realized by women receiving Welcome Baby.

Sustained Breastfeeding: A Worthwhile Investment; Costs May Be Overestimated

The long term and wide ranging benefits associated with breastfeeding initiation and duration are well documented in the literature and, generally speaking, a case can be made for the cost-effectiveness of this outcome for all women and infants. More refined cost estimates are likely to further support the cost effectiveness of Welcome Baby on exclusive breastfeeding outcomes. In addition, the potential impacts of Welcome Baby on breastfeeding outcomes are likely understated for reasons mentioned earlier, but it is also worth noting that the comparison group evaluated in the impacts analysis was drawn from a WIC sample—where women are also receiving breastfeeding counseling and support. If more dramatic outcomes were to be found in subsequent studies, the cost per unit increase would also be reduced. Further studies might consider more closely the monetary savings associated with infant and maternal health benefits and subsequent savings, as well as the social and emotional benefits of breastfeeding.

Welcome Baby Focus on Child Development Pays Off

The impact of Welcome Baby on child development outcomes is harder to quantify, but the program's focus on child development seems to be paying off based on findings from the Child and Family Survey. Though the incremental cost effectiveness ratios vary widely, there is a general trend indicating that the program is associated with sustained child development outcomes.

These outcomes have the potential to impact children's success long term and could be associated with costs savings ranging from reduced need for social and behavioral interventions to long term academic success, employment potential and reduced criminality. Again, assigning monetary value to these outcomes is challenging, but a case can be made for the potential long term cost savings that may be realized by families, the state and society as a whole.

Welcome Baby: More Evidence Needed to Make a Case for Sustainability

Overall, the findings from this study help begin to build a case for the benefits and, therefore, sustainability, of Welcome Baby, but more research is needed. While the findings from the Child and Family Survey suggest that Welcome Baby is having a significant and sustainable impact on improved child development outcomes, and breastfeeding results are even more compelling, the investments required to achieve those outcomes are relatively high. With enough time for sites to achieve fidelity to the model and cost savings related to the expansion, we are hopeful that these investments will diminish over time.

Long term sustainability of Welcome Baby would likely require the infusion of reimbursement from Medi-Cal or financial support from programs of the Department of Child and Family Services, whose stakeholders could envision programmatic and/or financial benefits from an expanded Welcome program. A continued exploration of the impacts associated with Welcome Baby, and further refinement of a cost effectiveness model that would account for the multiple and intertwined benefits realized, would go further in making the case for continued support of Welcome Baby.

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Appendix A: Descriptive Statistics of Child and Family Survey Sample

| | All Welcome Baby (n =446) | Comparison Group (n =278) |
|--|--|--|
| <i>Variable/Measure</i> | <i>Mean/%</i> | <i>Mean/%</i> |
| Male child | 53.8 | 51.4 |
| Child born prematurely | 9.0 | 9.4 |
| Child's age at time of survey (mos.) | 23.8 | 23.9 |
| First-time mom | 39.4 | 25.5 |
| Mother's age at birth of first child | 21.9 | 21.7 |
| Mother's age at birth of focal child | 27.2 | 28.3 |
| Mother's race/ethnicity | | |
| Black | 11.9 | 2.9 |
| White | 0.9 | 1.4 |
| Mexican | 59.0 | 65.0 |
| Salvadoran | 10.7 | 11.9 |
| Guatemalan | 8.2 | 8.7 |
| Other | 9.3 | 10.1 |
| Latina mother | 85.3 | 95.0 |
| Immigrant mother | 65.3 | 78.1 |
| Mother's primary language | | |
| English | 30.3 | 22.3 |
| Spanish | 69.0 | 76.2 |
| Other | 0.7 | 1.5 |
| Limited English proficient | 46.5 | 61.7 |
| Number of years living in LA | 15.2 | 14.0 |
| Mother is married | 38.4 | 38.1 |
| Mother has a spouse or boyfriend | 79.4 | 86.8 |
| Mother's highest education level | | |
| No formal schooling | 0.7 | 0.7 |
| Less than 9 th grade | 19.0 | 26.0 |
| 9 th through 11 th grade | 24.5 | 26.4 |
| A high school degree or GED | 28.7 | 31.1 |
| Vocational or trade school | 5.1 | 2.9 |
| Some college | 14.1 | 9.2 |
| Associates degree | 3.2 | 1.5 |
| Bachelor's degree or more | 4.6 | 2.2 |
| Mother has some post-secondary education | 27.1 | 15.8 |
| Mother currently enrolled in school | 15.7 | 13.3 |
| Mother currently employed | 36.3 | 27.1 |
| Currently looking for job if not employed | 39.4 | 30.2 |
| Monthly family income | | |
| < \$500 | 5.7 | 7.9 |
| \$500–\$999 | 33.2 | 24.9 |
| \$1,000–\$1,499 | 27.5 | 30.7 |
| \$1,500–\$1,999 | 18.3 | 20.9 |
| \$2,000 or more | 15.3 | 15.5 |
| Family size supported by income | 4.0 | 4.3 |

Appendix B: 12 and 24 Month Child and Family Survey Findings

12 Month Findings

Effects of *Welcome Baby!* Participation on Child and Family Outcomes at 12 Months

| Measured Outcome | Intervention Group Mean | Comparison Group Mean | Estimated Impact ¹ |
|---|-------------------------|-----------------------|-------------------------------|
| <i>Family and Maternal Well-being</i> | | | |
| Any depressive symptoms on PHQ-9 | .32 | .30 | .02 |
| Family functioning (FAD) | 37.87 | 37.57 | .30 |
| Perceived social support | 35.67 | 34.04 | 1.63* |
| CalFresh/SNAP receipt | .58 | .67 | -.19 |
| Child care subsidy receipt | .04 | .03 | .06 |
| CalWorks/TANF receipt | .26 | .24 | .05 |
| <i>Child Health and Nutrition</i> | | | |
| Child has health insurance | .97 | .98 | -.01 |
| Mother has health insurance | .68 | .61 | .07 |
| On-time child immunization | .95 | .97 | .02 |
| Emergency room visit due to accident or injury | .06 | .06 | .00 |
| Child overall health since birth at least good | .88 | .88 | .00 |
| Child identified as having special health care need | .93 | .94 | -.01 |
| Child sleeps alone in crib or bed | .42 | .36 | .06 |
| Breastfeeding attempted | .97 | .95 | .02* |
| Breastfeeding at birth hospital discharge | .90 | .87 | .04 |
| Exclusive breastfeeding | .40 | .33 | .07* |
| Duration of breastfeeding (months) | 7.30 | 7.58 | -.28 |
| <i>Parenting and Parent-Child Relationship</i> | | | |
| Parent Knowledge of Infant Development Inventory (KIDI) | 2.84 | 2.70 | .13 |
| Parental Attitudes towards Childrearing (PACR): strictness subscale | 20.38 | 20.41 | .03 |
| PICCOLO Teaching | 8.55 | 9.18 | -.62 |
| <i>Quality of Home Environment</i> | | | |
| HOME total scale | 34.78 | 34.43 | .35 |
| HOME literacy/learning materials subscale | 8.13 | 7.69 | .44** |
| HOME involvement subscale | 3.23 | 3.47 | -.25 |
| Engagement in activities | 44.05 | 42.66 | 1.40* |

Note: N ranged from 688 to 729. ** p < .01, * p < .05 in a one-tailed test.

¹ The estimated impact equals the difference between the adjusted mean for the intervention group and the adjusted mean for the comparison group. Means are adjusted for demographic characteristics, including child gender, child age at assessment, prematurity, mother's age at the child's birth, being a first-time mother, maternal education level, maternal employment status, Latina heritage, limited English proficiency, and maternal partnership status.

24 Month Findings

Effects of Welcome Baby on Parenting and the Parent-Child Relationship at 24 Months

| Welcome Baby | | | |
|---|-----------------------------|--|-----------------------------|
| Outcomes at 24 Months | All Welcome Baby (n=446) | Welcome Baby in Metro LA Only (n=204) | Comparison Group (n=278) |
| | Mean or % | Mean or % | Mean or % |
| Parenting and Parent-Child Relationship | | | |
| PICCOLO Teaching (<i>below 8=risk</i>) | 11.1 | 10.9 | 10.7 |
| PICCOLO Affect (<i>below 11=risk</i>) | 12.7 | 12.7 | 12.6 |
| PICCOLO Responsiveness (<i>below 11=risk</i>) | 12.7** | 12.9* | 12.3 |
| PICCOLO Encouragement (<i>below 10=risk</i>) | 12.8* | 12.7 | 12.5 |
| Quality of child interactions with mother during observed play activity | 17.4 | 17.4 | 17.4 |
| Use of negative discipline strategies (%) | 8.3 | 6.7 | 9.8 |
| Use of spanking (%) | 55.3 | 50.8 | 49.1 |
| More than one instance of physical punishment within last week (%) | 13.9 | 11.2 | 9.1 |

** p < .01, * p < .05 in a one-tailed test.

Effects of Welcome Baby on Child Development at 24 Months

| Welcome Baby | | | |
|---|-----------------------------|-------------------------------------|-----------------------------|
| Outcomes at 24 Months | All Welcome Baby (n=446) | Welcome Baby in Metro LA (n=204) | Comparison Group (n=278) |
| | Mean or % | Mean or % | Mean or % |
| Child Development | | | |
| Ages and Stages Questionnaires (ASQ-3) | | | |
| Subscale Means (subscale range=0–60) | | | |
| Communication (below 25.17=risk) | 48.0* | 48.6* | 45.8 |
| Gross Motor (below 38.07=risk) | 52.8 | 53.1 | 53.2 |
| Fine Motor (below 35.16=risk) | 49.4 | 49.0 | 48.5 |
| Problem Solving (below 29.78=risk) | 50.2 | 50.2 | 48.9 |
| Personal-Social (below 31.54=risk) | 50.5 | 50.7 | 49.4 |
| Doctor recommended monitoring speech and language development (%) | 6.6* | 6.1 | 4.2 |
| Child identified as having developmental delay or special need (%) | 5.9 | 6.1 | 7.2 |
| Types of services or treatments received | | | |
| Speech therapy (%) | 4.9 | 3.1 | 5.7 |
| Occupational therapy (%) | 3.1 | 3.1 | 3.4 |
| BITSEA Competency Scale (below 16=risk for girls; below 15=risk for boys) | 17.8* | 17.8* | 17.3 |
| BITSEA Problem Behaviors Scale (above 12=risk for girls; above 13=risk for boys) | 14.5 | 14.0 | 13.7 |

Effects of Welcome Baby on Child Nutrition at 24 Months

| Outcomes at 24 Months | Welcome Baby | | Comparison Group (n=278) |
|---|-----------------------------|-------------------------------------|-----------------------------|
| | All Welcome Baby (n=446) | Welcome Baby in Metro LA (n=204) | |
| | Mean or % | Mean or % | |
| Child Nutrition | | | |
| Child consumption of healthy foods in past week (<i>scale range=6–30</i>) | 20.7 | 20.7 | 20.5 |
| Child consumption of unhealthy foods in past week (<i>scale range=5–25</i>) | 10.6 | 10.5 | 10.6 |
| Maternal ratings of nutritional elements (<i>scale range=8–32</i>) | 26.4 | 26.6 | 26.9 |
| Child eats breakfast (%) | 97.1 | 97.5 | 97.0 |
| Child eats dinner at table with family (%) | 87.5 | 88.8 | 86.8 |

Effects of Welcome Baby on Maternal and Child Physical Health at 24 Months

| Outcomes at 24 Months | Welcome Baby | | Comparison Group (n=278) |
|---|-----------------------------|-------------------------------------|-----------------------------|
| | All Welcome Baby (n=446) | Welcome Baby in Metro LA (n=204) | |
| | Mean or % | Mean or % | |
| Child Weight | | | |
| Child BMI ¹ | 17.6 | 17.9 | 17.7 |
| Child overweight or obese (BMI 85% or above) (%) ¹ | 30.1 | 37.2 | 35.4 |
| Child weight-for-age percentile 95 or above (%) | 15.4 | 15.8 | 19.4 |

Effects of Welcome Baby on Maternal and Child Physical Health at 24 Months

| Outcomes at 24 Months | Welcome Baby | | Comparison Group (n=278) |
|---|-----------------------------|-------------------------------------|-----------------------------|
| | All Welcome Baby (n=446) | Welcome Baby in Metro LA (n=204) | |
| | Mean or % | Mean or % | |
| Maternal and Child Physical Health | | | |
| Child experienced a break in health coverage or no health insurance in past year (%) | 8.5 | 9.1 | 5.0 |
| Child dental coverage (%) | 88.0 | 88.6 | 88.4 |
| Child dental visit in past year (%) | 47.1 | 49.2 | 50.9 |
| Mother experienced a break in health coverage or no health insurance in past year (%) | 30.2 | 28.0 | 23.7 |
| Mother dental coverage (%) | 23.1 | 22.6 | 14.0 |
| Mother dental visit in past year (%) | 40.8 | 38.7 | 45.9 |
| Mother has smoked since child's birth (%) | 7.1 | 7.1 | 3.1 |
| Went to 18-month well-baby visit (%) | 96.5 | 95.9 | 95.1 |
| On-time child immunization (%) | 87.5 | 89.9 | 92.4 |

| | | | |
|--|------|------|------|
| Emergency room visit due to accident or illness in past year (%) | 31.8 | 32.5 | 29.2 |
| More than one ER visit in past year (%) | 13.9 | 14.2 | 9.9 |
| Child did not go to doctor when needed to (%) | 6.1 | 6.6 | 4.2 |
| Child health problems identified by physician (%) | | | |
| Chronic ear infections | 10.1 | 8.6 | 10.6 |
| Asthma | 5.7 | 0.0 | 3.8 |
| Underweight | 10.4 | 11.7 | 7.2 |
| Overweight | 6.8 | 5.6 | 8.8 |

Effects of Welcome Baby on Maternal Mental Health at 24 Months

| Outcomes at 24 Months | Welcome Baby | | Comparison Group (n=278) |
|---|-----------------------------|-------------------------------------|-----------------------------|
| | All Welcome Baby (n=446) | Welcome Baby in Metro LA (n=204) | |
| | Mean or % | Mean or % | |
| Maternal Mental Health | | | |
| Any depressive symptoms (PHQ-9) (%) | 33.5 | 32.0 | 33.8 |
| Parental distress (PSI) (scale range=12–60) | 26.5 | 26.5 | 26.9 |
| Dysfunctional parent-child interactions (PSI) (scale range=12–60) | 20.5 | 20.8 | 20.3 |
| Received social support (scale range=12–36) | 27.6 | 27.5 | 27.0 |

Effects of Welcome Baby on Family Well-being and Sources of Economic Support at 24 Months

| Outcomes at 24 Months | Welcome Baby | | Comparison Group (n=278) |
|---|-----------------------------|-------------------------------------|-----------------------------|
| | All Welcome Baby (n=446) | Welcome Baby in Metro LA (n=204) | |
| | % | % | |
| Family Well-being and Sources of Economic Support | | | |
| Material hardship | | | |
| Could not afford to pay full rent | 26.4 | 24.4 | 25.3 |
| Evicted | 2.6 | 2.5 | 1.5 |
| Could not pay gas, oil, or electric bill | 25.7 | 26.4 | 24.2 |
| Utilities shut off | 4.0 | 1.5 | 3.8 |
| Phone service disconnected | 13.9 | 13.7 | 12.8 |
| Food insecure | 31.4 | 35.7 | 29.9 |
| CalFresh/SNAP receipt | 65.9 | 65.5 | 69.8 |
| CalWorks/cash aid receipt | 29.7 | 25.9 | 27.8 |
| Home energy assistance receipt | 14.7 | 13.8 | 10.2 |
| Child care subsidy receipt, among mothers using non-parental child care (n=257) | 21.1 | 25.6 | 16.2 |